NIILM UNIVERSITY

Ph.D. Course Work in Biochemistry

Academic Session 2024-25

<center>**Ph.D. Regulations Regarding Course Work**</center>

<center>Clause 18: Ph.D. Ordinance NIILM University as per UGC Minimum Standards and Procedure for Award of Ph.D. Degrees Regulations 2022 with effect from academic session 2024-25</center>

I. The coursework shall be treated as a prerequisite for Ph.D. preparation. In the first year of registration, all research scholars are required to complete the course work for one semester following their provisional registration as a part of the Ph.D. program. It is mandatory to complete the course work in first 4 semesters to stay in the Ph.D. program. If a student fails to complete the coursework in first 4 semesters, will have to leave the program.

II. Earning a minimum of 12 total credits and a maximum of 16, is required.

III. Usually a course refers to a 'paper' and is a component of an academic program. Courses in Ph.D. course work shall be of two kinds: Core and Elective.

IV. A core course is a compulsory paper to be studied by all the scholars to complete the requirements of the Ph.D. degree.

V. Elective course is a course which is discipline specific and provided by the particular department from the main discipline or from a sister/related discipline which supports the main discipline, on mutual consent of the concerned departments.

VI. One credit equal to 15 contact hours for theory-based teaching or 30 hours of contact time for practical or activity-based teaching.

VII. The number of credits is given in the form L: T:P, where L indicates the number of contact hours of lecture, and T the number of contact hours for tutorials, P stands for laboratory credits.

VIII. The credits are distributed as follows:

Paper Code	Paper	Course type	Credit	L	T	P
PHD-ARM-101	Advanced Research Methodology	Core	4	3	1	0
PHD-DSC-102	Discipline Specific Course	Elective	4	3	1	0
PHD-RPE-103	Research and Publication Ethics	Core	2	1	1	0
PHD-SEM-104	Academic Writing, Literature Review and Seminar	Skill	2	0	1	2
	Total		**12**			

IX. All Ph.D., entrants irrespective of discipline, shall be trained in teaching proficiency related to teaching/education/pedagogy/writing related to their chosen Ph.D. subject during their doctoral training period, that include assigning 4-6 hours per week of teaching/ research assistantship for conducting tutorial or laboratory work and evaluations.

X. Courses PHD-SEM 104 includes research work on research article writing, seminar presentation and course PHD-TP 105 includes pedagogical training. Both these courses will be assessed internally without Semester End Examination.

XI. CoE will conduct Term/ Semester End Exam in PHD-ARM-101, PHD-DSC-102, and PHD-RPE-103.

XII. PHD-TP 105 is a non-credit course and internal assessment will be marked on the detailed mark card of the course work.

XIII. Advance Research Methodology course will include common research methodology and subject specific research methodology.

XIV. Research Advisory Committee may provide choices in selecting the courses/ credits that facilitates the entrepreneur in the monetization of IP thus generated.

XV. RAC can also recommend UGC recognized online courses as part of the credit requirements for the Ph.D. program.

XVI. Paper- will comprise of the following two activities:

(a)   External Assessment: Written Question Paper 70/39

(b)   Internal Assessment: 30/16

Marks will be converted into letter grade and grade point as per following table:

Marks	Letter Grade	Grade Point
81-100	A+	10
76-80	A	9
66-75	B+	8
61-65	B	7
55-60	C	6
Less than 55	F	0

The computation of the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA) shall be done as per University Examination Ordinance or Examination Rules & Regulations issued time to time.

The result and grade sheet for the course work will carry pass/ fail result.

COURSE WORK PAPER

I. Candidates who already hold an M. Phil. degree and have been accepted into the Ph.D. program, or those who have finished their M.Phil. Coursework and have been given permission to continue on to the Ph.D. in an integrated course, may be exempted from the Ph.D. course requirements by the Department. All additional applicants accepted into the Ph.D. program must complete the Ph.D. coursework required by the Department.

II. The NIILM University attendance rules, a minimum 75% attendance is must require, will be applied to all full-time research scholars. For the duration of their coursework, part-time research researchers must, nevertheless, adhere to the same rules.

III. A Ph.D. scholar has to obtain a minimum of 55% of marks or a minimum CGPA of 6.0 in the UGC 10-point scale (or an equivalent grade/CGPA in a point scale wherever grading system is followed) in the course work in order to be eligible to continue in the program and submit the thesis.

IV. Registration will be automatically canceled if the required course work is not completed with a minimum of 55% of marks/a minimum CGPA of 6.0 within the allotted time. If the course work is not finished within a year, the RAC and DRC may suggest a six-month extension or suggest that the registration be canceled with the DRC.

V. There is no provision of improvement or special supplementary exam to be conducted. Coursework will be offered in four semesters of first two years with regular & supplementary exams to avail the opportunity to clear the coursework in 2 years. **Failure to complete the course in 2 years means that the student has to leave the program.**

Course Structure:

PHD-ARM-101	Advance Research Methodology in Biochemistry	Credit Distribution: L:3, T:1, P:0=4
Course Objectives:	To acquaint the students with research process. To train them in the research methods and designs and to equip them to take up researches independently.	
Unit 1	**Introduction to Research** a. Nature and aims of research	

	b. Dimensions and types of research
	c. Theory and research
	d. The meaning of methodology
	e. Types of Methods of Research
Unit 2	**Research Planed Data Collection**
	a. Concept, logic, and research question/issues
	b. Variables, causal theory, and hypothesis
	c. Research Design and Collection of Data
	d. Sampling: Methods, Size, Errors
	e. Probability and non-probability
	f. Measurement and Scaling Techniques
	g. Issues in measurement: Qualitative and quantitative
Unit 3	**Data Processing**
	a. Analysis of quantitative data introduction to higher order statistics
	b. Editing, Coding and Classification of Data
	c. Analysis of qualitative data and Tabulation
	d. Introduction to advanced statistical techniques using SPSS
	e. Statistical Derivatives and Measures of Central Tendency
	f. Measures of Variation and Skewness
	g. Correlation and Simple Regression
	h. Diagrammatic and Graphic Presentation of Data
Unit 4	**Research Report Writing**
	a. Ethical issues in research
	b. APA style of writing concept
	c. APA style of writing: Referencing
	d. d. Research article writing
Unit 5	**Computer Application in Research**
	a. Introduction to MS Excel, Using Formulas and Functions
	b. Hand on to SPSS
	c. Features for Statistical Data Analysis
	d. Generating Charts/Graphs
	e. Introduction to MS Word, Features and Functions, Writing Report in MS Word
	f. Introduction to Open Office or Latex
	g. Creating Presentation in MS PowerPoint
	h. Introduction to Internet-Based Search
	i. Use of Advanced Research Techniques.

Recommended Readings:

1. Bayard, P. & Grayson, A. (1976). Introducing psychological research. London: McMillan.

2. Bordens, K.S. & Abbot, B.B. (2005). Research design and methods. New Delhi: Tata McGraw Hill.

3. Breakwell, G.M. Hammond, S. & Fife-Schaw, C. (1995). Research Methods in Psychology. New Delhi: Sage Publications.

4. Cresswell, J.W. (1994) Research design: L Qualitative and quantitative approaches. Thousand Oaks, CA: Sage Publication.

5. Drew, C.J.: Hardman, M.L. & Hart, W.A. (1996). Designing and conducting research: Inquiry in education and social science. New York: Allyn& Bacon.

6. Kerlinger, F.N. (1982). Foundations of behavioural research. Delhi: Subject Publication.

7. Nation, J.R. (1997). Research Methods. New Jersey: Prentice Hall.

8. Willing, C. & Stainton-Rogers, W. (Eds.) (2008). The Sage Handbook of Qualitative Research in Psychology. New Delhi: Sage Publications.

PHD-DSC-102	Discipline Specific Course (Tools and Techniques in Biochemistry Research)	Credit Distribution: L:3, T:0, P:1=4
Learning Outcomes	• Understand and apply both chemical and enzymatic methods for the analysis, separation, and identification of carbohydrates, lipids, and amino acid mixtures. • Learn about random and site-directed mutagenesis techniques for gene editing and functional studies.	
Unit 1	**Analytical techniques:** Chemical and enzymatic methods of carbohydrate analysis, separation and identification of carbohydrates, lipids and amino acids mixtures; principle and methods of protein separation techniques, basic of chromatography-gel filtration, Ion exchange, affinity, HPLC, FPLC, Electrophoresis- SDS, AGE, IEF, protein-protein interaction, immune-precipitation, DNA-protein interaction, EMSA, Chip assay and yeast two hybrid systems. Basic of Spectroscopy-UV-Vis, Fluorescence, CD, FTIR, NMR, X-ray crystallography, SPR; Basic of Microscopy- light, fluorescence, confocal, electron microscopy, phage-contrast, super-resolution	
Unit 2	**Recombinant DNA technology:** Isolation and purification of nucleic acids; amplification of DNA using PCR, recombinant PCR, Asymmetric PCR, nested PCR, use of restriction and modification in enzymes in cloning, plasmid vectors, λ phage, BAC, PAC, random and site directed mutagenesis, DNA sequencing, next generation sequencing, Principle and applications of southern, northern and western blotting, Recombinant protein expression and purification in different host systems.	
Unit 3	**Genomics and proteomics:** Whole genome analysis of mRNA and protein expression, real time PCR to monitor changes in gene expression profile, concept of micro arrays, PCR & microRNA array and its application. Animal and plant transformation: Plant transformation methods including tissue culture, non-tissue culture based, Agrobacterium mediated co-cultivation, plant vectors, particle bombardment. Methods of making transgenic and knockout animals, global knockout, conditional knockout, Creloxp and CRISPER/CAS knockout systems, codon biased and optimization, animal cell line and cell culture techniques.	
Unit 4	Molecular evolution and enhancement of protein's function, personalized medicine, pre-clinical and clinical trial, Homology modelling, basic of molecular docking, computer aided ligand-protein and DNA-protein interaction.	

Books recommended:

• Voet D., Voet J.G, Biochemistry 4[th]Edition. John Wiley and Sons, 2011.

- Nelson, D. C. andCox, M.M., Lehninger Principles of Biochemistry, 5thEdition, W. H.Freeman, 2010.
- Berg J.M., Tymoczko J.L. and Stryer L., Biochemistry. 7th edition, W.H. Freeman and Co.New York, 2011.
- Molecular biology by Robert F. Weaver McGraw-Hill 4 edition (2007)
- Advanced molecular biology by R. M. Twyman, (1998)
- Genes VII by B. Lewin Oxford University Press, Cell Press, London (2000)

PHD-DSC-102	Discipline Specific Course (Advanced Cancer Biology)	Credit Distribution: L:3, T:0, P:1=4
Learning Outcomes	• Understand the basic structure and function of cells and organisms, including their genetic and molecular components. • Understand how tumors stimulate the growth of new blood vessels (angiogenesis) to supply nutrients and oxygen for their growth.	
Unit 1	The Biology and Genetics of Cells and Organisms The Nature of Cancer Tumor suppressors and oncogenes Multistep tumorigenesis Migration, Invasion and metastasis Epithelial to Mesenchymal Transition Angiogenesis, Apoptosis and Autophagy	
Unit 2	Microenvironment of Tumor cells Stroma Interaction Tumor immunology Animal models for cancer growth and metastasis Cancer stem cells	
Unit 3	Abnormal cell signalling for cancer growth Signalling for metastasis and stem cells Reprogramming of metabolism and rewiring of signaling network Osteoblastic and osteolytic metastasis Role of PTHrP, CSF-1 and RANKL in cancer progression and metastasis.	
Unit 4	Therapeutic Intervention Success and failure of present therapies Immunotherapy Micro-RNA mediated cancer treatment and targeted drug delivery, Drug resistance Molecular diagnosis, prognosis and stem cell therapy.	

Books recommended:

- The Biology of Cancer, 2nd Edition, Robert AWeingberg, ISBN-10: 0815342209,ISBN-13: 978-0815342205
- Cancer Biology, 4th Edition, Raymond W Ruddon, ISBN-10: 0195175441 | ISBN13: 978-0195175448

PHD-DSC-102	Discipline Specific Course (Molecular Insights of Bacterial Infection and	Credit Distribution: L:3, T:0, P:1=4

	Therapeutics)	
Learning Outcomes	• Understand how some pathogens manipulate the host immune system to induce immune tolerance, preventing the immune system from attacking the pathogen. • Understand how molecular docking, virtual screening, and bioinformatics can be applied to discover new drug candidates.	
Unit 1	Mechanism of bacterial infection: Molecular basis of bacterial pathogenesis and virulence, bacterial biofilm, bacterial persistence, bacterial secreting systems, cell wall biosynthesis, hospital acquired infections and ESKAPE pathogens, biology and distribution of infection caused by A. baumannii, P. aeruginosa, S. aureus, K. pneumoniae, S. typhi, S. typhimurium, M. tuberculosis, E. coil, H. pylori, and V. cholera etc.	
Unit 2	Host-pathogen interaction: Interaction of host and microbes process of recognition and entry in host cells by different pathogens, human microbiome and their symbiotic relation, alteration of host cell behaviour and signaling by pathogens, Sensors of bacterial colonization, mechanisms of immune tolerance and alteration of host cell behaviour by pathogens, mechanism of bacterial coinfection like tuberculosis with HIV etc.	
Unit 3	Current therapeutics and their resistance: Antibiotics: classes and mechanism of action, Surveillance model for prediction of antimicrobial susceptibility; Bacterial drug resistance mechanism; Diagnosis of bacterial infection: 16S sequencing, PCR, ELISA, microscopy, antimicrobial susceptibility assay, model systems to understand pathogenic mechanisms	
Unit 4	Design of new therapeutics and their validation: In-silico approach to develop new therapeutics, Identification of drug targets; Vaccine design and validation; synthesis, characterization, mechanism and delivery of nanomedicine; screening, characterization and development of secondary metabolites based herbal medicine; screening of novel antibiotics from novel sites like soil etc using metagenomics, experimental validation of novel therapeutics in animal model.	

Books recommended:

• Michael J Pelczar, Microbiology, Tata McGraw, India.
• Prescott's Microbiology 8th Edition by Joanne Willey , Linda Sherwood , ChrisWoolverton

PHD-RPE-103	**Research and Publication Ethics**	**Credit Distribution: L:1, T:1, P:0=2**
Learning Outcomes	1. To have awareness about the publication ethics and publication misconducts. 2. To understand indexing and citation databases, open access publications, research metrics (citations, h-index, impact factor etc) 3. Develop hands-on skills to identify research misconduct and predatory publications.	
Unit 1	**Philosophy and Ethics (4 hrs)**	

	1. Introduction to philosophy: definition, nature and scope, concept, branches 2. Ethics: definition, moral philosophy, nature of moral judgements and reactions
Unit 2	**Scientific Conduct (4 hrs)** 1. Ethics with respect to science and research 2. Intellectual honesty and research integrity 3. Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP) 4. Redundant publications: duplicate and overlapping publications, salami slicing 5. Selective reporting and misrepresentation of data
Unit 3	**Publication Ethics (7 hrs)** 1. Publication ethics: definition, introduction and importance 2. Best practices / standards setting initiatives and guidelines: COPE, WAME, etc. 3. Conflicts of interest 4. Publication misconduct: definition, concept, problems that lead to unethical behavior and vice versa, types 5. Violation of publication ethics, authorship and contributorship 6. Identification of publication misconduct, complaints and appeals 7. Predatory publishers and journals
Unit 4 Practice	**Open Access Publishing (4 hrs)** 1. Open access publications and initiatives 2. SHERPA/ROMEO online resource to check publisher copyright &self-archiving policies 3. Software tool to identify predatory publications developed by SPPU 4. Journal finder / journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer Journal Suggester, etc.
Unit 5 Practice	**Publication Misconduct (4 hrs)** A. Group Discussions (2 hrs.) 1. Subject specific ethical issues, FFP, authorship 2. Conflicts of interest 3. Complaints and appeals: examples and fraud from India and abroad B. Software tools (2 hrs.) Use of plagiarism software like Turnitin, Urkundand other open source software tools
Unit 6 Practice	**Databases and Research Metrics (7 hrs)** A. Databases (4 hrs.) 1. Indexing databases 2. Citation databases: Web of Science, Scopus etc. B. Research Metrics (3 hrs.) 1. Impact Factor of journal as per Journal Citation Report, SNIP, SJR, IPP, Cite Score 2. Metrics: h-index, g-index, i10 index, altmetrics

Suggested Readings

1. Bird, A. (2006). Philosophy of Science. Routledge.
2. MacIntyre, A. (1967) A Short History of Ethics. London.
3. P. Chaddah, (2018) Ethics in Competitive Research: Do not get scooped; do not getplagiarized, ISBN:978-9387480865
4. National Academy of Sciences, National Academy of Engineering and Institute ofMedicine. (2009). On Being a Scientist: A Guide to Responsible Conduct in Research:Third Edition. National Academies Press.
5. Rensik, D. B. (2011). What is ethics in research & why is it important. National Instituteof Environmental Health Sciences, 1-10. Retrieved fromhttps://www.niehs.nih.gov/resources/biothics/whatis/index.cfm
6. Beall, J. (2012). Predatory publishers are corrupting open access. Nature, 489(7415),179-179. https://doi.org/10.1038/489179a

NIILM UNIVERSITY

Ph.D. Course Work in Biotechnology

Academic Session 2024-25

Ph.D. Regulations Regarding Course Work

Clause 18: Ph.D. Ordinance NIILM University as per UGC Minimum Standards and Procedure for Award of Ph.D. Degrees Regulations 2022 with effect from academic session 2024-25

I.   The coursework shall be treated as a prerequisite for Ph.D. preparation. In the first year of registration, all research scholars are required to complete the course work for one semester following their provisional registration as a part of the Ph.D. program. It is mandatory to complete the course work in first 4 semesters to stay in the Ph.D. program. If a student fails to complete the coursework in first 4 semesters, will have to leave the program.

II.   Earning a minimum of 12 total credits and a maximum of 16, is required.

III.   Usually a course refers to a 'paper' and is a component of an academic program. Courses in Ph.D. course work shall be of two kinds: Core and Elective.

IV.   A core course is a compulsory paper to be studied by all the scholars to complete the requirements of the Ph.D. degree.

V.   Elective course is a course which is discipline specific and provided by the particular department from the main discipline or from a sister/related discipline which supports the main discipline, on mutual consent of the concerned departments.

VI.   One credit equal to 15 contact hours for theory-based teaching or 30 hours of contact time for practical or activity-based teaching.

VII.   The number of credits is given in the form L: T:P, where L indicates the number of contact hours of lecture, and T the number of contact hours for tutorials, P stands for laboratory credits.

VIII. The credits are distributed as follows:

Paper Code	Paper	Course type	Credit	L	T	P
PHD-ARM-101	Advanced Research Methodology	Core	4	3	1	0
PHD-DSC-102	Advances in Biotechnology	Elective	4	1	1	2
PHD-RPE-103	Research and Publication Ethics	Core	2	1	1	0
PHD-SEM-104	Academic Writing, Literature Review and Seminar	Skill	2	0	1	2
	Total		12			

IX.   All Ph.D., entrants irrespective of discipline, shall be trained in teaching proficiency related to teaching/education/pedagogy/writing related to their chosen Ph.D. subject during their doctoral training period, that include assigning 4-6 hours per week of teaching/ research assistantship for conducting tutorial or laboratory work and evaluations.

X.   Courses PHD-SEM 104 includes research work on research article writing, seminar presentation and course PHD-TP 105 includes pedagogical training. Both these courses will be assessed internally without Semester End Examination.

XI.   CoE will conduct Term/ Semester End Exam in PHD-ARM-101, PHD-DSC-102, and PHD-RPE-103.

XII.   PHD-TP 105 is a non-credit course and internal assessment will be marked on the detailed mark card of the course work.

XIII. Advance Research Methodology course will include common research methodology and subject specific research methodology.

XIV.   Research Advisory Committee may provide choices in selecting the courses/ credits that facilitates the entrepreneur in the monetization of IP thus generated.

XV.   RAC can also recommend UGC recognized online courses as part of the credit requirements for the Ph.D. program.

XVI.   Paper- will comprise of the following two activities:

(a) External Assessment: Written Question Paper 70/39

(b) Internal Assessment: 30/16

Marks will be converted into letter grade and grade point as per following table:

Marks	Letter Grade	Grade Point
81-100	A+	10
76-80	A	9
66-75	B+	8
61-65	B	7
55-60	C	6
Less than 55	F	0

The computation of the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA) shall be done as per University Examination Ordinance or Examination Rules & Regulations issued time to time.

The result and grade sheet for the course work will carry pass/ fail result.

COURSE WORK PAPER

I.   Candidates who already hold an M. Phil. degree and have been accepted into the Ph.D. program, or those who have finished their M.Phil. Coursework and have been given permission to continue on to the Ph.D. in an integrated course, may be exempted from the Ph.D. course requirements by the Department. All additional applicants accepted into the Ph.D. program must complete the Ph.D. coursework required by the Department.

II. The NIILM University attendance rules, a minimum 75% attendance is must require, will be applied to all full-time research scholars. For the duration of their coursework, part-time research researchers must, nevertheless, adhere to the same rules.

III. A Ph.D. scholar has to obtain a minimum of 55% of marks or a minimum CGPA of 6.0 in the UGC 10-point scale (or an equivalent grade/CGPA in a point scale wherever grading system is followed) in the course work in order to be eligible to continue in the program and submit the thesis.

IV. Registration will be automatically canceled if the required course work is not completed with a minimum of 55% of marks/a minimum CGPA of 6.0 within the allotted time. If the course work is not finished within a year, the RAC and DRC may suggest a six-month extension or suggest that the registration be canceled with the DRC.

V. There is no provision of improvement or special supplementary exam to be conducted. Coursework will be offered in four semesters of first two years with regular & supplementary exams to avail the opportunity to clear the coursework in 2 years. **Failure to complete the course in 2 years means that the student has to leave the program.**

Course Structure:

PHD-ARM-101	Advance Research Methodology in Biotechnology	Credit Distribution: L:3, T:1, P:0=4
Course Objectives:	To acquaint the students with research process. To train them in the research methods and designs and to equip them to take up researches independently.	

Unit 1	Introduction to Research
	a. Nature and aims of research
	b. Dimensions and types of L research
	c. Theory and research
	d. The meaning of methodology
	e. Types of Methods of Research
Unit 2	Research Planed Data Collection
	a. Concept, logic, and research question/issues
	b. Variables, causal theory, and hypothesis
	c. Research Design and Collection of Data
	d. Sampling: Methods, Size, Errors
	e. Probability and non-probability
	f. Measurement and Scaling Techniques
	g. Issues in measurement: Qualitative and quantitative
Unit 3	Data Processing
	a. Analysis of quantitative data introduction to higher order statistics
	b. Editing, Coding and Classification of Data
	c. Analysis of qualitative data and Tabulation
	d. Introduction to advanced statistical techniques using SPSS
	e. Statistical Derivatives and Measures of Central Tendency
	f. Measures of Variation and Skewness
	g. Correlation and Simple Regression
	h. Diagrammatic and Graphic Presentation of Data
Unit 4	Research Report Writing
	a. Ethical issues in research
	b. APA style of writing concept
	c. APA style of writing: Referencing
	d. d. Research article writing
Unit 5	Computer Application in Research
	a. Introduction to MS Excel, Using Formulas and Functions
	b. Hand on to SPSS
	c. Features for Statistical Data Analysis
	d. Generating Charts/Graphs
	e. Introduction to MS Word, Features and Functions, Writing Report in MS Word
	f. Introduction to Open Office or Latex
	g. Creating Presentation in MS PowerPoint
	h. Introduction to Internet-Based Search
	i. Use of Advanced Research Techniques.

Recommended Readings:

1. Bayard, P. & Grayson, A. (1976). Introducing psychological research. London: McMillan.

2. Bordens, K.S. & Abbot, B.B. (2005). Research design and methods. New Delhi: Tata McGraw Hill.

3. Breakwell, G.M. Hammond, S. & Fife-Schaw, C. (1995). Research Methods in Psychology. New Delhi: Sage Publications.

4. Cresswell, J.W. (1994) Research design:L Qualitative and quantitative approaches. Thousand Oaks, CA: Sage Publication.

5. Drew, C.J.: Hardman, M.L. & Hart, W.A. (1996). Designing and conducting research: Inquiry in education and social science. New York: Allyn& Bacon.

6. Kerlinger, F.N. (1982). Foundations of behavioural research. Delhi: Subject Publication.

7. Nation, J.R. (1997). Research Methods. New Jersey: Prentice Hall.

8. Willing, C. & Stainton-Rogers, W. (Eds.) (2008). The Sage Handbook of Qualitative Research in Psychology. New Delhi: Sage Publications.

PHD-DSC-102	Discipline Specific Course (Biotechnology)	Credit Distribution: L:3, T:0, P:1=4
Learning Outcomes	- Master state-of-the-art tools and technologies shaping modern biotechnology and their interdisciplinary applications. - Evaluate biotechnological advancements in agriculture for food security and environmental sustainability. - Understand the role of microbial and animal biotechnology in industrial and environmental applications. - Analyze how innovations in medical and pharmaceutical biotechnology are transforming healthcare and therapeutics.	

Unit 1	**Cutting-Edge Tools and Emerging Technologies** (Branches: **Genomics, Proteomics, Bioinformatics, Nano biotechnology, Synthetic Biology**)
	1. **Advanced Analytical Tools:**
	   o Next-generation sequencing (NGS) and third-generation sequencing technologies.
	   o Mass spectrometry for proteomics and metabolomics.
	   o Single-cell and spatial omics technologies.
	2. **Emerging Technologies:**
	   o CRISPR-Cas and related genome-editing systems.
	   o Synthetic biology: Minimal genomes, synthetic cells, and biofoundries.
	   o Organoids and organ-on-chip models for disease modelling.
	3. **Interdisciplinary Innovations:**
	   o Artificial intelligence (AI) and machine learning (ML) in data analysis.
	   o Nano biotechnology: Nanoparticles in diagnostics and drug delivery.
	   o Bioprinting and tissue engineering for regenerative medicine.	

Unit 2	**Advances in Plant and Agricultural Biotechnology** (Branch: **Plant Biotechnology**)
	1. **Crop Improvement:**
	   o Genome editing for stress tolerance, higher yield, and nutritional enhancement.
	   o Applications of RNA interference (RNAi) and gene silencing in crop protection.
	2. **Sustainable Agriculture:**
	   o Biopesticides, biofertilizers, and microbial inoculants.
	   o Precision agriculture using biosensors and drones.
	3. **Plant Tissue Culture and Propagation:**	

	o Innovations in micro propagation techniques.
	o Production of secondary metabolites and phytochemicals.
	4. **Environmental Applications:**
	    o Phytoremediation using genetically engineered plants.
	    o Climate-resilient agriculture through biotechnological interventions.

Unit 3	**Advances in Animal and Microbial Biotechnology**
	(Branches: **Animal Biotechnology, Microbial Biotechnology**)
	1. **Animal Biotechnology:**
	    o Gene editing and cloning technologies for livestock improvement.
	    o Transgenic animals as disease models and for pharmaceutical production.
	    o Stem cell and regenerative technologies in veterinary applications.
	2. **Microbial Biotechnology:**
	    o Microbial bio factories for biofuels, bioplastics, and enzymes.
	    o Role of microbiomes in health, agriculture, and the environment.
	    o Innovations in biocontrol and bioremediation.
	3. **Industrial Applications:**
	    o Advances in fermentation technology.
	    o Synthetic biology approaches for microbial engineering.

Unit 4	**Advances in Medical and Pharmaceutical Biotechnology**
	(Branches: **Medical Biotechnology, Pharmaceutical Biotechnology**)
	1. **Innovations in Biopharmaceuticals:**
	    o Development of mRNA vaccines and therapeutics.
	    o Gene therapy and CAR-T cell therapy advancements.
	    o Antisense oligonucleotides and RNA therapeutics.
	2. **Diagnostics and Therapeutics:**
	    o Nanotechnology in disease detection and targeted drug delivery.
	    o Advances in biomarker discovery and liquid biopsy techniques.
	    o Immunotherapy: Immune checkpoint inhibitors and cancer vaccines.
	3. **Regenerative Medicine:**
	    o Stem cell research and applications in tissue engineering.
	    o Bioprinting technologies for organ development.
	4. **Future Directions:**
	    o Personalized medicine and pharmacogenomics.
	    o Artificial intelligence in drug discovery and development.
	    o Bioethics in medical biotechnology advancements.

Suggestion:

1. Molecular Cloning: A laboratory manual J Sambrook& EF Fritsch Cold Spring Harbor Laboratory press
2. Animal cell culture- practical approach by Edi. Jhon R.W. Masters ; Oxford
3. Bioinformatics Sequence and Genome Analysis by David W Mount, CSHL press
4. Essential Bioinformatics by JinXiong; Cambridge
5. Immunoinformatics: bioinformatics strategies for better understanding of immune function, Novartis Foundation,ISBN 0-470-85356-5

6. Walker JM (2018) Methods in Molecular Biology. ISSN: 1064-3745
    https://www.springer.com/series/7651
7. Oliver U (2012) How to Commercialise Research in Biotechnology? Effectiveness of the
    Innovation Process and of Technology Transfer in the Biotechnology Sector. ISBN 978-3-
    8349- 4134-3

PHD-RPE-103	Research and Publication Ethics	Credit Distribution: L:1, T:1, P:0=2
Learning Outcomes	1. To have awareness about the publication ethics and publication misconducts. 2. To understand indexing and citation databases, open access publications, research metrics (citations, h-index, impact factor etc) 3. Develop hands-on skills to identify research misconduct and predatory publications.	
Unit 1	**Philosophy and Ethics (4 hrs)** 1. Introduction to philosophy: definition, nature and scope, concept, branches 2. Ethics: definition, moral philosophy, nature of moral judgements and reactions	
Unit 2	**Scientific Conduct (4 hrs)** 1. Ethics with respect to science and research 2. Intellectual honesty and research integrity 3. Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP) 4. Redundant publications: duplicate and overlapping publications, salami slicing 5. Selective reporting and misrepresentation of data	
Unit 3	**Publication Ethics (7 hrs)** 1. Publication ethics: definition, introduction and importance 2. Best practices / standards setting initiatives and guidelines: COPE, WAME, etc. 3. Conflicts of interest 4. Publication misconduct: definition, concept, problems that lead to unethical behavior and vice versa, types 5. Violation of publication ethics, authorship and contributorship 6. Identification of publication misconduct, complaints and appeals 7. Predatory publishers and journals	
Unit 4 Practice	**Open Access Publishing (4 hrs)** 1. Open access publications and initiatives 2. SHERPA/ROMEO online resource to check publisher copyright &self-archiving policies 3. Software tool to identify predatory publications developed by SPPU 4. Journal finder / journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer	

	Journal Suggester, etc.
Unit 5 Practice	**Publication Misconduct (4 hrs)** A. Group Discussions (2 hrs.) 1. Subject specific ethical issues, FFP, authorship 2. Conflicts of interest 3. Complaints and appeals: examples and fraud from India and abroad B. Software tools (2 hrs.) Use of plagiarism software like Turnitin, Urkund and other open source software tools
Unit 6 Practice	**Databases and Research Metrics (7 hrs)** A. Databases (4 hrs.) 1. Indexing databases 2. Citation databases: Web of Science, Scopus etc. B. Research Metrics (3 hrs.) 1. Impact Factor of journal as per Journal Citation Report, SNIP, SJR, IPP, Cite Score 2. Metrics: h-index, g-index, i10 index, altmetrics

Suggested Readings

1. Bird, A. (2006). Philosophy of Science. Routledge.
2. MacIntyre, A. (1967) A Short History of Ethics. London.
3. P. Chaddah, (2018) Ethics in Competitive Research: Do not get scooped; do not getplagiarized, ISBN:978-9387480865
4. National Academy of Sciences, National Academy of Engineering and Institute ofMedicine. (2009). On Being a Scientist: A Guide to Responsible Conduct in Research:Third Edition. National Academies Press.
5. Rensik, D. B. (2011). What is ethics in research & why is it important. National Instituteof Environmental Health Sciences, 1-10. Retrieved fromhttps://www.niehs.nih.gov/resources/biothics/whatis/index.cfm
6. Beall, J. (2012). Predatory publishers are corrupting open access. Nature, 489(7415),179-179. https://doi.org/10.1038/489179a

NIILM UNIVERSITY

Ph.D. Course Work in Botany

Academic Session 2024-25

Ph.D. Regulations Regarding Course Work

Clause 18: Ph.D. Ordinance NIILM University as per UGC Minimum Standards and Procedure for Award of Ph.D. Degrees Regulations 2022 with effect from academic session 2024-25

I.   The coursework shall be treated as a prerequisite for Ph.D. preparation. In the first year of registration, all research scholars are required to complete the course work for one semester following their provisional registration as a part of the Ph.D. program. It is mandatory to complete the course work in first 4 semesters to stay in the Ph.D. program. If a student fails to complete the coursework in first 4 semesters, will have to leave the program.

II.   Earning a minimum of 12 total credits and a maximum of 16, is required.

III.   Usually a course refers to a 'paper' and is a component of an academic program. Courses in Ph.D. course work shall be of two kinds: Core and Elective.

IV.   A core course is a compulsory paper to be studied by all the scholars to complete the requirements of the Ph.D. degree.

V.   Elective course is a course which is discipline specific and provided by the particular department from the main discipline or from a sister/related discipline which supports the main discipline, on mutual consent of the concerned departments.

VI.   One credit equal to 15 contact hours for theory-based teaching or 30 hours of contact time for practical or activity-based teaching.

VII.   The number of credits is given in the form L: T:P, where L indicates the number of contact hours of lecture, and T the number of contact hours for tutorials, P stands for laboratory credits.

VIII. The credits are distributed as follows:

Paper Code	Paper	Course type	Credit	L	T	P
PHD-ARM-101	Advanced Research Methodology	Core	4	3	1	0
PHD-DSC-102	Discipline Specific Course	Elective	4	3	1	0
PHD-RPE-103	Research and Publication Ethics	Core	2	1	1	0
PHD-SEM-104	Academic Writing, Literature Review and Seminar	Skill	2	0	1	2
	Total		12			

IX.   All Ph.D., entrants irrespective of discipline, shall be trained in teaching proficiency related to teaching/education/pedagogy/writing related to their chosen Ph.D. subject during their doctoral training period, that include assigning 4-6 hours per week of teaching/ research assistantship for conducting tutorial or laboratory work and evaluations.

X.   Courses PHD-SEM 104 includes research work on research article writing, seminar presentation and course PHD-TP 105 includes pedagogical training. Both these courses will be assessed internally without Semester End Examination.

XI.   CoE will conduct Term/ Semester End Exam in PHD-ARM-101, PHD-DSC-102, and PHD-RPE-103.

XII.   PHD-TP 105 is a non-credit course and internal assessment will be marked on the detailed mark card of the course work.

XIII. Advance Research Methodology course will include common research methodology and subject specific research methodology.

XIV.   Research Advisory Committee may provide choices un selecting the courses/ credits that facilitates the entrepreneur in the monetization of IP thus generated.

XV.   RAC can also recommend UGC recognized online courses as part of the credit requirements for the Ph.D. programme.

XVI.   Paper- will comprise of the following two activities:

    (a) External Assessment: Written Question Paper 70/39

    (b) Internal Assessment: 30/16

Marks will be converted into letter grade and grade point as per following table:

Marks	Letter Grade	Grade Point
81-100	A+	10
76-80	A	9
66-75	B+	8
61-65	B	7
55-60	C	6
Less than 55	F	0

The computation of the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA) shall be done as per University Examination Ordinance or Examination Rules & Regulations issued time to time.

The result and grade sheet for the course work will carry pass/ fail result.

COURSE WORK PAPER

I.   Candidates who already hold an M. Phil. degree and have been accepted into the Ph.D. program, or those who have finished their M.Phil. Coursework and have been given permission to continue on to the Ph.D. in an integrated course, may be exempted from the Ph.D. course requirements by the Department. All additional applicants accepted into the Ph.D. program must complete the Ph.D. coursework required by the Department.

II.   The NIILM University attendance rules, a minimum 75% attendance is must require, will be applied to all full-time research scholars. For the duration of their coursework, part-time research researchers must, nevertheless, adhere to the same rules.

III.   A Ph.D. scholar has to obtain a minimum of 55% of marks or a minimum CGPA of 6.0 in the UGC 10-point scale (or an equivalent grade/CGPA in a point scale wherever grading system is followed) in the course work in order to be eligible to continue in the programme and submit the thesis.

IV.   Registration will be automatically canceled if the required course work is not completed with a minimum of 55% of marks/a minimum CGPA of 6.0 within the allotted time. If the course work is not finished within a year, the RAC and DRC may suggest a six-month extension or suggest that the registration be canceled with the DRC.

V.   There is no provision of improvement or special supplementary exam to be conducted. Coursework will be offered in four semesters of first two years with regular & supplementary exams to avail the opportunity to clear the coursework in 2 years. **Failure to complete the course in 2 years means that the student has to leave the program.**

Course Structure:

PHD-ARM-101	Advance Research Methodology in Botany	Credit Distribution: L:3, T:1, P:0=4
Course Objectives:	To acquaint the students with research process. To train them in the research methods and designs and to equip them to take up researches independently.	
Unit 1	**Introduction to Research** a. Nature and aims of research	

	b. Dimensions and types of research
	c. Theory and research
	d. The meaning of methodology
	e. Types of Methods of Research
Unit 2	**Research Planed Data Collection**
	a. Concept, logic, and research question/issues
	b. Variables, causal theory, and hypothesis
	c. Research Design and Collection of Data
	d. Sampling: Methods, Size, Errors
	e. Probability and non-probability
	f. Measurement and Scaling Techniques
	g. Issues in measurement: Qualitative and quantitative
Unit 3	**Data Processing**
	a. Analysis of quantitative data introduction to higher order statistics
	b. Editing, Coding and Classification of Data
	c. Analysis of qualitative data and Tabulation
	d. Introduction to advanced statistical techniques using SPSS
	e. Statistical Derivatives and Measures of Central Tendency
	f. Measures of Variation and Skewness
	g. Correlation and Simple Regression
	h. Diagrammatic and Graphic Presentation of Data
Unit 4	**Research Report Writing**
	a. Ethical issues in research
	b. APA style of writing concept
	c. APA style of writing: Referencing
	d. d. Research article writing
Unit 5	**Computer Application in Research**
	a. Introduction to MS Excel, Using Formulas and Functions
	b. Hand on to SPSS
	c. Features for Statistical Data Analysis
	d. Generating Charts/Graphs
	e. Introduction to MS Word, Features and Functions, Writing Report in MS Word
	f. Introduction to Open Office or Latex
	g. Creating Presentation in MS PowerPoint
	h. Introduction to Internet-Based Search
	i. Use of Advanced Research Techniques.

Recommended Readings:

1. Bayard, P. & Grayson, A. (1976). Introducing psychological research. London: McMillan.
2. Bordens, K.S. & Abbot, B.B. (2005). Research design and methods. New Delhi: Tata McGraw Hill.
3. Breakwell, G.M. Hammond, S. & Fife-Schaw, C. (1995). Research Methods in Psychology. New Delhi: Sage Publications.
4. Cresswell, J.W. (1994) Research design:L Qualitative and quantitative approaches. Thousand Oaks, CA: Sage Publication.
5. Drew, C.J.: Hardman, M.L. & Hart, W.A. (1996). Designing and conducting research: Inquiry in education and social science. New York: Allyn & Bacon.

6. Kerlinger, F.N. (1982). Foundations of behavioral research. Delhi: Subject Publication.

7. Nation, J.R. (1997). Research Methods. New Jersey: Prentice Hall.

8. Willing, C. & Stainton-Rogers, W. (Eds.) (2008). The Sage Handbook of Qualitative Research in Psychology. New Delhi: Sage Publications.

PHD-DSC-102	Discipline Specific Course (Botany)	Credit Distribution: L:3, T:0, P:1=4
Learning Outcomes	• Study biodiversity hotspots and the impact of climate change on biodiversity. • Analyze the benefits of molecular markers in developing transgenic crops. • Explore biotic stress responses, including hypersensitive response (HR) and systemic acquired resistance (SAR) • Explore the role of biosensors and recent advancements in enzyme technology.	
Unit 1	**Taxonomy, Biodiversity and Conservation** The principles and practices of Taxonomy. Global biodiversity, measuresof biodiversity, diversity indices, biodiversity values, use and importance of biodiversity,threatened biodiversity, major causes of biodiversity loss. Biodiversity of India. RET species. Key concepts in plant evolution. Developmental, experimental and genetic variations, breeding systems, apomixes, population genetics, evolution. Phenetic methods, molecular systematics, cladistic methods, phylogenetic analysis, APGclassification. Diagnostic features, systematic position and affinities of major groups offlowering plants recognized in APG classification,In-situ and ex-situ conservation. Climate change and Biodiversity. Biodiversity and Forest Acts.	
Unit 2	**Molecular Biology** Application of Tissue culture and achievements in plant biotechnology, Techniques in biotechnology: Construction of synthetic vectors and their uses in r-DNA technology, An overview of gene silencing and its applications, DNA barcoding in plants.Biosafety guidelines in India, Guidelines and regulation Biotechnology for environment: Bioenergy, Biofuel, Bioremediation and Climate change. Sequencing of whole genome, functional and comparative genomics (Rice, *Arabidopsis*, Soyabean), Proteomics and Proteome analysis.	
Unit 3	**Stress Physiology** Physiological Effects and Mechanism of action of Auxins, Gibberellins,Cytokinins, Abscissic acid, Polyamines and Salicylic acid Water deficit and its physiological consequences, drought tolerance mechanisms, salinity stress and plant responses, heat stress and heat shock proteins, metal toxicity, pollution stress. Biotic stress, HR and SAR mechanisms. Biotechnological approaches for stress tolerance in plants.	
Unit 4	**Ecology** Phytogeography of Indian Subcontinent; Plant habitat relationship: Allelopathy, Mechanism of self-regulation in ecological systems. Understanding rarity and monitoring rare plants population. Use of IUCN guidelines. Population Size, Restoration of degraded lands: Habitat	

	restoration for afforestration with any suitable example Ecotoxicology with respect to contamination of food chains. Ecofriendly approach, Bioremediation, Green products.
Unit 5	**Plant Pathology** Molecular techniques for Identification and classification of fungi; Seed pathology: Major seedborne plant pathogens of fungal, bacterial and viral origin. Techniques involved in identificationof seed borne pathogens.Recent concept of plant defence: Mechanism of sensing pathogenecity, Systemic Acquired Resistance (SAR), Biochemical defence, Regulation of lignification in defence.

Suggested Books:

1. Ray Samit and A.K. Ray (ed.) 2006. Biodiversity and Biotechnology. New Central Book
2. Osborne, P.L.(2000). Tropical ecosystems and ecological concepts. Cambridge UniversityPress.
3. Synge, H. (1981). The Biological aspects of rare plant conservations. John Wiley and Sons.
4. BrijGopal, P.S. Pathak, K.G. Saxena (1998). Ecology Today- an anthology of Contemporary.
5. Ray Samit and A.K. Ray (ed.) 2006. Biodiversity and Biotechnology. New Central BookAgency Ltd. Kolkata.
6. Singh Gurucharan 2010. Plant systematic: An Integrated approach. Science Publisher. USA.
7. Ecological research. International Scientific PublicationIntroduction to plant physiology by W.G.Hopkins and NPA Huner, Wiley Int.3rd Ed. 2
8. Old and Primrose (1984).Principles of gene manipulation. Blackwell Patterson, 1996. Genome mapping in plants, Academic Press.330p
9. Weising,K.,H.Nybom, K.Wolff, W. Meyere.1995. DNA Fingerprinting.CRL Press.
10. Dennis, E.S.et al, 1992 Plant Gene Research: Basic knowledge and Application. SpringerVerlag Wien Publ. New York.
11. Gengopadhyay, S 1984 Clinical plant pathology, Kalyani Publ. New Delhi
12. Nane Y.1 and Thapliyal 1979, Fungicides in plant disease control. Oxford IBH, Publ. NewDelhi.
13. Smith, J.E and D.R. Berry. 1978. The filamentous fungi. Vol-I Industrial mycology. Vol-IIDevelopmentMycologym, Edward Arnold Publ. London
14. Taiz, 1, and E. Zeiger. 1998. Plant physiology, SinquerAssoc Inc. Publ. New York

PHD-RPE-103	**Research and Publication Ethics**	**Credit Distribution:** **L:1, T:1, P:0=2**
Learning Outcomes	1. To have awareness about the publication ethics and publication misconducts. 2. To understand indexing and citation databases, open access publications, research metrics (citations, h-index, impact factor etc) 3. Develop hands-on skills to identify research misconduct and predatory publications.	
Unit 1	**Philosophy and Ethics (4 hrs)** 1. Introduction to philosophy: definition, nature and scope, concept, branches 2. Ethics: definition, moral philosophy, nature of moral judgements and reactions	

Unit 2	**Scientific Conduct (4 hrs)**
	1. Ethics with respect to science and research
	2. Intellectual honesty and research integrity
	3. Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP)
	4. Redundant publications: duplicate and overlapping publications, salami slicing
	5. Selective reporting and misrepresentation of data
Unit 3	**Publication Ethics (7 hrs)**
	1. Publication ethics: definition, introduction and importance
	2. Best practices / standards setting initiatives and guidelines: COPE, WAME, etc.
	3. Conflicts of interest
	4. Publication misconduct: definition, concept, problems that lead to unethical behavior and vice versa, types
	5. Violation of publication ethics, authorship and contributorship
	6. Identification of publication misconduct, complaints and appeals
	7. Predatory publishers and journals
Unit 4 Practice	**Open Access Publishing (4 hrs)**
	1. Open access publications and initiatives
	2. SHERPA/ROMEO online resource to check publisher copyright & self-archiving policies
	3. Software tool to identify predatory publications developed by SPPU
	4. Journal finder / journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer Journal Suggester, etc.
Unit 5 Practice	**Publication Misconduct (4 hrs)**
	A. Group Discussions (2 hrs.)
	1. Subject specific ethical issues, FFP, authorship
	2. Conflicts of interest
	3. Complaints and appeals: examples and fraud from India and abroad
	B. Software tools (2 hrs.)
	Use of plagiarism software like Turnitin, Urkundandother open source software tools
Unit 6 Practice	**Databases and Research Metrics (7 hrs)**
	A. Databases (4 hrs.)
	1. Indexing databases
	2. Citation databases: Web of Science, Scopus etc.
	B. Research Metrics (3 hrs.)
	1. Impact Factor of journal as per Journal Citation Report, SNIP, SJR, IPP, Cite Score
	2. Metrics: h-index, g-index, i10 index, altmetrics

Suggested Readings

1. Bird, A. (2006). Philosophy of Science. Routledge.
2. MacIntyre, A. (1967) A Short History of Ethics. London.

3. P. Chaddah, (2018) Ethics in Competitive Research: Do not get scooped; do not getplagiarized, ISBN:978-9387480865

4. National Academy of Sciences, National Academy of Engineering and Institute ofMedicine. (2009). On Being a Scientist: A Guide to Responsible Conduct in Research:Third Edition. National Academies Press.

5. Rensik, D. B. (2011). What is ethics in research & why is it important. National Instituteof Environmental Health Sciences, 1-10. Retrieved fromhttps://www.niehs.nih.gov/resources/biothics/whatis/index.cfm

6. Beall, J. (2012). Predatory publishers are corrupting open access. Nature, 489(7415),179-179. https://doi.org/10.1038/489179a

NIILM UNIVERSITY

Ph.D. Course Work in Chemistry

Academic Session 2024-25

Ph.D. Regulations Regarding Course Work

Clause 18: Ph.D. Ordinance NIILM University as per UGC Minimum Standards and Procedure for Award of Ph.D. Degrees Regulations 2022 with effect from academic session 2024-25

I. The coursework shall be treated as a prerequisite for Ph.D. preparation. In the first year of registration, all research scholars are required to complete the course work for one semester following their provisional registration as a part of the Ph.D. program. It is mandatory to complete the course work in first 4 semesters to stay in the Ph.D. program. If a student fails to complete the coursework in first 4 semesters, will have to leave the program.

II. Earning a minimum of 12 total credits and a maximum of 16, is required.

III. Usually a course refers to a 'paper' and is a component of an academic program. Courses in Ph.D. course work shall be of two kinds: Core and Elective.

IV. A core course is a compulsory paper to be studied by all the scholars to complete the requirements of the Ph.D. degree.

V. Elective course is a course which is discipline specific and provided by the particular department from the main discipline or from a sister/related discipline which supports the main discipline, on mutual consent of the concerned departments.

VI. One credit equal to 15 contact hours for theory-based teaching or 30 hours of contact time for practical or activity-based teaching.

VII. The number of credits is given in the form L: T: P, where L indicates the number of contact hours of lecture, and T the number of contact hours for tutorials, P stands for laboratory credits.

VIII. The credits are distributed as follows:

Paper Code	Paper	Course type	Credit	L	T	P
PHD-ARM-101	Advanced Research Methodology	Core	4	3	1	0
PHD-DSC-102	Discipline Specific Course	Elective	4	3	1	0
PHD-RPE-103	Research and Publication Ethics	Core	2	1	1	0
PHD-SEM-104	Academic Writing, Literature Review and Seminar	Skill	2	0	1	2
	Total		12			

IX. All Ph.D., entrants irrespective of discipline, shall be trained in teaching proficiency related to teaching/education/pedagogy/writing related to their chosen Ph.D. subject during their doctoral training period, that include assigning 4-6 hours per week of teaching/ research assistantship for conducting tutorial or laboratory work and evaluations.

X. Courses PHD-SEM 104 includes research work on research article writing, seminar presentation and course PHD-TP 105 includes pedagogical training. Both these courses will be assessed internally without Semester End Examination.

XI. CoE will conduct Term/ Semester End Exam in PHD-ARM-101, PHD-DSC-102, and PHD-RPE-103.

XII. PHD-TP 105 is a non-credit course and internal assessment will be marked on the detailed mark card of the course work.

XIII. Advance Research Methodology course will include common research methodology and subject specific research methodology.

XIV. Research Advisory Committee may provide choices in selecting the courses/ credits that facilitates the entrepreneur in the monetization of IP thus generated.

XV.   RAC can also recommend UGC recognized online courses as part of the credit requirements for the Ph.D. programme.

XVI.   Paper- will comprise of the following two activities:

(a) External Assessment: Written Question Paper 70/39

(b) Internal Assessment: 30/16

Marks will be converted into letter grade and grade point as per following table:

Marks	Letter Grade	Grade Point
81-100	A+	10
76-80	A	9
66-75	B+	8
61-65	B	7
55-60	C	6
Less than 55	F	0

The computation of the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA) shall be done as per University Examination Ordinance or Examination Rules & Regulations issued time to time.

The result and grade sheet for the course work will carry pass/ fail result.

COURSE WORK PAPER

I.   Candidates who already hold an M. Phil. degree and have been accepted into the Ph.D. program, or those who have finished their M.Phil. Coursework and have been given permission to continue on to the Ph.D. in an integrated course, may be exempted from the Ph.D. course requirements by the Department. All additional applicants accepted into the Ph.D. program must complete the Ph.D. coursework required by the Department.

II.   The NIILM University attendance rules, a minimum 75% attendance is must require, will be applied to all full-time research scholars. For the duration of their coursework, part-time research researchers must, nevertheless, adhere to the same rules.

III.   A Ph.D. scholar has to obtain a minimum of 55% of marks or a minimum CGPA of 6.0 in the UGC 10-point scale (or an equivalent grade/CGPA in a point scale wherever grading system is followed) in the course work in order to be eligible to continue in the programme and submit the thesis.

IV.   Registration will be automatically canceled if the required course work is not completed with a minimum of 55% of marks/a minimum CGPA of 6.0 within the allotted time. If the course work is not finished within a year, the RAC and DRC may suggest a six-month extension or suggest that the registration be canceled with the DRC.

V.   There is no provision of improvement or special supplementary exam to be conducted. Coursework will be offered in four semesters of first two years with regular & supplementary exams to avail the opportunity to clear the coursework in 2 years. **Failure to complete the course in 2 years means that the student has to leave the program.**

Course Structure:

PHD-ARM-101	Advance Research Methodology in Chemistry	Credit Distribution: L:3, T:1, P:0=4
Course Objectives:	To acquaint the students with research process. To train them in the research methods and designs and to equip them to take up researches independently.	
Unit 1	**Introduction to Research** a. Nature and aims of research	

	b. Dimensions and types of research
	c. Theory and research
	d. The meaning of methodology
	e. Types of Methods of Research
Unit 2	**Research Planed Data Collection**
	a. Concept, logic, and research question/issues
	b. Variables, causal theory, and hypothesis
	c. Research Design and Collection of Data
	d. Sampling: Methods, Size, Errors
	e. Probability and non-probability
	f. Measurement and Scaling Techniques
	g. Issues in measurement: Qualitative and quantitative
Unit 3	**Data Processing**
	a. Analysis of quantitative data introduction to higher order statistics
	b. Editing, Coding and Classification of Data
	c. Analysis of qualitative data and Tabulation
	d. Introduction to advanced statistical techniques using SPSS
	e. Statistical Derivatives and Measures of Central Tendency
	f. Measures of Variation and Skewness
	g. Correlation and Simple Regression
	h. Diagrammatic and Graphic Presentation of Data
Unit 4	**Research Report Writing**
	a. Ethical issues in research
	b. APA style of writing concept
	c. APA style of writing: Referencing
	d. d. Research article writing
Unit 5	**Computer Application in Research**
	a. Introduction to MS Excel, Using Formulas and Functions
	b. Hand on to SPSS
	c. Features for Statistical Data Analysis
	d. Generating Charts/Graphs
	e. Introduction to MS Word, Features and Functions, Writing Report in MS Word
	f. Introduction to Open Office or Latex
	g. Creating Presentation in MS PowerPoint
	h. Introduction to Internet-Based Search
	i. Use of Advanced Research Techniques.

Recommended Readings:

1. Bayard, P. & Grayson, A. (1976). Introducing psychological research. London: McMillan.

2. Bordens, K.S. & Abbot, B.B. (2005). Research design and methods. New Delhi: Tata McGraw Hill.

3. Breakwell, G.M. Hammond, S. & Fife-Schaw, C. (1995). Research Methods in Psychology. New Delhi: Sage Publications.

4. Cresswell, J.W. (1994) Research design: L Qualitative and quantitative approaches. Thousand Oaks, CA: Sage Publication.

5. Drew, C.J.: Hardman, M.L. & Hart, W.A. (1996). Designing and conducting research: Inquiry in education and social science. New York: Allyn & Bacon.

6. Kerlinger, F.N. (1982). Foundations of behavioral research. Delhi: Subject Publication.

7. Nation, J.R. (1997). Research Methods. New Jersey: Prentice Hall.

8. Willing, C. & Stainton-Rogers, W. (Eds.) (2008). The Sage Handbook of Qualitative Research in Psychology. New Delhi: Sage Publications.

PHD-DSC-102	Discipline Specific Course (Inorganic Chemistry)	Credit Distribution: L:3, T:0, P:1=4
Learning Outcomes	• Understand superimposed AC polarography and square wave polarography. • Learn the applications of ESR in inorganic complex structure determination. • Classify host-guest compounds and understand their thermodynamics and kinetic stability.	
Unit 1	**Electro analytical techniques:** Basic principle of polarography, Dropping mercury electrode (DME), advantages and disadvantages of DME, cathodic and and anodic wave. Different types of current, diffusion controlled wave, Applications of polarography, Superimposed AC polarography and Square wave polarography. Amperometric and coulometric titrations: Basic principle and applications. Cyclic voltammetry: cathodic and anodic stripping voltammetry. Electro-gravimetry: IR Drop, polarization of current and its types. Factors affecting deposition.	
Unit 2	**Spectroscopic techniques in inorganic analysis:** Electron spin resonance (ESR), Mossbauer and electronic spectroscopy: Basic principle and applications to determine the structures of inorganic complexes.	
Unit 3	**Organometallics:** Synthesis, reactivity and applications of σ-bonded and Π-bonded complexes (organometallics) in catalysis. **Supramolecular Chemistry:** Classification of host-guest compounds, thermodynamics and kinetic stability of supramolecular compounds, different types of macro-molecules hosts, host design, pre-organised hosts cyclodextrin, calixarenes, cryptands and determination of binding constant for supramolecular compounds	
Unit 4	**Bioinorganic Chemistry:** Metalloenzymes: Metalloenzymes of Zinc, Copper and Cobalt-structure, reactivity and biochemical functioning. Medicinal aspects of $vitB_{12}$. Inorganic compounds as medicine: Lithium drugs in psychiatry, Drugs in hypo and hyperactivity of thyroids. Chelation therapy in Alzheimer disease. Vanadium based diabetes drugs. Bio-sensor: Theoretical and practical aspects of clark and enzyme electrode, glucosebio-sensor, cholesterol bio- sensor, glucose bio-sensor based on $NAD^+/NADH$, ureabio-sensor, and amino acid sensors.	

Books Suggested:

1. The Inorganic Chemistry of Biological Process: M.N. Huges: John Wiley & Sons.

2. Principles of Bioinorganic Chemistry: S.J. Lippard and J.M. Berg: University Science Books.

3. Principles of polarography: Jaroslav Heyrovsky: academic press.

4. Introduction to polarography and allied techniques: kamala zutshi, new age international.

5. Principles of instrumental analysis by Douglas A. Skoog, F. James Holler, Stanley R. Crouch: Cengage Learning.

6. Fundamentals of molecular spectroscopy: C. N. Banwell: McGraw Hills.
7. Textbook of quantitative inorganic analysis: A. I. Vogel ELBS London.

8. Chemical sensors and biosensors: Brian R. Eggins, John wiley and sons, LTD.

9. Chemical sensors and biosensors: Fundamnetal and application: Florinel- Gabriel Banica, John Wiley.

10. Supramolecular Chemistry: Concepts and perspectives: J. M. Lehn, Wiley VCH.

11. Supramolecular Chemistry: Jerry L. Atwood, Jonathan, W.Steed, Wiley 2nd edition

PHD-DSC-102	Discipline Specific Course (Organic Chemistry)	Credit Distribution: L:3, T:0, P:1=4
Learning Outcomes	• Learn how these techniques provide detailed information about molecular structure and interactions. • Learn how these techniques are used in the analysis of organic compounds. • Understand the role of bioinformatics in drug discovery, including the use of chemical databases, ADME (Absorption, Distribution, Metabolism, Excretion), and toxicity.	
Unit 1	**Spectroscopic techniques:** 2DNMR–Principle of COSY, HETCOR, HSQC, DQFCOSY,RL-COSY, DEPT, INEPT, NOESY, HMBC, HMQC, INADEQUATE Structural elucidation by spectroscopic methods: application of UV, IR and NMR spectroscopy, mass spectrometry in structural analysis of organic compounds. (Combined problems) Principle of GC-MS, HPLC-MS and GC-FTIR.	
Unit 2	**Organic Synthesis:** Exploitation of various Name reactions/ Rearrangements in organic synthesis with special reference to C-C bond formation (Aldol condensation, Benzoin condensation, Perkin reaction, Cannizaro reaction, Grignard reaction, Diels Alder reaction, Wittig reaction, Friedel Craft Reaction); Coupling reactions (Heck, Sonogashira, Suzuki). Metathesis, Organic Oxidation-Reduction reactions (Wolf Kishner reduction, Birch Reduction, Oppenauer oxidation); Sigma tropic rearrangements (Claisen and Copere arrangement); C-Nre arrangement (Beckman, Hoffmann, Schmidt, Lossen rearrangement)	
Unit 3	**Biological and Medicinal Chemistry:** Brief introduction to microbes: bacteria, fungi, viruses and parasites, Classification of bacteria, Introduction to the terms MIC, IC_{50}, K_i, therapeuticindex, LD50 and ED50.	

	Classification of drugs based on therapeutic action, Elementary idea about drug action: there ceptorrole, neurotransmitters and receptors, ion channels and their control. Membrane bound enzymes-activation/ deactivation. Chemical basis of messenger induced change of shape by the receptor.
Unit 4	**Computer aided drug discovery and quantitative tools:** The Lead compound, Pharmacophore, Bioinformatics in drug discovery and development, chemical databases, ADME and Toxicity, Virtual Screening, Molecular Docking, Ramachandran Plot, Structure and Ligand Based Drug Designing, Case studies. Introduction to QSAR methodologies and its application in molecular design.

PHD-DSC-102	Discipline Specific Course (Physical Chemistry)	Credit Distribution: L:3, T:0, P:1=4
Learning Outcomes	• Learn about configurations, weights, and the relative population of states. • Learn about degradation kinetics and the methods of using different heating rates for analysis. • Study the synthetic routes for nano composites and their significance in modern materials science.	
Unit 1	The Boltzmann distribution, configurations and weights, relative population of states, molecular partition functions, contributions to partition function, statistical entropy, internal energy, entropy and partition function and other derived functions, contribution to equilibrium constant, applications of statistical thermodynamics to activated complex theory	
Unit 2	Brief account of Thermal analysis techniques, Thermogravimetry (TG) and its application in the study of different materials and composites. Degradation kinetics using different heating rate methods. Differential thermalanalysis (DTA), Differential Scanning Calorimetry (DSC) studies and their applications in different components. Evolved gas analysis (EGA) and hyphenated thermal techniques. Different methods for the preparation of nano materials, properties and applications of nanomaterials. Synthetic routes of nano composites.	
Unit 3	Recapitulations of polymers and polymerizations, Copolymerization, average molecular weight, molecular weight determination of polymers by Gel Permeation Chromatography, Dendrimers, Hyper branched and star polymers, Plasticizers, Polymer composites and its classification, Polymer composites using filler reinforcement, Biocomposites, Applications of biocomposites in automobiles, agriculture and in construction materials, Polymer nano composites, Properties and applications of polymer nano composites.	
Unit 4	Techniques of approximation, Many electron atoms, coulomb integral, exchange integral, electron correlation, Slater determinants, treatment of hydrogen molecule ion and hydrogen molecule, Self consistent field methods. Molecular rotations and vibrations, Molecular electronic transitions, selection rules.	

Books suggested:

1. An Introduction to Statistical Thermodynamics (Dover Book son Physics) Paperback–1January1987
2. Statistical Thermodynamics by M. C. Gupta, Wiley
3. F.W. Billmeyer, Jr. Textbook of Polymer Science, Wiley- Interscience, N.Y.
4. Introduction to polymer chemistry, R.Seymour, Wiley– Interscience
5. Physical chemistry of Macromolecules, by D.D.Deshpande,Vishal publications,
6. Principles of polymer chemistry by P.J.Flory.
7. Polymer Science by V R Gowarikar, V.R.Viswanathan, Jayadhar Sreedhar; New Age international Publisher
8. Principles of polymerization, G.Odian, Wiley–Interscience Principals of Instrumental Analysis D.A. Skoog, D.M. West & F.J. Holler, T.A. Nieman Saunders College Publishing
9. Introduction to Thermal Analysis Edited by M.E. Brown Springer
10. Polymer Composites, Macro and Microcomposite**s**; edited by S.Thomas, K.Joseph, S,K.Malhotra, K. Goda and M.S.Sreekala, Wiley-VCH
11. Quantum Chemistry by Ira N Levine, Pearson

PHD-RPE-103	**Research and Publication Ethics**	**Credit Distribution: L:1, T:1, P:0=2**
Learning Outcomes	1. To have awareness about the publication ethics and publication misconducts. 2. To understand indexing and citation databases, open access publications, research metrics (citations, h-index, impact factor etc) 3. Develop hands-on skills to identify research misconduct and predatory publications.	
Unit 1	**Philosophy and Ethics (4 hrs)** 1. Introduction to philosophy: definition, nature and scope, concept, branches 2. Ethics: definition, moral philosophy, nature of moral judgements and reactions	
Unit 2	**Scientific Conduct (4 hrs)** 1. Ethics with respect to science and research 2. Intellectual honesty and research integrity 3. Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP) 4. Redundant publications: duplicate and overlapping publications, salami slicing 5. Selective reporting and misrepresentation of data	
Unit 3	**Publication Ethics (7 hrs)** 1. Publication ethics: definition, introduction and importance 2. Best practices / standards setting initiatives and guidelines: COPE, WAME, etc. 3. Conflicts of interest 4. Publication misconduct: definition, concept, problems that lead to	

	unethical behavior and vice versa, types 5. Violation of publication ethics, authorship and contributor ship 6. Identification of publication misconduct, complaints and appeals 7. Predatory publishers and journals
Unit 4 Practice	**Open Access Publishing (4 hrs)** 1. Open access publications and initiatives 2. SHERPA/ROMEO online resource to check publisher copyright & self-archiving policies 3. Software tool to identify predatory publications developed by SPPU 4. Journal finder / journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer Journal Suggester, etc.
Unit 5 Practice	**Publication Misconduct (4 hrs)** A. Group Discussions (2 hrs.) 1. Subject specific ethical issues, FFP, authorship 2. Conflicts of interest 3. Complaints and appeals: examples and fraud from India and abroad B. Software tools (2 hrs.) Use of plagiarism software like Turnitin, Urkund and other open source software tools
Unit 6 Practice	**Databases and Research Metrics (7 hrs)** A. Databases (4 hrs.) 1. Indexing databases 2. Citation databases: Web of Science, Scopus etc. B. Research Metrics (3 hrs.) 1. Impact Factor of journal as per Journal Citation Report, SNIP, SJR, IPP, Cite Score 2. Metrics: h-index, g-index, i10 index, altmetrics

Suggested Readings

1. Bird, A. (2006). Philosophy of Science. Routledge.
2. MacIntyre, A. (1967) A Short History of Ethics. London.
3. P. Chaddah, (2018) Ethics in Competitive Research: Do not get scooped; do not get plagiarized, ISBN:978-9387480865
4. National Academy of Sciences, National Academy of Engineering and Institute of Medicine. (2009). On Being a Scientist: A Guide to Responsible Conduct in Research: Third Edition. National Academies Press.
5. Rensik, D. B. (2011). What is ethics in research & why is it important. National Institute of Environmental Health Sciences, 1-10. Retrieved from https://www.niehs.nih.gov/resources/biothics/whatis/index.cfm
6. Beall, J. (2012). Predatory publishers are corrupting open access. Nature, 489(7415), 179-179. https://doi.org/10.1038/489179a

NIILM UNIVERSITY

Ph.D. Course Work in Civil Engineering

Academic Session 2024-25

Ph.D. Regulations Regarding Course Work

Clause 18: Ph.D. Ordinance NIILM University as per UGC Minimum Standards and Procedure for Award of Ph.D. Degrees Regulations 2022 with effect from academic session 2024-25

I. The coursework shall be treated as a prerequisite for Ph.D. preparation. In the first year of registration, all research scholars are required to complete the course work for one semester following their provisional registration as a part of the Ph.D. program. It is mandatory to complete the course work in first 4 semesters to stay in the Ph.D. program. If a student fails to complete the coursework in first 4 semesters, will have to leave the program.

II. Earning a minimum of 12 total credits and a maximum of 16, is required.

III. Usually a course refers to a 'paper' and is a component of an academic program. Courses in Ph.D. course work shall be of two kinds: Core and Elective.

IV. A core course is a compulsory paper to be studied by all the scholars to complete the requirements of the Ph.D. degree.

V. Elective course is a course which is discipline specific and provided by the particular department from the main discipline or from a sister/related discipline which supports the main discipline, on mutual consent of the concerned departments.

VI. One credit equal to 15 contact hours for theory-based teaching or 30 hours of contact time for practical or activity-based teaching.

VII. The number of credits is given in the form L: T:P, where L indicates the number of contact hours of lecture, and T the number of contact hours for tutorials, P stands for laboratory credits.

VIII. The credits are distributed as follows:

Paper Code	Paper	Course type	Credit	L	T	P
PHD-ARM-101	Advanced Research Methodology	Core	4	3	1	0
PHD-DSC-102	Discipline Specific Course	Elective	4	3	1	0
PHD-RPE-103	Research and Publication Ethics	Core	2	1	1	0
PHD-SEM-104	Academic Writing, Literature Review and Seminar	Skill	2	0	1	2
	Total		12			

IX. All Ph.D., entrants irrespective of discipline, shall be trained in teaching proficiency related to teaching/education/pedagogy/writing related to their chosen Ph.D. subject during their doctoral training period, that include assigning 4-6 hours per week of teaching/ research assistantship for conducting tutorial or laboratory work and evaluations.

X.   Courses PHD-SEM 104 includes research work on research article writing, seminar presentation and course PHD-TP 105 includes pedagogical training. Both these courses will be assessed internally without Semester End Examination.

XI.   CoE will conduct Term/ Semester End Exam in PHD-ARM-101, PHD-DSC-102, and PHD-RPE-103.

XII.   PHD-TP 105 is a non-credit course and internal assessment will be marked on the detailed mark card of the course work.

XIII. Advance Research Methodology course will include common research methodology and subject specific research methodology.

XIV.   Research Advisory Committee may provide choices in selecting the courses/ credits that facilitates the entrepreneur in the monetization of IP thus generated.

XV.   RAC can also recommend UGC recognized online courses as part of the credit requirements for the Ph.D. program.

XVI.   Paper- will comprise of the following two activities:

   (a) External Assessment: Written Question Paper 70/39

   (b) Internal Assessment: 30/16

   Marks will be converted into letter grade and grade point as per following table:

Marks	Letter Grade	Grade Point
81-100	A+	10
76-80	A	9
66-75	B+	8
61-65	B	7
55-60	C	6
Less than 55	F	0

   The computation of the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA) shall be done as per University Examination Ordinance or Examination Rules & Regulations issued time to time.

   The result and grade sheet for the course work will carry pass/ fail result.

   COURSE WORK PAPER

   I.   Candidates who already hold an M. Phil. degree and have been accepted into the Ph.D. program, or those who have finished their M.Phil. Coursework and have been given permission to continue on to the Ph.D. in an integrated course, may be exempted from the Ph.D. course requirements by the Department. All additional applicants accepted into the Ph.D. program must complete the Ph.D. coursework required by the Department.

   II.   The NIILM University attendance rules, a minimum 75% attendance is must require, will be applied to all full-time research scholars. For the duration of their coursework, part-time research researchers must, nevertheless, adhere to the same rules.

   III. A Ph.D. scholar has to obtain a minimum of 55% of marks or a minimum CGPA of 6.0 in the UGC 10-point scale (or an equivalent grade/CGPA in a point scale wherever grading system is followed) in the course work in order to be eligible to continue in the program and submit the thesis.

IV. Registration will be automatically canceled if the required course work is not completed with a minimum of 55% of marks/a minimum CGPA of 6.0 within the allotted time. If the course work is not finished within a year, the RAC and DRC may suggest a six-month extension or suggest that the registration be canceled with the DRC.

V. There is no provision of improvement or special supplementary exam to be conducted. Coursework will be offered in four semesters of first two years with regular & supplementary exams to avail the opportunity to clear the coursework in 2 years. **Failure to complete the course in 2 years means that the student has to leave the program.**

Course Structure:

PHD-ARM-101	Advance Research Methodology in Civil Engineering	Credit Distribution: L:3, T:1, P:0=4
Course Objectives:	To acquaint the students with research process. To train them in the research methods and designs and to equip them to take up researches independently.	
Unit 1	**Introduction to Research** a. Nature and aims of research b. Dimensions and types of research c. Theory and research d. The meaning of methodology e. Types of Methods of Research	
Unit 2	**Research Planed Data Collection** a. Concept, logic, and research question/issues b. Variables, causal theory, and hypothesis c. Research Design and Collection of Data d. Sampling: Methods, Size, Errors e. Probability and non-probability f. Measurement and Scaling Techniques g. Issues in measurement: Qualitative and quantitative	
Unit 3	**Data Processing** a. Analysis of quantitative data introduction to higher order statistics b. Editing, Coding and Classification of Data c. Analysis of qualitative data and Tabulation d. Introduction to advanced statistical techniques using SPSS e. Statistical Derivatives and Measures of Central Tendency f. Measures of Variation and Skewness g. Correlation and Simple Regression h. Diagrammatic and Graphic Presentation of Data	
Unit 4	**Research Report Writing** a. Ethical issues in research b. APA style of writing concept c. APA style of writing: Referencing d. d. Research article writing	

Unit 5	**Computer Application in Research**
	a. Introduction to MS Excel, Using Formulas and Functions
	b. Hand on to SPSS
	c. Features for Statistical Data Analysis
	d. Generating Charts/Graphs
	e. Introduction to MS Word, Features and Functions, Writing Report in MS Word
	f. Introduction to Open Office or Latex
	g. Creating Presentation in MS PowerPoint
	h. Introduction to Internet-Based Search
	i. Use of Advanced Research Techniques.

Recommended Readings:

1. Bayard, P. & Grayson, A. (1976). Introducing psychological research. London: McMillan.

2. Bordens, K.S. & Abbot, B.B. (2005). Research design and methods. New Delhi: Tata McGraw Hill.

3. Breakwell, G.M. Hammond, S. & Fife-Schaw, C. (1995). Research Methods in Psychology. New Delhi: Sage Publications.

4. Cresswell, J.W. (1994) Research design: L Qualitative and quantitative approaches. Thousand Oaks, CA: Sage Publication.

5. Drew, C.J.: Hardman, M.L. & Hart, W.A. (1996). Designing and conducting research: Inquiry in education and social science. New York: Allyn& Bacon.

6. Kerlinger, F.N. (1982). Foundations of behavioural research. Delhi: Subject Publication.

7. Nation, J.R. (1997). Research Methods. New Jersey: Prentice Hall.

8. Willing, C. & Stainton-Rogers, W. (Eds.) (2008). The Sage Handbook of Qualitative Research in Psychology. New Delhi: Sage Publications.

PHD-DSC-102	**Discipline Specific Course (Foundation Engineering)**	**Credit Distribution: L:3, T:0, P:1=4**
Learning Outcomes	• Solve numerical problems based on the BIS method for foundation design. • Study the behaviour of piles and pile groups under load, including failure modes. • Study tilts and shifts in well foundations and their effects on stability. • Study specific applications of geo-synthetics in foundation improvement, reinforcement, and retaining walls.	
Unit 1	**General principles of Foundation Design** Functions of foundations, essential requirements of a good foundation, types of foundations, and principal modes of failure' estimation of allowable bearing pressures, calculation of ultimate bearing capacity by theoretical and empirical methods: Terzaghi's Method, Skempton's analysis for clays' Mayerhof's analysis Bls Method (5:6403), Settlement of foundations. Factors to be considered foundation design, numerical problem based in BIS method.	
Unit 2	**Pile Foundations**	

	Purpose/uses of foundations, classification of piles based on different criteria, Brief details of timber, concrete, steel piles their advantages and disadvantages ' selection of pile type, pile action, behaviour of pile and pile groups under load' definition of failure load. Estimation of carrying capacity methods based of on sPT and cPT, ultimate load on driven and cast-in-place piles and bored and cast-in-place piles in cohesion less soils Factors affecting pile capacity - Numerical problems Ultimatecapacityofmodificationforinplace piles and bored and cast-in-place piles' Capacity of very long piles - Numerical problems Carrying capacity of piles on rocks'
Unit 3	**Well Foundations** Basic Principles, Forces acting on Well foundations, sinking of Wells, Tilts and Shifts. Soil Stability: Retaining walls-Introduction, types, Principles of design, Modes of failure, drainage of the backfill, problems related to design of Gravity retaining wall and stability of retaining walls.. Unbraced excavations, braced excavations. Sheet piles - type's anchors and tie backs. Shoring and Underpinning - necessity and methods
Unit 4	**Improvement of Foundation Soils Purpose** (a) lmprovement of granular soils: term used to describe degree of compactness relative density, density ratio and degree of compaction; Methods - Vibration at ground surface' factors influencing roller compaction; deep dynamic compaction' vibro-compact on impact at methods depth. (b) lmprovement of cohesive soils: preloading, or dewaterring of installing sand drains ,drain wicks, electrical and thermal methods' Grouting : purpose, functions, types of grouts ; soil bentonite - cement mix' cement mix' emulsions, solutions: grout injection methods Geo-synthetics : types' functions' manufacturing of geo-textiles , Classification of geo-textiles. Specific Applications: Bearing capacity improvement, reinforcement, retaining walls, embankment etc. testing of geosynthetics, usage in India and a case study.
Unit 5	**Social Considerations in Foundation Design and Construction** Elementary principles of design and construction of foundations subjected to earthquake or dynamic loads, special Books: measures for foundations constructed under water.

Reference

1. Tomlinson MJ, Foundation Design and Construction ELBs-LonBman, 6e,.
2. Bowles Joseph E, Foundation Analysis and Design, McGraw Hill.
3. Som, NN & Das S.C. , Theory and Practice of Foundation Design, Prentice Hall of lndia, 2003
4. Braja M. Das, Principles of Foundation Engineering, 5e, Thomson, 2007
5. Koerner, Robert M, Construction and Geotechnical Methods in Foundation Entineering ' Mccraw ' Hill,

6. Dinesh Mohan, Pile foundations, Oxford &lBH, 1998
7. Kurian, N.P. Modern Foundations, Tata McGraw Hill, 1982.
8. Fang H.Y. Foundation Engineering Handbook, van Nostrand Reinhold, 23,l99L'
9. KanirajShenbaSa R, Design Aids in soil Mechanics and FoundtionEnSineering, Tata Mccraw Hill

PHD-RPE-103	Research and Publication Ethics	Credit Distribution: L:1, T:1, P:0=2
Learning Outcomes	1. To have awareness about the publication ethics and publication misconducts. 2. To understand indexing and citation databases, open access publications, research metrics (citations, h-index, impact factor etc) 3. Develop hands-on skills to identify research misconduct and predatory publications.	
Unit 1	**Philosophy and Ethics (4 hrs)** 1. Introduction to philosophy: definition, nature and scope, concept, branches 2. Ethics: definition, moral philosophy, nature of moral judgements and reactions	
Unit 2	**Scientific Conduct (4 hrs)** 1. Ethics with respect to science and research 2. Intellectual honesty and research integrity 3. Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP) 4. Redundant publications: duplicate and overlapping publications, salami slicing 5. Selective reporting and misrepresentation of data	
Unit 3	**Publication Ethics (7 hrs)** 1. Publication ethics: definition, introduction and importance 2. Best practices / standards setting initiatives and guidelines: COPE, WAME, etc. 3. Conflicts of interest 4. Publication misconduct: definition, concept, problems that lead to unethical behavior and vice versa, types 5. Violation of publication ethics, authorship and contributorship 6. Identification of publication misconduct, complaints and appeals 7. Predatory publishers and journals	
Unit 4 Practice	**Open Access Publishing (4 hrs)** 1. Open access publications and initiatives 2. SHERPA/ROMEO online resource to check publisher copyright &self-archiving policies	

	3. Software tool to identify predatory publications developed by SPPU 4. Journal finder / journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer Journal Suggester, etc.
Unit 5 Practice	**Publication Misconduct (4 hrs)** A. Group Discussions (2 hrs.) 1. Subject specific ethical issues, FFP, authorship 2. Conflicts of interest 3. Complaints and appeals: examples and fraud from India and abroad B. Software tools (2 hrs.) Use of plagiarism software like Turnitin, Urkund and other open source software tools
Unit 6 Practice	**Databases and Research Metrics (7 hrs)** A. Databases (4 hrs.) 1. Indexing databases 2. Citation databases: Web of Science, Scopus etc. B. Research Metrics (3 hrs.) 1. Impact Factor of journal as per Journal Citation Report, SNIP, SJR, IPP, Cite Score 2. Metrics: h-index, g-index, i10 index, altmetrics

Suggested Readings

1. Bird, A. (2006). Philosophy of Science. Routledge.
2. MacIntyre, A. (1967) A Short History of Ethics. London.
3. P. Chaddah, (2018) Ethics in Competitive Research: Do not get scooped; do not getplagiarized, ISBN:978-9387480865
4. National Academy of Sciences, National Academy of Engineering and Institute ofMedicine. (2009). On Being a Scientist: A Guide to Responsible Conduct in Research:Third Edition. National Academies Press.
5. Rensik, D. B. (2011). What is ethics in research & why is it important. National Instituteof Environmental Health Sciences, 1-10. Retrieved fromhttps://www.niehs.nih.gov/resources/biothics/whatis/index.cfm
6. Beall, J. (2012). Predatory publishers are corrupting open access. Nature, 489(7415),179-179. https://doi.org/10.1038/489179a

NIILM UNIVERSITY

Ph.D. Course Work in Clinical Psychology

Academic Session 2024-25

Ph.D. Regulations Regarding Course Work

Clause 18: Ph.D. Ordinance NIILM University as per UGC Minimum Standards and Procedure for Award of Ph.D. Degrees Regulations 2022 with effect from academic session 2024-25

I. The coursework shall be treated as a prerequisite for Ph.D. preparation. In the first year of registration, all research scholars are required to complete the course work for one semester following their provisional registration as a part of the Ph.D. program. It is mandatory to complete the course work in first 4 semesters to stay in the Ph.D. program. If a student fails to complete the coursework in first 4 semesters, will have to leave the program.

II. Earning a minimum of 12 total credits and a maximum of 16, is required.

III. Usually a course refers to a 'paper' and is a component of an academic program. Courses in Ph.D. course work shall be of two kinds: Core and Elective.

IV. A core course is a compulsory paper to be studied by all the scholars to complete the requirements of the Ph.D. degree.

V. Elective course is a course which is discipline specific and provided by the particular department from the main discipline or from a sister/related discipline which supports the main discipline, on mutual consent of the concerned departments.

VI. One credit equal to 15 contact hours for theory-based teaching or 30 hours of contact time for practical or activity-based teaching.

VII. The number of credits is given in the form L: T: P, where L indicates the number of contact hours of lecture, and T the number of contact hours for tutorials, P stands for laboratory credits.

VIII. The credits are distributed as follows:

Paper Code	Paper	Course type	Credit	L	T	P
PHD-ARM-101	Advanced Research Methodology	Core	4	3	1	0
PHD-DSC-102	Discipline Specific Course	Elective	4	3	1	0
PHD-RPE-103	Research and Publication Ethics	Core	2	1	1	0
PHD-SEM-104	Academic Writing, Literature Review and Seminar	Skill	2	0	1	2
	Total		12			

IX. All Ph.D., entrants irrespective of discipline, shall be trained in teaching proficiency related to teaching/education/pedagogy/writing related to their chosen Ph.D. subject during their doctoral training period, that include assigning 4-6 hours per week of teaching/ research assistantship for conducting tutorial or laboratory work and evaluations.

X. Courses PHD-SEM 104 includes research work on research article writing, seminar presentation and course PHD-TP 105 includes pedagogical training. Both these courses will be assessed internally without Semester End Examination.

XI. CoE will conduct Term/ Semester End Exam in PHD-ARM-101, PHD-DSC-102, and PHD-RPE-103.

XII. PHD-TP 105 is a non-credit course and internal assessment will be marked on the detailed mark card of the course work.

XIII. Advance Research Methodology course will include common research methodology and subject specific research methodology.

XIV. Research Advisory Committee may provide choices in selecting the courses/ credits that facilitates the entrepreneur in the monetization of IP thus generated.

XV. RAC can also recommend UGC recognized online courses as part of the credit requirements for the Ph.D. program.

XVI. Paper- will comprise of the following two activities:

   (a) External Assessment: Written Question Paper 70/39

   (b) Internal Assessment: 30/16

   Marks will be converted into letter grade and grade point as per following table:

Marks	Letter Grade	Grade Point
81-100	A+	10
76-80	A	9
66-75	B+	8
61-65	B	7
55-60	C	6
Less than 55	F	0

The computation of the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA) shall be done as per University Examination Ordinance or Examination Rules & Regulations issued time to time.

The result and grade sheet for the course work will carry pass/ fail result.

COURSE WORK PAPER

I. Candidates who already hold an M. Phil. degree and have been accepted into the Ph.D. program, or those who have finished their M.Phil. Coursework and have been given permission to continue on to the Ph.D. in an integrated course, may be exempted from the Ph.D. course requirements by the Department. All additional applicants accepted into the Ph.D. program must complete the Ph.D. coursework required by the Department.

II. The NIILM University attendance rules, a minimum 75% attendance is must require, will be applied to all full-time research scholars. For the duration of their coursework, part-time research researchers must, nevertheless, adhere to the same rules.

III. A Ph.D. scholar has to obtain a minimum of 55% of marks or a minimum CGPA of 6.0 in the UGC 10-point scale (or an equivalent grade/CGPA in a point scale wherever grading system is followed) in the course work in order to be eligible to continue in the program and submit the thesis.

IV. Registration will be automatically canceled if the required course work is not completed with a minimum of 55% of marks/a minimum CGPA of 6.0 within the allotted time. If the course work is not finished within a year, the RAC and DRC may suggest a six-month extension or suggest that the registration be canceled with the DRC.

V. There is no provision of improvement or special supplementary exam to be conducted. Coursework will be offered in four semesters of first two years with regular & supplementary exams to avail the opportunity to clear the coursework in 2 years. **Failure to complete the course in 2 years means that the student has to leave the program.**

Course Structure:

PHD-ARM-101	Advance Research Methodology in Clinical Psychology	Credit Distribution: L:3, T:1, P:0=4
Course Objectives:	To acquaint the students with research process in Psychology. To train them in the research methods and designs in Psychology and to equip them to take up psychological researches independently	
Unit 1	Introduction to Psychological Research a. Nature and aims of psychological research b. Dimensions and types of research c. Theory and research d. The meaning of methodology e. e. Types of Methods of Research	
Unit 2	Research Planed Data Collection a. Concept, logic, and research question/issues b. Variables, causal theory, and hypothesis c. Research Design and Collection of Data d. Sampling: Methods, Size, Errors e. Probability and non-probability f. Measurement and Scaling Techniques g. Issues in measurement: Qualitative and quantitative	
Unit 3	Data Processing i. Analysis of quantitative data introduction to higher order statistics a. Editing, Coding and Classification of Data b. Analysis of qualitative data and Tabulation c. Introduction to advanced statistical techniques using SPSS d. Statistical Derivatives and Measures of Central Tendency e. Measures of Variation and Skewness f. Correlation and Simple Regression g. Diagrammatic and Graphic Presentation of Data	
Unit 4	Research Report Writing a. Ethical issues in psychological research b. APA style of writing concept c. APA style of writing: Referencing d. d. Research article writing	

Unit 5	Computer Application in Research
	a. Introduction to MS Excel, Using Formulas and Functions
	b. Hand on to SPSS
	c. Features for Statistical Data Analysis
	d. Generating Charts/Graphs
	e. Introduction to MS Word, Features and Functions, Writing Report in MS Word
	f. Introduction to Open Office or Latex
	g. Creating Presentation in MS PowerPoint
	h. Introduction to Internet-Based Search
	i. Use of Advanced Research Techniques.

Recommended Readings:

1. Bayard, P. & Grayson, A. (1976). Introducing psychological research. London: McMillan.

2. Bordens, K.S. & Abbot, B.B. (2005). Research design and methods. New Delhi: Tata McGraw Hill.

3. Breakwell, G.M. Hammond, S. & Fife-Schaw, C. (1995). Research Methods in Psychology. New Delhi: Sage Publications.

4. Cresswell, J.W. (1994) Research design:L Qualitative and quantitative approaches. Thousand Oaks, CA: Sage Publication.

5. Drew, C.J.: Hardman, M.L. & Hart, W.A. (1996). Designing and conducting research: Inquiry in education and social science. New York: Allyn & Bacon.

6. Kerlinger, F.N. (1982). Foundations of behavioural research. Delhi: Subject Publication.

7. Nation, J.R. (1997). Research Methods. New Jersey: Prentice Hall.

8. Willing, C. & Stainton-Rogers, W. (Eds.) (2008). The Sage Handbook of Qualitative Research in Psychology. New Delhi: Sage Publications.

PHD-DSC-102	Discipline Specific Course (Clinical Psychology)	Credit Distribution: L:3, T:1, P:0=4
Learning Outcomes	• Formulate clinical profiles for various psychological disorders (neuroses, psychoses, physical disorders).	
	• Utilize Behavioural Counselling, Clinical Hypnotherapy, and Family/Marital therapies for diverse psychological conditions.	
	• Apply clinical behavioural techniques for childhood anxiety, OCD, PTSD, and impulse control disorders.	
	• Address stress, pain conditions, and psychotic disorders with evidence-based therapeutic approaches.	
Unit 1	Clinical Assessment: Observation, Interview, Case history, psychological tests, Neurological and Psycho neurological examination. Theoretical Foundations Learning, biological and cognitive foundations; Behavioural assessment, analysis and formulations (for Neuroses, Psychoses and other conditions, including physical disorders).	
Unit 2	Rational Emotive Behaviour therapy, Cognitive therapy, Cognitive Behaviour	

	therapy, Stress Inoculation Training and other methods. Other Approaches - Behavioural Counselling, Clinical Hypnotherapy, Group behavioural approaches, Behavioural family/marital therapies.
Unit 3	Causes, Symptoms, and treatment of Tic and Elimination Disorders: Tic disorders; Nonorganic enuresis and encopresis; Emotional disorders (Anxiety dis.; School refusal; Sibling rivalry; Phobic dis.; OCD, Somatoform dis.; Depressive dis.; Suicide and Para-suicide; Child abuse; Feeding and eating dis.; PTSD, Panic dis.); Impulse control disorders
Unit 4	Clinical Applications Clinical applications of behavioural techniques in the management of anxiety disorders, speech and psychomotor disorders, substance use, Sexual dysfunction and deviant behaviours, personality disorders, Management of Childhood disorders, Psychotic disorders, stress and pain conditions, chronic mental illness.

Essential References:

1) Basmajian J.V. (1979). Biofeedback – Principles and practice for clinicians, Williams & Wilkins Company: Baltimore.

2) Bellack, A.S., Hersen, M. & Kazdin, A.E. (1985). International handbook of behavior modification and therapy, Plenum Press: NY.

3) Dimatteo, M. R. & Martin, L.R. (2002). Health Psychology, Pearson, New Delhi. Lambert, M.J. (2004). Handbook of Psychotherapy and behaviour change, 5th ed., John Wiley and Sons: USA.

4) Rimm D.C. & Masters J.C. (1979). Behaviour therapy: Techniques and empirical findings, Academic Press: NY. Sweet, J.J., Rozensky, R.H. & Tovian, S.M. (1991), Handbook of clinical psychology in medical settings,

PHD-RPE-103	Research and Publication Ethics	Credit Distribution: L:1, T:1, P:0=2
Learning Outcomes	1. To have awareness about the publication ethics and publication misconducts. 2. To understand indexing and citation databases, open access publications, research metrics (citations, h-index, impact factor etc) 3. Develop hands-on skills to identify research misconduct and predatory publications.	
Unit 1	Philosophy and Ethics (4 hrs) 1. Introduction to philosophy: definition, nature and scope, concept, branches 2. Ethics: definition, moral philosophy, nature of moral judgements and reactions	
Unit 2	Scientific Conduct (4 hrs)	

	1. Ethics with respect to science and research
	2. Intellectual honesty and research integrity
	3. Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP)
	4. Redundant publications: duplicate and overlapping publications, salami slicing
	5. Selective reporting and misrepresentation of data
Unit 3	Publication Ethics (7 hrs)
	1. Publication ethics: definition, introduction and importance
	2. Best practices / standards setting initiatives and guidelines: COPE, WAME, etc.
	3. Conflicts of interest
	4. Publication misconduct: definition, concept, problems that lead to unethical behavior and vice versa, types
	5. Violation of publication ethics, authorship and contributor ship
	6. Identification of publication misconduct, complaints and appeals
	7. Predatory publishers and journals
Unit 4 Practice	Open Access Publishing (4 hrs)
	1. Open access publications and initiatives
	2. SHERPA/ROMEO online resource to check publisher copyright & self-archiving policies
	3. Software tool to identify predatory publications developed by SPPU
	4. Journal finder / journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer Journal Suggester, etc.
Unit 5 Practice	Publication Misconduct (4 hrs)
	A. Group Discussions (2 hrs.)
	1. Subject specific ethical issues, FFP, authorship
	2. Conflicts of interest
	3. Complaints and appeals: examples and fraud from India and abroad
	B. Software tools (2 hrs.)
	Use of plagiarism software like Turnitin, Urkund and other open source software tools
Unit 6 Practice	Databases and Research Metrics (7 hrs)
	A. Databases (4 hrs.)
	1. Indexing databases
	2. Citation databases: Web of Science, Scopus etc.
	B. Research Metrics (3 hrs.)
	1. Impact Factor of journal as per Journal Citation Report, SNIP, SJR, IPP, Cite Score
	2. Metrics: h-index, g-index, i10 index, altmetrics

Suggested Readings

1. Bird, A. (2006). Philosophy of Science. Routledge.
2. MacIntyre, A. (1967) A Short History of Ethics. London.
3. P. Chaddah, (2018) Ethics in Competitive Research: Do not get scooped; do not get plagiarized, ISBN:978-9387480865
4. National Academy of Sciences, National Academy of Engineering and Institute of Medicine. (2009). On Being a Scientist: A Guide to Responsible Conduct in Research: Third Edition. National Academies Press.
5. Rensik, D. B. (2011). What is ethics in research & why is it important. National Institute of Environmental Health Sciences, 1-10. Retrieved from https://www.niehs.nih.gov/resources/biothics/whatis/index.cfm
6. Beall, J. (2012). Predatory publishers are corrupting open access. Nature, 489(7415), 179-179. https://doi.org/10.1038/489179a

NIILM UNIVERSITY

Ph.D. Course Work in Commerce

Academic Session 2024-25

Ph.D. Regulations Regarding Course Work

Clause 18: Ph.D. Ordinance NIILM University as per UGC Minimum Standards and Procedure for Award of Ph.D. Degrees Regulations 2022 with effect from academic session 2024-25

I. The coursework shall be treated as a prerequisite for Ph.D. preparation. In the first year of registration, all research scholars are required to complete the course work for one semester following their provisional registration as a part of the Ph.D. program. It is mandatory to complete the course work in first 4 semesters to stay in the Ph.D. program. If a student fails to complete the coursework in first 4 semesters, will have to leave the program.

II. Earning a minimum of 12 total credits and a maximum of 16, is required.

III. Usually a course refers to a 'paper' and is a component of an academic program. Courses in Ph.D. course work shall be of two kinds: Core and Elective.

IV. A core course is a compulsory paper to be studied by all the scholars to complete the requirements of the Ph.D. degree.

V. Elective course is a course which is discipline specific and provided by the particular department from the main discipline or from a sister/related discipline which supports the main discipline, on mutual consent of the concerned departments.

VI. One credit equal to 15 contact hours for theory-based teaching or 30 hours of contact time for practical or activity-based teaching.

VII. The number of credits is given in the form L: T: P, where L indicates the number of contact hours of lecture, and T the number of contact hours for tutorials, P stands for laboratory credits.

VIII. The credits are distributed as follows:

Paper Code	Paper	Course type	Credit	L	T	P
PHD-ARM-101	Advanced Research Methodology	Core	4	3	1	0
PHD-DSC-102	Discipline Specific Course	Elective	4	3	1	0
PHD-RPE-103	Research and Publication Ethics	Core	2	1	1	0
PHD-SEM-104	Academic Writing, Literature Review and Seminar	Skill	2	0	1	2
	Total		12			

IX. All Ph.D., entrants irrespective of discipline, shall be trained in teaching proficiency related to teaching/education/pedagogy/writing related to their chosen Ph.D. subject during their doctoral training period, that include assigning 4-6 hours per week of teaching/ research assistantship for conducting tutorial or laboratory work and evaluations.

X. Courses PHD-SEM 104 includes research work on research article writing, seminar presentation and course PHD-TP 105 includes pedagogical training. Both these courses will be assessed internally without Semester End Examination.

XI. CoE will conduct Term/ Semester End Exam in PHD-ARM-101, PHD-DSC-102, and PHD-RPE-103.

XII. PHD-TP 105 is a non-credit course and internal assessment will be marked on the detailed mark card of the course work.

XIII. Advance Research Methodology course will include common research methodology and subject specific research methodology.

XIV. Research Advisory Committee may provide choices in selecting the courses/ credits that facilitates the entrepreneur in the monetization of IP thus generated.

XV. RAC can also recommend UGC recognized online courses as part of the credit requirements for the Ph.D. program.

XVI. Paper- will comprise of the following two activities:

(a) External Assessment: Written Question Paper 70/39

(b) Internal Assessment: 30/16

Marks will be converted into letter grade and grade point as per following table:

Marks	Letter Grade	Grade Point
81-100	A+	10
76-80	A	9
66-75	B+	8
61-65	B	7
55-60	C	6
Less than 55	F	0

The computation of the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA) shall be done as per University Examination Ordinance or Examination Rules & Regulations issued time to time.

The result and grade sheet for the course work will carry pass/ fail result.

COURSE WORK PAPER

I. Candidates who already hold an M. Phil. degree and have been accepted into the Ph.D. program, or those who have finished their M.Phil. Coursework and have been given permission to continue on to the Ph.D. in an integrated course, may be exempted from the Ph.D. course requirements by the Department. All additional applicants accepted into the Ph.D. program must complete the Ph.D. coursework required by the Department.

II. The NIILM University attendance rules, a minimum 75% attendance is must require, will be applied to all full-time research scholars. For the duration of their coursework, part-time research researchers must, nevertheless, adhere to the same rules.

III. A Ph.D. scholar has to obtain a minimum of 55% of marks or a minimum CGPA of 6.0 in the UGC 10-point scale (or an equivalent grade/CGPA in a point scale wherever grading system is followed) in the course work in order to be eligible to continue in the program and submit the thesis.

IV. Registration will be automatically canceled if the required course work is not completed with a minimum of 55% of marks/a minimum CGPA of 6.0 within the allotted time. If the course work is not finished within a year, the RAC and DRC may suggest a six-month extension or suggest that the registration be canceled with the DRC.

V. There is no provision of improvement or special supplementary exam to be conducted. Coursework will be offered in four semesters of first two years with regular & supplementary exams to avail the opportunity to clear the coursework in 2 years. **Failure to complete the course in 2 years means that the student has to leave the program.**

Course Structure:

PHD-ARM-101	Advance Research Methodology in Commerce	Credit Distribution: L:3, T:1, P:0=4
Course Objectives:	To acquaint the students with research process. To train them in the research methods and designs and to equip them to take up researches independently.	
Unit 1	**Introduction to Research** a. Nature and aims of research b. Dimensions and types of research c. Theory and research d. The meaning of methodology e. Types of Methods of Research	
Unit 2	**Research Planed Data Collection** a. Concept, logic, and research question/issues b. Variables, causal theory, and hypothesis c. Research Design and Collection of Data d. Sampling: Methods, Size, Errors e. Probability and non-probability f. Measurement and Scaling Techniques g. Issues in measurement: Qualitative and quantitative	
Unit 3	**Data Processing** a. Analysis of quantitative data introduction to higher order statistics b. Editing, Coding and Classification of Data c. Analysis of qualitative data and Tabulation d. Introduction to advanced statistical techniques using SPSS e. Statistical Derivatives and Measures of Central Tendency f. Measures of Variation and Skewness g. Correlation and Simple Regression h. Diagrammatic and Graphic Presentation of Data	
Unit 4	**Research Report Writing** a. Ethical issues in research b. APA style of writing concept c. APA style of writing: Referencing d. d. Research article writing	

Unit 5	**Computer Application in Research**
	a. Introduction to MS Excel, Using Formulas and Functions
	b. Hand on to SPSS
	c. Features for Statistical Data Analysis
	d. Generating Charts/Graphs
	e. Introduction to MS Word, Features and Functions, Writing Report in MS Word
	f. Introduction to Open Office or Latex
	g. Creating Presentation in MS PowerPoint
	h. Introduction to Internet-Based Search
	i. Use of Advanced Research Techniques.

Recommended Readings:

1. Bayard, P. & Grayson, A. (1976). Introducing psychological research. London: McMillan.

2. Bordens, K.S. & Abbot, B.B. (2005). Research design and methods. New Delhi: Tata McGraw Hill.

3. Breakwell, G.M. Hammond, S. & Fife-Schaw, C. (1995). Research Methods in Psychology. New Delhi: Sage Publications.

4. Cresswell, J.W. (1994) Research design: L Qualitative and quantitative approaches. Thousand Oaks, CA: Sage Publication.

5. Drew, C.J.: Hardman, M.L. & Hart, W.A. (1996). Designing and conducting research: Inquiry in education and social science. New York: Allyn & Bacon.

6. Kerlinger, F.N. (1982). Foundations of behavioural research. Delhi: Subject Publication.

7. Nation, J.R. (1997). Research Methods. New Jersey: Prentice Hall.

8. Willing, C. & Stainton-Rogers, W. (Eds.) (2008). The Sage Handbook of Qualitative Research in Psychology. New Delhi: Sage Publications.

Select Any One from the following Elective Courses

Sr. No.	Paper Code	Course Title	
1	**PHD-DSC-102**	**Fundamentals of Commerce**	**Credit Distribution: L:3, T:1, P:0=4**
2	**PHD-DSC-102**	**Emerging areas in Accounting and Finance**	**Credit Distribution: L:3, T:1, P:0=4**
3	**PHD-DSC-102**	**Emerging areas in Marketing Management**	**Credit Distribution: L:3, T:1, P:0=4**
4	**PHD-DSC-102**	**Emerging areas in Human Resource Management**	**Credit Distribution: L:3, T:1, P:0=4**

PHD-DSC-102	Discipline Specific Course (Fundamentals of Commerce)	Credit Distribution: L:3, T:1, P:0=4
Learning Outcomes	• Understand accounting concepts, conventions, GAAP, and Indian Accounting Standards. • Understand accounting for mergers, acquisitions, and internal/external reconstruction. • Perform financial analysis using comparative statements, common-size statements, ratio analysis, cash flow, and fund flow statements.	
Unit 1	Accounting Concept and conventions, GAAP, Accounting Standards in India, Harmonization of Indian Accounting Standards, Capital Budgeting, Methods of capital Budgeting, traditional and modern method of evaluation, working capital and management, cash management, inventory management, receivable management, Dividend decisions.	
Unit 2	Accounting for Managers, methods of analysis, financial analysis and interpretation, comparative statement analysis, common-size statement, Ratio Analysis, Cash flow statement, fund flow statement, budgeting, fixed budget, flexible budget, performance budgeting, zero-base budgeting, Activity based Costing, Value Chain Analysis, Quality Costing, Target Costing.	
Unit 3	Accounting for merger and acquisition, internal and external reconstruction, Break even Analysis: Linear and Non-Linear Approaches, emerging short-term & long-term financial instruments, financial decisions, cost of capital, capital structure, theories of capital structure.	
Unit 4	Importance of Human Resource Management; Challenges Faced by a modern Human Resource Manager; Broad Functions of an HRM Department, Determination of HR Requirements, Need and Types of HR Policies; Indian Labour Policy Job Analysis; Purposes, uses, contents, steps and techniques, Recruitment and Selection Marketing Concepts; Marketing Mix; Strategic Marketing Planning, Marketing Environment – Macro and Micro Components and their Impact on Marketing Decisions, Market Segmentation; Buyer Behaviour.	

References:

- Robbins, S.P. Management Concepts, Pearson Education India, New Delhi.
- Koontz, Weilhrich, Management: A Global and Entrepreneurial Perspective, McGraw Hill.
- Jones and George, Contemporary Management, McGraw Hill.
- Richard L. Draft, The New Era of Management, Cengage India
- Mullins. J, Management and OB, 8th Edn. Pearson Education
- Stoner, J., Management, Prentice Hall of India., New Delhi
- Koontz.Essentials of Management, Tata McGraw-Hill, 8th Ed.,
- Chandan, J.S. Management Concepts and Strategies, Vikas Publishing House.

- Hooda, R.P. : Statistics for Business and Economics, Macmillan, New Delhi.

PHD-DSC-102	Discipline Specific Course (Emerging areas in Accounting and Finance)	Credit Distribution: L:3, T:1, P:0=4
Learning Outcomes	• Develop skills in capital budgeting, evaluating traditional and modern methods, and managing working capital, cash, inventory, and receivables. • Understand and apply theories like the Efficient Market Hypothesis, Markowitz's Optimization, CAPM, and Arbitrage Pricing Theory. • Understand TDS, advance tax, and GST calculations.	
Unit 1	Accounting Concept and conventions, GAAP, Accounting Standards in India, Harmonization of Indian Accounting Standards, Capital Budgeting, Methods of capital Budgeting, traditional and modern method of evaluation, working capital and management, cash management, inventory management, receivable management, Dividend decisions.	
Unit 2	Salient Features & Operations of Stock Exchanges, Changing Scenario of Indian Stock Market, Common Stock & bond Valuation Models, Fundamental Analysis, Technical Analysis., Efficient Market Theory, Markowitz's Risk-Return Optimization, Sharpe Single-Index Model, Capital Asset Pricing Model, Arbitrage Pricing Theory, Managed Portfolios and Performance Examination, Portfolio Revision & Portfolio Re-balancing. Concept and uses of financial economics, Financial Derivatives, Risk management	
Unit 3	International Accounting and Reporting, Various Approaches to Corporate Valuation, Restructuring- Merger, Acquisition & Divestment, Leveraged Buy-outs (LBOs), International accounting standards , Human Resource Accounting: Need, Methods, Benefits, Social Accounting: Environmental Accounting: Accounting for Price Level Changes	
Unit 4	Direct and Indirect Taxes in India. Definitions, Residential Status and tax liability, Exempted Incomes, Computation of Income various heads of income, clubbing of income, set off and carry forward of losses, Deductions from Gross Total Income Salient features of assessment of individual, Hindu Undivided Family, Firm, Association of Person and Company. Tax deduction and source, Advanced Payment of Tax and calculation of GST. Research Papers based on the above syllabus to be discussed in the class.	

Reference:

1. Ahuja, Girish& Gupta, Ravi: Practical Approach to Income Tax, Wealth Tax and Central Sales Tax, Bharat Law House Pvt. Ltd., New Delhi
2. Datey, V. S.: Indirect Taxes: Taxman Publications, New Delhi
3. Singhania, Vinod K.: Student Guide to Income Tax, Taxman Publications, New Delhi
4. Mehrotra H. C.: Income Tax Law and Accounts, Sahitya Bhawan, Agra
5. Bare Acts related to Income Tax, Central Sales Tax and Service Tax

6. Pandey, I. M., Financial management, Vikas Publishing House Pvt. Ltd., Noida, 2005, 10th ed.
7. Khan, M.Y. and Jain, P.K., Financial management Text, Cases and Problems, Tata McGrawHill Publishing Company Ltd., New Delhi, 2007
8. Chandra, Prasanna, Financial management Theory and Practice, Tata McGraw-Hill Publishing Company Ltd., New Delhi, 2007
9. Chandra, P. 2002, Investment Analysis, Tata McGraw Hill
10. Bhalla, V.K. 2001. Investment Management: Security Analysis & Portfolio Management, S. Chand and Company, 8th Ed.
11. Fischer, D.E. and Jordan, R.J. 1995, Security Analysis & Portfolio Management, Prentice Hall of India
12. Fuller, R. J. and Farrel, J.L. 1987, Modern Investment & Security Analysis, McGraw Hill International.
13. Avdhani V.A. 1994, Security Analysis & Portfolio Management, Himalaya Publishing House
14. Hull, J.C. 1995, Introduction to Futures & Options Markets, Prentice Hall, Eaglewood Cliffs, New Jersey.
15. Levi, Maurice D: International Finance, McGraw- Hill, International Edition.
16. Singhania V.K. &SinghaniaKapil, Direct taxes law & practices, Taxmann.
17. Gupta, R. L. and Radhaswamy M.-Advanced Accoutning, S. Chand, New Delhi
18. Arunanandan and Raman-Advanced Accounting, Himalaya, Delhi
19. Maheshwari and Maheshwari-Advanced Accounting, Vikash, New Delhi
20. Hanif and Mukharjee-Advanced Accounting, Tata MacGrawHill, New Delhi
21. Jain and Narang-Advanced Accounting, Kalyani, New Delhi
22. Basu and Das-Practice in Accountancy, Rabindra Library, Kolkata

PHD-DSC-102	Discipline Specific Course (Emerging areas in Marketing Management)	Credit Distribution: L:3, T:1, P:0=4
Learning Outcomes	• Understand the concept, functions, and evolution of retailing. • Understand the Service Management Trinity: internal, external, and interactive marketing. • Grasp branding concepts, including brand awareness, personality, image, identity, loyalty, and equity.	
Unit 1	**Consumer Behaviour** Introduction to Consumer Behavior; Scope & applications of Consumer Research. Demographics, Psychographics & Lifestyle; Influence of Society, Culture, Subculture and social class; Cross-Cultural Consumer Behavior; Consumer Perception; Consumer Learning; Consumer Attitudes & Beliefs: Models of Consumer Behavior.	
Unit 2	**Marketing of Services** Growth of Service Economy; Characteristics of Services; Services Classification. Service Management Trinity: Internal, External and Interactive	

	Marketing. Service Product Development, Service Quality, Consumer Behavior in Services.
Unit 3	**Sales and Distribution Management** Nature, Scope and objectives of Sales Management; Determination of size of sales force, Conducting sales training programs; Designing and Administering Compensation Plan; Distribution Channels: Role of Marketing Channels, Factors affecting choice of Distribution; Channel Structure; Channel Conflict and Co-ordination.
Unit 4	**Integrated Marketing Communications** The Role of IMC in Marketing, Reasons for Growing Importance of IMC, Direct Marketing; Sales and Trade Promotion; The Internet and Interactive Media; Personal Selling; Evaluating the Ethical Aspects of IMC.
Unit 5	**Product and Brand Management** Product Management: Product Concepts and Classification; Product Mix and Line Decisions; Product Development Process; New Product Launches, Concept and importance of Branding; Basic branding concepts: brand awareness, brand personality, brand image, brand identity, brand loyalty, brand equity; Major Branding Decisions: Brand Positioning and Re-launch: Brand building and communication. Brand Equity
Unit 6	**Retail Management** Retailing: Concept, Definition and Functions; Evolution of Retailing; Unorganized and organized retailing; Retailing Structure and Different Formats: Super Market, Specialty Store, Departmental Store, etc. Retail Store Location, Design and Layout Decision, Retail Pricing, Retail Promotion; Future of Retailing Research Papers based on the above syllabus to be discussed in the class.

Suggested Readings:

1. J. Zeithaml, V A and Bitner, M J. Services Marketing; 3rd edition; McGraw Hill, New Delhi; 2002.
2. Hoffman & Bateson; Essentials of Service Marketing; Thomson Learning; Mumbai.
3. Shankar, Ravi, Service Marketing, Excel, 2002.
4. Dalrymple, D J., Sales Management: Concepts and Cases. New York, John Wiley, 1989.
5. Still, R &Govoni, Sales Management, Prentice Hall Inc., 1988.
6. Khanna, K.K. Physical Distribution Management, Himalaya Publishing House, New Delhi.
7. Belch, George E and Belch, Michael A. Introduction to Advertising and Promotion. 3rd ed. Chicago; Irwin, 2002.
8. Berman. Bell & Evans, Joel R.; Retail Management; A Strategic Approach; PHI/Pearson Education; New Delhi.

9. Kenneth E. Clow and Donald Baack (2004); Integrated Advertising, Promotion and Marketing Communications; PHI Ltd., New Delhi
10. Levy Michael &WeitzBartcn W.; Retailing Management; Tata McGraw Hill. New Delhi.
11. Loudon & Loudon; Consumer Behavior; TMH; New Delhi
12. Lehman, Donald R. and Winer, Russel S., Product Management, Tata McGraw Hill, 3rd edition, 2002.

PHD-DSC-102	Discipline Specific Course (Emerging areas in Human Resource Management)	Credit Distribution: L:3, T:1, P:0=4
Learning Outcomes	• Understand trade unionism, collective bargaining, and negotiation techniques. • Understand Indian and Western ethical frameworks. • Design and evaluate compensation packages aligned with economic theories and statutory provisions.	
Unit 1	**Human Resource Management** Human resource planning – concepts, process and techniques, career planning, recruitment and selection, performance appraisal and performance management, compensation management –economic theory of rewards, compensation systems, tools and techniques for designing compensation packages, compensation packages of senior managers, statutory provisions and institutions related to compensation management; motivation, discipline and grievance management, retirement, HR information system, HR accounting, HR audit.	
Unit 2	**Industrial Relations** Emergence of the concept of industrial relations – theoretical and philosophical underpinnings, Trade unionism, collective bargaining, negotiation skills, industrial democracy, and institutions related to welfare and rights of workers.	
Unit 3	**Training and Development** Learning theories, training – concepts and types, training skills, training needs assessment, action research, designing and delivering training modules, organisational change – process, factors, strategies for managing change, OD interventions and strategies, Human Resource Development – Meaning, concepts, quality of work life, HRD climate, interventions, strategies, HRD practices in Indian organisations, coaching and mentoring.	
Unit 4	**Strategic and Global HRM** Strategic management and its relevance for HRM, strategic HRM – meaning, concepts, approaches and models, HR strategy formulation, implementation and integration with the business enterprise, evaluation of HR strategy. Global HRM – meaning, concepts, cross-cultural issues, organisational culture and national culture, workforce diversity, HR strategies in MNCs, global sourcing,	

	management and compensation of human resources, HR issues and strategies in BPO sector.
Unit 5	**Contemporary issues in HRM** Employee empowerment and participative management, employee engagement, managing creativity and innovation, TQM and HR strategies, research issues in HRM.
Unit 6	**Ethics in HRM** Understanding Indian and western conceptualisations and theories of ethics, ethical dilemma, ethical climate, stakeholder management, CSR and corporate governance, harassment and discrimination at the workplace, ethical issues in HRM.Research papers based on the above syllabus to be discussed in the class**.**

Suggested Readings:

1. Adler, N.J.; International Dimensions of Organizational Behaviour; Kent Pub; Boston. 1991.
2. Armstrong Michel and Murlis, Helen. Reward Management: A Handbook of Salary Administration London Kegan Paul. 1988.Arthur, M. Career Theory Handbook. Englewood Cliff, Prentice Hall Inc., 1991.
3. Beardwell and Holden, 1996, Human Resource Management, London Pitman.
4. Blanchard, P. Nick, Effective Training: Systems, Strategies and Practices, New Delhi, Pearson.
5. Dale, B. Total quality and Human Resources: An Executive Guide. Oxford, Blackwell. 1992.
6. Dayal, Ishwar. Successful Applications of HRD. New Concepts, New Delhi, 1996.
7. Dowling, P.J. etc.; International Dimensions of Human Resource Management; 2nd Ed.., Wadsworth; California; 1994.
8. Greenhaus, J H. Career Management. New York, Dryden, 1987.
9. Hofstede, G.; Cultures Consequence: International Differences in Work Related Values; 2nd edition; Sage; London; 2001.
10. Kohli, Uddesh&Sinha, Dharni P. HRD - Global Challenges & Strategies in 2000 A.D. ISTD, New Delhi, 1995.
11. Maheshwari, B L. &Sinha, Dharni P. Management of Change Through HRD. Tata McGraw Hill. New Delhi, 1991.
12. Malik, P L. Handbook of Industrial Law, Eastern Book, Lucknow, 1995.
13. Mead, R; International Management: Cross Cultural Dimensions; Blackwell; Cambridge; 1994.
14. Micton, Rock. Handbook of Wages and Salary Administration. 1984.
15. Pareek, U. et al. Managing Transitions: The HRD Response. Tata McGraw Hill, New Delhi. 1992.
16. Pareek, Udai, and Rolf P Lynton, Training for Development, New Delhi, Vistaar.

17. Ramaswamy, E A. The Strategic Management of industrial Relations, Oxford University Press, New Delhi, 1994.
18. Robbins, SP and Decenzo, D. Human Resource Management. PHI Learning, New Delhi.
19. Srivastava S C. Industrial Relations and Labour Law, Vikas, New Delhi, 2007.
20. Supreme Court cases related to labour laws.

PHD-RPE-103	Research and Publication Ethics	Credit Distribution: L:1, T:1, P:0=2
Learning Outcomes	1. To have awareness about the publication ethics and publication misconducts. 2. To understand indexing and citation databases, open access publications, research metrics (citations, h-index, impact factor etc) 3. Develop hands-on skills to identify research misconduct and predatory publications.	
Unit 1	**Philosophy and Ethics (4 hrs)** 1. Introduction to philosophy: definition, nature and scope, concept, branches 2. Ethics: definition, moral philosophy, nature of moral judgements and reactions	
Unit 2	**Scientific Conduct (4 hrs)** 1. Ethics with respect to science and research 2. Intellectual honesty and research integrity 3. Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP) 4. Redundant publications: duplicate and overlapping publications, salami slicing 5. Selective reporting and misrepresentation of data	
Unit 3	**Publication Ethics (7 hrs)** 1. Publication ethics: definition, introduction and importance 2. Best practices / standards setting initiatives and guidelines: COPE, WAME, etc. 3. Conflicts of interest 4. Publication misconduct: definition, concept, problems that lead to unethical behavior and vice versa, types 5. Violation of publication ethics, authorship and contributor ship 6. Identification of publication misconduct, complaints and appeals 7. Predatory publishers and journals	
Unit 4 Practice	**Open Access Publishing (4 hrs)** 1. Open access publications and initiatives 2. SHERPA/ROMEO online resource to check publisher copyright &self-	

	archiving policies
	3. Software tool to identify predatory publications developed by SPPU
	4. Journal finder / journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer
	Journal Suggester, etc.
Unit 5 Practice	**Publication Misconduct (4 hrs)**
	A. Group Discussions (2 hrs.)
	1. Subject specific ethical issues, FFP, authorship
	2. Conflicts of interest
	3. Complaints and appeals: examples and fraud from India and abroad
	B. Software tools (2 hrs.)
	Use of plagiarism software like Turnitin, Urkund and other open source software tools
Unit 6 Practice	**Databases and Research Metrics (7 hrs)**
	A. Databases (4 hrs.)
	1. Indexing databases
	2. Citation databases: Web of Science, Scopus etc.
	B. Research Metrics (3 hrs.)
	1. Impact Factor of journal as per Journal Citation Report, SNIP, SJR, IPP, Cite Score
	2. Metrics: h-index, g-index, i10 index, altmetrics

Suggested Readings

1. Bird, A. (2006). Philosophy of Science. Routledge.
2. MacIntyre, A. (1967) A Short History of Ethics. London.
3. P. Chaddah, (2018) Ethics in Competitive Research: Do not get scooped; do not getplagiarized, ISBN:978-9387480865
4. National Academy of Sciences, National Academy of Engineering and Institute ofMedicine. (2009). On Being a Scientist: A Guide to Responsible Conduct in Research:Third Edition. National Academies Press.
5. Rensik, D. B. (2011). What is ethics in research & why is it important. National Instituteof Environmental Health Sciences, 1-10. Retrieved fromhttps://www.niehs.nih.gov/resources/biothics/whatis/index.cfm
6. Beall, J. (2012). Predatory publishers are corrupting open access. Nature, 489(7415),179-179. https://doi.org/10.1038/489179a

NIILM UNIVERSITY

Ph.D. Course Work in

Computer Science & Applications

Academic Session 2024-25

Ph.D. Regulations Regarding Course Work

Clause 18: Ph.D. Ordinance NIILM University as per UGC Minimum Standards and Procedure for Award of Ph.D. Degrees Regulations 2022 with effect from academic session 2024-25

I. The coursework shall be treated as a prerequisite for Ph.D. preparation. In the first year of registration, all research scholars are required to complete the course work for one semester following their provisional registration as a part of the Ph.D. program. It is mandatory to complete the course work in first 4 semesters to stay in the Ph.D. program. If a student fails to complete the coursework in first 4 semesters, will have to leave the program.

II. Earning a minimum of 12 total credits and a maximum of 16, is required.

III. Usually a course refers to a 'paper' and is a component of an academic program. Courses in Ph.D. course work shall be of two kinds: Core and Elective.

IV. A core course is a compulsory paper to be studied by all the scholars to complete the requirements of the Ph.D. degree.

V. Elective course is a course which is discipline specific and provided by the particular department from the main discipline or from a sister/related discipline which supports the main discipline, on mutual consent of the concerned departments.

VI. One credit equal to 15 contact hours for theory-based teaching or 30 hours of contact time for practical or activity-based teaching.

VII. The number of credits is given in the form L: T: P, where L indicates the number of contact hours of lecture, and T the number of contact hours for tutorials, P stands for laboratory credits.

VIII. The credits are distributed as follows:

Paper Code	Paper	Course type	Credit	L	T	P
PHD-ARM-101	Advanced Research Methodology	Core	4	3	1	0
PHD-DSC-102	Discipline Specific Course	Elective	4	3	1	0
PHD-RPE-103	Research and Publication Ethics	Core	2	1	1	0
PHD-SEM-104	Academic Writing, Literature Review and Seminar	Skill	2	0	1	2
	Total		12			

IX. All Ph.D., entrants irrespective of discipline, shall be trained in teaching proficiency related to teaching/education/pedagogy/writing related to their chosen Ph.D. subject during their doctoral training period, that include assigning 4-6 hours per week of teaching/ research assistantship for conducting tutorial or laboratory work and evaluations.

X.   Courses PHD-SEM 104 includes research work on research article writing, seminar presentation and course PHD-TP 105 includes pedagogical training. Both these courses will be assessed internally without Semester End Examination.

XI.   CoE will conduct Term/ Semester End Exam in PHD-ARM-101, PHD-DSC-102, and PHD-RPE-103.

XII.   PHD-TP 105 is a non-credit course and internal assessment will be marked on the detailed mark card of the course work.

XIII.   Advance Research Methodology course will include common research methodology and subject specific research methodology.

XIV.   Research Advisory Committee may provide choices in selecting the courses/ credits that facilitates the entrepreneur in the monetization of IP thus generated.

XV.   RAC can also recommend UGC recognized online courses as part of the credit requirements for the Ph.D. program.

XVI.   Paper- will comprise of the following two activities:

   (a) External Assessment: Written Question Paper 70/39

   (b) Internal Assessment: 30/16

   Marks will be converted into letter grade and grade point as per following table:

Marks	Letter Grade	Grade Point
81-100	A+	10
76-80	A	9
66-75	B+	8
61-65	B	7
55-60	C	6
Less than 55	F	0

The computation of the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA) shall be done as per University Examination Ordinance or Examination Rules & Regulations issued time to time.

The result and grade sheet for the course work will carry pass/ fail result.

COURSE WORK PAPER

I.   Candidates who already hold an M. Phil. degree and have been accepted into the Ph.D. program, or those who have finished their M.Phil. Coursework and have been given permission to continue on to the Ph.D. in an integrated course, may be exempted from the Ph.D. course requirements by the Department. All additional applicants accepted into the Ph.D. program must complete the Ph.D. coursework required by the Department.

II.   The NIILM University attendance rules, a minimum 75% attendance is must require, will be applied to all full-time research scholars. For the duration of their coursework, part-time research researchers must, nevertheless, adhere to the same rules.

III.   A Ph.D. scholar has to obtain a minimum of 55% of marks or a minimum CGPA of 6.0 in the UGC 10-point scale (or an equivalent grade/CGPA in a point scale wherever grading system is followed) in the course work in order to be eligible to continue in the program and submit the thesis.

IV. Registration will be automatically canceled if the required course work is not completed with a minimum of 55% of marks/a minimum CGPA of 6.0 within the allotted time. If the course work is not finished within a year, the RAC and DRC may suggest a six-month extension or suggest that the registration be canceled with the DRC.

V. There is no provision of improvement or special supplementary exam to be conducted. Coursework will be offered in four semesters of first two years with regular & supplementary exams to avail the opportunity to clear the coursework in 2 years. **Failure to complete the course in 2 years means that the student has to leave the program.**

Course Structure:

PHD-ARM-101	Advance Research Methodology in Computer Science and Application	Credit Distribution: L:3, T:1, P:0=4
Course Objectives:	To acquaint the students with research process. To train them in the research methods and designs and to equip them to take up researches independently.	
Unit 1	**Introduction to Research** a. Nature and aims of research b. Dimensions and types of research c. Theory and research d. The meaning of methodology e. Types of Methods of Research	
Unit 2	**Research Planed Data Collection** a. Concept, logic, and research question/issues b. Variables, causal theory, and hypothesis c. Research Design and Collection of Data d. Sampling: Methods, Size, Errors e. Probability and non-probability f. Measurement and Scaling Techniques g. Issues in measurement: Qualitative and quantitative	
Unit 3	**Data Processing** a. Analysis of quantitative data introduction to higher order statistics b. Editing, Coding and Classification of Data c. Analysis of qualitative data and Tabulation d. Introduction to advanced statistical techniques using SPSS e. Statistical Derivatives and Measures of Central Tendency f. Measures of Variation and Skewness g. Correlation and Simple Regression h. Diagrammatic and Graphic Presentation of Data	
Unit 4	**Research Report Writing** a. Ethical issues in research b. APA style of writing concept c. APA style of writing: Referencing d. d. Research article writing	

Unit 5	**Computer Application in Research**
	a. Introduction to MS Excel, Using Formulas and Functions
	b. Hand on to SPSS
	c. Features for Statistical Data Analysis
	d. Generating Charts/Graphs
	e. Introduction to MS Word, Features and Functions, Writing Report in MS Word
	f. Introduction to Open Office or Latex
	g. Creating Presentation in MS PowerPoint
	h. Introduction to Internet-Based Search
	i. Use of Advanced Research Techniques.

Recommended Readings:

1. Bayard, P. & Grayson, A. (1976). Introducing psychological research. London: McMillan.

2. Bordens, K.S. & Abbot, B.B. (2005). Research design and methods. New Delhi: Tata McGraw Hill.

3. Breakwell, G.M. Hammond, S. & Fife-Schaw, C. (1995). Research Methods in Psychology. New Delhi: Sage Publications.

4. Cresswell, J.W. (1994) Research design: L Qualitative and quantitative approaches. Thousand Oaks, CA: Sage Publication.

5. Drew, C.J.: Hardman, M.L. & Hart, W.A. (1996). Designing and conducting research: Inquiry in education and social science. New York: Allyn & Bacon.

6. Kerlinger, F.N. (1982). Foundations of behavioural research. Delhi: Subject Publication.

7. Nation, J.R. (1997). Research Methods. New Jersey: Prentice Hall.

8. Willing, C. & Stainton-Rogers, W. (Eds.) (2008). The Sage Handbook of Qualitative Research in Psychology. New Delhi: Sage Publications.

PHD-DSC-102	**Discipline Specific Course (Computer Science and Application)**	**Credit Distribution: L:3, T:0, P:1=4**
Learning Outcomes	• Understand the principles and techniques of fuzzy logic, fuzzy sets, and fuzzy operations. • Explore advanced image processing techniques, such as morphological operations, edge detection, and image transformation, for solving complex real-world problems. • Learn about Ad Hoc networks, their characteristics, protocols, and applications, especially in dynamic and decentralized environments.	
Unit 1	**Digital Image Processing** Introduction to Digital Image Processing: Enhancement, Segmentation, Object Detection and Recognition.	
Unit 2	**Machine Learning** Introduction to Artificial Intelligence, Artificial neural network, Support Vector Machine (SVM) with applications.	
Unit 3	**Soft Computing**	

	Introduction to Fuzzy Logic, Fuzzy Sets and Operations, Introduction to Genetic Algorithm and its Applications.
Unit 4	**Network Services & Computing Software** Introduction to Cloud Computing, Mobile Computing and Ad Hoc Network. Introduction to MATLAB and R.
Unit 5	**Software Testing & Quality Assurance** Introduction to software testing, Inspection, Static analysis, Unit testing, Integration and system testing, Regression testing, Functional testing, Structural testing, Test cases election, Testing of object-oriented software, Performance testing, Security testing, Web application testing, Graphical user interface (GUI) testing, Usability testing, Fault-based testing, Test automation and tools, Planning and monitoring the software quality process

Suggested Readings:
1. "Digital Image processing" by Rafael C. Gonzalez, Richard Eugene Woods Prentice Hall.
2. "Introduction to Artificial Intelligence and Expert System" by Dan W. Patterson, PHI.
3. "Neural Network, Fuzzy Logic and Genetic Algorithm" by S. Rajashekharan, G.A. Vijay Laxmi, PHI
4. "MATLAB Primer" by Timothy A. Devis Kermit Sigmon, Chapman and Hall.

PHD-RPE-103	**Research and Publication Ethics**	**Credit Distribution:** **L:1, T:1, P:0=2**
Learning Outcomes	1. To have awareness about the publication ethics and publication misconducts. 2. To understand indexing and citation databases, open access publications, research metrics (citations, h-index, impact factor etc) 3. Develop hands-on skills to identify research misconduct and predatory publications.	
Unit 1	**Philosophy and Ethics (4 hrs)** 1. Introduction to philosophy: definition, nature and scope, concept, branches 2. Ethics: definition, moral philosophy, nature of moral judgements and reactions	
Unit 2	**Scientific Conduct (4 hrs)** 1. Ethics with respect to science and research 2. Intellectual honesty and research integrity 3. Scientific misconducts: Falsification, Fabrication, and Plagiarism	

	(FFP)
	4. Redundant publications: duplicate and overlapping publications, salami slicing
	5. Selective reporting and misrepresentation of data
Unit 3	**Publication Ethics (7 hrs)**
	1. Publication ethics: definition, introduction and importance
	2. Best practices / standards setting initiatives and guidelines: COPE, WAME, etc.
	3. Conflicts of interest
	4. Publication misconduct: definition, concept, problems that lead to unethical behavior
	and vice versa, types
	5. Violation of publication ethics, authorship and contributor ship
	6. Identification of publication misconduct, complaints and appeals
	7. Predatory publishers and journals
Unit 4 Practice	**Open Access Publishing (4 hrs)**
	1. Open access publications and initiatives
	2. SHERPA/ROMEO online resource to check publisher copyright & self-archiving policies
	3. Software tool to identify predatory publications developed by SPPU
	4. Journal finder / journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer
	Journal Suggester, etc.
Unit 5 Practice	**Publication Misconduct (4 hrs)**
	A. Group Discussions (2 hrs.)
	1. Subject specific ethical issues, FFP, authorship
	2. Conflicts of interest
	3. Complaints and appeals: examples and fraud from India and abroad
	B. Software tools (2 hrs.)
	Use of plagiarism software like Turnitin, Urkund and other open source software tools
Unit 6 Practice	**Databases and Research Metrics (7 hrs)**
	A. Databases (4 hrs.)
	1. Indexing databases
	2. Citation databases: Web of Science, Scopus etc.
	B. Research Metrics (3 hrs.)
	1. Impact Factor of journal as per Journal Citation Report, SNIP, SJR, IPP, Cite Score
	2. Metrics: h-index, g-index, i10 index, altmetrics

Suggested Readings

1. Bird, A. (2006). Philosophy of Science. Routledge.
2. MacIntyre, A. (1967) A Short History of Ethics. London.

3. P. Chaddah, (2018) Ethics in Competitive Research: Do not get scooped; do not get plagiarized, ISBN:978-9387480865
4. National Academy of Sciences, National Academy of Engineering and Institute of Medicine. (2009). On Being a Scientist: A Guide to Responsible Conduct in Research: Third Edition. National Academies Press.
5. Rensik, D. B. (2011). What is ethics in research & why is it important. National Institute of Environmental Health Sciences, 1-10. Retrieved from https://www.niehs.nih.gov/resources/biothics/whatis/index.cfm
6. Beall, J. (2012). Predatory publishers are corrupting open access. Nature, 489(7415), 179-179. https://doi.org/10.1038/489179a

NIILM UNIVERSITY

Ph.D. Course Work in Computer Science and Engineering

Academic Session 2024-25

Ph.D. Regulations Regarding Course Work

Clause 18: Ph.D. Ordinance NIILM University as per UGC Minimum Standards and Procedure for Award of Ph.D. Degrees Regulations 2022 with effect from academic session 2024-25

I.   The coursework shall be treated as a prerequisite for Ph.D. preparation. In the first year of registration, all research scholars are required to complete the course work for one semester following their provisional registration as a part of the Ph.D. program. It is mandatory to complete the course work in first 4 semesters to stay in the Ph.D. program. If a student fails to complete the coursework in first 4 semesters, will have to leave the program.

II.   Earning a minimum of 12 total credits and a maximum of 16, is required.

III.   Usually a course refers to a 'paper' and is a component of an academic program. Courses in Ph.D. course work shall be of two kinds: Core and Elective.

IV.   A core course is a compulsory paper to be studied by all the scholars to complete the requirements of the Ph.D. degree.

V.   Elective course is a course which is discipline specific and provided by the particular department from the main discipline or from a sister/related discipline which supports the main discipline, on mutual consent of the concerned departments.

VI.   One credit equal to 15 contact hours for theory-based teaching or 30 hours of contact time for practical or activity-based teaching.

VII.   The number of credits is given in the form L: T: P, where L indicates the number of contact hours of lecture, and T the number of contact hours for tutorials, P stands for laboratory credits.

VIII. The credits are distributed as follows:

Paper Code	Paper	Course type	Credit	L	T	P
PHD-ARM-101	Advanced Research Methodology	Core	4	3	1	0
PHD-DSC-102	Discipline Specific Course	Elective	4	3	1	0
PHD-RPE-103	Research and Publication Ethics	Core	2	1	1	0
PHD-SEM-104	Academic Writing, Literature Review and Seminar	Skill	2	0	1	2
	Total		**12**			

IX.   All Ph.D., entrants irrespective of discipline, shall be trained in teaching proficiency related to teaching/education/pedagogy/writing related to their chosen Ph.D. subject during their doctoral training period, that include assigning 4-6 hours per week of teaching/ research assistantship for conducting tutorial or laboratory work and evaluations.

X. Courses PHD-SEM 104 includes research work on research article writing, seminar presentation and course PHD-TP 105 includes pedagogical training. Both these courses will be assessed internally without Semester End Examination.

XI. CoE will conduct Term/ Semester End Exam in PHD-ARM-101, PHD-DSC-102, and PHD-RPE-103.

XII. PHD-TP 105 is a non-credit course and internal assessment will be marked on the detailed mark card of the course work.

XIII. Advance Research Methodology course will include common research methodology and subject specific research methodology.

XIV. Research Advisory Committee may provide choices in selecting the courses/ credits that facilitates the entrepreneur in the monetization of IP thus generated.

XV. RAC can also recommend UGC recognized online courses as part of the credit requirements for the Ph.D. program.

XVI. Paper- will comprise of the following two activities:

   (a) External Assessment: Written Question Paper 70/39

   (b) Internal Assessment: 30/16

   Marks will be converted into letter grade and grade point as per following table:

Marks	Letter Grade	Grade Point
81-100	A+	10
76-80	A	9
66-75	B+	8
61-65	B	7
55-60	C	6
Less than 55	F	0

The computation of the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA) shall be done as per University Examination Ordinance or Examination Rules & Regulations issued time to time.

The result and grade sheet for the course work will carry pass/ fail result.

COURSE WORK PAPER

I. Candidates who already hold an M. Phil. degree and have been accepted into the Ph.D. program, or those who have finished their M.Phil. Coursework and have been given permission to continue on to the Ph.D. in an integrated course, may be exempted from the Ph.D. course requirements by the Department. All additional applicants accepted into the Ph.D. program must complete the Ph.D. coursework required by the Department.

II. The NIILM University attendance rules, a minimum 75% attendance is must require, will be applied to all full-time research scholars. For the duration of their coursework, part-time research researchers must, nevertheless, adhere to the same rules.

III. A Ph.D. scholar has to obtain a minimum of 55% of marks or a minimum CGPA of 6.0 in the UGC 10-point scale (or an equivalent grade/CGPA in a point scale wherever grading system is followed) in the course work in order to be eligible to continue in the program and submit the thesis.

IV. Registration will be automatically canceled if the required course work is not completed with a minimum of 55% of marks/a minimum CGPA of 6.0 within the allotted time. If the course work is not finished within a year, the RAC and DRC may suggest a six-month extension or suggest that the registration be canceled with the DRC.

V. There is no provision of improvement or special supplementary exam to be conducted. Coursework will be offered in four semesters of first two years with regular & supplementary exams to avail the opportunity to clear the coursework in 2 years. **Failure to complete the course in 2 years means that the student has to leave the program.**

Course Structure:

PHD-ARM-101	Advance Research Methodology in Computer Science and Engineering	Credit Distribution: L:3, T:1, P:0=4
Course Objectives:	To acquaint the students with research process. To train them in the research methods and designs and to equip them to take up researches independently.	
Unit 1	Introduction to Research f. Nature and aims of research g. Dimensions and types of research h. Theory and research i. The meaning of methodology j. Types of Methods of Research	
Unit 2	Research Planed Data Collection h. Concept, logic, and research question/issues i. Variables, causal theory, and hypothesis j. Research Design and Collection of Data k. Sampling: Methods, Size, Errors l. Probability and non-probability m. Measurement and Scaling Techniques n. Issues in measurement: Qualitative and quantitative	
Unit 3	Data Processing i. Analysis of quantitative data introduction to higher order statistics j. Editing, Coding and Classification of Data k. Analysis of qualitative data and Tabulation l. Introduction to advanced statistical techniques using SPSS m. Statistical Derivatives and Measures of Central Tendency n. Measures of Variation and Skewness o. Correlation and Simple Regression p. Diagrammatic and Graphic Presentation of Data	
Unit 4	Research Report Writing e. Ethical issues in research f. APA style of writing concept g. APA style of writing: Referencing h. d. Research article writing	

Unit 5	Computer Application in Research
	j. Introduction to MS Excel, Using Formulas and Functions
	k. Hand on to SPSS
	l. Features for Statistical Data Analysis
	m. Generating Charts/Graphs
	n. Introduction to MS Word, Features and Functions, Writing Report in MS Word
	o. Introduction to Open Office or Latex
	p. Creating Presentation in MS PowerPoint
	q. Introduction to Internet-Based Search
	r. Use of Advanced Research Techniques.

Recommended Readings:

1. Bayard, P. & Grayson, A. (1976). Introducing psychological research. London: McMillan.

2. Bordens, K.S. & Abbot, B.B. (2005). Research design and methods. New Delhi: Tata McGraw Hill.

3. Breakwell, G.M. Hammond, S. & Fife-Schaw, C. (1995). Research Methods in Psychology. New Delhi: Sage Publications.

4. Cresswell, J.W. (1994) Research design:L Qualitative and quantitative approaches. Thousand Oaks, CA: Sage Publication.

5. Drew, C.J.: Hardman, M.L. & Hart, W.A. (1996). Designing and conducting research: Inquiry in education and social science. New York: Allyn & Bacon.

6. Kerlinger, F.N. (1982). Foundations of behavioural research. Delhi: Subject Publication.

7. Nation, J.R. (1997). Research Methods. New Jersey: Prentice Hall.

8. Willing, C. & Stainton-Rogers, W. (Eds.) (2008). The Sage Handbook of Qualitative Research in Psychology. New Delhi: Sage Publications.

PHD-DSC-102	Discipline Specific Course (Computer Science and Engineering)	Credit Distribution: L:3, T:0, P:1=4
Learning Outcomes	• Learn about the **costs of software quality** and how to manage them effectively • Understand the importance of **quality control tools** and **quality assurance** concepts. • Study **testing metrics** and their role in assessing testing effectiveness.	
Unit 1	**Digital Image Processing** Introduction to Digital Image Processing: Enhancement, Segmentation, Object Detection and Recognition.	
Unit 2	**Machine Learning** Introduction to Artificial Intelligence, Artificial neural network, Support Vector Machine (SVM) with applications. Testing metrics, Testing Paradigms: Scripted testing, Exploratory testing, Test planning, Supporting Technologies: Defect taxonomies, Testing tools and standards, Case studies.	
Unit 3	**Soft Computing**	

	Introduction to Fuzzy Logic, Fuzzy Sets and Operations, Introduction to Genetic Algorithm and its Applications.
Unit 4	**Network Services & Computing Software** Introduction to Cloud Computing, Mobile Computing and Ad Hoc Network. Introduction to MATLAB and R.
Unit 5	**Software Testing & Quality Assurance** Introduction to software testing, Inspection, Static analysis, Unit testing, Integration and system testing, Regression testing, Functional testing, Structural testing, Test cases election, Testing of object-oriented software, Performance testing, Security testing, Web application testing, Graphical user interface (GUI) testing, Usability testing, Fault-based testing, Test automation and tools, Planning and monitoring the software quality process

References:

1. A Practitioner's Guide to Test Case Design by LEE Copland, Artech House Publishers, Boston - London.
2. Software Testing – A Craft's man Approach, Paul C. Jorgensen, A CRC Press LLC.
3. Software Quality Theory and Management by Alan C. Gillies, Chapman & Hall.
4. Software Quality by Galrry S. Marliss, Thomson.
5. Metrics and Models in Software Quality Engineering by Stephen H. Kan , Pearson Education
6. Handbook of Software Quality Assurance by G. Gordon Sculmeyer, Artech House Publishers, Boston –London

PHD-RPE-103	**Research and Publication Ethics**	**Credit Distribution: L:1, T:1, P:0=2**
Learning Outcomes	1. To have awareness about the publication ethics and publication misconducts. 2. To understand indexing and citation databases, open access publications, research metrics (citations, h-index, impact factor etc) 3. Develop hands-on skills to identify research misconduct and predatory publications.	
Unit 1	**Philosophy and Ethics (4 hrs)** 1. Introduction to philosophy: definition, nature and scope, concept, branches 2. Ethics: definition, moral philosophy, nature of moral judgements and reactions	
Unit 2	**Scientific Conduct (4 hrs)** 1. Ethics with respect to science and research 2. Intellectual honesty and research integrity 3. Scientific misconducts: Falsification, Fabrication, and Plagiarism	

	(FFP) 4. Redundant publications: duplicate and overlapping publications, salami slicing 5. Selective reporting and misrepresentation of data
Unit 3	**Publication Ethics (7 hrs)** 1. Publication ethics: definition, introduction and importance 2. Best practices / standards setting initiatives and guidelines: COPE, WAME, etc. 3. Conflicts of interest 4. Publication misconduct: definition, concept, problems that lead to unethical behavior and vice versa, types 5. Violation of publication ethics, authorship and contributor ship 6. Identification of publication misconduct, complaints and appeals 7. Predatory publishers and journals
Unit 4 Practice	**Open Access Publishing (4 hrs)** 1. Open access publications and initiatives 2. SHERPA/ROMEO online resource to check publisher copyright & self-archiving policies 3. Software tool to identify predatory publications developed by SPPU 4. Journal finder / journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer Journal Suggester, etc.
Unit 5 Practice	**Publication Misconduct (4 hrs)** A. Group Discussions (2 hrs.) 1. Subject specific ethical issues, FFP, authorship 2. Conflicts of interest 3. Complaints and appeals: examples and fraud from India and abroad B. Software tools (2 hrs.) Use of plagiarism software like Turnitin, Urkund and other open source software tools
Unit 6 Practice	**Databases and Research Metrics (7 hrs)** A. Databases (4 hrs.) 1. Indexing databases 2. Citation databases: Web of Science, Scopus etc. B. Research Metrics (3 hrs.) 1. Impact Factor of journal as per Journal Citation Report, SNIP, SJR, IPP, Cite Score 2. Metrics: h-index, g-index, i10 index, altmetrics

Suggested Readings
1. Bird, A. (2006). Philosophy of Science. Routledge.
2. MacIntyre, A. (1967) A Short History of Ethics. London.

3. P. Chaddah, (2018) Ethics in Competitive Research: Do not get scooped; do not get plagiarized, ISBN:978-9387480865

4. National Academy of Sciences, National Academy of Engineering and Institute of Medicine. (2009). On Being a Scientist: A Guide to Responsible Conduct in Research: Third Edition. National Academies Press.

5. Rensik, D. B. (2011). What is ethics in research & why is it important. National Institute of Environmental Health Sciences, 1-10. Retrieved from https://www.niehs.nih.gov/resources/biothics/whatis/index.cfm

6. Beall, J. (2012). Predatory publishers are corrupting open access. Nature, 489(7415), 179-179. https://doi.org/10.1038/489179a

NIILM UNIVERSITY

Ph.D. Course Work in Defence and Strategies Studies

Academic Session 2024-25

Ph.D. Regulations Regarding Course Work

Clause 18: Ph.D. Ordinance NIILM University as per UGC Minimum Standards and Procedure for Award of Ph.D. Degrees Regulations 2022 with effect from academic session 2024-25

   I.   The coursework shall be treated as a prerequisite for Ph.D. preparation. In the first year of registration, all research scholars are required to complete the course work for one semester following their provisional registration as a part of the Ph.D. program. It is mandatory to complete the course work in first 4 semesters to stay in the Ph.D. program. If a student fails to complete the coursework in first 4 semesters, will have to leave the program.

  II.   Earning a minimum of 12 total credits and a maximum of 16, is required.

 III.   Usually a course refers to a 'paper' and is a component of an academic program. Courses in Ph.D. course work shall be of two kinds: Core and Elective.

 IV.   A core course is a compulsory paper to be studied by all the scholars to complete the requirements of the Ph.D. degree.

  V.   Elective course is a course which is discipline specific and provided by the particular department from the main discipline or from a sister/related discipline which supports the main discipline, on mutual consent of the concerned departments.

 VI.   One credit equal to 15 contact hours for theory-based teaching or 30 hours of contact time for practical or activity-based teaching.

 VII.   The number of credits is given in the form L: T: P, where L indicates the number of contact hours of lecture, and T the number of contact hours for tutorials, P stands for laboratory credits.

VIII.   The credits are distributed as follows:

Paper Code	Paper	Course type	Credit	L	T	P
PHD-ARM-101	Advanced Research Methodology	Core	4	3	1	0
PHD-DSC-102	Discipline Specific Course	Elective	4	3	1	0
PHD-RPE-103	Research and Publication Ethics	Core	2	1	1	0
PHD-SEM-104	Academic Writing, Literature Review and Seminar	Skill	2	0	1	2
	Total		**12**			

 IX.   All Ph.D., entrants irrespective of discipline, shall be trained in teaching proficiency related to teaching/education/pedagogy/writing related to their chosen Ph.D. subject during their doctoral training period, that include assigning 4-6 hours per week of teaching/ research assistantship for conducting tutorial or laboratory work and evaluations.

X. Courses PHD-SEM 104 includes research work on research article writing, seminar presentation and course PHD-TP 105 includes pedagogical training. Both these courses will be assessed internally without Semester End Examination.

XI. CoE will conduct Term/ Semester End Exam in PHD-ARM-101, PHD-DSC-102, and PHD-RPE-103.

XII. PHD-TP 105 is a non-credit course and internal assessment will be marked on the detailed mark card of the course work.

XIII. Advance Research Methodology course will include common research methodology and subject specific research methodology.

XIV. Research Advisory Committee may provide choices in selecting the courses/ credits that facilitates the entrepreneur in the monetization of IP thus generated.

XV. RAC can also recommend UGC recognized online courses as part of the credit requirements for the Ph.D. program.

XVI. Paper- will comprise of the following two activities:

(a) **External Assessment: Written Question Paper 70/39**

(b) **Internal Assessment: 30/16**

Marks will be converted into letter grade and grade point as per following table:

Marks	Letter Grade	Grade Point
81-100	A+	10
76-80	A	9
66-75	B+	8
61-65	B	7
55-60	C	6
Less than 55	F	0

The computation of the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA) shall be done as per University Examination Ordinance or Examination Rules & Regulations issued time to time.

The result and grade sheet for the course work will carry pass/ fail result.

COURSE WORK PAPER

I. Candidates who already hold an M. Phil. degree and have been accepted into the Ph.D. program, or those who have finished their M.Phil. Coursework and have been given permission to continue on to the Ph.D. in an integrated course, may be exempted from the Ph.D. course requirements by the Department. All additional applicants accepted into the Ph.D. program must complete the Ph.D. coursework required by the Department.

II. The NIILM University attendance rules, a minimum 75% attendance is must require, will be applied to all full-time research scholars. For the duration of their coursework, part-time research researchers must, nevertheless, adhere to the same rules.

III. A Ph.D. scholar has to obtain a minimum of 55% of marks or a minimum CGPA of 6.0 in the UGC 10-point scale (or an equivalent grade/CGPA in a point scale wherever grading system is followed) in the course work in order to be eligible to continue in the program and submit the thesis.

IV. Registration will be automatically canceled if the required course work is not completed with a minimum of 55% of marks/a minimum CGPA of 6.0 within the allotted time. If the course work is not finished within a year, the RAC and DRC may suggest a six-month extension or suggest that the registration be canceled with the DRC.

V. There is no provision of improvement or special supplementary exam to be conducted. Coursework will be offered in four semesters of first two years with regular & supplementary exams to avail the opportunity to clear the coursework in 2 years. **Failure to complete the course in 2 years means that the student has to leave the program.**

Course Structure:

PHD-ARM-101	Advance Research Methodology in Defence and Strategies Studies	Credit Distribution: L:3, T:1, P:0=4
Course Objectives:	To acquaint the students with research process. To train them in the research methods and designs and to equip them to take up researches independently.	
Unit 1	**Introduction to Research** a. Nature and aims of research b. Dimensions and types of research c. Theory and research d. The meaning of methodology e. Types of Methods of Research	
Unit 2	**Research Planed Data Collection** a. Concept, logic, and research question/issues b. Variables, causal theory, and hypothesis c. Research Design and Collection of Data d. Sampling: Methods, Size, Errors e. Probability and non-probability f. Measurement and Scaling Techniques g. Issues in measurement: Qualitative and quantitative	
Unit 3	**Data Processing** a. Analysis of quantitative data introduction to higher order statistics b. Editing, Coding and Classification of Data c. Analysis of qualitative data and Tabulation d. Introduction to advanced statistical techniques using SPSS e. Statistical Derivatives and Measures of Central Tendency f. Measures of Variation and Skewness g. Correlation and Simple Regression h. Diagrammatic and Graphic Presentation of Data	
Unit 4	**Research Report Writing** a. Ethical issues in research b. APA style of writing concept c. APA style of writing: Referencing d. d. Research article writing	

Unit 5	**Computer Application in Research**
	a. Introduction to MS Excel, Using Formulas and Functions
	b. Hand on to SPSS
	c. Features for Statistical Data Analysis
	d. Generating Charts/Graphs
	e. Introduction to MS Word, Features and Functions, Writing Report in MS Word
	f. Introduction to Open Office or Latex
	g. Creating Presentation in MS PowerPoint
	h. Introduction to Internet-Based Search
	i. Use of Advanced Research Techniques.

Recommended Readings:

1. Bayard, P. & Grayson, A. (1976). Introducing psychological research. London: McMillan.
2. Bordens, K.S. & Abbot, B.B. (2005). Research design and methods. New Delhi: Tata McGraw Hill.
3. Breakwell, G.M. Hammond, S. & Fife-Schaw, C. (1995). Research Methods in Psychology. New Delhi: Sage Publications.
4. Cresswell, J.W. (1994) Research design: L Qualitative and quantitative approaches. Thousand Oaks, CA: Sage Publication.
5. Drew, C.J.: Hardman, M.L. & Hart, W.A. (1996). Designing and conducting research: Inquiry in education and social science. New York: Allyn & Bacon.
6. Kerlinger, F.N. (1982). Foundations of behavioural research. Delhi: Subject Publication.
7. Nation, J.R. (1997). Research Methods. New Jersey: Prentice Hall.
8. Willing, C. & Stainton-Rogers, W. (Eds.) (2008). The Sage Handbook of Qualitative Research in Psychology. New Delhi: Sage Publications.

PHD-DSC-102	**Discipline Specific Course (Defence and Strategies Studies)**	**Credit Distribution: L:3, T:1, P:0=4**
Learning Outcomes	• Understand the impact of international treaties and policies on national security. • Be equipped to critically assess India's strategic position in a changing global and regional environment. • Have a comprehensive understanding of national security concepts, policies, and global strategic dynamics.	
Unit 1	1. Concept of National Security with reference to the contemporary thinking. 2. Defence, Foreign and Security and Policies: Concept, formulation, objectives and linkages. 3. Military Alliances and pacts, Peace Treaties, Defence Cooperation, Strategic Partnership and Security Dialogue. 4. National Power and National Security	
Unit 2	1. India's Maritime Strategy/ Policy and Naval capabilities.	

	2.	Strategic Environment of South Asia.
	3.	Strategic Importance of Indian Ocean and India's Security.
	4.	Nuclearization of South Asia and India's Security.
Unit 3	1.	National Interest
	2.	Armaments Disarmament Proliferation of Weapons of Mass Destruction (WMD) and NPT, CTBT.
	3.	Military, Nuclear and Missile capabilities of China, Pakistan and India.
Unit 4	1.	Emergence of New World Order after Cold War.
	2.	Sino-Indian Relations and border disputes with reference to1962 war.
	3.	Development in Central Asian Republics
	4.	Kashmir Problem

Books Recommended:

1. Adic, W.A.C., "Oil Politics and Sea, the Indian Ocean Ports".
2. Agarwal, R.K., 'Defence Production & Development".
3. Anand, V.K., "Insurgency and Counter-Insurgency".
4. Bajpai,S.C.,"Northern frontier of India"
5. Bajpai,U.S.,"Non-Alignment, Perspective and Prospective".
6. Bandopadhyaya, J.,"Making of India's Foreign Policy".
7. Brines, R.,"Indo-Pak Conflict".
8. Chaudhary, J.N.,"India's Problem of National Security in the 70s".
9. Frankel,J.,"National Interest".
10. Khera,S.S.,"India's Defence Problem".
11. Kohli, S.MN.,"Sea Power and the Indian Ocean".
12. Kumar, M., "Theoretical Aspects of International Politics".
13. Maxwell, M., "India China War".
14. Mishra, K.P., Non-alignment Frontier & Dynamics".
15. Morgenthau, H.J.," Politics Among Nations"

PHD-RPE-103	Research and Publication Ethics	Credit Distribution: L:1, T:1, P:0=2
Learning Outcomes	1. To have awareness about the publication ethics and publication misconducts. 2. To understand indexing and citation databases, open access publications, research metrics (citations, h-index, impact factor etc) 3. Develop hands-on skills to identify research misconduct and predatory publications.	

Unit 1	**Philosophy and Ethics (4 hrs)**
	1. Introduction to philosophy: definition, nature and scope, concept, branches
	2. Ethics: definition, moral philosophy, nature of moral judgements and reactions
Unit 2	**Scientific Conduct (4 hrs)**
	1. Ethics with respect to science and research
	2. Intellectual honesty and research integrity
	3. Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP)
	4. Redundant publications: duplicate and overlapping publications, salami slicing
	5. Selective reporting and misrepresentation of data
Unit 3	**Publication Ethics (7 hrs)**
	1. Publication ethics: definition, introduction and importance
	2. Best practices / standards setting initiatives and guidelines: COPE, WAME, etc.
	3. Conflicts of interest
	4. Publication misconduct: definition, concept, problems that lead to unethical behavior
	and vice versa, types
	5. Violation of publication ethics, authorship and contributor ship
	6. Identification of publication misconduct, complaints and appeals
	7. Predatory publishers and journals
Unit 4 Practice	**Open Access Publishing (4 hrs)**
	1. Open access publications and initiatives
	2. SHERPA/ROMEO online resource to check publisher copyright & self-archiving policies
	3. Software tool to identify predatory publications developed by SPPU
	4. Journal finder / journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer
	Journal Suggester, etc.
Unit 5 Practice	**Publication Misconduct (4 hrs)**
	A. Group Discussions (2 hrs.)
	1. Subject specific ethical issues, FFP, authorship
	2. Conflicts of interest
	3. Complaints and appeals: examples and fraud from India and abroad
	B. Software tools (2 hrs.)
	Use of plagiarism software like Turnitin, Urkund and other open source software tools
Unit 6 Practice	**Databases and Research Metrics (7 hrs)**
	A. Databases (4 hrs.)
	1. Indexing databases

	2. Citation databases: Web of Science, Scopus etc. B. Research Metrics (3 hrs.) 1. Impact Factor of journal as per Journal Citation Report, SNIP, SJR, IPP, Cite Score 2. Metrics: h-index, g-index, i10 index, altmetrics

Suggested Readings

1. Bird, A. (2006). Philosophy of Science. Routledge.
2. MacIntyre, A. (1967) A Short History of Ethics. London.
3. P. Chaddah, (2018) Ethics in Competitive Research: Do not get scooped; do not get plagiarized, ISBN:978-9387480865
4. National Academy of Sciences, National Academy of Engineering and Institute of Medicine. (2009). On Being a Scientist: A Guide to Responsible Conduct in Research: Third Edition. National Academies Press.
5. Rensik, D. B. (2011). What is ethics in research & why is it important. National Institute of Environmental Health Sciences, 1-10. Retrieved from https://www.niehs.nih.gov/resources/biothics/whatis/index.cfm
6. Beall, J. (2012). Predatory publishers are corrupting open access. Nature, 489(7415), 179-179. https://doi.org/10.1038/489179a

NIILM UNIVERSITY

Ph.D. Course Work in Economics

Academic Session 2024-25

Ph.D. Regulations Regarding Course Work

Clause 18: Ph.D. Ordinance NIILM University as per UGC Minimum Standards and Procedure for Award of Ph.D. Degrees Regulations 2022 with effect from academic session 2024-25

I.   The coursework shall be treated as a prerequisite for Ph.D. preparation. In the first year of registration, all research scholars are required to complete the course work for one semester following their provisional registration as a part of the Ph.D. program. It is mandatory to complete the course work in first 4 semesters to stay in the Ph.D. program. If a student fails to complete the coursework in first 4 semesters, will have to leave the program.

II.   Earning a minimum of 12 total credits and a maximum of 16, is required.

III.   Usually a course refers to a 'paper' and is a component of an academic program. Courses in Ph.D. course work shall be of two kinds: Core and Elective.

IV.   A core course is a compulsory paper to be studied by all the scholars to complete the requirements of the Ph.D. degree.

V.   Elective course is a course which is discipline specific and provided by the particular department from the main discipline or from a sister/related discipline which supports the main discipline, on mutual consent of the concerned departments.

VI.   One credit equal to 15 contact hours for theory-based teaching or 30 hours of contact time for practical or activity-based teaching.

VII.   The number of credits is given in the form L: T: P, where L indicates the number of contact hours of lecture, and T the number of contact hours for tutorials, P stands for laboratory credits.

VIII.   The credits are distributed as follows:

Paper Code	Paper	Course type	Credit	L	T	P
PHD-ARM-101	Advanced Research Methodology	Core	4	3	1	0
PHD-DSC-102	Discipline Specific Course	Elective	4	3	1	0
PHD-RPE-103	Research and Publication Ethics	Core	2	1	1	0
PHD-SEM-104	Academic Writing, Literature Review and Seminar	Skill	2	0	1	2
	Total		12			

IX.   All Ph.D., entrants irrespective of discipline, shall be trained in teaching proficiency related to teaching/education/pedagogy/writing related to their chosen Ph.D. subject during their doctoral training period, that include assigning 4-6 hours per week of teaching/ research assistantship for conducting tutorial or laboratory work and evaluations.

X.   Courses PHD-SEM 104 includes research work on research article writing, seminar presentation and course PHD-TP 105 includes pedagogical training. Both these courses will be assessed internally without Semester End Examination.

XI.   CoE will conduct Term/ Semester End Exam in PHD-ARM-101, PHD-DSC-102, and PHD-RPE-103.

XII.   PHD-TP 105 is a non-credit course and internal assessment will be marked on the detailed mark card of the course work.

XIII.   Advance Research Methodology course will include common research methodology and subject specific research methodology.

XIV.   Research Advisory Committee may provide choices in selecting the courses/ credits that facilitates the entrepreneur in the monetization of IP thus generated.

XV.   RAC can also recommend UGC recognized online courses as part of the credit requirements for the Ph.D. program.

XVI.   Paper- will comprise of the following two activities:

    (a) External Assessment: Written Question Paper 70/39
    (b) Internal Assessment: 30/16

Marks will be converted into letter grade and grade point as per following table:

Marks	Letter Grade	Grade Point
81-100	A+	10
76-80	A	9
66-75	B+	8
61-65	B	7
55-60	C	6
Less than 55	F	0

The computation of the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA) shall be done as per University Examination Ordinance or Examination Rules & Regulations issued time to time.

The result and grade sheet for the course work will carry pass/ fail result.

COURSE WORK PAPER

I.   Candidates who already hold an M. Phil. degree and have been accepted into the Ph.D. program, or those who have finished their M.Phil. Coursework and have been given permission to continue on to the Ph.D. in an integrated course, may be exempted from the Ph.D. course requirements by the Department. All additional applicants accepted into the Ph.D. program must complete the Ph.D. coursework required by the Department.

II.   The NIILM University attendance rules, a minimum 75% attendance is must require, will be applied to all full-time research scholars. For the duration of their coursework, part-time research researchers must, nevertheless, adhere to the same rules.

III.   A Ph.D. scholar has to obtain a minimum of 55% of marks or a minimum CGPA of 6.0 in the UGC 10-point scale (or an equivalent grade/CGPA in a point scale wherever grading system is followed) in the course work in order to be eligible to continue in the program and submit the thesis.

IV. Registration will be automatically canceled if the required course work is not completed with a minimum of 55% of marks/a minimum CGPA of 6.0 within the allotted time. If the course work is not finished within a year, the RAC and DRC may suggest a six-month extension or suggest that the registration be canceled with the DRC.

V. There is no provision of improvement or special supplementary exam to be conducted. Coursework will be offered in four semesters of first two years with regular & supplementary exams to avail the opportunity to clear the coursework in 2 years. **Failure to complete the course in 2 years means that the student has to leave the program.**

Course Structure:

PHD-ARM-101	Advance Research Methodology in Economics	Credit Distribution: L:3, T:1, P:0=4
Course Objectives:	To acquaint the students with research process. To train them in the research methods and designs and to equip them to take up researches independently.	
Unit 1	**Introduction to Research** a. Nature and aims of research b. Dimensions and types of research c. Theory and research d. The meaning of methodology e. Types of Methods of Research	
Unit 2	**Research Planed Data Collection** a. Concept, logic, and research question/issues b. Variables, causal theory, and hypothesis c. Research Design and Collection of Data d. Sampling: Methods, Size, Errors e. Probability and non-probability f. Measurement and Scaling Techniques g. Issues in measurement: Qualitative and quantitative	
Unit 3	**Data Processing** a. Analysis of quantitative data introduction to higher order statistics b. Editing, Coding and Classification of Data c. Analysis of qualitative data and Tabulation d. Introduction to advanced statistical techniques using SPSS e. Statistical Derivatives and Measures of Central Tendency f. Measures of Variation and Skewness g. Correlation and Simple Regression h. Diagrammatic and Graphic Presentation of Data	
Unit 4	**Research Report Writing** a. Ethical issues in research b. APA style of writing concept c. APA style of writing: Referencing d. d. Research article writing	

Unit 5	**Computer Application in Research**
	a. Introduction to MS Excel, Using Formulas and Functions
	b. Hand on to SPSS
	c. Features for Statistical Data Analysis
	d. Generating Charts/Graphs
	e. Introduction to MS Word, Features and Functions, Writing Report in MS Word
	f. Introduction to Open Office or Latex
	g. Creating Presentation in MS PowerPoint
	h. Introduction to Internet-Based Search
	i. Use of Advanced Research Techniques.

Recommended Readings:

1. Bayard, P. & Grayson, A. (1976). Introducing psychological research. London: McMillan.

2. Bordens, K.S. & Abbot, B.B. (2005). Research design and methods. New Delhi: Tata McGraw Hill.

3. Breakwell, G.M. Hammond, S. & Fife-Schaw, C. (1995). Research Methods in Psychology. New Delhi: Sage Publications.

4. Cresswell, J.W. (1994) Research design: L Qualitative and quantitative approaches. Thousand Oaks, CA: Sage Publication.

5. Drew, C.J.: Hardman, M.L. & Hart, W.A. (1996). Designing and conducting research: Inquiry in education and social science. New York: Allyn & Bacon.

6. Kerlinger, F.N. (1982). Foundations of behavioural research. Delhi: Subject Publication.

7. Nation, J.R. (1997). Research Methods. New Jersey: Prentice Hall.

8. Willing, C. & Stainton-Rogers, W. (Eds.) (2008). The Sage Handbook of Qualitative Research in Psychology. New Delhi: Sage Publications.

PHD-DSC-102	**Discipline Specific Course (Advances in Economic Theory and Policy)**	**Credit Distribution: L:3, T:1, P:0=4**
Learning Outcomes	• Understand the role of information in economic decision-making, focusing on concepts such as asymmetric information, moral hazard, adverse selection, and signalling. • Analyze the New Classical critique of macroeconomic policy • Understand the interrelationship between money, finance, and economic growth, focusing on how financial markets and institutions affect economic development. • Study the structural transformation of India's industrial sector, including shifts in industry composition, growth drivers, and the impact of globalization.	
Unit 1	**Advances in Microeconomic Theory** Economics of Information; Inter-temporal Choice-Intertemporal production;	

	Introduction to Behavioural Economics
	Advances in Macroeconomic Theory
	Relative Efficiency of Fiscal and Monetary Policies in an IS-LM Model; Rational Expectations and Theory of Macro Economic Policy: Lucas, Sargent and Wallace; The New Classical Critique of Micro Foundations and its Policy Implications
Unit 2	**Advances in Economic growth and Development**
	History of Thought in Development Economics; Endogenous Economic Growth; Human Capital: Education and Health; Population and Development; Money, Finance and Growth; Trade and Growth; Political Economy of Growth
	Contemporary Issues in Indian Economy
	Poverty, Income Distribution and Justice; Migration and Demographic Transition; Land Reforms in India and their impact on Agrarian Structure; The New Economic Policy and Indian Agriculture; Nature and Problems of Rural Development in India ; Indian Industry and Structural Changes; Rural poverty alleviation and employment programmes
Unit 3	**Advances in Public Economics**
	Private and public provision of public goods; Developments in theory of taxation- Effects, Efficiency, Optimality; Public Choice Theory- Contributions of Bowen, Black, Buchanan, Tullock, Arrow, Tiebout, Clarke, Anthony Downs, Niskanen
	Advances in Natural Resource Economics and Sustainable Development
	Environmental Valuation; Issues in resource economics; Environment and Development debate; Integrated environmental and economic accounting and the measurement of environmentally corrected GDP; Social forestry — rationale and benefits; Climate Change Mitigation and Coping strategies.
Unit 4	**Recent Developments in Trade Theory**
	Post–Heckscher-Ohlin Theories of Trade and Intra-Industry Trade; International Factor Movements; International Trade and the Developing Countries; International Financial Markets and Instruments; The International Monetary System: Past, Present, and Future
	Recent Developments in Financial Economics
	Hedging strategies with financial markets: forward, futures and options; Arbitrage and risk neutral pricing; The Greeks and hedging schemes; Exotic Options and hedging issues

References:

1. Blanchard, O., 'Macroeconomics', 4 th Edition, Prentice Hall.
2. Erol D'Souza. (2012), 'Macroeconomics', Pearson Education.
3. Romer, D., (2001), 'Advanced Macroeconomics', 2nd edition, McGraw-Hill.

4. Henderson, M. and R.E. Quandt, 'Microeconomic Theory: Mathematical Approach', McGraw Hill.

5. Pindyck, R.S., Rubinfeld, D.L. and Mehta, P.L., (2015), 'Microeconomics', 8th edition, Prentice

6. Hall. Varian, Hall R. (1992), 'Microeconomic Analysis' 3 rd edition, W.W. Norton & Company, New York.

7. Rao, Hanumantha, C.H., Technological Change and Distribution of Gains in Indian Agriculture, 1980.

8. Ahluwalia, I.J., Industrialisation Growth in Indian Stangation since Mid-60's 1985.

9. Kapila, Uma (ed.) Indian Economy since Independence, 1993.

10. Dholkia, B.H., Sources of Economic Growth, 1974.

11. Jalan, Bimal (ed.), The Indian Economy Problems and Prospects, 1975.

12. Brahamanda, P.R. and Panchmukhi, V.R. (ed.) The Development Process of the Indian Economy, Himalaya Publishing House, Bombay, 1987.

13. Dantwala, M.L., Indian Agriculture Development since Independence, Oxford, IBH Pub. Co., New Delhi, 1991.

14. Raj Kapila and Uma Kapila, India's Ecnomy in the 21st Century, 2002.

15. Chelliah, R.J., (1996), 'Towards Sustainable Growth: Essays in Fiscal and Financial Sector Reforms in India', Oxford University Press.

16. Ray, D., (2013), 'Development Economics', Oxford University Press.

17. Todaro, M.P. and Smith, S.C., 'Economic Development', 8 th edition, Pearson.

18. De Janvry, A., & Sadoulet, E. (2015). Development economics: Theory and practice. Routledge.

19. Setterfield, M. (Ed.). (2010). Handbook of alternative theories of economic growth. Cheltenham: Edward Elgar

20. Hillman, A. L. (2009). Public Finance and Public Policy. Cambridge University Press.

21. Leach, John (2004). A Course in Public Economics. Cambridge University Press.

22. Boadway, R. (1984). Public Sector Economics. Cambridge Winthrop Publishers.

23. Ihori, Toshihiro (2016). Principles of Public Finance. Springer.

24. Jha, Raghbendra (1998). Modern Public Economics. Routledge.

25. Hanley, N., Shogren, J. F., & White, B. (2016). Environmental economics: in theory and practice. Macmillan international higher education.

26. Field, B. C. (1994). Environmental economics: an introduction. McGraw-Hill Book Company (UK) Ltd.

27. Kolstad, C. (2011). Intermediate environmental economics: International edition. OUP Catalogue.

28. Salvatore, D., and Reed, (2013), 'International Economics' 11th edition, Wiley.

29. Krugman, R., and Obstfeld, M., (2013), 'International Economics: Theory and Policy', Pearson Education.

30. Appleyard, D. R. (2010). International economics. New York: McGraw-Hill/Irwin.

31. Hull, J. C. (2014), Options, Futures and other derivatives, Pearson, 9th Ed.

32. Hull, J. C. and White, A. (2006), Hull-White on Derivatives: A compilation of articles, Risk Books

33. Janakiraman, S. (2011), Derivatives and Risk Management, Pearson, 1st Ed

34. Kolb, Robert (1996). Financial Derivatives. John Wiley & Sons, USA.

PHD-RPE-103	**Research and Publication Ethics**	**Credit Distribution: L:1, T:1, P:0=2**
Learning Outcomes	1. To have awareness about the publication ethics and publication misconducts. 2. To understand indexing and citation databases, open access publications, research metrics (citations, h-index, impact factor etc) 3. Develop hands-on skills to identify research misconduct and predatory publications.	
Unit 1	**Philosophy and Ethics (4 hrs)** 1. Introduction to philosophy: definition, nature and scope, concept, branches 2. Ethics: definition, moral philosophy, nature of moral judgements and reactions	
Unit 2	**Scientific Conduct (4 hrs)** 1. Ethics with respect to science and research 2. Intellectual honesty and research integrity 3. Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP) 4. Redundant publications: duplicate and overlapping publications, salami slicing 5. Selective reporting and misrepresentation of data	
Unit 3	**Publication Ethics (7 hrs)** 1. Publication ethics: definition, introduction and importance 2. Best practices / standards setting initiatives and guidelines: COPE, WAME, etc. 3. Conflicts of interest 4. Publication misconduct: definition, concept, problems that lead to unethical behavior and vice versa, types 5. Violation of publication ethics, authorship and contributor ship 6. Identification of publication misconduct, complaints and appeals 7. Predatory publishers and journals	
Unit 4 Practice	**Open Access Publishing (4 hrs)** 1. Open access publications and initiatives 2. SHERPA/ROMEO online resource to check publisher copyright & self-archiving policies 3. Software tool to identify predatory publications developed by SPPU 4. Journal finder / journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer	

	Journal Suggester, etc.
Unit 5 Practice	**Publication Misconduct (4 hrs)**
	A. Group Discussions (2 hrs.)
	1. Subject specific ethical issues, FFP, authorship
	2. Conflicts of interest
	3. Complaints and appeals: examples and fraud from India and abroad
	B. Software tools (2 hrs.)
	Use of plagiarism software like Turnitin, Urkund and other open source software tools
Unit 6 Practice	**Databases and Research Metrics (7 hrs)**
	A. Databases (4 hrs.)
	1. Indexing databases
	2. Citation databases: Web of Science, Scopus etc.
	B. Research Metrics (3 hrs.)
	1. Impact Factor of journal as per Journal Citation Report, SNIP, SJR, IPP, Cite Score
	2. Metrics: h-index, g-index, i10 index, altmetrics

Suggested Readings

1. Bird, A. (2006). Philosophy of Science. Routledge.
2. MacIntyre, A. (1967) A Short History of Ethics. London.
3. P. Chaddah, (2018) Ethics in Competitive Research: Do not get scooped; do not get plagiarized, ISBN:978-9387480865
4. National Academy of Sciences, National Academy of Engineering and Institute of Medicine. (2009). On Being a Scientist: A Guide to Responsible Conduct in Research: Third Edition. National Academies Press.
5. Rensik, D. B. (2011). What is ethics in research & why is it important. National Institute of Environmental Health Sciences, 1-10. Retrieved from https://www.niehs.nih.gov/resources/biothics/whatis/index.cfm
6. Beall, J. (2012). Predatory publishers are corrupting open access. Nature, 489(7415), 179-179. https://doi.org/10.1038/489179a

NIILM UNIVERSITY

Ph.D. Course Work in Education

Academic Session 2024-25

Ph.D. Regulations Regarding Course Work

Clause 18: Ph.D. Ordinance NIILM University as per UGC Minimum Standards and Procedure for Award of Ph.D. Degrees Regulations 2022 with effect from academic session 2024-25

I. The coursework shall be treated as a prerequisite for Ph.D. preparation. In the first year of registration, all research scholars are required to complete the course work for one semester following their provisional registration as a part of the Ph.D. program. It is mandatory to complete the course work in first 4 semesters to stay in the Ph.D. program. If a student fails to complete the coursework in first 4 semesters, will have to leave the program.

II. Earning a minimum of 12 total credits and a maximum of 16, is required.

III. Usually a course refers to a 'paper' and is a component of an academic program. Courses in Ph.D. course work shall be of two kinds: Core and Elective.

IV. A core course is a compulsory paper to be studied by all the scholars to complete the requirements of the Ph.D. degree.

V. Elective course is a course which is discipline specific and provided by the particular department from the main discipline or from a sister/related discipline which supports the main discipline, on mutual consent of the concerned departments.

VI. One credit equal to 15 contact hours for theory-based teaching or 30 hours of contact time for practical or activity-based teaching.

VII. The number of credits is given in the form L: T: P, where L indicates the number of contact hours of lecture, and T the number of contact hours for tutorials, P stands for laboratory credits.

VIII. The credits are distributed as follows:

Paper Code	Paper	Course type	Credit	L	T	P
PHD-ARM-101	Advanced Research Methodology	Core	4	3	1	0
PHD-DSC-102	Discipline Specific Course	Elective	4	3	1	0
PHD-RPE-103	Research and Publication Ethics	Core	2	1	1	0
PHD-SEM-104	Academic Writing, Literature Review and Seminar	Skill	2	0	1	2
	Total		12			

IX. All Ph.D., entrants irrespective of discipline, shall be trained in teaching proficiency related to teaching/education/pedagogy/writing related to their chosen Ph.D. subject during their doctoral training period, that include assigning 4-6 hours per week of teaching/ research assistantship for conducting tutorial or laboratory work and evaluations.

X. Courses PHD-SEM 104 includes research work on research article writing, seminar presentation and course PHD-TP 105 includes pedagogical training. Both these courses will be assessed internally without Semester End Examination.

XI. CoE will conduct Term/ Semester End Exam in PHD-ARM-101, PHD-DSC-102, and PHD-RPE-103.

XII. PHD-TP 105 is a non-credit course and internal assessment will be marked on the detailed mark card of the course work.

XIII. Advance Research Methodology course will include common research methodology and subject specific research methodology.

XIV. Research Advisory Committee may provide choices in selecting the courses/ credits that facilitates the entrepreneur in the monetization of IP thus generated.

XV. RAC can also recommend UGC recognized online courses as part of the credit requirements for the Ph.D. program.

XVI. Paper- will comprise of the following two activities:

(a) External Assessment: Written Question Paper 70/39

(b) Internal Assessment: 30/16

Marks will be converted into letter grade and grade point as per following table:

Marks	Letter Grade	Grade Point
81-100	A+	10
76-80	A	9
66-75	B+	8
61-65	B	7
55-60	C	6
Less than 55	F	0

The computation of the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA) shall be done as per University Examination Ordinance or Examination Rules & Regulations issued time to time.

The result and grade sheet for the course work will carry pass/ fail result.

COURSE WORK PAPER

I. Candidates who already hold an M. Phil. degree and have been accepted into the Ph.D. program, or those who have finished their M.Phil. Coursework and have been given permission to continue on to the Ph.D. in an integrated course, may be exempted from the Ph.D. course requirements by the Department. All additional applicants accepted into the Ph.D. program must complete the Ph.D. coursework required by the Department.

II. The NIILM University attendance rules, a minimum 75% attendance is must require, will be applied to all full-time research scholars. For the duration of their coursework, part-time research researchers must, nevertheless, adhere to the same rules.

III. A Ph.D. scholar has to obtain a minimum of 55% of marks or a minimum CGPA of 6.0 in the UGC 10-point scale (or an equivalent grade/CGPA in a point scale wherever grading system is followed) in the course work in order to be eligible to continue in the program and submit the thesis.

IV. Registration will be automatically canceled if the required course work is not completed with a minimum of 55% of marks/a minimum CGPA of 6.0 within the allotted time. If the course work is not finished within a year, the RAC and DRC may suggest a six-month extension or suggest that the registration be canceled with the DRC.

V. There is no provision of improvement or special supplementary exam to be conducted. Coursework will be offered in four semesters of first two years with regular & supplementary exams to avail the opportunity to clear the coursework in 2 years. **Failure to complete the course in 2 years means that the student has to leave the program.**

Course Structure:

PHD-ARM-101	Advance Research Methodology in Education	Credit Distribution: L:3, T:1, P:0=4
Course Objectives:	To acquaint the students with research process. To train them in the research methods and designs and to equip them to take up researches independently.	
Unit 1	**Introduction to Research** a. Nature and aims of research b. Dimensions and types of research c. Theory and research d. The meaning of methodology e. Types of Methods of Research	
Unit 2	**Research Planed Data Collection** a. Concept, logic, and research question/issues b. Variables, causal theory, and hypothesis c. Research Design and Collection of Data d. Sampling: Methods, Size, Errors e. Probability and non-probability f. Measurement and Scaling Techniques g. Issues in measurement: Qualitative and quantitative	
Unit 3	**Data Processing** a. Analysis of quantitative data introduction to higher order statistics b. Editing, Coding and Classification of Data c. Analysis of qualitative data and Tabulation d. Introduction to advanced statistical techniques using SPSS e. Statistical Derivatives and Measures of Central Tendency f. Measures of Variation and Skewness g. Correlation and Simple Regression h. Diagrammatic and Graphic Presentation of Data	
Unit 4	**Research Report Writing** a. Ethical issues in research b. APA style of writing concept c. APA style of writing: Referencing d. d. Research article writing	

Unit 5	**Computer Application in Research**
	a. Introduction to MS Excel, Using Formulas and Functions
	b. Hand on to SPSS
	c. Features for Statistical Data Analysis
	d. Generating Charts/Graphs
	e. Introduction to MS Word, Features and Functions, Writing Report in MS Word
	f. Introduction to Open Office or Latex
	g. Creating Presentation in MS PowerPoint
	h. Introduction to Internet-Based Search
	i. Use of Advanced Research Techniques.

Recommended Readings:

1. Bayard, P. & Grayson, A. (1976). Introducing psychological research. London: McMillan.
2. Bordens, K.S. & Abbot, B.B. (2005). Research design and methods. New Delhi: Tata McGraw Hill.
3. Breakwell, G.M. Hammond, S. & Fife-Schaw, C. (1995). Research Methods in Psychology. New Delhi: Sage Publications.
4. Cresswell, J.W. (1994) Research design: L Qualitative and quantitative approaches. Thousand Oaks, CA: Sage Publication.
5. Drew, C.J.: Hardman, M.L. & Hart, W.A. (1996). Designing and conducting research: Inquiry in education and social science. New York: Allyn & Bacon.
6. Kerlinger, F.N. (1982). Foundations of behavioural research. Delhi: Subject Publication.
7. Nation, J.R. (1997). Research Methods. New Jersey: Prentice Hall.
8. Willing, C. & Stainton-Rogers, W. (Eds.) (2008). The Sage Handbook of Qualitative Research in Psychology. New Delhi: Sage Publications.

PHD-DSC-102	**Discipline Specific Course (Education)**	**Credit Distribution: L:3, T:1, P:0=4**
Learning Outcomes	• Grasp the evolving nature of education, understanding pedagogical shifts, inclusive practices, and the role of education in advancing gender equality and social justice.	
	• Gain insights into how education can foster entrepreneurship and enhance professional development through communication and interpersonal relationships.	
	• Understand the components of effective curriculum design and evaluation. They will be equipped to develop, implement, and assess curricula that meet educational goals and respond to learner needs.	
Unit 1	Recent trends in Education	
	a) Paradigm shifts in the process and pedagogy of education	
	b) Educational leadership, Inclusive Education , Generic and life	

	skills, Classroom realities of the world's education , Higher education as a common good, Gender equality and women participation
Unit 2	Entrepreneurship and Professional Development a) Entrepreneurship Education b) Professional Development through interpersonal relationship c) Cognitive sciences and futurology of education
Unit 3	ICT and Communication in Educational Research a) Evaluating online resources: Authority, Accuracy and objectivity b) E- learning: scope, trends, attributes, opportunities c) Open educational resources d) Massive open online courses.
Unit 4	Curriculum Development a) Understanding the meaning , nature and scope of curriculum b) Developing curriculum framework as per need c) Implementation and evaluation process of Curriculum

Text Books:

1. Bartlett, L.D. and Weisentein, G. R. (2003). Successful Inclusion for Educational Leaders, New Jersey: Prentice Hall.
2. Mishra, B. K., Mohanty, R. K. (2008). Trends in Education: R. Lall Book Depot, Near Govt. Inter College, Meerut U.P.
3. Mohit Chakrabarti, (2005). Education in the 21 st Century, Delhi, Kalpar publication

Suggested Readings:

1) Hegarthy, S. &Alur, M. (2002) Education of Children with Special Needs: from Segregation to Inclusion, Corwin Press. Sage Publishers

2) Mason Robin & Frank R. (2006). E-learning - The key concepts. Routledge, New York.

3) Pathak, R.P. & Chaudhary, J (2012). Educational Technology, Pearson, New Delhi.

4) Richard Andrews & Caroline (2007). E-learning Research - A handbook of, SAGE, New Delhi.

5) Anand, C. L. et al. (1983). The Teacher and Education in Emerging Indian Society, New Delhi, NCERT.

PHD-RPE-103	**Research and Publication Ethics**	**Credit Distribution:** **L:1, T:1, P:0=2**
Learning Outcomes	1. To have awareness about the publication ethics and publication misconducts. 2. To understand indexing and citation databases, open access publications, research metrics (citations, h-index, impact factor etc) 3. Develop hands-on skills to identify research misconduct and predatory	

	publications.
Unit 1	**Philosophy and Ethics (4 hrs)** 1. Introduction to philosophy: definition, nature and scope, concept, branches 2. Ethics: definition, moral philosophy, nature of moral judgements and reactions
Unit 2	**Scientific Conduct (4 hrs)** 1. Ethics with respect to science and research 2. Intellectual honesty and research integrity 3. Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP) 4. Redundant publications: duplicate and overlapping publications, salami slicing 5. Selective reporting and misrepresentation of data
Unit 3	**Publication Ethics (7 hrs)** 1. Publication ethics: definition, introduction and importance 2. Best practices / standards setting initiatives and guidelines: COPE, WAME, etc. 3. Conflicts of interest 4. Publication misconduct: definition, concept, problems that lead to unethical behavior and vice versa, types 5. Violation of publication ethics, authorship and contributor ship 6. Identification of publication misconduct, complaints and appeals 7. Predatory publishers and journals
Unit 4 Practice	**Open Access Publishing (4 hrs)** 1. Open access publications and initiatives 2. SHERPA/ROMEO online resource to check publisher copyright & self-archiving policies 3. Software tool to identify predatory publications developed by SPPU 4. Journal finder / journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer Journal Suggester, etc.
Unit 5 Practice	**Publication Misconduct (4 hrs)** A. Group Discussions (2 hrs.) 1. Subject specific ethical issues, FFP, authorship 2. Conflicts of interest 3. Complaints and appeals: examples and fraud from India and abroad B. Software tools (2 hrs.) Use of plagiarism software like Turnitin, Urkund and other open source software tools
Unit 6 Practice	**Databases and Research Metrics (7 hrs)** A. Databases (4 hrs.)

	1. Indexing databases
	2. Citation databases: Web of Science, Scopus etc.
	B. Research Metrics (3 hrs.)
	1. Impact Factor of journal as per Journal Citation Report, SNIP, SJR, IPP, Cite Score
	2. Metrics: h-index, g-index, i10 index, altmetrics

Suggested Readings

1. Bird, A. (2006). Philosophy of Science. Routledge.
2. MacIntyre, A. (1967) A Short History of Ethics. London.
3. P. Chaddah, (2018) Ethics in Competitive Research: Do not get scooped; do not get plagiarized, ISBN:978-9387480865
4. National Academy of Sciences, National Academy of Engineering and Institute of Medicine. (2009). On Being a Scientist: A Guide to Responsible Conduct in Research: Third Edition. National Academies Press.
5. Rensik, D. B. (2011). What is ethics in research & why is it important. National Institute of Environmental Health Sciences, 1-10. Retrieved from https://www.niehs.nih.gov/resources/biothics/whatis/index.cfm
6. Beall, J. (2012). Predatory publishers are corrupting open access. Nature, 489(7415), 179-179. https://doi.org/10.1038/489179a

NIILM UNIVERSITY

Ph.D. Course Work in Electrical Engineering

Academic Session 2024-25

Ph.D. Regulations Regarding Course Work

Clause 18: Ph.D. Ordinance NIILM University as per UGC Minimum Standards and Procedure for Award of Ph.D. Degrees Regulations 2022 with effect from academic session 2024-25

I. The coursework shall be treated as a prerequisite for Ph.D. preparation. In the first year of registration, all research scholars are required to complete the course work for one semester following their provisional registration as a part of the Ph.D. program. It is mandatory to complete the course work in first 4 semesters to stay in the Ph.D. program. If a student fails to complete the coursework in first 4 semesters, will have to leave the program.

II. Earning a minimum of 12 total credits and a maximum of 16, is required.

III. Usually a course refers to a 'paper' and is a component of an academic program. Courses in Ph.D. course work shall be of two kinds: Core and Elective.

IV. A core course is a compulsory paper to be studied by all the scholars to complete the requirements of the Ph.D. degree.

V. Elective course is a course which is discipline specific and provided by the particular department from the main discipline or from a sister/related discipline which supports the main discipline, on mutual consent of the concerned departments.

VI. One credit equal to 15 contact hours for theory-based teaching or 30 hours of contact time for practical or activity-based teaching.

VII. The number of credits is given in the form L: T:P, where L indicates the number of contact hours of lecture, and T the number of contact hours for tutorials, P stands for laboratory credits.

VIII. The credits are distributed as follows:

Paper Code	Paper	Course type	Credit	L	T	P
PHD-ARM-101	Advanced Research Methodology	Core	4	3	1	0
PHD-DSC-102	Discipline Specific Course	Elective	4	3	1	0
PHD-RPE-103	Research and Publication Ethics	Core	2	1	1	0
PHD-SEM-104	Academic Writing, Literature Review and Seminar	Skill	2	0	1	2
	Total		**12**			

IX. All Ph.D., entrants irrespective of discipline, shall be trained in teaching proficiency related to teaching/education/pedagogy/writing related to their chosen Ph.D. subject during their doctoral training period, that include assigning 4-6 hours per week of teaching/ research assistantship for conducting tutorial or laboratory work and evaluations.

X. Courses PHD-SEM 104 includes research work on research article writing, seminar presentation and course PHD-TP 105 includes pedagogical training. Both these courses will be assessed internally without Semester End Examination.

XI. CoE will conduct Term/ Semester End Exam in PHD-ARM-101, PHD-DSC-102, and PHD-RPE-103.

XII. PHD-TP 105 is a non-credit course and internal assessment will be marked on the detailed mark card of the course work.

XIII. Advance Research Methodology course will include common research methodology and subject specific research methodology.

XIV. Research Advisory Committee may provide choices in selecting the courses/ credits that facilitates the entrepreneur in the monetization of IP thus generated.

XV. RAC can also recommend UGC recognized online courses as part of the credit requirements for the Ph.D. program.

XVI. Paper- will comprise of the following two activities:

(a) **External Assessment: Written Question Paper 70/39**

(b) **Internal Assessment: 30/16**

Marks will be converted into letter grade and grade point as per following table:

Marks	Letter Grade	Grade Point
81-100	A+	10
76-80	A	9
66-75	B+	8
61-65	B	7
55-60	C	6
Less than 55	F	0

The computation of the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA) shall be done as per University Examination Ordinance or Examination Rules & Regulations issued time to time.

The result and grade sheet for the course work will carry pass/ fail result.

COURSE WORK PAPER

I. Candidates who already hold an M. Phil. degree and have been accepted into the Ph.D. program, or those who have finished their M.Phil. Coursework and have been given permission to continue on to the Ph.D. in an integrated course, may be exempted from the Ph.D. course requirements by the Department. All additional applicants accepted into the Ph.D. program must complete the Ph.D. coursework required by the Department.

II. The NIILM University attendance rules, a minimum 75% attendance is must require, will be applied to all full-time research scholars. For the duration of their coursework, part-time research researchers must, nevertheless, adhere to the same rules.

III. A Ph.D. scholar has to obtain a minimum of 55% of marks or a minimum CGPA of 6.0 in the UGC 10-point scale (or an equivalent grade/CGPA in a point scale wherever grading system is followed) in the course work in order to be eligible to continue in the program and submit the thesis.

IV. Registration will be automatically canceled if the required course work is not completed with a minimum of 55% of marks/a minimum CGPA of 6.0 within the allotted time. If the course work is not finished within a year, the RAC and DRC may suggest a six-month extension or suggest that the registration be canceled with the DRC.

V. There is no provision of improvement or special supplementary exam to be conducted. Coursework will be offered in four semesters of first two years with regular & supplementary exams to avail the opportunity to clear the coursework in 2 years. **Failure to complete the course in 2 years means that the student has to leave the program.**

Course Structure:

PHD-ARM-101	Advance Research Methodology in Electrical Engineering	Credit Distribution: L:3, T:1, P:0=4
Course Objectives:	To acquaint the students with research process. To train them in the research methods and designs and to equip them to take up researches independently.	
Unit 1	**Introduction to Research** a. Nature and aims of research b. Dimensions and types of research c. Theory and research d. The meaning of methodology e. Types of Methods of Research	
Unit 2	**Research Planed Data Collection** a. Concept, logic, and research question/issues b. Variables, causal theory, and hypothesis c. Research Design and Collection of Data d. Sampling: Methods, Size, Errors e. Probability and non-probability f. Measurement and Scaling Techniques g. Issues in measurement: Qualitative and quantitative	
Unit 3	**Data Processing** a. Analysis of quantitative data introduction to higher order statistics b. Editing, Coding and Classification of Data c. Analysis of qualitative data and Tabulation d. Introduction to advanced statistical techniques using SPSS e. Statistical Derivatives and Measures of Central Tendency f. Measures of Variation and Skewness g. Correlation and Simple Regression h. Diagrammatic and Graphic Presentation of Data	
Unit 4	**Research Report Writing** a. Ethical issues in research b. APA style of writing concept c. APA style of writing: Referencing d. d. Research article writing	

Unit 5	**Computer Application in Research**
	a. Introduction to MS Excel, Using Formulas and Functions
	b. Hand on to SPSS
	c. Features for Statistical Data Analysis
	d. Generating Charts/Graphs
	e. Introduction to MS Word, Features and Functions, Writing Report in MS Word
	f. Introduction to Open Office or Latex
	g. Creating Presentation in MS PowerPoint
	h. Introduction to Internet-Based Search
	i. Use of Advanced Research Techniques.

Recommended Readings:

1. Bayard, P. & Grayson, A. (1976). Introducing psychological research. London: McMillan.

2. Bordens, K.S. & Abbot, B.B. (2005). Research design and methods. New Delhi: Tata McGraw Hill.

3. Breakwell, G.M. Hammond, S. & Fife-Schaw, C. (1995). Research Methods in Psychology. New Delhi: Sage Publications.

4. Cresswell, J.W. (1994) Research design: L Qualitative and quantitative approaches. Thousand Oaks, CA: Sage Publication.

5. Drew, C.J.: Hardman, M.L. & Hart, W.A. (1996). Designing and conducting research: Inquiry in education and social science. New York: Allyn& Bacon.

6. Kerlinger, F.N. (1982). Foundations of behavioural research. Delhi: Subject Publication.

7. Nation, J.R. (1997). Research Methods. New Jersey: Prentice Hall.

8. Willing, C. & Stainton-Rogers, W. (Eds.) (2008). The Sage Handbook of Qualitative Research in Psychology. New Delhi: Sage Publications.

PHD-DSC-102	**Discipline Specific Course (Electrical Engineering)**	**Credit Distribution: L:3, T:0, P:1=4**
Learning Outcomes	• Explore the working principles and applications of **fuel cells** in renewable energy systems. • Study **grid integration** of PV systems and issues related to efficiency and energy storage. • Understand the design techniques for **continuous** and **discrete-time** systems, focusing on stability and performance analysis.	
Unit 1	Intelligent Control Neural network architecture for modeling and Control, System identification and control, Fuzzy, Neuro-fuzzy, Typical applications of ANN, Classification, Clustering, Pattern Recognition, Different architectures of neural network, Learning algorithms, Knowledge based systems, Genetic algorithms.	
Unit 2	Multivariable and Optimal Control Systems Introduction, general structure Examples, state space and transfer matrix forms; Controllability and observability, state Estimation, decoupling , model matching control, classical	

	control extended to multivariable control system. Pontryagins minimum principle and its application to optimal control. Continuous and discrete time systems, linear regulator problem, minimum time optimal control, bangbang control.
Unit 3	Control System Design Design of linear and non-linear systems, continuous and discrete time, SISO and MIMO systems by state variable techniques. Advanced PID design techniques, Application of softwares, Simulink and CAD for control system design.
Unit 4	Modeling of Dynamic Systems Modeling and simulation techniques applied to dynamic systems covering physical systems such as electrical, mechanical, thermal, chemical, biomedical and biological.
Unit 5	Renewable Energy Sources Solar Photovoltaic, new organic photovoltaic materials and devices, Modeling and characterization of PV cells and modules, Grid integration of PV systems. Wind Energy systems, wind turbine Electrical generators and converters, Wind turbine system reliability, Wind resources and its characterization, grid integration of wind turbines and wind farms., Power quality and reliability issues related with wind farm interfaced to weak gird.fuel cells systems. Hybrid systems, standalone hybrid systems, other sustainable Energy sources such as biomass, tidal, wave, geothermal, small and mirco hydel systems.

Reference Books:

1. Simon Haykin, 'Neural Networks: A Compressive Foundation', Second Edition, Person Education.

2. Zimmermann, H.J, 'Fuzzy Set Theory and its Applications', Second Edition, Kluwer Academic Publishers.

3. M. Ganesh, 'Introduction to fuzzy sets and fuzzy Logic', Prentice Hall India.

4. Mohamed H. Hassoun, 'Fundamentals of Artificial Neural Network', Prentice Hall India.

5. Jacek Zurada, 'Introduction to Artificial Neural Network', Jaico Publishing House India.

6. 'Linear Multivariable Control Systems', Y. S. Apte, New Age International Publications.

7. 'Multivariable Control System': W.M. Wonham. .

8. 'Optimal Control: An Introduction' O Kirk, Prentice Hall.

9. 'Multivariable Feedback Control', S.Skogestad, I.Postlethwaite,

10. John Wiley and Sons, 2005

11. Control System Design', G.C.Godwin, S.F.Graebe, M.E.Salgada, Prentice Hall of India.

12. 'Control System Design Guide: A practical Guide', George Eills, Academic Press (3rd Edition).

PHD-RPE-103	Research and Publication Ethics	Credit Distribution: L:1, T:1, P:0=2
Learning Outcomes	1. To have awareness about the publication ethics and publication misconducts. 2. To understand indexing and citation databases, open access publications, research metrics (citations, h-index, impact factor etc) 3. Develop hands-on skills to identify research misconduct and predatory publications.	
Unit 1	**Philosophy and Ethics (4 hrs)** 1. Introduction to philosophy: definition, nature and scope, concept, branches 2. Ethics: definition, moral philosophy, nature of moral judgements and reactions	
Unit 2	**Scientific Conduct (4 hrs)** 1. Ethics with respect to science and research 2. Intellectual honesty and research integrity 3. Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP) 4. Redundant publications: duplicate and overlapping publications, salami slicing 5. Selective reporting and misrepresentation of data	
Unit 3	**Publication Ethics (7 hrs)** 1. Publication ethics: definition, introduction and importance 2. Best practices / standards setting initiatives and guidelines: COPE, WAME, etc. 3. Conflicts of interest 4. Publication misconduct: definition, concept, problems that lead to unethical behavior and vice versa, types 5. Violation of publication ethics, authorship and contributorship 6. Identification of publication misconduct, complaints and appeals 7. Predatory publishers and journals	
Unit 4 Practice	**Open Access Publishing (4 hrs)** 1. Open access publications and initiatives 2. SHERPA/ROMEO online resource to check publisher copyright &self-archiving policies	

	3. Software tool to identify predatory publications developed by SPPU 4. Journal finder / journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer Journal Suggester, etc.
Unit 5 Practice	**Publication Misconduct (4 hrs)** A. Group Discussions (2 hrs.) 1. Subject specific ethical issues, FFP, authorship 2. Conflicts of interest 3. Complaints and appeals: examples and fraud from India and abroad B. Software tools (2 hrs.) Use of plagiarism software like Turnitin, Urkund and other open source software tools
Unit 6 Practice	**Databases and Research Metrics (7 hrs)** A. Databases (4 hrs.) 1. Indexing databases 2. Citation databases: Web of Science, Scopus etc. B. Research Metrics (3 hrs.) 1. Impact Factor of journal as per Journal Citation Report, SNIP, SJR, IPP, Cite Score 2. Metrics: h-index, g-index, i10 index, altmetrics

Suggested Readings

1. Bird, A. (2006). Philosophy of Science. Routledge.
2. MacIntyre, A. (1967) A Short History of Ethics. London.
3. P. Chaddah, (2018) Ethics in Competitive Research: Do not get scooped; do not getplagiarized, ISBN:978-9387480865
4. National Academy of Sciences, National Academy of Engineering and Institute ofMedicine. (2009). On Being a Scientist: A Guide to Responsible Conduct in Research:Third Edition. National Academies Press.
5. Rensik, D. B. (2011). What is ethics in research & why is it important. National Instituteof Environmental Health Sciences, 1-10. Retrieved fromhttps://www.niehs.nih.gov/resources/biothics/whatis/index.cfm
6. Beall, J. (2012). Predatory publishers are corrupting open access. Nature, 489(7415),179-179. https://doi.org/10.1038/489179a

NIILM UNIVERSITY

Ph.D. Course Work in Electronics and Communication Engineering

Academic Session 2024-25

Ph.D. Regulations Regarding Course Work

Clause 18: Ph.D. Ordinance NIILM University as per UGC Minimum Standards and Procedure for Award of Ph.D. Degrees Regulations 2022 with effect from academic session 2024-25

I. The coursework shall be treated as a prerequisite for Ph.D. preparation. In the first year of registration, all research scholars are required to complete the course work for one semester following their provisional registration as a part of the Ph.D. program. It is mandatory to complete the course work in first 4 semesters to stay in the Ph.D. program. If a student fails to complete the coursework in first 4 semesters, will have to leave the program.

II. Earning a minimum of 12 total credits and a maximum of 16, is required.

III. Usually a course refers to a 'paper' and is a component of an academic program. Courses in Ph.D. course work shall be of two kinds: Core and Elective.

IV. A core course is a compulsory paper to be studied by all the scholars to complete the requirements of the Ph.D. degree.

V. Elective course is a course which is discipline specific and provided by the particular department from the main discipline or from a sister/related discipline which supports the main discipline, on mutual consent of the concerned departments.

VI. One credit equal to 15 contact hours for theory-based teaching or 30 hours of contact time for practical or activity-based teaching.

VII. The number of credits is given in the form L: T: P, where L indicates the number of contact hours of lecture, and T the number of contact hours for tutorials, P stands for laboratory credits.

VIII. The credits are distributed as follows:

Paper Code	Paper	Course type	Credit	L	T	P
PHD-ARM-101	Advanced Research Methodology	Core	4	3	1	0
PHD-DSC-102	Discipline Specific Course	Elective	4	3	1	0
PHD-RPE-103	Research and Publication Ethics	Core	2	1	1	0
PHD-SEM-104	Academic Writing, Literature Review and Seminar	Skill	2	0	1	2
	Total		12			

IX. All Ph.D., entrants irrespective of discipline, shall be trained in teaching proficiency related to teaching/education/pedagogy/writing related to their chosen Ph.D. subject during their doctoral training period, that include assigning 4-6 hours per week of teaching/ research assistantship for conducting tutorial or laboratory work and evaluations.

X. Courses PHD-SEM 104 includes research work on research article writing, seminar presentation and course PHD-TP 105 includes pedagogical training. Both these courses will be assessed internally without Semester End Examination.

XI. CoE will conduct Term/ Semester End Exam in PHD-ARM-101, PHD-DSC-102, and PHD-RPE-103.

XII. PHD-TP 105 is a non-credit course and internal assessment will be marked on the detailed mark card of the course work.

XIII. Advance Research Methodology course will include common research methodology and subject specific research methodology.

XIV. Research Advisory Committee may provide choices in selecting the courses/ credits that facilitates the entrepreneur in the monetization of IP thus generated.

XV. RAC can also recommend UGC recognized online courses as part of the credit requirements for the Ph.D. program.

XVI. Paper- will comprise of the following two activities:

(a) External Assessment: Written Question Paper 70/39

(b) Internal Assessment: 30/16

Marks will be converted into letter grade and grade point as per following table:

Marks	Letter Grade	Grade Point
81-100	A+	10
76-80	A	9
66-75	B+	8
61-65	B	7
55-60	C	6
Less than 55	F	0

The computation of the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA) shall be done as per University Examination Ordinance or Examination Rules & Regulations issued time to time.

The result and grade sheet for the course work will carry pass/ fail result.

COURSE WORK PAPER

I. Candidates who already hold an M. Phil. degree and have been accepted into the Ph.D. program, or those who have finished their M.Phil. Coursework and have been given permission to continue on to the Ph.D. in an integrated course, may be exempted from the Ph.D. course requirements by the Department. All additional applicants accepted into the Ph.D. program must complete the Ph.D. coursework required by the Department.

II. The NIILM University attendance rules, a minimum 75% attendance is must require, will be applied to all full-time research scholars. For the duration of their coursework, part-time research researchers must, nevertheless, adhere to the same rules.

III. A Ph.D. scholar has to obtain a minimum of 55% of marks or a minimum CGPA of 6.0 in the UGC 10-point scale (or an equivalent grade/CGPA in a point scale wherever grading system is followed) in the course work in order to be eligible to continue in the program and submit the thesis.

IV. Registration will be automatically canceled if the required course work is not completed with a minimum of 55% of marks/a minimum CGPA of 6.0 within the allotted time. If the course work is not finished within a year, the RAC and DRC may suggest a six-month extension or suggest that the registration be canceled with the DRC.

V. There is no provision of improvement or special supplementary exam to be conducted. Coursework will be offered in four semesters of first two years with regular & supplementary exams to avail the opportunity to clear the coursework in 2 years. **Failure to complete the course in 2 years means that the student has to leave the program.**

Course Structure:

PHD-ARM-101	Advance Research Methodology in Electronics and Communication Engineering	Credit Distribution: L:3, T:1, P:0=4
Course Objectives:	To acquaint the students with research process. To train them in the research methods and designs and to equip them to take up researches independently.	
Unit 1	**Introduction to Research** a. Nature and aims of research b. Dimensions and types of research c. Theory and research d. The meaning of methodology e. Types of Methods of Research	
Unit 2	**Research Planed Data Collection** a. Concept, logic, and research question/issues b. Variables, causal theory, and hypothesis c. Research Design and Collection of Data d. Sampling: Methods, Size, Errors e. Probability and non-probability f. Measurement and Scaling Techniques g. Issues in measurement: Qualitative and quantitative	
Unit 3	**Data Processing** a. Analysis of quantitative data introduction to higher order statistics b. Editing, Coding and Classification of Data c. Analysis of qualitative data and Tabulation d. Introduction to advanced statistical techniques using SPSS e. Statistical Derivatives and Measures of Central Tendency f. Measures of Variation and Skewness g. Correlation and Simple Regression h. Diagrammatic and Graphic Presentation of Data	
Unit 4	**Research Report Writing** a. Ethical issues in research b. APA style of writing concept c. APA style of writing: Referencing	

	d. d. Research article writing	
Unit 5	**Computer Application in Research**	
	a. Introduction to MS Excel, Using Formulas and Functions	
	b. Hand on to SPSS	
	c. Features for Statistical Data Analysis	
	d. Generating Charts/Graphs	
	e. Introduction to MS Word, Features and Functions, Writing Report in MS Word	
	f. Introduction to Open Office or Latex	
	g. Creating Presentation in MS PowerPoint	
	h. Introduction to Internet-Based Search	
	i. Use of Advanced Research Techniques.	

Recommended Readings:

1. Bayard, P. & Grayson, A. (1976). Introducing psychological research. London: McMillan.
2. Bordens, K.S. & Abbot, B.B. (2005). Research design and methods. New Delhi: Tata McGraw Hill.
3. Breakwell, G.M. Hammond, S. & Fife-Schaw, C. (1995). Research Methods in Psychology. New Delhi: Sage Publications.
4. Cresswell, J.W. (1994) Research design: L Qualitative and quantitative approaches. Thousand Oaks, CA: Sage Publication.
5. Drew, C.J.: Hardman, M.L. & Hart, W.A. (1996). Designing and conducting research: Inquiry in education and social science. New York: Allyn& Bacon.
6. Kerlinger, F.N. (1982). Foundations of behavioural research. Delhi: Subject Publication.
7. Nation, J.R. (1997). Research Methods. New Jersey: Prentice Hall.
8. Willing, C. & Stainton-Rogers, W. (Eds.) (2008). The Sage Handbook of Qualitative Research in Psychology. New Delhi: Sage Publications.

PHD-DSC-102	Discipline Specific Course (Electronics and Communication)	Credit Distribution: L:3, T:0, P:1=4
Learning Outcomes	• Understand the **continuity equation** for carriers, describing charge conservation in semiconductors. • Learn about the characteristics and behaviour of **junction** and **Schottky diodes** in monolithic technologies. • Learn the basic process of **wafer fabrication**, starting from a silicon wafer to the finished integrated circuit.	
Unit 1	Introduction to Semiconductor Physics: Review of Quantum Mechanics, Boltzman transport equation, continuity equation, Poisson equation Integrated Passive Devices: Types and Structures of resistors and capacitors in monolithic technology, dependence of model parameters on structures	
Unit 2	Integrated Diodes: Junction and Schottky diodes in monolithic technologies –	

	static and dynamic behavior – small and large signal models – SPICE models Integrated Bipolar Transistor: Types and structures in monolithic technologies – Basic model (Eber-Moll) – Gunmel - Poon model- dynamic model, parasitic effects – SPICE model – parameter extraction
Unit 3	Integrated MOS Transistor: nMOS and pMOS transistor – threshold voltage – threshold voltage equations – MOS device equations – Basic DC equations second order effects – MOS models – small signal AC characteristics – MOS FET SPICE model level 1, 2, 3 and 4
Unit 4	VLSI Fabrication Techniques: An overview of wafer fabrication, wafer processing – oxidation – patterning – diffusion – ion implantation – deposition – Silicon gate nMOS process – CMOS processes – n-well- p-well- twin tub- Silicon on insulator – CMOS process enhancements – interconnects circuit elements
Unit 5	Modeling of Hetero Junction Devices: Band gap Engineering, Bandgap Offset at abrupt Hetero Junction, Modified current continuity equations, Hetero Junction bipolar transistors (HBTs), SiGe

REFERENCES:

1. Physics of Semiconductor Devices – Sze S. M, 2nd edition, Mcgraw hill, New York, 1981

2. Introduction to Device Modeling and Circuit Simulation – Tor A. Fijedly, Wiley-Interscience, 1997.

3. Digital Control Systems, Kuo, Oxford University Press, 2ndEdition, 2003.

4. Digital Control Engineering, M.Gopal

5. Switching and Finite Automata Theory – Z. Kohavi , 2nd ed., 2001, TMH

6. Digital Design – Morris Mano, M.D.Ciletti, 4thEdition, PHI.

7. Digital Circuits and Logic Design – Samuel C. Lee , PHI

8. Advanced UNIX Programming, Richard Stevens

9. VX Works Programmers Guide

PHD-RPE-103	Research and Publication Ethics	Credit Distribution: L:1, T:1, P:0=2
Learning Outcomes	1. To have awareness about the publication ethics and publication misconducts. 2. To understand indexing and citation databases, open access publications,	

	research metrics (citations, h-index, impact factor etc) 3. Develop hands-on skills to identify research misconduct and predatory publications.
Unit 1	**Philosophy and Ethics (4 hrs)** 1. Introduction to philosophy: definition, nature and scope, concept, branches 2. Ethics: definition, moral philosophy, nature of moral judgements and reactions
Unit 2	**Scientific Conduct (4 hrs)** 1. Ethics with respect to science and research 2. Intellectual honesty and research integrity 3. Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP) 4. Redundant publications: duplicate and overlapping publications, salami slicing 5. Selective reporting and misrepresentation of data
Unit 3	**Publication Ethics (7 hrs)** 1. Publication ethics: definition, introduction and importance 2. Best practices / standards setting initiatives and guidelines: COPE, WAME, etc. 3. Conflicts of interest 4. Publication misconduct: definition, concept, problems that lead to unethical behavior and vice versa, types 5. Violation of publication ethics, authorship and contributorship 6. Identification of publication misconduct, complaints and appeals 7. Predatory publishers and journals
Unit 4 Practice	**Open Access Publishing (4 hrs)** 1. Open access publications and initiatives 2. SHERPA/ROMEO online resource to check publisher copyright &self-archiving policies 3. Software tool to identify predatory publications developed by SPPU 4. Journal finder / journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer Journal Suggester, etc.
Unit 5 Practice	**Publication Misconduct (4 hrs)** A. Group Discussions (2 hrs.) 1. Subject specific ethical issues, FFP, authorship 2. Conflicts of interest 3. Complaints and appeals: examples and fraud from India and abroad B. Software tools (2 hrs.) Use of plagiarism software like Turnitin, Urkundand other open source software tools

Unit 6 Practice	**Databases and Research Metrics (7 hrs)**
	A. Databases (4 hrs.)
	1. Indexing databases
	2. Citation databases: Web of Science, Scopus etc.
	B. Research Metrics (3 hrs.)
	1. Impact Factor of journal as per Journal Citation Report, SNIP, SJR, IPP, Cite Score
	2. Metrics: h-index, g-index, i10 index, altmetrics

Suggested Readings

1. Bird, A. (2006). Philosophy of Science. Routledge.
2. MacIntyre, A. (1967) A Short History of Ethics. London.
3. P. Chaddah, (2018) Ethics in Competitive Research: Do not get scooped; do not getplagiarized, ISBN:978-9387480865
4. National Academy of Sciences, National Academy of Engineering and Institute ofMedicine. (2009). On Being a Scientist: A Guide to Responsible Conduct in Research:Third Edition. National Academies Press.
5. Rensik, D. B. (2011). What is ethics in research & why is it important. National Instituteof Environmental Health Sciences, 1-10. Retrieved fromhttps://www.niehs.nih.gov/resources/biothics/whatis/index.cfm
6. Beall, J. (2012). Predatory publishers are corrupting open access. Nature, 489(7415),179-179. https://doi.org/10.1038/489179a

NIILM UNIVERSITY

Ph.D. Course Work in English

Academic Session 2024-25

Ph.D. Regulations Regarding Course Work

Clause 18: Ph.D. Ordinance NIILM University as per UGC Minimum Standards and Procedure for Award of Ph.D. Degrees Regulations 2022 with effect from academic session 2024-25

I.   The coursework shall be treated as a prerequisite for Ph.D. preparation. In the first year of registration, all research scholars are required to complete the course work for one semester following their provisional registration as a part of the Ph.D. program. It is mandatory to complete the course work in first 4 semesters to stay in the Ph.D. program. If a student fails to complete the coursework in first 4 semesters, will have to leave the program.

II.   Earning a minimum of 12 total credits and a maximum of 16, is required.

III.   Usually a course refers to a 'paper' and is a component of an academic program. Courses in Ph.D. course work shall be of two kinds: Core and Elective.

IV.   A core course is a compulsory paper to be studied by all the scholars to complete the requirements of the Ph.D. degree.

V.   Elective course is a course which is discipline specific and provided by the particular department from the main discipline or from a sister/related discipline which supports the main discipline, on mutual consent of the concerned departments.

VI.   One credit equal to 15 contact hours for theory-based teaching or 30 hours of contact time for practical or activity-based teaching.

VII.   The number of credits is given in the form L: T: P, where L indicates the number of contact hours of lecture, and T the number of contact hours for tutorials, P stands for laboratory credits.

VIII.   The credits are distributed as follows:

Paper Code	Paper	Course type	Credit	L	T	P
PHD-ARM-101	Advanced Research Methodology	Core	4	3	1	0
PHD-DSC-102	Discipline Specific Course	Elective	4	3	1	0
PHD-RPE-103	Research and Publication Ethics	Core	2	1	1	0
PHD-SEM-104	Academic Writing, Literature Review and Seminar	Skill	2	0	1	2
	Total		12			

IX.   All Ph.D., entrants irrespective of discipline, shall be trained in teaching proficiency related to teaching/education/pedagogy/writing related to their chosen Ph.D. subject during their doctoral training period, that include assigning 4-6 hours per week of teaching/ research assistantship for conducting tutorial or laboratory work and evaluations.

X. Courses PHD-SEM 104 includes research work on research article writing, seminar presentation and course PHD-TP 105 includes pedagogical training. Both these courses will be assessed internally without Semester End Examination.

XI. CoE will conduct Term/ Semester End Exam in PHD-ARM-101, PHD-DSC-102, and PHD-RPE-103.

XII. PHD-TP 105 is a non-credit course and internal assessment will be marked on the detailed mark card of the course work.

XIII. Advance Research Methodology course will include common research methodology and subject specific research methodology.

XIV. Research Advisory Committee may provide choices in selecting the courses/ credits that facilitates the entrepreneur in the monetization of IP thus generated.

XV. RAC can also recommend UGC recognized online courses as part of the credit requirements for the Ph.D. program.

XVI. Paper- will comprise of the following two activities:

(a) External Assessment: Written Question Paper 70/39

(b) Internal Assessment: 30/16

Marks will be converted into letter grade and grade point as per following table:

Marks	Letter Grade	Grade Point
81-100	A+	10
76-80	A	9
66-75	B+	8
61-65	B	7
55-60	C	6
Less than 55	F	0

The computation of the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA) shall be done as per University Examination Ordinance or Examination Rules & Regulations issued time to time.

The result and grade sheet for the course work will carry pass/ fail result.

COURSE WORK PAPER

I. Candidates who already hold an M. Phil. degree and have been accepted into the Ph.D. program, or those who have finished their M.Phil. Coursework and have been given permission to continue on to the Ph.D. in an integrated course, may be exempted from the Ph.D. course requirements by the Department. All additional applicants accepted into the Ph.D. program must complete the Ph.D. coursework required by the Department.

II. The NIILM University attendance rules, a minimum 75% attendance is must require, will be applied to all full-time research scholars. For the duration of their coursework, part-time research researchers must, nevertheless, adhere to the same rules.

III. A Ph.D. scholar has to obtain a minimum of 55% of marks or a minimum CGPA of 6.0 in the UGC 10-point scale (or an equivalent grade/CGPA in a point scale wherever grading system is followed) in the course work in order to be eligible to continue in the program and submit the thesis.

IV. Registration will be automatically canceled if the required course work is not completed with a minimum of 55% of marks/a minimum CGPA of 6.0 within the allotted time. If the course work is not finished within a year, the RAC and DRC may suggest a six-month extension or suggest that the registration be canceled with the DRC.

V. There is no provision of improvement or special supplementary exam to be conducted. Coursework will be offered in four semesters of first two years with regular & supplementary exams to avail the opportunity to clear the coursework in 2 years. **Failure to complete the course in 2 years means that the student has to leave the program.**

Course Structure:

PHD-ARM-101	Advance Research Methodology in English	Credit Distribution: L:3, T:1, P:0=4
Course Objectives:	To acquaint the students with research process. To train them in the research methods and designs and to equip them to take up researches independently.	
Unit 1	**Introduction to Research** a. Nature and aims of research b. Dimensions and types of research c. Theory and research d. The meaning of methodology e. Types of Methods of Research	
Unit 2	**Research Planed Data Collection** a. Concept, logic, and research question/issues b. Variables, causal theory, and hypothesis c. Research Design and Collection of Data d. Sampling: Methods, Size, Errors e. Probability and non-probability f. Measurement and Scaling Techniques g. Issues in measurement: Qualitative and quantitative	
Unit 3	**Data Processing** a. Analysis of quantitative data introduction to higher order statistics b. Editing, Coding and Classification of Data c. Analysis of qualitative data and Tabulation d. Introduction to advanced statistical techniques using SPSS e. Statistical Derivatives and Measures of Central Tendency f. Measures of Variation and Skewness g. Correlation and Simple Regression h. Diagrammatic and Graphic Presentation of Data	
Unit 4	**Research Report Writing** a. Ethical issues in research b. APA style of writing concept c. APA style of writing: Referencing d. d. Research article writing	

Unit 5	**Computer Application in Research**
	a. Introduction to MS Excel, Using Formulas and Functions
	b. Hand on to SPSS
	c. Features for Statistical Data Analysis
	d. Generating Charts/Graphs
	e. Introduction to MS Word, Features and Functions, Writing Report in MS Word
	f. Introduction to Open Office or Latex
	g. Creating Presentation in MS PowerPoint
	h. Introduction to Internet-Based Search
	i. Use of Advanced Research Techniques.

Recommended Readings:

1. Bayard, P. & Grayson, A. (1976). Introducing psychological research. London: McMillan.

2. Bordens, K.S. & Abbot, B.B. (2005). Research design and methods. New Delhi: Tata McGraw Hill.

3. Breakwell, G.M. Hammond, S. & Fife-Schaw, C. (1995). Research Methods in Psychology. New Delhi: Sage Publications.

4. Cresswell, J.W. (1994) Research design: L Qualitative and quantitative approaches. Thousand Oaks, CA: Sage Publication.

5. Drew, C.J.: Hardman, M.L. & Hart, W.A. (1996). Designing and conducting research: Inquiry in education and social science. New York: Allyn & Bacon.

6. Kerlinger, F.N. (1982). Foundations of behavioural research. Delhi: Subject Publication.

7. Nation, J.R. (1997). Research Methods. New Jersey: Prentice Hall.

8. Willing, C. & Stainton-Rogers, W. (Eds.) (2008). The Sage Handbook of Qualitative Research in Psychology. New Delhi: Sage Publications.

PHD-DSC-102	**Discipline Specific Course (English)**	**Credit Distribution: L:3, T:1, P:0=4**
Learning Outcomes	• Understand foundational theories of Indian aesthetics, including the concept of Rasa as theorized by S.N. Dasgupta. • Develop skills to assess cultural representation, power, and resistance in post-colonial contexts. • Develop the ability to analyze texts through diasporic and ecological lenses, addressing identity, belonging, and environmental concerns.	
Unit 1	**Classical Indian Aesthetics** 1. S.N. Dasgupta–"The Theory of Rasa" 2. S.K. De–"Kuntaka's Theory of Poetry: Vakrokti"	
Unit 2	**Post-structuralism and Deconstruction** 1. Michel Foucault: "What is Author?" 2. Jacques Derrida:"Structure, Sign and Play in the Discourse of the Human Sciences"	
Unit 3	**Post colonialism and Neocolonialism**	

	1. Homi K.Bhabha:"The Location of Culture"
	2. Graham Huggan "The Neocolonialism of Post colonialism: A Cautionary Note"
Unit 4	**Feminism and Post-Feminism**
	1. Elaine Showalter:"Feminist criticism in the Wilderness"
	2. Elaine J. Hall and Marnie Salupo Rodriguez:"The Myth of Post feminism"
Unit 5	**Psychoanalysis**
	1. Jacques Lacan:"The insistence of the Letter in the Unconscious"
	2. Harold Bloom:"Poetic Origins and Final Phases"
Unit 6	**New Historicism and Cultural Materialism**
	1. Louis Montrose:"Professing the Renaissance"
	2. Jean Baudrillard:"Simulacra and Simulations"
Unit 7	**Diaspora and Ecocriticism**
	1. Stuart Hall–"Cultural Identity and Diaspora"
	2. Cheryll Glotfelty – "Literary Studiesin an age of Environmental Crisis"
Unit 8	**Contemporary Identity Theories**
	1. Anthony Elliott and Charles Lemert—"Introduction"*The New Individualism: The Emotional Costs of Globalization.*
	2. Giorgio Agamben— "The Politicization of Life" from *Homo Sacer: Sovereign Power and Bare Life*

Books Recommended:

1. Berry, Peter. *Beginning Theory*. New Delhi; Viva Books (Pvt.) Ltd., 2008.

2. Daiches, David. *Critical Approaches to Literature*, New Delhi Longman, 1991.

3. Gibaldim, Joseph, *MLA Handbook for Research Papers*. Soch, Wilbar Five Approaches to Literary *Criticism*. London: McMillan, 1962.

4. David Lodge, ed. *Modern Criticism and Theory*. New Delhi: Pearson Education, 2005.

5. Rivkin and Michael Ryan, ed. *Literary Theory: An Anthology*, Oxford: Blackwell, 2002.

6. Leitch, Vincent B, et.al. *The Norton Anthology of Theory and Criticism*. Third Edition, New York: Norton, 2018.

PHD-RPE-103	**Research and Publication Ethics**	**Credit Distribution: L:1, T:1, P:0=2**
Learning Outcomes	1. To have awareness about the publication ethics and publication misconducts.	
	2. To understand indexing and citation databases, open access	

	publications, research metrics (citations, h-index, impact factor etc) 3. Develop hands-on skills to identify research misconduct and predatory publications.
Unit 1	**Philosophy and Ethics (4 hrs)** 1. Introduction to philosophy: definition, nature and scope, concept, branches 2. Ethics: definition, moral philosophy, nature of moral judgements and reactions
Unit 2	**Scientific Conduct (4 hrs)** 1. Ethics with respect to science and research 2. Intellectual honesty and research integrity 3. Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP) 4. Redundant publications: duplicate and overlapping publications, salami slicing 5. Selective reporting and misrepresentation of data
Unit 3	**Publication Ethics (7 hrs)** 1. Publication ethics: definition, introduction and importance 2. Best practices / standards setting initiatives and guidelines: COPE, WAME, etc. 3. Conflicts of interest 4. Publication misconduct: definition, concept, problems that lead to unethical behavior and vice versa, types 5. Violation of publication ethics, authorship and contributor ship 6. Identification of publication misconduct, complaints and appeals 7. Predatory publishers and journals
Unit 4 Practice	**Open Access Publishing (4 hrs)** 1. Open access publications and initiatives 2. SHERPA/ROMEO online resource to check publisher copyright & self-archiving policies 3. Software tool to identify predatory publications developed by SPPU 4. Journal finder / journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer Journal Suggester, etc.
Unit 5 Practice	**Publication Misconduct (4 hrs)** A. Group Discussions (2 hrs.) 1. Subject specific ethical issues, FFP, authorship 2. Conflicts of interest 3. Complaints and appeals: examples and fraud from India and abroad B. Software tools (2 hrs.) Use of plagiarism software like Turnitin, Urkund and other open source

	software tools
Unit 6 Practice	**Databases and Research Metrics (7 hrs)**
	A. Databases (4 hrs.)
	1. Indexing databases
	2. Citation databases: Web of Science, Scopus etc.
	B. Research Metrics (3 hrs.)
	1. Impact Factor of journal as per Journal Citation Report, SNIP, SJR, IPP, Cite Score
	2. Metrics: h-index, g-index, i10 index, altmetrics

Suggested Readings

1. Bird, A. (2006). Philosophy of Science. Routledge.
2. MacIntyre, A. (1967) A Short History of Ethics. London.
3. P. Chaddah, (2018) Ethics in Competitive Research: Do not get scooped; do not get plagiarized, ISBN:978-9387480865
4. National Academy of Sciences, National Academy of Engineering and Institute of Medicine. (2009). On Being a Scientist: A Guide to Responsible Conduct in Research: Third Edition. National Academies Press.
5. Rensik, D. B. (2011). What is ethics in research & why is it important. National Institute of Environmental Health Sciences, 1-10. Retrieved from https://www.niehs.nih.gov/resources/biothics/whatis/index.cfm
6. Beall, J. (2012). Predatory publishers are corrupting open access. Nature, 489(7415), 179-179. https://doi.org/10.1038/489179a

NIILM UNIVERSITY

Ph.D. Course Work in Environmental Studies

Academic Session 2024-25

Ph.D. Regulations Regarding Course Work

Clause 18: Ph.D. Ordinance NIILM University as per UGC Minimum Standards and Procedure for Award of Ph.D. Degrees Regulations 2022 with effect from academic session 2024-25

I. The coursework shall be treated as a prerequisite for Ph.D. preparation. In the first year of registration, all research scholars are required to complete the course work for one semester following their provisional registration as a part of the Ph.D. program. It is mandatory to complete the course work in first 4 semesters to stay in the Ph.D. program. If a student fails to complete the coursework in first 4 semesters, will have to leave the program.

II. Earning a minimum of 12 total credits and a maximum of 16, is required.

III. Usually a course refers to a 'paper' and is a component of an academic program. Courses in Ph.D. course work shall be of two kinds: Core and Elective.

IV. A core course is a compulsory paper to be studied by all the scholars to complete the requirements of the Ph.D. degree.

V. Elective course is a course which is discipline specific and provided by the particular department from the main discipline or from a sister/related discipline which supports the main discipline, on mutual consent of the concerned departments.

VI. One credit equal to 15 contact hours for theory-based teaching or 30 hours of contact time for practical or activity-based teaching.

VII. The number of credits is given in the form L: T:P, where L indicates the number of contact hours of lecture, and T the number of contact hours for tutorials, P stands for laboratory credits.

VIII. The credits are distributed as follows:

Paper Code	Paper	Course type	Credit	L	T	P
PHD-ARM-101	Advanced Research Methodology	Core	4	3	1	0
PHD-DSC-102	Discipline Specific Course	Elective	4	3	1	0
PHD-RPE-103	Research and Publication Ethics	Core	2	1	1	0
PHD-SEM-104	Academic Writing, Literature Review and Seminar	Skill	2	0	1	2
	Total		**12**			

IX. All Ph.D., entrants irrespective of discipline, shall be trained in teaching proficiency related to teaching/education/pedagogy/writing related to their chosen Ph.D. subject during their doctoral training period, that include assigning 4-6 hours per week of teaching/ research assistantship for conducting tutorial or laboratory work and evaluations.

X. Courses PHD-SEM 104 includes research work on research article writing, seminar presentation and course PHD-TP 105 includes pedagogical training. Both these courses will be assessed internally without Semester End Examination.

XI. CoE will conduct Term/ Semester End Exam in PHD-ARM-101, PHD-DSC-102, and PHD-RPE-103.

XII. PHD-TP 105 is a non-credit course and internal assessment will be marked on the detailed mark card of the course work.

XIII. Advance Research Methodology course will include common research methodology and subject specific research methodology.

XIV. Research Advisory Committee may provide choices in selecting the courses/ credits that facilitates the entrepreneur in the monetization of IP thus generated.

XV. RAC can also recommend UGC recognized online courses as part of the credit requirements for the Ph.D. program.

XVI. Paper- will comprise of the following two activities:

(a) **External Assessment: Written Question Paper 70/39**

(b) **Internal Assessment: 30/16**

Marks will be converted into letter grade and grade point as per following table:

Marks	Letter Grade	Grade Point
81-100	A+	10
76-80	A	9
66-75	B+	8
61-65	B	7
55-60	C	6
Less than 55	F	0

The computation of the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA) shall be done as per University Examination Ordinance or Examination Rules & Regulations issued time to time.

The result and grade sheet for the course work will carry pass/ fail result.

COURSE WORK PAPER

I. Candidates who already hold an M. Phil. degree and have been accepted into the Ph.D. program, or those who have finished their M.Phil. Coursework and have been given permission to continue on to the Ph.D. in an integrated course, may be exempted from the Ph.D. course requirements by the Department. All additional applicants accepted into the Ph.D. program must complete the Ph.D. coursework required by the Department.

II. The NIILM University attendance rules, a minimum 75% attendance is must require, will be applied to all full-time research scholars. For the duration of their coursework, part-time research researchers must, nevertheless, adhere to the same rules.

III. A Ph.D. scholar has to obtain a minimum of 55% of marks or a minimum CGPA of 6.0 in the UGC 10-point scale (or an equivalent grade/CGPA in a point scale wherever grading system is followed) in the course work in order to be eligible to continue in the program and submit the thesis.

IV. Registration will be automatically canceled if the required course work is not completed with a minimum of 55% of marks/a minimum CGPA of 6.0 within the allotted time. If the course work is not finished within a year, the RAC and DRC may suggest a six-month extension or suggest that the registration be canceled with the DRC.

V. There is no provision of improvement or special supplementary exam to be conducted. Coursework will be offered in four semesters of first two years with regular & supplementary exams to avail the opportunity to clear the coursework in 2 years. **Failure to complete the course in 2 years means that the student has to leave the program.**

Course Structure:

PHD-ARM-101	Advance Research Methodology in Environmental Studies	Credit Distribution: L:3, T:1, P:0=4
Course Objectives:	To acquaint the students with research process. To train them in the research methods and designs and to equip them to take up researches independently.	
Unit 1	**Introduction to Research** a. Nature and aims of research b. Dimensions and types of research c. Theory and research d. The meaning of methodology e. Types of Methods of Research	
Unit 2	**Research Planed Data Collection** a. Concept, logic, and research question/issues b. Variables, causal theory, and hypothesis c. Research Design and Collection of Data d. Sampling: Methods, Size, Errors e. Probability and non-probability f. Measurement and Scaling Techniques g. Issues in measurement: Qualitative and quantitative	
Unit 3	**Data Processing** a. Analysis of quantitative data introduction to higher order statistics b. Editing, Coding and Classification of Data c. Analysis of qualitative data and Tabulation d. Introduction to advanced statistical techniques using SPSS e. Statistical Derivatives and Measures of Central Tendency f. Measures of Variation and Skewness g. Correlation and Simple Regression h. Diagrammatic and Graphic Presentation of Data	
Unit 4	**Research Report Writing** a. Ethical issues in research b. APA style of writing concept c. APA style of writing: Referencing d. d. Research article writing	

Unit 5	**Computer Application in Research** a. Introduction to MS Excel, Using Formulas and Functions b. Hand on to SPSS c. Features for Statistical Data Analysis d. Generating Charts/Graphs e. Introduction to MS Word, Features and Functions, Writing Report in MS Word f. Introduction to Open Office or Latex g. Creating Presentation in MS PowerPoint h. Introduction to Internet-Based Search i. Use of Advanced Research Techniques.

Recommended Readings:

1. Bayard, P. & Grayson, A. (1976). Introducing psychological research. London: McMillan.

2. Bordens, K.S. & Abbot, B.B. (2005). Research design and methods. New Delhi: Tata McGraw Hill.

3. Breakwell, G.M. Hammond, S. & Fife-Schaw, C. (1995). Research Methods in Psychology. New Delhi: Sage Publications.

4. Cresswell, J.W. (1994) Research design: L Qualitative and quantitative approaches. Thousand Oaks, CA: Sage Publication.

5. Drew, C.J.: Hardman, M.L. & Hart, W.A. (1996). Designing and conducting research: Inquiry in education and social science. New York: Allyn & Bacon.

6. Kerlinger, F.N. (1982). Foundations of behavioural research. Delhi: Subject Publication.

7. Nation, J.R. (1997). Research Methods. New Jersey: Prentice Hall.

8. Willing, C. & Stainton-Rogers, W. (Eds.) (2008). The Sage Handbook of Qualitative Research in Psychology. New Delhi: Sage Publications.

PHD-DSC-102	**Discipline Specific Course (Environmental Studies)**	**Credit Distribution:** **L:3, T:0, P:1=4**
Learning Outcomes	• Students will learn about modern approaches to conserving wildlife • Understand the trends in using fish canning and tannery waste, as well as the role of waste in sustainable agriculture and energy production. • Learn about recent trends in eco-toxicology related to pollution and environmental monitoring.	
Unit 1	**Introduction Environment:** Concept, types and components; Atmosphere: Composition of Air, Importance, Layers; Importance of Hydrosphere; Basic concepts of Lithosphere and Biosphere Environmental Sciences: Definition, objectives, principles, stages, importance and scope Multidisciplinary nature of Environmental Sciences; Environmental Ethics; Environmental Management; Needs of Environmental Science	
Unit 2	**Fundamental of Environmental Chemistry:** Stoichiometry, Gibbs Energy, Chemical Potential, Chemical Equilibrium, Acid	

	Base Reactions, Solubility Product, Solubility of gases in water, unsaturated and saturated hydrocarbon, radionuclide
Unit 3	**Environmental Pollution:** Introduction, Sources and mitigation of pollution, Classification and effect of air pollutants, Transport and diffusion of pollutants, Vehicular Pollution, Smog formation and effects, Monitoring and control of air pollution, Air quality standards; Acid Rain, Ozone layer depletion, Global warming
Unit 4	**Environmental Law and Legislation:** Fundamental principles of environmental protection; sustainable development; Constitutional Perspective: Fundamental right to wholesome environment, Directive principles of state policy; Fundamental duty; National Environmental Policy; Environmental Regulatory Framework in India; Role of International Environmental Agencies -UNEP, GEF, UNFCC and IPCC

References:

- E. P. Odum, Fundamentals of Ecology, Nataraj Publisher, Dehradun1996
- M. C. Dash, Fundamentals of Ecology, Tata McGraw Hill, 1994
- S. S. Dara, A Text Book of Environmental Chemistry and Pollution Control, 2004
- R. S. Shukla & P. S. Chandel, A Text Book of Plant Ecology including Ethnobotany and Soil Science
- J. P. Sharma, Comprehensive Environmental Studies (For Under Graduate Students) Laxmi Publication (P) Ltd.
- P. D. Sharma, Ecology and Environment, Rastogi Publication
- D. K. Asthana & Meera Asthana, Environment: Problems and Solutions, S. Chand Publication
- K. S. Rao, Practical Ecology, Anmol Publication Pvt. Ltd., 1998
- E. D. Enger & B. E. Smith, Environmental Science – A study of Inter relationships, 5th edition, W C B publication.

PHD-RPE-103	**Research and Publication Ethics**	**Credit Distribution: L:1, T:1, P:0=2**
Learning Outcomes	1. To have awareness about the publication ethics and publication misconducts. 2. To understand indexing and citation databases, open access publications, research metrics (citations, h-index, impact factor etc) 3. Develop hands-on skills to identify research misconduct and predatory publications.	
Unit 1	**Philosophy and Ethics (4 hrs)** 1. Introduction to philosophy: definition, nature and scope, concept,	

	branches
	2. Ethics: definition, moral philosophy, nature of moral judgements and reactions
Unit 2	**Scientific Conduct (4 hrs)** 1. Ethics with respect to science and research 2. Intellectual honesty and research integrity 3. Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP) 4. Redundant publications: duplicate and overlapping publications, salami slicing 5. Selective reporting and misrepresentation of data
Unit 3	**Publication Ethics (7 hrs)** 1. Publication ethics: definition, introduction and importance 2. Best practices / standards setting initiatives and guidelines: COPE, WAME, etc. 3. Conflicts of interest 4. Publication misconduct: definition, concept, problems that lead to unethical behavior and vice versa, types 5. Violation of publication ethics, authorship and contributor ship 6. Identification of publication misconduct, complaints and appeals 7. Predatory publishers and journals
Unit 4 Practice	**Open Access Publishing (4 hrs)** 1. Open access publications and initiatives 2. SHERPA/ROMEO online resource to check publisher copyright &self-archiving policies 3. Software tool to identify predatory publications developed by SPPU 4. Journal finder / journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer Journal Suggester, etc.
Unit 5 Practice	**Publication Misconduct (4 hrs)** A. Group Discussions (2 hrs.) 1. Subject specific ethical issues, FFP, authorship 2. Conflicts of interest 3. Complaints and appeals: examples and fraud from India and abroad B. Software tools (2 hrs.) Use of plagiarism software like Turnitin, Urkund and other open source software tools
Unit 6 Practice	**Databases and Research Metrics (7 hrs)** A. Databases (4 hrs.) 1. Indexing databases 2. Citation databases: Web of Science, Scopus etc. B. Research Metrics (3 hrs.)

	1. Impact Factor of journal as per Journal Citation Report, SNIP, SJR, IPP, Cite Score
	2. Metrics: h-index, g-index, i10 index, altmetrics

Suggested Readings

1. Bird, A. (2006). Philosophy of Science. Routledge.
2. MacIntyre, A. (1967) A Short History of Ethics. London.
3. P. Chaddah, (2018) Ethics in Competitive Research: Do not get scooped; do not getplagiarized, ISBN:978-9387480865
4. National Academy of Sciences, National Academy of Engineering and Institute ofMedicine. (2009). On Being a Scientist: A Guide to Responsible Conduct in Research:Third Edition. National Academies Press.
5. Rensik, D. B. (2011). What is ethics in research & why is it important. National Instituteof Environmental Health Sciences, 1-10. Retrieved fromhttps://www.niehs.nih.gov/resources/biothics/whatis/index.cfm
6. Beall, J. (2012). Predatory publishers are corrupting open access. Nature, 489(7415),179-179. https://doi.org/10.1038/489179a

NIILM UNIVERSITY

Ph.D. Course Work in Fashion Designing

Academic Session 2024-25

Ph.D. Regulations Regarding Course Work

Clause 18: Ph.D. Ordinance NIILM University as per UGC Minimum Standards and Procedure for Award of Ph.D. Degrees Regulations 2022 with effect from academic session 2024-25

I. The coursework shall be treated as a prerequisite for Ph.D. preparation. In the first year of registration, all research scholars are required to complete the course work for one semester following their provisional registration as a part of the Ph.D. program. It is mandatory to complete the course work in first 4 semesters to stay in the Ph.D. program. If a student fails to complete the coursework in first 4 semesters, will have to leave the program.

II. Earning a minimum of 12 total credits and a maximum of 16, is required.

III. Usually a course refers to a 'paper' and is a component of an academic program. Courses in Ph.D. course work shall be of two kinds: Core and Elective.

IV. A core course is a compulsory paper to be studied by all the scholars to complete the requirements of the Ph.D. degree.

V. Elective course is a course which is discipline specific and provided by the particular department from the main discipline or from a sister/related discipline which supports the main discipline, on mutual consent of the concerned departments.

VI. One credit equal to 15 contact hours for theory-based teaching or 30 hours of contact time for practical or activity-based teaching.

VII. The number of credits is given in the form L: T: P, where L indicates the number of contact hours of lecture, and T the number of contact hours for tutorials, P stands for laboratory credits.

VIII. The credits are distributed as follows:

Paper Code	Paper	Course type	Credit	L	T	P
PHD-ARM-101	Advanced Research Methodology	Core	4	3	1	0
PHD-DSC-102	Discipline Specific Course	Elective	4	3	1	0
PHD-RPE-103	Research and Publication Ethics	Core	2	1	1	0
PHD-SEM-104	Academic Writing, Literature Review and Seminar	Skill	2	0	1	2
	Total		12			

IX. All Ph.D., entrants irrespective of discipline, shall be trained in teaching proficiency related to teaching/education/pedagogy/writing related to their chosen Ph.D. subject during their doctoral training period, that include assigning 4-6 hours per week of teaching/ research assistantship for conducting tutorial or laboratory work and evaluations.

X. Courses PHD-SEM 104 includes research work on research article writing, seminar presentation and course PHD-TP 105 includes pedagogical training. Both these courses will be assessed internally without Semester End Examination.

XI. CoE will conduct Term/ Semester End Exam in PHD-ARM-101, PHD-DSC-102, and PHD-RPE-103.

XII. PHD-TP 105 is a non-credit course and internal assessment will be marked on the detailed mark card of the course work.

XIII. Advance Research Methodology course will include common research methodology and subject specific research methodology.

XIV. Research Advisory Committee may provide choices in selecting the courses/ credits that facilitates the entrepreneur in the monetization of IP thus generated.

XV. RAC can also recommend UGC recognized online courses as part of the credit requirements for the Ph.D. program.

XVI. Paper- will comprise of the following two activities:

(a) **External Assessment: Written Question Paper 70/39**

(b) **Internal Assessment: 30/16**

Marks will be converted into letter grade and grade point as per following table:

Marks	Letter Grade	Grade Point
81-100	A+	10
76-80	A	9
66-75	B+	8
61-65	B	7
55-60	C	6
Less than 55	F	0

The computation of the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA) shall be done as per University Examination Ordinance or Examination Rules & Regulations issued time to time.

The result and grade sheet for the course work will carry pass/ fail result.

COURSE WORK PAPER

I. Candidates who already hold an M. Phil. degree and have been accepted into the Ph.D. program, or those who have finished their M.Phil. Coursework and have been given permission to continue on to the Ph.D. in an integrated course, may be exempted from the Ph.D. course requirements by the Department. All additional applicants accepted into the Ph.D. program must complete the Ph.D. coursework required by the Department.

II. The NIILM University attendance rules, a minimum 75% attendance is must require, will be applied to all full-time research scholars. For the duration of their coursework, part-time research researchers must, nevertheless, adhere to the same rules.

III. A Ph.D. scholar has to obtain a minimum of 55% of marks or a minimum CGPA of 6.0 in the UGC 10-point scale (or an equivalent grade/CGPA in a point scale wherever grading system is followed) in the course work in order to be eligible to continue in the program and submit the thesis.

IV. Registration will be automatically canceled if the required course work is not completed with a minimum of 55% of marks/a minimum CGPA of 6.0 within the allotted time. If the course work is not finished within a year, the RAC and DRC may suggest a six-month extension or suggest that the registration be canceled with the DRC.

V. There is no provision of improvement or special supplementary exam to be conducted. Coursework will be offered in four semesters of first two years with regular & supplementary exams to avail the opportunity to clear the coursework in 2 years. **Failure to complete the course in 2 years means that the student has to leave the program.**

Course Structure:

PHD-ARM-101	Advance Research Methodology in Fashion Designing	Credit Distribution: L:3, T:1, P:0=4
Course Objectives:	To acquaint the students with research process. To train them in the research methods and designs and to equip them to take up researches independently.	
Unit 1	**Introduction to Research** a. Nature and aims of research b. Dimensions and types of research c. Theory and research d. The meaning of methodology e. Types of Methods of Research	
Unit 2	**Research Planed Data Collection** a. Concept, logic, and research question/issues b. Variables, causal theory, and hypothesis c. Research Design and Collection of Data d. Sampling: Methods, Size, Errors e. Probability and non-probability f. Measurement and Scaling Techniques g. Issues in measurement: Qualitative and quantitative	
Unit 3	**Data Processing** a. Analysis of quantitative data introduction to higher order statistics b. Editing, Coding and Classification of Data c. Analysis of qualitative data and Tabulation d. Introduction to advanced statistical techniques using SPSS e. Statistical Derivatives and Measures of Central Tendency f. Measures of Variation and Skewness g. Correlation and Simple Regression h. Diagrammatic and Graphic Presentation of Data	
Unit 4	**Research Report Writing** a. Ethical issues in research b. APA style of writing concept c. APA style of writing: Referencing d. d. Research article writing	

Unit 5	**Computer Application in Research**
	a. Introduction to MS Excel, Using Formulas and Functions
	b. Hand on to SPSS
	c. Features for Statistical Data Analysis
	d. Generating Charts/Graphs
	e. Introduction to MS Word, Features and Functions, Writing Report in MS Word
	f. Introduction to Open Office or Latex
	g. Creating Presentation in MS PowerPoint
	h. Introduction to Internet-Based Search
	i. Use of Advanced Research Techniques.

Recommended Readings:

1. Bayard, P. & Grayson, A. (1976). Introducing psychological research. London: McMillan.
2. Bordens, K.S. & Abbot, B.B. (2005). Research design and methods. New Delhi: Tata McGraw Hill.
3. Breakwell, G.M. Hammond, S. & Fife-Schaw, C. (1995). Research Methods in Psychology. New Delhi: Sage Publications.
4. Cresswell, J.W. (1994) Research design: L Qualitative and quantitative approaches. Thousand Oaks, CA: Sage Publication.
5. Drew, C.J.: Hardman, M.L. & Hart, W.A. (1996). Designing and conducting research: Inquiry in education and social science. New York: Allyn & Bacon.
6. Kerlinger, F.N. (1982). Foundations of behavioural research. Delhi: Subject Publication.
7. Nation, J.R. (1997). Research Methods. New Jersey: Prentice Hall.
8. Willing, C. & Stainton-Rogers, W. (Eds.) (2008). The Sage Handbook of Qualitative Research in Psychology. New Delhi: Sage Publications.

PHD-DSC-102	**Discipline Specific Course (Fashion Designing)**	**Credit Distribution: L:3, T:0, P:1=4**
Learning Outcomes	• Learn techniques for generating design ideas, including mood boards, brainstorming, and trend forecasting. • Learn draping techniques to create three-dimensional garment forms and prototype designs. • Study emerging movements in sustainable fashion, such as slow fashion, upcycling, and zero-waste design, and their impact on the fashion industry.	
Unit 1	**Fashion Theory and History:** ➢ **Evolution of Fashion:** Study of clothing and adornment through various historical periods, from ancient civilizations to contemporary fashion. ➢ **Theoretical Frameworks:** Exploration of key theoretical perspectives in fashion studies, including structuralism, postmodernism, and feminist theory. ➢ **Sociocultural Influences:** Analysis of how societal norms,	

	cultural values, and identity shape fashion trends and practices.
	➢ **Economic and Political Factors:** Understanding the impact of economic systems, political movements, and globalization on the fashion industry**.**
	➢ **Fashion Movements:** Examination of significant fashion movements such as Art Deco, Minimalism, and Streetwear, and their cultural significance**.**
	➢ **Semiotics in Fashion:** Study of symbols, signs, and meanings in fashion communication and representation.
Unit 2	**Fashion Design Process and Technology:**
	➢ **Concept Development:** Techniques for generating and refining design concepts, including mood boards, brainstorming, and trend analysis.
	➢ **Design Sketching and Illustration:** Development of technical drawing skills and rendering techniques for communicating design ideas visually.
	➢ **Textile Science:** Understanding the properties and characteristics of different textiles, including fiber types, fabric structures, and textile finishes.
	➢ **Garment Construction:** Hands-on experience in pattern making, cutting, and sewing techniques for creating garments.
	➢ **Draping and Prototyping:** Exploration of draping methods and techniques for creating three-dimensional garment forms.
	➢ **Digital Design Tools:** Introduction to software applications such as Adobe Illustrator and Photoshop for digital fashion design and visualization.
Unit 3	**Fashion Marketing and Merchandising**:
	➢ **Brand Management**: Strategies for building and managing fashion brands, including brand identity, positioning, and communication.
	➢ **Consumer Behavior**: Analysis of consumer motivations, preferences, and purchasing behavior in the fashion market.
	➢ Market Research: Methods for conducting market research, including surveys, focus groups, and trend analysis, to inform product development and marketing strategies.
	➢ **Retail Management**: Principles of retail merchandising, store layout, and visual merchandising techniques for creating compelling retail environments.
	➢ **Promotion and Advertising**: Understanding advertising and promotional strategies in the fashion industry, including print, digital, and social media campaigns.
	➢ **E-commerce**: Overview of e-commerce platforms, online retailing trends, and strategies for driving online sales in the fashion sector.
Unit 4	**Specialization Areas and Research Methodology:**
	➢ **Specialization Areas:** Exploration of specialized areas within fashion design, such as Sustainable Fashion Practices, Textile Design and

	Innovation, Fashion Communication, or Fashion Technology. ➢ **Research Methodologies:** Introduction to qualitative and quantitative research methods used in fashion research, including literature reviews, case studies, and empirical research. ➢ **Literature Review Techniques:** Strategies for conducting comprehensive literature reviews, synthesizing existing research, and identifying gaps in the literature. ➢ **Application of Research Methods:** Application of research methods to the chosen specialization area, including the development of research questions, data collection, and analysis techniques.
Unit 5	**Sustainable Fashion and Innovation:** ➢ **Sustainable Fashion Practices:** Investigate sustainable and ethical practices in fashion design and production, including eco-friendly materials, circular design principles, and supply chain transparency**.** ➢ **Sustainable Fashion Movements**: Explore emerging movements and initiatives in sustainable fashion, such as slow fashion, upcycling, and zero-waste design. ➢ **Innovation in Fashion Technology:** Examine advancements in fashion technology, including wearable technology, 3D printing, digital fabrication, and virtual fitting technologies**.** ➢ **Circular Economy in Fashion:** Study circular economy models and strategies in the fashion industry, including closed-loop production systems, garment recycling, and product life extension**.** ➢ **Ethical and Social Responsibility**: Discuss ethical issues, social responsibility, and labor practices in the fashion industry, addressing issues such as fair labor practices, worker rights, and diversity and inclusion.

References:

- Fashion Theory: A Reader by Malcolm Barnard

- Fashion: A Philosophy by Lars Svendsen

- The Fashion System by Roland Barthes

- Sustainable Fashion and Textiles: Design Journeys by Kate Fletcher

- The Dynamics of Fashion by Elaine Stone

- Fashion Design Course: Principles, Practice, and Techniques by Steven Faerm

- The Complete Costume History by Auguste Racinet

- Fashion in the Western World by The Kyoto Costume Institute

- Dress and Identity by Mary Ellen Roach-Higgin

- Fabric for Fashion: The Swatch Book by Clive Hallett and Amanda Johnston

- Textiles and Fashion: Materials, Design, and Technology by Rose Sinclair

- Textiles: Concepts and Principles by Virginia Hencken Elsasser

- Patternmaking for Fashion Design by Helen Joseph Armstrong

- The Art of Fashion Draping by Connie Amaden-Crawford

- Metric Pattern Cutting for Women's Wear by Winifred Aldrich

- Fashion Marketing and Merchandising by Rosy Boardman and Rachel Parker

- Fashion Brands: Branding Style from Armani to Zara by Mark Tungate

- Fashion Buying and Merchandising by Tim Jackson and David Shaw

- 3D Fashion Design: Technique, Design, and Visualization by Thomas Makryniotis

- Fashion Design on Computers by Stott and Norris

- Digital Textile Design by Melanie Bowles and Ceri Isaac

- Research Methods for the Fashion Industry by Julia Gaimster

- Qualitative Research in Fashion Studies by Diane Crane

- Fashion Forecasting by Evelyn L. Brannon

PHD-RPE-103	Research and Publication Ethics	Credit Distribution: L:1, T:1, P:0=2
Learning Outcomes	1. To have awareness about the publication ethics and publication misconducts. 2. To understand indexing and citation databases, open access publications, research metrics (citations, h-index, impact factor etc) 3. Develop hands-on skills to identify research misconduct and predatory publications.	
Unit 1	**Philosophy and Ethics (4 hrs)** 1. Introduction to philosophy: definition, nature and scope, concept, branches 2. Ethics: definition, moral philosophy, nature of moral judgements and reactions	
Unit 2	**Scientific Conduct (4 hrs)**	

	1. Ethics with respect to science and research 2. Intellectual honesty and research integrity 3. Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP) 4. Redundant publications: duplicate and overlapping publications, salami slicing 5. Selective reporting and misrepresentation of data
Unit 3	**Publication Ethics (7 hrs)** 1. Publication ethics: definition, introduction and importance 2. Best practices / standards setting initiatives and guidelines: COPE, WAME, etc. 3. Conflicts of interest 4. Publication misconduct: definition, concept, problems that lead to unethical behavior and vice versa, types 5. Violation of publication ethics, authorship and contributor ship 6. Identification of publication misconduct, complaints and appeals 7. Predatory publishers and journals
Unit 4 Practice	**Open Access Publishing (4 hrs)** 1. Open access publications and initiatives 2. SHERPA/ROMEO online resource to check publisher copyright & self-archiving policies 3. Software tool to identify predatory publications developed by SPPU 4. Journal finder / journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer Journal Suggester, etc.
Unit 5 Practice	**Publication Misconduct (4 hrs)** A. Group Discussions (2 hrs.) 1. Subject specific ethical issues, FFP, authorship 2. Conflicts of interest 3. Complaints and appeals: examples and fraud from India and abroad B. Software tools (2 hrs.) Use of plagiarism software like Turnitin, Urkund and other open source software tools
Unit 6 Practice	**Databases and Research Metrics (7 hrs)** A. Databases (4 hrs.) 1. Indexing databases 2. Citation databases: Web of Science, Scopus etc. B. Research Metrics (3 hrs.) 1. Impact Factor of journal as per Journal Citation Report, SNIP, SJR, IPP, Cite Score 2. Metrics: h-index, g-index, i10 index, altmetrics

Suggested Readings

1. Bird, A. (2006). Philosophy of Science. Routledge.
2. MacIntyre, A. (1967) A Short History of Ethics. London.
3. P. Chaddah, (2018) Ethics in Competitive Research: Do not get scooped; do not get plagiarized, ISBN:978-9387480865
4. National Academy of Sciences, National Academy of Engineering and Institute of Medicine. (2009). On Being a Scientist: A Guide to Responsible Conduct in Research: Third Edition. National Academies Press.
5. Rensik, D. B. (2011). What is ethics in research & why is it important. National Institute of Environmental Health Sciences, 1-10. Retrieved from https://www.niehs.nih.gov/resources/biothics/whatis/index.cfm
6. Beall, J. (2012). Predatory publishers are corrupting open access. Nature, 489(7415), 179-179. https://doi.org/10.1038/489179a

NIILM UNIVERSITY

Ph.D. Course Work in Forensic Science

Academic Session 2024-25

Ph.D. Regulations Regarding Course Work

Clause 18: Ph.D. Ordinance NIILM University as per UGC Minimum Standards and Procedure for Award of Ph.D. Degrees Regulations 2022 with effect from academic session 2024-25

I.   The coursework shall be treated as a prerequisite for Ph.D. preparation. In the first year of registration, all research scholars are required to complete the course work for one semester following their provisional registration as a part of the Ph.D. program. It is mandatory to complete the course work in first 4 semesters to stay in the Ph.D. program. If a student fails to complete the coursework in first 4 semesters, will have to leave the program.

II. Earning a minimum of 12 total credits and a maximum of 16, is required.

III. Usually a course refers to a 'paper' and is a component of an academic program. Courses in Ph.D. course work shall be of two kinds: Core and Elective.

IV. A core course is a compulsory paper to be studied by all the scholars to complete the requirements of the Ph.D. degree.

V.   Elective course is a course which is discipline specific and provided by the particular department from the main discipline or from a sister/related discipline which supports the main discipline, on mutual consent of the concerned departments.

VI. One credit equal to 15 contact hours for theory-based teaching or 30 hours of contact time for practical or activity-based teaching.

VII. The number of credits is given in the form L: T:P, where L indicates the number of contact hours of lecture, and T the number of contact hours for tutorials, P stands for laboratory credits.

VIII. The credits are distributed as follows:

Paper Code	Paper	Course type	Credit	L	T	P
PHD-ARM-101	Advanced Research Methodology	Core	4	3	1	0
PHD-DSC-102	Discipline Specific Course	Elective	4	3	1	0
PHD-RPE-103	Research and Publication Ethics	Core	2	1	1	0
PHD-SEM-104	Academic Writing, Literature Review and Seminar	Skill	2	0	1	2
	Total		12			

IX. All Ph.D., entrants irrespective of discipline, shall be trained in teaching proficiency related to teaching/education/pedagogy/writing related to their chosen Ph.D. subject during their doctoral training period, that include assigning 4-6 hours per week of teaching/ research assistantship for conducting tutorial or laboratory work and evaluations.

X. Courses PHD-SEM 104 includes research work on research article writing, seminar presentation and course PHD-TP 105 includes pedagogical training. Both these courses will be assessed internally without Semester End Examination.

XI. CoE will conduct Term/ Semester End Exam in PHD-ARM-101, PHD-DSC-102, and PHD-RPE-103.

XII. PHD-TP 105 is a non-credit course and internal assessment will be marked on the detailed mark card of the course work.

XIII. Advance Research Methodology course will include common research methodology and subject specific research methodology.

XIV. Research Advisory Committee may provide choices in selecting the courses/ credits that facilitates the entrepreneur in the monetization of IP thus generated.

XV. RAC can also recommend UGC recognized online courses as part of the credit requirements for the Ph.D. program.

XVI. Paper- will comprise of the following two activities:

   (a) External Assessment: Written Question Paper 70/39

   (b) Internal Assessment: 30/16

   Marks will be converted into letter grade and grade point as per following table:

Marks	Letter Grade	Grade Point
81-100	A+	10
76-80	A	9
66-75	B+	8
61-65	B	7
55-60	C	6
Less than 55	F	0

The computation of the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA) shall be done as per University Examination Ordinance or Examination Rules & Regulations issued time to time.

The result and grade sheet for the course work will carry pass/ fail result.

COURSE WORK PAPER

I. Candidates who already hold an M. Phil. degree and have been accepted into the Ph.D. program, or those who have finished their M.Phil. Coursework and have been given permission to continue on to the Ph.D. in an integrated course, may be exempted from the Ph.D. course requirements by the Department. All additional applicants accepted into the Ph.D. program must complete the Ph.D. coursework required by the Department.

II. The NIILM University attendance rules, a minimum 75% attendance is must require, will be applied to all full-time research scholars. For the duration of their coursework, part-time research researchers must, nevertheless, adhere to the same rules.

III. A Ph.D. scholar has to obtain a minimum of 55% of marks or a minimum CGPA of 6.0 in the UGC 10-point scale (or an equivalent grade/CGPA in a point scale wherever grading system is followed) in the course work in order to be eligible to continue in the program and submit the thesis.

IV. Registration will be automatically canceled if the required course work is not completed with a minimum of 55% of marks/a minimum CGPA of 6.0 within the allotted time. If the course work is not finished within a year, the RAC and DRC may suggest a six-month extension or suggest that the registration be canceled with the DRC.

V. There is no provision of improvement or special supplementary exam to be conducted. Coursework will be offered in four semesters of first two years with regular & supplementary exams to avail the opportunity to clear the coursework in 2 years. **Failure to complete the course in 2 years means that the student has to leave the program.**

Course Structure:

PHD-ARM-101	Advance Research Methodology in Forensic Science	Credit Distribution: L:3, T:1, P:0=4
Course Objectives:	To acquaint the students with research process. To train them in the research methods and designs and to equip them to take up researches independently.	
Unit 1	**Introduction to Research** a. Nature and aims of research b. Dimensions and types of research c. Theory and research d. The meaning of methodology e. Types of Methods of Research	
Unit 2	**Research Planed Data Collection** a. Concept, logic, and research question/issues b. Variables, causal theory, and hypothesis c. Research Design and Collection of Data d. Sampling: Methods, Size, Errors e. Probability and non-probability f. Measurement and Scaling Techniques g. Issues in measurement: Qualitative and quantitative	
Unit 3	**Data Processing** a. Analysis of quantitative data introduction to higher order statistics b. Editing, Coding and Classification of Data c. Analysis of qualitative data and Tabulation d. Introduction to advanced statistical techniques using SPSS e. Statistical Derivatives and Measures of Central Tendency f. Measures of Variation and Skewness g. Correlation and Simple Regression h. Diagrammatic and Graphic Presentation of Data	
Unit 4	**Research Report Writing** a. Ethical issues in research b. APA style of writing concept c. APA style of writing: Referencing d. d. Research article writing	

Unit 5	**Computer Application in Research**
	a. Introduction to MS Excel, Using Formulas and Functions
	b. Hand on to SPSS
	c. Features for Statistical Data Analysis
	d. Generating Charts/Graphs
	e. Introduction to MS Word, Features and Functions, Writing Report in MS Word
	f. Introduction to Open Office or Latex
	g. Creating Presentation in MS PowerPoint
	h. Introduction to Internet-Based Search
	i. Use of Advanced Research Techniques.

Recommended Readings:

1. Bayard, P. & Grayson, A. (1976). Introducing psychological research. London: McMillan.

2. Bordens, K.S. & Abbot, B.B. (2005). Research design and methods. New Delhi: Tata McGraw Hill.

3. Breakwell, G.M. Hammond, S. & Fife-Schaw, C. (1995). Research Methods in Psychology. New Delhi: Sage Publications.

4. Cresswell, J.W. (1994) Research design: L Qualitative and quantitative approaches. Thousand Oaks, CA: Sage Publication.

5. Drew, C.J.: Hardman, M.L. & Hart, W.A. (1996). Designing and conducting research: Inquiry in education and social science. New York: Allyn & Bacon.

6. Kerlinger, F.N. (1982). Foundations of behavioral research. Delhi: Subject Publication.

7. Nation, J.R. (1997). Research Methods. New Jersey: Prentice Hall.

8. Willing, C. & Stainton-Rogers, W. (Eds.) (2008). The Sage Handbook of Qualitative Research in Psychology. New Delhi: Sage Publications.

PHD-DSC-102	**Discipline Specific Course (Advances in Forensic Science Tools)**	**Credit Distribution: L:3, T:0, P:1=4**
Learning Outcomes	- Students will understand the foundational principles of forensic science, including evidence handling, chain of custody, and scientific rigor. - Students will understand the role of chemical analysis in forensic investigations, focusing on identification and quantification of substances. - Learners will appreciate the importance of biological evidence in forensic science, such as blood, hair, and bodily fluids. - Learners will understand the application of computer and cyber forensic tools in investigating digital crimes, data recovery, and evidence analysis	
Unit 1	**Introduction to Forensic Science** Forensic Science Laboratories, Need and Scope of Forensic Science, Basic Principles of Forensic Science, Branches of Forensic science, and Future research perspectives in Forensic Science	
Unit 2	**Advanced Forensic Chemical Techniques** Need of chemical analysis in Forensic investigations, Brief Introduction to	

	Chromatographic techniques: TLC, HPTLC and GC techniques, with special reference to qualitative and quantitative analysis. Brief Introduction to Spectroscopic techniques: Overview and Forensic applications of UV-VIS and FTIR, Forensic Applications: Mass Spectrometry, AAS and X-ray techniques in forensic analysis
Unit 3	**Advanced Forensic Biological Techniques** Need of biological analysis on Forensic Science, Electrophoretic Techniques: Theory, General Principles and Forensic applications. DNA Fingerprinting Techniques: RT-PCR and RFLP, PCR, AFLP-PCR, Combined DNA Index System (CODIS).
Unit 4	**Advanced Forensic Physical Techniques** Role of Microscopy in Forensic Science Investigation: Light and Scanning Microscopes, Comparison Microscopy, Profiling and Automated Finger print Identification Systems (AFIS), Video spectral comparator (VSC), Introduction to NIBIN and IBIS, Advanced Computer and Cyber forensic tools, Forensic Psychological techniques and their legal prospectus, methods of Criminal

Suggested Books:

1) Nanda, B.B. and Tewari, R.K. (2001): Forensic Science in India : A vision for the twenty first century Select Publisher, New Delhi.

2) Saferstien : Forensic Science, Handbook, Vol. I, II & III, Prentice Hall Inc. USA.

3) Saferstein : Handbook of Forensic Science (Vol-I to III), 1976, Prentice Hall Inc., USA.

4) Deforest, Gansellen &Lee: Introduction to Criminalistics.

5) Sharma, B.R.: Forensic Science in Criminal Investigaion and Trials, Central Law Agency, Allahabad, 1974.

6) Lee &Gaensslen: Advances in Forensic Science, (Vol. 2) Instrumental Analysis.

7) Settle,F.A.: Handbook of Instrumental Techniques for Analytical Chemistry, Prentice Hall, 1997.

8) Ellen, D (1997): The scientific examination of Documents, Methods and techniuqes. 2nd ed., Taylor & Francis Ltd.

9) Willard (1986) Instrumental Methods of Analysis, CBS Publishers & Distributor

PHD-RPE-103	**Research and Publication Ethics**	**Credit Distribution: L:1, T:1, P:0=2**
Learning Outcomes	1. To have awareness about the publication ethics and publication misconducts.	

	2. To understand indexing and citation databases, open access publications, research metrics (citations, h-index, impact factor etc) 3. Develop hands-on skills to identify research misconduct and predatory publications.
Unit 1	**Philosophy and Ethics (4 hrs)** 1. Introduction to philosophy: definition, nature and scope, concept, branches 2. Ethics: definition, moral philosophy, nature of moral judgements and reactions
Unit 2	**Scientific Conduct (4 hrs)** 1. Ethics with respect to science and research 2. Intellectual honesty and research integrity 3. Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP) 4. Redundant publications: duplicate and overlapping publications, salami slicing 5. Selective reporting and misrepresentation of data
Unit 3	**Publication Ethics (7 hrs)** 1. Publication ethics: definition, introduction and importance 2. Best practices / standards setting initiatives and guidelines: COPE, WAME, etc. 3. Conflicts of interest 4. Publication misconduct: definition, concept, problems that lead to unethical behavior and vice versa, types 5. Violation of publication ethics, authorship and contributor ship 6. Identification of publication misconduct, complaints and appeals 7. Predatory publishers and journals
Unit 4 Practice	**Open Access Publishing (4 hrs)** 1. Open access publications and initiatives 2. SHERPA/ROMEO online resource to check publisher copyright &self-archiving policies 3. Software tool to identify predatory publications developed by SPPU 4. Journal finder / journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer Journal Suggester, etc.
Unit 5 Practice	**Publication Misconduct (4 hrs)** A. Group Discussions (2 hrs.) 1. Subject specific ethical issues, FFP, authorship 2. Conflicts of interest 3. Complaints and appeals: examples and fraud from India and abroad B. Software tools (2 hrs.)

	Use of plagiarism software like Turnitin, Urkund and other open source software tools
Unit 6 Practice	**Databases and Research Metrics (7 hrs)**
	A. Databases (4 hrs.)
	1. Indexing databases
	2. Citation databases: Web of Science, Scopus etc.
	B. Research Metrics (3 hrs.)
	1. Impact Factor of journal as per Journal Citation Report, SNIP, SJR, IPP, Cite Score
	2. Metrics: h-index, g-index, i10 index, altmetrics

Suggested Readings

1. Bird, A. (2006). Philosophy of Science. Routledge.
2. MacIntyre, A. (1967) A Short History of Ethics. London.
3. P. Chaddah, (2018) Ethics in Competitive Research: Do not get scooped; do not getplagiarized, ISBN:978-9387480865
4. National Academy of Sciences, National Academy of Engineering and Institute ofMedicine. (2009). On Being a Scientist: A Guide to Responsible Conduct in Research:Third Edition. National Academies Press.
5. Rensik, D. B. (2011). What is ethics in research & why is it important. National Instituteof Environmental Health Sciences, 1-10. Retrieved fromhttps://www.niehs.nih.gov/resources/biothics/whatis/index.cfm
6. Beall, J. (2012). Predatory publishers are corrupting open access. Nature, 489(7415),179-179. https://doi.org/10.1038/489179a

NIILM UNIVERSITY

Ph.D. Course Work in Geography

Academic Session 2024-25

Ph.D. Regulations Regarding Course Work

Clause 18: Ph.D. Ordinance NIILM University as per UGC Minimum Standards and Procedure for Award of Ph.D. Degrees Regulations 2022 with effect from academic session 2024-25

I. The coursework shall be treated as a prerequisite for Ph.D. preparation. In the first year of registration, all research scholars are required to complete the course work for one semester following their provisional registration as a part of the Ph.D. program. It is mandatory to complete the course work in first 4 semesters to stay in the Ph.D. program. If a student fails to complete the coursework in first 4 semesters, will have to leave the program.

II. Earning a minimum of 12 total credits and a maximum of 16, is required.

III. Usually a course refers to a 'paper' and is a component of an academic program. Courses in Ph.D. course work shall be of two kinds: Core and Elective.

IV. A core course is a compulsory paper to be studied by all the scholars to complete the requirements of the Ph.D. degree.

V. Elective course is a course which is discipline specific and provided by the particular department from the main discipline or from a sister/related discipline which supports the main discipline, on mutual consent of the concerned departments.

VI. One credit equal to 15 contact hours for theory-based teaching or 30 hours of contact time for practical or activity-based teaching.

VII. The number of credits is given in the form L: T:P, where L indicates the number of contact hours of lecture, and T the number of contact hours for tutorials, P stands for laboratory credits.

VIII. The credits are distributed as follows:

Paper Code	Paper	Course type	Credit	L	T	P
PHD-ARM-101	Advanced Research Methodology	Core	4	3	1	0
PHD-DSC-102	Discipline Specific Course	Elective	4	3	1	0
PHD-RPE-103	Research and Publication Ethics	Core	2	1	1	0
PHD-SEM-104	Academic Writing, Literature Review and Seminar	Skill	2	0	1	2
	Total		12			

IX. All Ph.D., entrants irrespective of discipline, shall be trained in teaching proficiency related to teaching/education/pedagogy/writing related to their chosen Ph.D. subject during their doctoral training period, that include assigning 4-6 hours per week of teaching/ research assistantship for conducting tutorial or laboratory work and evaluations.

X. Courses PHD-SEM 104 includes research work on research article writing, seminar presentation and course PHD-TP 105 includes pedagogical training. Both these courses will be assessed internally without Semester End Examination.

XI. CoE will conduct Term/ Semester End Exam in PHD-ARM-101, PHD-DSC-102, and PHD-RPE-103.

XII. PHD-TP 105 is a non-credit course and internal assessment will be marked on the detailed mark card of the course work.

XIII. Advance Research Methodology course will include common research methodology and subject specific research methodology.

XIV. Research Advisory Committee may provide choices in selecting the courses/ credits that facilitates the entrepreneur in the monetization of IP thus generated.

XV. RAC can also recommend UGC recognized online courses as part of the credit requirements for the Ph.D. program.

XVI. Paper- will comprise of the following two activities:

   (a) External Assessment: Written Question Paper 70/39

   (b) Internal Assessment: 30/16

Marks will be converted into letter grade and grade point as per following table:

Marks	Letter Grade	Grade Point
81-100	A+	10
76-80	A	9
66-75	B+	8
61-65	B	7
55-60	C	6
Less than 55	F	0

The computation of the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA) shall be done as per University Examination Ordinance or Examination Rules & Regulations issued time to time.

The result and grade sheet for the course work will carry pass/ fail result.

COURSE WORK PAPER

I. Candidates who already hold an M. Phil. degree and have been accepted into the Ph.D. program, or those who have finished their M.Phil. Coursework and have been given permission to continue on to the Ph.D. in an integrated course, may be exempted from the Ph.D. course requirements by the Department. All additional applicants accepted into the Ph.D. program must complete the Ph.D. coursework required by the Department.

II. The NIILM University attendance rules, a minimum 75% attendance is must require, will be applied to all full-time research scholars. For the duration of their coursework, part-time research researchers must, nevertheless, adhere to the same rules.

III. A Ph.D. scholar has to obtain a minimum of 55% of marks or a minimum CGPA of 6.0 in the UGC 10-point scale (or an equivalent grade/CGPA in a point scale wherever grading system is followed) in the course work in order to be eligible to continue in the program and submit the thesis.

IV. Registration will be automatically canceled if the required course work is not completed with a minimum of 55% of marks/a minimum CGPA of 6.0 within the allotted time. If the course work is not finished within a year, the RAC and DRC may suggest a six-month extension or suggest that the registration be canceled with the DRC.

V. There is no provision of improvement or special supplementary exam to be conducted. Coursework will be offered in four semesters of first two years with regular & supplementary exams to avail the opportunity to clear the coursework in 2 years. **Failure to complete the course in 2 years means that the student has to leave the program.**

Course Structure:

PHD-ARM-101	Advance Research Methodology in Geography	Credit Distribution: L:3, T:1, P:0=4
Course Objectives:	To acquaint the students with research process. To train them in the research methods and designs and to equip them to take up researches independently.	
Unit 1	**Introduction to Research** a. Nature and aims of research b. Dimensions and types of research c. Theory and research d. The meaning of methodology e. Types of Methods of Research	
Unit 2	**Research Planed Data Collection** a. Concept, logic, and research question/issues b. Variables, causal theory, and hypothesis c. Research Design and Collection of Data d. Sampling: Methods, Size, Errors e. Probability and non-probability f. Measurement and Scaling Techniques g. Issues in measurement: Qualitative and quantitative	
Unit 3	**Data Processing** a. Analysis of quantitative data introduction to higher order statistics b. Editing, Coding and Classification of Data c. Analysis of qualitative data and Tabulation d. Introduction to advanced statistical techniques using SPSS e. Statistical Derivatives and Measures of Central Tendency f. Measures of Variation and Skewness g. Correlation and Simple Regression h. Diagrammatic and Graphic Presentation of Data	
Unit 4	**Research Report Writing** a. Ethical issues in research b. APA style of writing concept c. APA style of writing: Referencing d. d. Research article writing	

Unit 5	**Computer Application in Research**
	a. Introduction to MS Excel, Using Formulas and Functions
	b. Hand on to SPSS
	c. Features for Statistical Data Analysis
	d. Generating Charts/Graphs
	e. Introduction to MS Word, Features and Functions, Writing Report in MS Word
	f. Introduction to Open Office or Latex
	g. Creating Presentation in MS PowerPoint
	h. Introduction to Internet-Based Search
	i. Use of Advanced Research Techniques.

Recommended Readings:

1. Bayard, P. & Grayson, A. (1976). Introducing psychological research. London: McMillan.

2. Bordens, K.S. & Abbot, B.B. (2005). Research design and methods. New Delhi: Tata McGraw Hill.

3. Breakwell, G.M. Hammond, S. & Fife-Schaw, C. (1995). Research Methods in Psychology. New Delhi: Sage Publications.

4. Cresswell, J.W. (1994) Research design: L Qualitative and quantitative approaches. Thousand Oaks, CA: Sage Publication.

5. Drew, C.J.: Hardman, M.L. & Hart, W.A. (1996). Designing and conducting research: Inquiry in education and social science. New York: Allyn& Bacon.

6. Kerlinger, F.N. (1982). Foundations of behavioural research. Delhi: Subject Publication.

7. Nation, J.R. (1997). Research Methods. New Jersey: Prentice Hall.

8. Willing, C. & Stainton-Rogers, W. (Eds.) (2008). The Sage Handbook of Qualitative Research in Psychology. New Delhi: Sage Publications.

PHD-DSC-102	**Discipline Specific Course (Research designs and advance quantitative methods in geography)**	**Credit Distribution: L:3, T:0, P:1=4**
Learning Outcomes	• Understand the importance of setting research objectives to guide the study • Understand the process of writing bibliographies, references, and footnotes systematically. • Learn techniques such as partial and multiple correlation, stepwise regression, composite index, and principal component analysis (PCA).	
Unit 1	• Defining Research problems and objectives of research, Types of research – Descriptive vs. Analytical, Applied vs. Fundamental, Quantitative vs. Qualitative, and Conceptual vs. Empirical; Selection of research problem • Research design and methods, Research proposal and features of good research design	
Unit 2	• Literature review – Its objectives and importance, Sources and types of geographical literature, Procedure of critical literature review and ideal	

	literature review, Identifying gap areas from literature review, Citation and acknowledgement.
	• Report and thesis writing – Structure and components of scientific report and theses, Analysis of data, illustrations and tables, Bibliography, referencing and footnotes - Oral presentation
Unit 3	• Theory of distribution, Inferential Statistics and Measures of Inequality.
	• Bi -Variate Analysis: Significance and techniques such as- Correlation Karl Pearsons Product Moment Correlation Coefficient, Spearman's Rank correlation (rho), Nonparametric Tests: Chi-square test.
Unit 4	• Causal Relationship and Estimation: simple Linear Regression and Residual
	• Multivariate Analysis: Partial and Multiple Correlation, Multiple and step-wise regression, Composite Index, and PCA.

Suggested Readings:

1. 1. A. Reza Hoshmand (second edition): Statistical Methods for Environmental and Agricultural Sciences, CRC Press, New York, 1998.
2. A. Stewart Fotheringham, Chris Brunsdon, and M. Charlton: Quantitative Geography: Perspective on Spatial Data Analysis, Sage Publishers, 2000.
3. Allan Bryman (2016) Social Research Methods, OUP.
4. Aslam Mahmood: Statistical Methods in Geographical Studies, Rajesh Publications, New Delhi, 1993.
5. Black James and Champion D.J. (1976) Methods and Issues in social Research, New York, Jolm Wiley and Sons.
6. Derek Gregory and Rex Walford (1989) Horizons in Human Geography.
7. G.S. Monga, StatisticalMehtods
8. Goode and Hat: Research Methodology in Social Sciences, Oxford University Press, New Delhi.
9. Har Prasad (1992) Research Methods and Techniques in Geography,Rawat Publication, Jaipur.
10. Jack Levin and J.A. Fox: Elementary Statistics in Social Research, 10th edition, PeasonEducation, New Delhi, 2006.
11. Johnston R.J. (1991) A Question of Place: Exploring the Practices of Human Geography, Blackwell.
12. Keith Hoggard (2002) Researching Human Geography, OUP.
13. M.H. Qureshi, Paradigms in Geographical Research, Concept, New Delhi.
14. Mishra H.N. and Singh V.P. (ed.) (1998) Research Methodology: Social, Spatial and Policy Dimensions, Rawat Publishers, Jaipur.
15. P.A. Rogerson: Statistical Methods for Geography, (A Student's Guide), 3rd Edition, Sage Publication, New Delhi, 2010.
16. Paul Fyrabend, Against Methods, Vera.
17. R. J. Johnston: Multivariate Statistical Analysis in Geography, Longman Scientific and Technical, John Wiley & Sons, 1989 (4th edition).

18. Robert Hanmund and PatricMcCullagh: Quantitative Techniques in Geography: An Introduction Clarenden Press, 1974.
19. S. Gregory: Statistical Methods and the Geographers, Longman, London, 1964.
20. Saroj K. Paul : Statistics for Geoscientists: Techniques and Applications, Concept Publishing Company, New Delhi, 1998
21. Suzanne, Davies W: Quantitative Methods in Human Geography, Oxford University Press, 2013.
22. Young P.V. (1986) An Introduction to Research Methodology.

PHD-RPE-103	Research and Publication Ethics	Credit Distribution: L:1, T:1, P:0=2
Learning Outcomes	1. To have awareness about the publication ethics and publication misconducts. 2. To understand indexing and citation databases, open access publications, research metrics (citations, h-index, impact factor etc) 3. Develop hands-on skills to identify research misconduct and predatory publications.	
Unit 1	**Philosophy and Ethics (4 hrs)** 1. Introduction to philosophy: definition, nature and scope, concept, branches 2. Ethics: definition, moral philosophy, nature of moral judgements and reactions	
Unit 2	**Scientific Conduct (4 hrs)** 1. Ethics with respect to science and research 2. Intellectual honesty and research integrity 3. Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP) 4. Redundant publications: duplicate and overlapping publications, salami slicing 5. Selective reporting and misrepresentation of data	
Unit 3	**Publication Ethics (7 hrs)** 1. Publication ethics: definition, introduction and importance 2. Best practices / standards setting initiatives and guidelines: COPE, WAME, etc. 3. Conflicts of interest 4. Publication misconduct: definition, concept, problems that lead to unethical behavior and vice versa, types 5. Violation of publication ethics, authorship and contributorship 6. Identification of publication misconduct, complaints and appeals 7. Predatory publishers and journals	
Unit 4 Practice	**Open Access Publishing (4 hrs)** 1. Open access publications and initiatives	

	2. SHERPA/ROMEO online resource to check publisher copyright &self-archiving policies 3. Software tool to identify predatory publications developed by SPPU 4. Journal finder / journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer Journal Suggester, etc.
Unit 5 Practice	**Publication Misconduct (4 hrs)** A. Group Discussions (2 hrs.) 1. Subject specific ethical issues, FFP, authorship 2. Conflicts of interest 3. Complaints and appeals: examples and fraud from India and abroad B. Software tools (2 hrs.) Use of plagiarism software like Turnitin, Urkundand other open source software tools
Unit 6 Practice	**Databases and Research Metrics (7 hrs)** A. Databases (4 hrs.) 1. Indexing databases 2. Citation databases: Web of Science, Scopus etc. B. Research Metrics (3 hrs.) 1. Impact Factor of journal as per Journal Citation Report, SNIP, SJR, IPP, Cite Score 2. Metrics: h-index, g-index, i10 index, altmetrics

Suggested Readings

1. Bird, A. (2006). Philosophy of Science. Routledge.
2. MacIntyre, A. (1967) A Short History of Ethics. London.
3. P. Chaddah, (2018) Ethics in Competitive Research: Do not get scooped; do not getplagiarized, ISBN:978-9387480865
4. National Academy of Sciences, National Academy of Engineering and Institute ofMedicine. (2009). On Being a Scientist: A Guide to Responsible Conduct in Research:Third Edition. National Academies Press.
5. Rensik, D. B. (2011). What is ethics in research & why is it important. National Instituteof Environmental Health Sciences, 1-10. Retrieved fromhttps://www.niehs.nih.gov/resources/biothics/whatis/index.cfm
6. Beall, J. (2012). Predatory publishers are corrupting open access. Nature, 489(7415),179-179. https://doi.org/10.1038/489179a

NIILM UNIVERSITY

Ph.D. Course Work in Geology

Academic Session 2024-25

Ph.D. Regulations Regarding Course Work

Clause 18: Ph.D. Ordinance NIILM University as per UGC Minimum Standards and Procedure for Award of Ph.D. Degrees Regulations 2022 with effect from academic session 2024-25

I. The coursework shall be treated as a prerequisite for Ph.D. preparation. In the first year of registration, all research scholars are required to complete the course work for one semester following their provisional registration as a part of the Ph.D. program. It is mandatory to complete the course work in first 4 semesters to stay in the Ph.D. program. If a student fails to complete the coursework in first 4 semesters, will have to leave the program.

II. Earning a minimum of 12 total credits and a maximum of 16, is required.

III. Usually a course refers to a 'paper' and is a component of an academic program. Courses in Ph.D. course work shall be of two kinds: Core and Elective.

IV. A core course is a compulsory paper to be studied by all the scholars to complete the requirements of the Ph.D. degree.

V. Elective course is a course which is discipline specific and provided by the particular department from the main discipline or from a sister/related discipline which supports the main discipline, on mutual consent of the concerned departments.

VI. One credit equal to 15 contact hours for theory-based teaching or 30 hours of contact time for practical or activity-based teaching.

VII. The number of credits is given in the form L: T: P, where L indicates the number of contact hours of lecture, and T the number of contact hours for tutorials, P stands for laboratory credits.

VIII. The credits are distributed as follows:

Paper Code	Paper	Course type	Credit	L	T	P
PHD-ARM-101	Advanced Research Methodology	Core	4	3	1	0
PHD-DSC-102	Discipline Specific Course	Elective	4	3	1	0
PHD-RPE-103	Research and Publication Ethics	Core	2	1	1	0
PHD-SEM-104	Academic Writing, Literature Review and Seminar	Skill	2	0	1	2
	Total		12			

IX. All Ph.D., entrants irrespective of discipline, shall be trained in teaching proficiency related to teaching/education/pedagogy/writing related to their chosen Ph.D. subject during their doctoral training period, that include assigning 4-6 hours per week of teaching/ research assistantship for conducting tutorial or laboratory work and evaluations.

X. Courses PHD-SEM 104 includes research work on research article writing, seminar presentation and course PHD-TP 105 includes pedagogical training. Both these courses will be assessed internally without Semester End Examination.

XI. CoE will conduct Term/ Semester End Exam in PHD-ARM-101, PHD-DSC-102, and PHD-RPE-103.

XII. PHD-TP 105 is a non-credit course and internal assessment will be marked on the detailed mark card of the course work.

XIII. Advance Research Methodology course will include common research methodology and subject specific research methodology.

XIV. Research Advisory Committee may provide choices in selecting the courses/ credits that facilitates the entrepreneur in the monetization of IP thus generated.

XV. RAC can also recommend UGC recognized online courses as part of the credit requirements for the Ph.D. program.

XVI. Paper- will comprise of the following two activities:

   (a) External Assessment: Written Question Paper 70/39

   (b) Internal Assessment: 30/16

   Marks will be converted into letter grade and grade point as per following table:

Marks	Letter Grade	Grade Point
81-100	A+	10
76-80	A	9
66-75	B+	8
61-65	B	7
55-60	C	6
Less than 55	F	0

The computation of the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA) shall be done as per University Examination Ordinance or Examination Rules & Regulations issued time to time.

The result and grade sheet for the course work will carry pass/ fail result.

COURSE WORK PAPER

I. Candidates who already hold an M. Phil. degree and have been accepted into the Ph.D. program, or those who have finished their M.Phil. Coursework and have been given permission to continue on to the Ph.D. in an integrated course, may be exempted from the Ph.D. course requirements by the Department. All additional applicants accepted into the Ph.D. program must complete the Ph.D. coursework required by the Department.

II. The NIILM University attendance rules, a minimum 75% attendance is must require, will be applied to all full-time research scholars. For the duration of their coursework, part-time research researchers must, nevertheless, adhere to the same rules.

III. A Ph.D. scholar has to obtain a minimum of 55% of marks or a minimum CGPA of 6.0 in the UGC 10-point scale (or an equivalent grade/CGPA in a point scale wherever grading system is followed) in the course work in order to be eligible to continue in the program and submit the thesis.

IV. Registration will be automatically canceled if the required course work is not completed with a minimum of 55% of marks/a minimum CGPA of 6.0 within the allotted time. If the course work is not finished within a year, the RAC and DRC may suggest a six-month extension or suggest that the registration be canceled with the DRC.

V. There is no provision of improvement or special supplementary exam to be conducted. Coursework will be offered in four semesters of first two years with regular & supplementary exams to avail the opportunity to clear the coursework in 2 years. **Failure to complete the course in 2 years means that the student has to leave the program.**

Course Structure:

PHD-ARM-101	Advance Research Methodology in Geology	Credit Distribution: L:3, T:1, P:0=4
Course Objectives:	To acquaint the students with research process. To train them in the research methods and designs and to equip them to take up researches independently.	
Unit 1	**Introduction to Research** a. Nature and aims of research b. Dimensions and types of research c. Theory and research d. The meaning of methodology e. Types of Methods of Research	
Unit 2	**Research Planed Data Collection** a. Concept, logic, and research question/issues b. Variables, causal theory, and hypothesis c. Research Design and Collection of Data d. Sampling: Methods, Size, Errors e. Probability and non-probability f. Measurement and Scaling Techniques g. Issues in measurement: Qualitative and quantitative	
Unit 3	**Data Processing** a. Analysis of quantitative data introduction to higher order statistics b. Editing, Coding and Classification of Data c. Analysis of qualitative data and Tabulation d. Introduction to advanced statistical techniques using SPSS e. Statistical Derivatives and Measures of Central Tendency f. Measures of Variation and Skewness g. Correlation and Simple Regression h. Diagrammatic and Graphic Presentation of Data	
Unit 4	**Research Report Writing** a. Ethical issues in research b. APA style of writing concept c. APA style of writing: Referencing d. d. Research article writing	

Unit 5	**Computer Application in Research**
	a. Introduction to MS Excel, Using Formulas and Functions
	b. Hand on to SPSS
	c. Features for Statistical Data Analysis
	d. Generating Charts/Graphs
	e. Introduction to MS Word, Features and Functions, Writing Report in MS Word
	f. Introduction to Open Office or Latex
	g. Creating Presentation in MS PowerPoint
	h. Introduction to Internet-Based Search
	i. Use of Advanced Research Techniques.

Recommended Readings:

1. Bayard, P. & Grayson, A. (1976). Introducing psychological research. London: McMillan.
2. Bordens, K.S. & Abbot, B.B. (2005). Research design and methods. New Delhi: Tata McGraw Hill.
3. Breakwell, G.M. Hammond, S. & Fife-Schaw, C. (1995). Research Methods in Psychology. New Delhi: Sage Publications.
4. Cresswell, J.W. (1994) Research design: L Qualitative and quantitative approaches. Thousand Oaks, CA: Sage Publication.
5. Drew, C.J.: Hardman, M.L. & Hart, W.A. (1996). Designing and conducting research: Inquiry in education and social science. New York: Allyn & Bacon.
6. Kerlinger, F.N. (1982). Foundations of behavioural research. Delhi: Subject Publication.
7. Nation, J.R. (1997). Research Methods. New Jersey: Prentice Hall.
8. Willing, C. & Stainton-Rogers, W. (Eds.) (2008). The Sage Handbook of Qualitative Research in Psychology. New Delhi: Sage Publications.

PHD-DSC-102	**Discipline Specific Course (Geological Techniques)**	**Credit Distribution: L:3, T:1, P:0=4**
Learning Outcomes	• Understand and apply the principles of pre-field map preparation, including identifying relevant geological features and areas for field study. • Understand and use petrography techniques to study rock and mineral composition. • Learn to interpret geochronological data and apply dating methods to interpret the geological history of a region.	
Unit 1	Preparation of pre-field map; field mapping in igneous, sedimentary and metamorphic terrain; field data collection and documentation; sampling procedure; modern and conventional mapping and sampling tools; Preparation of lithology and geological sections.	
Unit 2	Laboratory techniques in geology: preparation of thin sections and polished sections/blocks of minerals, rocks and ores; thin section preparation techniques for loose sediments and heavy minerals; staining techniques, petrography and ore microscopy; SEM.	

Unit 3	Analytical methods and tools in geology; concepts in chemical analysis of rocks; rock reference materials; selecting suitable analytical techniques; reporting analytical data; advanced laboratory techniques: X-ray diffraction method, X-ray fluorescence spectrometry, emission and absorption spectrometry, mass spectrometry, EPMA and ion microprobe analysis; Raman spectroscopy and its applications in earth sciences.
Unit 4	Dating methods in geology; relative and absolute dating-tools and techniques; interpretation of geochronological data, dating techniques for Quaternary events/sediments; use of stable isotopes in geological interpretation.
Unit 5	Processing and interpretation of satellite data for geological and geomorphic information; use of GPS and GIS techniques in field mapping and documentation.

Reference Books:

1. A Handbook of Silicate Rock Analysis - P. J. Potts, Blackie Academic & Professional
2. An Introduction to Geographical Information Systems - I. Heywood, S. Cornelius and S. Carver, Pearson
3. Basic Geological Mapping - R. J. Lisle, Peter Brabham and John Barnes, Wiley-Blackwell
4. Geological Structures and Maps: A Practical Guide - R. J. Lisle, Elsevier
5. Global Positioning System: Concept, Technique and Application - A. Rahman and S. Fazal, New Age International
6. Handbook of Mineral Exploration and Ore Petrology: Techniques and Applications - R. Dhana Raju, Geological Society of India
7. Introduction to Optical Mineralogy - William D. Nesse, Oxford University Press
8. Isotope Geology - C. J. Allegre, Cambridge University Press
9. Principles of Radiometric Dating - K. Gopalan, Cambridge University Press
10. Quaternary Dating Methods - Mike Walker, Wiley
11. Raman Microscopy: Developments and Applications - G. Turrell and J. Corset (Eds.), Elsevier
12. Remote Sensing and Image Interpretation - T. M. Lillesand, R. W. Kiefer and J. W. Chipman, John Wiley and Sons
13. Aspects of Multivariate Statistical Analysis in Geology - R. A. Reyment and E. Savazzi, Elsevier
14. Guide to Thin Section Microscopy - M. M. Raith, Peter Raase and Jurgen Reinhardt, ISBN 978300037671
15. Image Interpretation in Geology - S. A. Drury, Nelson Thornes
16. Introduction to Geochemical Modeling - Francis Albarede, Cambridge University Press
17. Isotope Geology - A. P. Dikkins, Cambridge University Press
18. Optical Mineralogy: Principles and Practices - C. D. Gribble and A. J. Hall, George Allen & Unwin
19. Remote Sensing Geology - R. P. Gupta, Springer-Verlag
20. Sedimentary Rocks in the Field: A Colour Guide - D. A. V. Stow, Manson Publishing

21. The Field Description of Igneous Rocks - D. Jerram and N. Petford, Wiley-Blackwell
22. The Field Description of Metamorphic Rocks - N. Fry, Wiley-Blackwell
23. Using Geochemical Data: Evaluation, Presentation, Interpretation - H. Rollinson, Longman Scientific & Technical

PHD-RPE-103	Research and Publication Ethics	Credit Distribution: L:1, T:1, P:0=2
Learning Outcomes	1. To have awareness about the publication ethics and publication misconducts. 2. To understand indexing and citation databases, open access publications, research metrics (citations, h-index, impact factor etc) 3. Develop hands-on skills to identify research misconduct and predatory publications.	
Unit 1	**Philosophy and Ethics (4 hrs)** 1. Introduction to philosophy: definition, nature and scope, concept, branches 2. Ethics: definition, moral philosophy, nature of moral judgements and reactions	
Unit 2	**Scientific Conduct (4 hrs)** 1. Ethics with respect to science and research 2. Intellectual honesty and research integrity 3. Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP) 4. Redundant publications: duplicate and overlapping publications, salami slicing 5. Selective reporting and misrepresentation of data	
Unit 3	**Publication Ethics (7 hrs)** 1. Publication ethics: definition, introduction and importance 2. Best practices / standards setting initiatives and guidelines: COPE, WAME, etc. 3. Conflicts of interest 4. Publication misconduct: definition, concept, problems that lead to unethical behavior and vice versa, types 5. Violation of publication ethics, authorship and contributor ship 6. Identification of publication misconduct, complaints and appeals 7. Predatory publishers and journals	
Unit 4 Practice	**Open Access Publishing (4 hrs)** 1. Open access publications and initiatives 2. SHERPA/ROMEO online resource to check publisher copyright & self-archiving policies 3. Software tool to identify predatory publications developed by SPPU 4. Journal finder / journal suggestion tools viz. JANE, Elsevier Journal	

	Finder, Springer
	Journal Suggester, etc.
Unit 5 Practice	**Publication Misconduct (4 hrs)**
	A. Group Discussions (2 hrs.)
	1. Subject specific ethical issues, FFP, authorship
	2. Conflicts of interest
	3. Complaints and appeals: examples and fraud from India and abroad
	B. Software tools (2 hrs.)
	Use of plagiarism software like Turnitin, Urkund and other open source software tools
Unit 6 Practice	**Databases and Research Metrics (7 hrs)**
	A. Databases (4 hrs.)
	1. Indexing databases
	2. Citation databases: Web of Science, Scopus etc.
	B. Research Metrics (3 hrs.)
	1. Impact Factor of journal as per Journal Citation Report, SNIP, SJR, IPP, Cite Score
	2. Metrics: h-index, g-index, i10 index, altmetrics

Suggested Readings

1. Bird, A. (2006). Philosophy of Science. Routledge.
2. MacIntyre, A. (1967) A Short History of Ethics. London.
3. P. Chaddah, (2018) Ethics in Competitive Research: Do not get scooped; do not get plagiarized, ISBN:978-9387480865
4. National Academy of Sciences, National Academy of Engineering and Institute of Medicine. (2009). On Being a Scientist: A Guide to Responsible Conduct in Research: Third Edition. National Academies Press.
5. Rensik, D. B. (2011). What is ethics in research & why is it important. National Institute of Environmental Health Sciences, 1-10. Retrieved from https://www.niehs.nih.gov/resources/biothics/whatis/index.cfm
6. Beall, J. (2012). Predatory publishers are corrupting open access. Nature, 489(7415), 179-179. https://doi.org/10.1038/489179a

NIILM UNIVERSITY

Ph.D. Course Work in Hindi

Academic Session 2024-25

Ph.D. Regulations Regarding Course Work

Clause 18: Ph.D. Ordinance NIILM University as per UGC Minimum Standards and Procedure for Award of Ph.D. Degrees Regulations 2022 with effect from academic session 2024-25

I. The coursework shall be treated as a prerequisite for Ph.D. preparation. In the first year of registration, all research scholars are required to complete the course work for one semester following their provisional registration as a part of the Ph.D. program. It is mandatory to complete the course work in first 4 semesters to stay in the Ph.D. program. If a student fails to complete the coursework in first 4 semesters, will have to leave the program.

II. Earning a minimum of 12 total credits and a maximum of 16, is required.

III. Usually a course refers to a 'paper' and is a component of an academic program. Courses in Ph.D. course work shall be of two kinds: Core and Elective.

IV. A core course is a compulsory paper to be studied by all the scholars to complete the requirements of the Ph.D. degree.

V. Elective course is a course which is discipline specific and provided by the particular department from the main discipline or from a sister/related discipline which supports the main discipline, on mutual consent of the concerned departments.

VI. One credit equal to 15 contact hours for theory-based teaching or 30 hours of contact time for practical or activity-based teaching.

VII. The number of credits is given in the form L: T: P, where L indicates the number of contact hours of lecture, and T the number of contact hours for tutorials, P stands for laboratory credits.

VIII. The credits are distributed as follows:

Paper Code	Paper	Course type	Credit	L	T	P
PHD-ARM-101	Advanced Research Methodology	Core	4	3	1	0
PHD-DSC-102	Discipline Specific Course	Elective	4	3	1	0
PHD-RPE-103	Research and Publication Ethics	Core	2	1	1	0
PHD-SEM-104	Academic Writing, Literature Review and Seminar	Skill	2	0	1	2
	Total		12			

IX. All Ph.D., entrants irrespective of discipline, shall be trained in teaching proficiency related to teaching/education/pedagogy/writing related to their chosen Ph.D. subject during their doctoral training period, that include assigning 4-6 hours per week of teaching/ research assistantship for conducting tutorial or laboratory work and evaluations.

X. Courses PHD-SEM 104 includes research work on research article writing, seminar presentation and course PHD-TP 105 includes pedagogical training. Both these courses will be assessed internally without Semester End Examination.

XI. CoE will conduct Term/ Semester End Exam in PHD-ARM-101, PHD-DSC-102, and PHD-RPE-103.

XII. PHD-TP 105 is a non-credit course and internal assessment will be marked on the detailed mark card of the course work.

XIII. Advance Research Methodology course will include common research methodology and subject specific research methodology.

XIV. Research Advisory Committee may provide choices in selecting the courses/ credits that facilitates the entrepreneur in the monetization of IP thus generated.

XV. RAC can also recommend UGC recognized online courses as part of the credit requirements for the Ph.D. program.

XVI. Paper- will comprise of the following two activities:

(a) External Assessment: Written Question Paper 70/39

(b) Internal Assessment: 30/16

Marks will be converted into letter grade and grade point as per following table:

Marks	Letter Grade	Grade Point
81-100	A+	10
76-80	A	9
66-75	B+	8
61-65	B	7
55-60	C	6
Less than 55	F	0

The computation of the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA) shall be done as per University Examination Ordinance or Examination Rules & Regulations issued time to time.

The result and grade sheet for the course work will carry pass/ fail result.

COURSE WORK PAPER

I. Candidates who already hold an M. Phil. degree and have been accepted into the Ph.D. program, or those who have finished their M.Phil. Coursework and have been given permission to continue on to the Ph.D. in an integrated course, may be exempted from the Ph.D. course requirements by the Department. All additional applicants accepted into the Ph.D. program must complete the Ph.D. coursework required by the Department.

II. The NIILM University attendance rules, a minimum 75% attendance is must require, will be applied to all full-time research scholars. For the duration of their coursework, part-time research researchers must, nevertheless, adhere to the same rules.

III. A Ph.D. scholar has to obtain a minimum of 55% of marks or a minimum CGPA of 6.0 in the UGC 10-point scale (or an equivalent grade/CGPA in a point scale wherever grading system is followed) in the course work in order to be eligible to continue in the program and submit the thesis.

IV. Registration will be automatically canceled if the required course work is not completed with a minimum of 55% of marks/a minimum CGPA of 6.0 within the allotted time. If the course work is not finished within a year, the RAC and DRC may suggest a six-month extension or suggest that the registration be canceled with the DRC.

V. There is no provision of improvement or special supplementary exam to be conducted. Coursework will be offered in four semesters of first two years with regular & supplementary exams to avail the opportunity to clear the coursework in 2 years. **Failure to complete the course in 2 years means that the student has to leave the program.**

Course Structure:

PHD-ARM-101	Advance Research Methodology in Hindi	Credit Distribution: L:3, T:1, P:0=4
Course Objectives:	To acquaint the students with research process. To train them in the research methods and designs and to equip them to take up researches independently.	
Unit 1	**Introduction to Research** a. Nature and aims of research b. Dimensions and types of research c. Theory and research d. The meaning of methodology e. Types of Methods of Research	
Unit 2	**Research Planed Data Collection** a. Concept, logic, and research question/issues b. Variables, causal theory, and hypothesis c. Research Design and Collection of Data d. Sampling: Methods, Size, Errors e. Probability and non-probability f. Measurement and Scaling Techniques g. Issues in measurement: Qualitative and quantitative	
Unit 3	**Data Processing** a. Analysis of quantitative data introduction to higher order statistics b. Editing, Coding and Classification of Data c. Analysis of qualitative data and Tabulation d. Introduction to advanced statistical techniques using SPSS e. Statistical Derivatives and Measures of Central Tendency f. Measures of Variation and Skewness g. Correlation and Simple Regression h. Diagrammatic and Graphic Presentation of Data	
Unit 4	**Research Report Writing** a. Ethical issues in research b. APA style of writing concept c. APA style of writing: Referencing d. d. Research article writing	

Unit 5	**Computer Application in Research**
	a. Introduction to MS Excel, Using Formulas and Functions
	b. Hand on to SPSS
	c. Features for Statistical Data Analysis
	d. Generating Charts/Graphs
	e. Introduction to MS Word, Features and Functions, Writing Report in MS Word
	f. Introduction to Open Office or Latex
	g. Creating Presentation in MS PowerPoint
	h. Introduction to Internet-Based Search
	i. Use of Advanced Research Techniques.

Recommended Readings:

1. Bayard, P. & Grayson, A. (1976). Introducing psychological research. London: McMillan.

2. Bordens, K.S. & Abbot, B.B. (2005). Research design and methods. New Delhi: Tata McGraw Hill.

3. Breakwell, G.M. Hammond, S. & Fife-Schaw, C. (1995). Research Methods in Psychology. New Delhi: Sage Publications.

4. Cresswell, J.W. (1994) Research design: L Qualitative and quantitative approaches. Thousand Oaks, CA: Sage Publication.

5. Drew, C.J.: Hardman, M.L. & Hart, W.A. (1996). Designing and conducting research: Inquiry in education and social science. New York: Allyn & Bacon.

6. Kerlinger, F.N. (1982). Foundations of behavioural research. Delhi: Subject Publication.

7. Nation, J.R. (1997). Research Methods. New Jersey: Prentice Hall.

8. Willing, C. & Stainton-Rogers, W. (Eds.) (2008). The Sage Handbook of Qualitative Research in Psychology. New Delhi: Sage Publications.

PHD-DSC-102	**Discipline Specific Course (□□□□ □□□□□□□□ □□ □□□□□ □□□□□□□□)**	**Credit Distribution: L:3, T:1, P:0=4**
Learning Outcomes	• □□□□□□ □ □□□□□□□□□□□□□ □□□□ □□ □□□□□ □ □□□□ □□□□ □□ □□□□□□□□□ □□ □□□□□ □□□□□ • □□□□□ □□□□□□□ □□ □□□□□□□ □□□□□□□□□□□□ □□ □□□□□□□ □□□□ • □□□□□□□ □□ □□□□□□□ □□□□□□□□□□ □□ □□□□□□□□ □□□□□□□□□ □□ □□□□□ □□□□□ • □□□□□□□□□ □□□□□□□ □□ □□□□□□ □□ □□□□□□□□ □□ □□□□□ □□ □□□□□□	
Unit 1	**(□□□□□□□□□ □□ □□□□□□ □□□□□□□)** • □□□□□□□□□ □□ □□□□□□□□□ • □□□□□□□ □□ □□□□□□□ □□ □□□□□□□ • □□□□□□□□□□ □□□ □□□□□□ : □□□□, □□□□□□□□□ □□ □□□□□ • □□□□□□□□□, □□□□□□□□□□□□ • □□□□□ □□□□□□□□□, □□□□□□□□□□□□ □□□□□	

Unit 2	(□□□□ □□□□□□□□ □□ □□□□□□□)
	• □□□□□□□□□□□□□□□□
	• □□□ - □□□□□□□□□□□□□□□□
	• □□□□ – □□□□□□□□□□□□□□□
	• □□□□□□□ □□□□□□□ : □□□□□, □□□□□□□ □□□ □□□□□□□□
	• □□□□ □□□□□□□ : □□□□□, □□□□□□□ □□□ □□□□□□□□
Unit 3	(□□□□□□□ □□□□□□□□ □□□□□□□□□)
	• □□ □□□□□□□□□□
	• □□□□□□□ □□□□□□□□□
	• □□□□□□ □□□□□□□□□
	• □□□□ □□□□□□□□□
	• □□□□□□□□□ □□□□□□□□□
	• □□□□□□□ □□□□□□□□□
Unit 4	(□□□□□□□□□ □□□□□□□ □□□□□□□□□)
	• □□□□□□□□ □□□□□□□□□
	• □□□□□□□ □□□□□□□□□
	• □□□□□□□ □□□□□□□□□
	• □□□□□□□□□□□
	• □□□□□□□□□□□□
	• □□□□□□□□□□□□□□□

□□□□□ □□□□□□□□

- □□□□□ □□□□ □□ □□□□□□ □□ □□□□□□ – □□□□ □□□
- □□□□□□□□□□□□□□ – □□□□ □□□□□□ □□□□□□□□
- □□□□□□□□□□ – □□□□□□□□□□ □□□
- □□□□□□□ □□ □□□□□□ □□□□ – □□□□□□□□□□□□□□ □□□
- □□□□□□ □□□□ – □□□□□□ □□□□
- □□□□□□□ □□□□□□□□ □□ □□□□□□□, □□□□□□ □□□□□□□ □□□□□□□□, □□□□□ □□□□□□□□□□□□ □□□□□□□, □□□□, 1961
- □□□□□□□ □□□□□□□□ □□ □□□□□□□, □□□□□ □□□□□□ □□□□□□□□, □□□□□□ □□□□□□ □□□□□□□, □□□□□□, 1963
- □□□□□□□ □□□□□□□□ □□ □□□□ □□□-1,2, □□□□□□□□ □□□□□□ □□□□□, □□□□ □□□□□□□□, 1960
- □□□□□□□ □□□□□□□□ □□ □□□□□□, □□□□□□□□□ □□□□□□, □□□□□ □□□□□□□□□ □□□, □□□□, 1961
- □□□□□□□ □□□□□□□□ □□ □□□□□□ □. □□□□□□□□, □□□□□ □□□□□□□□□ □□□□, □□□□□□□, 1973

PHD-DSC-102	Discipline Specific Course (□□□□□□ □□□□□ □□□□□ □□ □□□□□ □□□□□□)	Credit Distribution: L:3, T:1, P:0=4
Learning Outcomes	• □□□□□□□ □□□□□ □□□□□ □□ □□□□□□□□□ □□ □□□□□□□	
	• □□□□□□□ □□□□□ □□□□□ □□□□□□□, □□□□□, □□□□□□□ □□□□□□□□ □□	

	▢▢▢▢▢
	• ▢▢▢▢▢▢▢ ▢▢▢▢▢▢ ▢▢▢▢▢▢ ▢▢ ▢▢▢▢▢▢▢ ▢▢▢▢▢▢ ▢▢ ▢▢▢▢▢ ▢▢▢▢▢▢▢▢▢ ▢▢ ▢▢▢
	• ▢▢▢▢▢▢▢ ▢▢▢▢▢ ▢▢▢▢▢ ▢▢ ▢▢▢▢▢▢ ▢▢ ▢▢▢▢▢▢▢▢ ▢▢▢▢▢▢ ▢▢ ▢▢▢▢▢▢▢ ▢▢ ▢▢▢
Unit 1	(▢▢▢▢▢▢▢▢ ▢ ▢▢▢▢▢▢▢▢ ▢▢▢▢▢ ▢▢▢▢▢ ▢▢▢▢▢) • ▢▢▢▢▢▢ ▢▢▢▢▢ ▢▢▢▢▢ ▢▢ ▢▢▢▢▢▢ ▢▢▢▢▢▢▢▢ • ▢▢▢▢▢▢▢▢ ▢ ▢▢▢▢▢▢▢▢ ▢▢▢▢▢ ▢▢▢▢▢ ▢▢▢▢▢ ▢▢ ▢▢▢▢▢▢▢▢▢ • ▢▢▢▢▢▢ ▢▢▢▢▢▢ ▢▢ ▢▢▢▢▢ ▢▢ ▢▢▢▢▢▢▢▢▢ ▢▢▢▢▢▢ (▢▢▢▢▢▢▢, ▢▢▢▢▢ ▢▢▢ ▢▢▢▢▢, ▢▢▢▢▢▢ ▢▢▢ ▢▢▢▢▢▢▢ ▢▢▢▢▢)
Unit 2	(▢▢▢▢▢▢) • ▢▢▢▢▢▢ ▢▢ ▢▢▢▢▢▢ ▢▢▢▢▢▢▢ • ▢▢▢▢▢▢▢ ▢▢▢▢▢ ▢▢ ▢▢▢▢▢▢▢ • ▢▢▢▢▢▢ ▢▢▢▢▢▢ ▢▢ ▢▢▢▢▢ ▢▢ ▢▢▢▢▢▢▢▢ ▢▢▢▢▢▢ (▢▢▢▢▢ ▢▢▢▢▢▢, ▢▢▢▢▢▢▢ ▢▢▢▢▢▢ ▢▢▢▢▢, ▢▢▢▢▢▢▢▢ ▢▢▢)
Unit 3	(▢▢▢▢▢▢▢, ▢▢▢▢▢▢▢, ▢▢ ▢▢▢▢▢) • ▢▢▢▢▢▢▢▢ ▢▢▢▢▢ ▢▢ ▢▢▢▢▢▢ ▢▢▢▢▢▢▢▢ ▢▢▢▢▢▢ • ▢▢▢▢▢▢▢▢ ▢▢▢▢▢ ▢▢ ▢▢▢▢▢▢ ▢▢▢▢▢▢▢ ▢▢ ▢▢▢▢▢▢▢▢▢ • ▢▢ ▢▢▢▢▢ ▢▢ ▢▢▢▢▢▢ ▢▢▢▢▢▢▢ ▢▢ ▢▢▢▢▢▢▢ • ▢▢▢▢▢▢ ▢▢▢▢▢▢ ▢▢ ▢▢▢▢▢ ▢▢ ▢▢▢▢▢▢▢▢ ▢▢▢▢▢▢ (▢▢▢▢▢▢▢, ▢▢▢▢▢▢▢▢ ▢▢▢▢▢▢ ▢▢▢▢▢▢ ▢▢▢▢▢, ▢▢▢▢▢ ▢▢▢▢ ▢▢▢▢▢▢▢)
Unit 4	(▢▢▢▢▢▢ ▢▢▢▢▢) • ▢▢▢▢▢▢ ▢▢▢▢▢ ▢▢ ▢▢▢▢▢▢ ▢▢▢▢▢▢▢ • ▢▢▢▢▢▢ ▢▢▢▢▢ ▢▢▢▢▢▢ ▢ ▢▢▢▢ ▢▢▢▢▢▢▢ • ▢▢▢▢▢▢ ▢▢▢▢▢▢ ▢▢ ▢▢▢▢▢ ▢▢ ▢▢▢▢▢▢▢▢ ▢▢▢▢▢▢ (▢▢▢▢▢▢▢▢▢ ▢▢▢▢▢ ▢▢▢▢▢, ▢▢▢▢▢ ▢▢▢▢, ▢▢▢▢▢ ▢▢▢▢▢▢)

▢▢▢▢▢ ▢▢▢▢▢▢▢▢

- ▢▢▢▢▢▢▢ ▢▢▢▢▢▢▢▢▢, ▢▢▢▢ ▢▢▢▢▢▢▢ ▢▢▢
- ▢▢▢ ▢▢▢▢▢ ▢▢▢▢▢, ▢▢▢▢▢▢▢ ▢▢▢▢▢▢▢▢ ▢▢ ▢▢▢▢▢ ▢▢▢▢▢▢ ▢▢ ▢▢▢▢▢▢▢▢
- ▢▢▢▢▢▢▢, ▢▢▢▢▢ ▢▢▢▢
- ▢▢▢▢▢▢ ▢▢ ▢▢▢▢▢▢▢ ▢▢▢▢▢, ▢▢. ▢▢▢ ▢▢▢▢▢ ▢▢▢▢▢
- ▢▢▢▢▢▢▢▢▢▢▢ ▢▢▢, ▢▢. ▢▢▢▢▢▢▢▢ ▢▢▢▢▢▢
- ▢▢▢▢▢▢▢▢▢, ▢▢ ▢▢▢▢▢ ▢▢ ▢▢▢▢▢▢▢▢▢
- ▢▢▢▢▢▢▢ ▢▢▢▢▢▢ ▢▢▢▢▢▢, ▢▢▢▢▢▢▢ ▢▢▢▢▢ ▢▢▢▢▢
- ▢▢▢▢▢▢▢▢ ▢▢▢▢▢▢▢▢, ▢▢ ▢▢▢▢▢ ▢▢ ▢▢ ▢▢▢▢▢▢▢
- ▢▢. ▢▢▢▢▢▢▢▢▢, ▢▢▢▢▢▢ ▢▢▢▢▢▢ ▢▢▢▢▢ ▢▢ ▢▢▢▢▢ ▢▢▢▢▢▢▢▢▢▢▢

PHD-DSC-102	Discipline Specific Course (□□□□□□ □□□□□ □□□□ □□ □□□□□ □□□□□□)	Credit Distribution: L:3, T:1, P:0=4
Learning Outcomes	□□□□□□□ □□□□□ □□□□ □□ □□□□□□□□□ □□ □□□□□□□	□□□□□□□ □□□□□ □□□□ □□□□□□□, □□□□□, □□□□□□□ □□□□□□□□ □□ □□□□□□ □□□□□□□ □□□□□ □□□□ □□ □□□□□□□ □□□□□□ □□ □□□□□ □□□□□□□□□ □□ □□□	 □□□□□□□ □□□□□ □□□□ □□ □□□□□□□ □□ □□□□□□□□ □□□□□□ □□ □□□□□□□ □□ □□□	
Unit 1	**(□□□□□ □□□□ – □□□ □□□□□□□)** • □□□□□ □□□□□□□ □□ □□□□□□□ □□□□□□□□ □□ □□□□□ • □□□□□ □□□□□ □□ □□□□□□□ □□□□□□□□ □□ □□□□□ □□□□□□ □□□□□□□□□□, □□□□□ □□ □□□□ □□□□□□□□ • □□□□□□ □□□□□□□□ □□ □□□–□□□□□□ □□ □□□□□□□□□□ □□□□□□ (□□□□□□□□, □□□□□□□□□ □□□□, □□□□□ □□□□□)
Unit 2	**(□□□□□ □□□□ – □□□□ □□ □□□□□□)** • □□□□□ □□□□ □□ □□□□□□□ □□□□□□□□ □□ □□□□□ • □□□□□ □□□□□ □□ □□□□□□□ □□□□□□□□ □□ □□□□□ • □□□□□□ □□□□□□□□ □□ □□□□ □□ □□□□□ □□ □□□□□□□□□ □□□□□□ (□□□□□□□□ □□□□□□□□□, □□□□ □□□□□, □□□□□□□ □□□□□)
Unit 3	**(□□□□□ □□□□ – □□□□□ □□ □□□□□□□□□)** • □□□□□ □□□□□ □□ □□□□□□□ □□□□□□□□ □□ □□□□□ • □□□□□ □□□□□□□□□ □□ □□□□□□□ □□□□□□□□ □□ □□□□□ • □□□□□□ □□□□□□□□□□ □□ □□□□□□ □□ □□□□□□□□□ □□□□□□ (□□□□□□□□ □□□□□, □□□□□□□□ □□□□□, □□□□□□ □□□□□)
Unit 4	**(□□□□□ □□□□ – □□□□□□□, □□□□□ □□ □□□□□□□)** • □□□□□ □□□□□□□ □□ □□□□□□□ □□□□□□□□ □□ □□□□□ • □□□□□ □□□□□ □□ □□□□□□□ □□□□□□□□ □□ □□□□□ • □□□□□□ □□□□□□□, □□□□□ □□ □□□□□□□ □□□□□□ □□ □□□□□□□ □□ □□□□□□□□□ □□□□□□ (□□□□□□□ □□□□□, □□□□□□ □□□□□□□, □□□□□□□ □□□□□□□□)

□□□□□ □□□□□□□□

- □□□□□□□□ □□□□□, □□□□□□□□□□ □□ □□□□ □□□
- □□□□□□□□ □□ □□□□□□ □□□□□, □□□□. □□□□□□□□
- □□□□□ □□□□, □□□□□□□ □□ □□□□□□□□□□
- □□□□□ □□□, □□□□□□□ □□ □□□□□□
- □□. □□□□□□□□, □□□□□ □□□□□ □□ □□□□□, □□□□□□ □□□□□□□, □□□□□□
- □□□□□□□□ □□□□, □□□□□: □□□□□ □□ □□□□□□□□□□, □□□□ □□□□□□□, □□ □□□□□□□
- □□□□ □□□□, □□□□□□ □□□□□□□ □□□ □□□□□□□□, □□□□ □□□□□□□, □□□□□□□

- ● □□□□□ □□□□, □□□□□□□□□ □□□□□□ □□□□□□ □□□□□□□□□□, □□□□ □□□□□□□, □□ □□□□□□□
- ● □□□□□□□ □□□□□□□□□, □□□□□ □□□□□□□ □□ □□□□□□□
- ● □□□□. □□□□□□□, □□□□□ □□□□□□□□□ : □□□□□ □□□□□□
- ● □□□□□□□□ □□□□□□□□□ □□ □□□□□ □□□□□□ □□ □□□□□□□□, □□□ □□□□□ □□□□□
- ● □□□□□□□□□□ □□□□□ □□□ □□□□□□□ □□□□□□, □□. □□□□□□□□□□ □□□□□, □□□□□□□□, □□□□□□□□
- ● □□□□□ □□□□□□□□□, □□□□□□□ □□ □□□□□□□□

PHD-RPE-103	Research and Publication Ethics	Credit Distribution: L:1, T:1, P:0=2
Learning Outcomes	1. To have awareness about the publication ethics and publication misconducts. 2. To understand indexing and citation databases, open access publications, research metrics (citations, h-index, impact factor etc) 3. Develop hands-on skills to identify research misconduct and predatory publications.	
Unit 1	**Philosophy and Ethics (4 hrs)** 1. Introduction to philosophy: definition, nature and scope, concept, branches 2. Ethics: definition, moral philosophy, nature of moral judgements and reactions	
Unit 2	**Scientific Conduct (4 hrs)** 1. Ethics with respect to science and research 2. Intellectual honesty and research integrity 3. Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP) 4. Redundant publications: duplicate and overlapping publications, salami slicing 5. Selective reporting and misrepresentation of data	
Unit 3	**Publication Ethics (7 hrs)** 1. Publication ethics: definition, introduction and importance 2. Best practices / standards setting initiatives and guidelines: COPE, WAME, etc. 3. Conflicts of interest 4. Publication misconduct: definition, concept, problems that lead to unethical behavior and vice versa, types 5. Violation of publication ethics, authorship and contributor ship 6. Identification of publication misconduct, complaints and appeals 7. Predatory publishers and journals	

Unit 4 Practice	**Open Access Publishing (4 hrs)**
	1. Open access publications and initiatives
	2. SHERPA/ROMEO online resource to check publisher copyright & self-archiving policies
	3. Software tool to identify predatory publications developed by SPPU
	4. Journal finder / journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer Journal Suggester, etc.
Unit 5 Practice	**Publication Misconduct (4 hrs)**
	A. Group Discussions (2 hrs.)
	1. Subject specific ethical issues, FFP, authorship
	2. Conflicts of interest
	3. Complaints and appeals: examples and fraud from India and abroad
	B. Software tools (2 hrs.)
	Use of plagiarism software like Turnitin, Urkund and other open source software tools
Unit 6 Practice	**Databases and Research Metrics (7 hrs)**
	A. Databases (4 hrs.)
	1. Indexing databases
	2. Citation databases: Web of Science, Scopus etc.
	B. Research Metrics (3 hrs.)
	1. Impact Factor of journal as per Journal Citation Report, SNIP, SJR, IPP, Cite Score
	2. Metrics: h-index, g-index, i10 index, altmetrics

Suggested Readings

1. Bird, A. (2006). Philosophy of Science. Routledge.
2. MacIntyre, A. (1967) A Short History of Ethics. London.
3. P. Chaddah, (2018) Ethics in Competitive Research: Do not get scooped; do not get plagiarized, ISBN:978-9387480865
4. National Academy of Sciences, National Academy of Engineering and Institute of Medicine. (2009). On Being a Scientist: A Guide to Responsible Conduct in Research: Third Edition. National Academies Press.
5. Rensik, D. B. (2011). What is ethics in research & why is it important. National Institute of Environmental Health Sciences, 1-10. Retrieved from https://www.niehs.nih.gov/resources/biothics/whatis/index.cfm
6. Beall, J. (2012). Predatory publishers are corrupting open access. Nature, 489(7415), 179-179. https://doi.org/10.1038/489179a

NIILM UNIVERSITY

Ph.D. Course Work in History

Academic Session 2024-25

Ph.D. Regulations Regarding Course Work

Clause 18: Ph.D. Ordinance NIILM University as per UGC Minimum Standards and Procedure for Award of Ph.D. Degrees Regulations 2022 with effect from academic session 2024-25

I.   The coursework shall be treated as a prerequisite for Ph.D. preparation. In the first year of registration, all research scholars are required to complete the course work for one semester following their provisional registration as a part of the Ph.D. program. It is mandatory to complete the course work in first 4 semesters to stay in the Ph.D. program.

If a student fails to complete the coursework in first 4 semesters, will have to leave the program.

II. Earning a minimum of 12 total credits and a maximum of 16, is required.

III. Usually a course refers to a 'paper' and is a component of an academic program. Courses in Ph.D. course work shall be of two kinds: Core and Elective.

IV. A core course is a compulsory paper to be studied by all the scholars to complete the requirements of the Ph.D. degree.

V. Elective course is a course which is discipline specific and provided by the particular department from the main discipline or from a sister/related discipline which supports the main discipline, on mutual consent of the concerned departments.

VI. One credit equal to 15 contact hours for theory-based teaching or 30 hours of contact time for practical or activity-based teaching.

VII. The number of credits is given in the form L: T: P, where L indicates the number of contact hours of lecture, and T the number of contact hours for tutorials, P stands for laboratory credits.

VIII. The credits are distributed as follows:

Paper Code	Paper	Course type	Credit	L	T	P
PHD-ARM-101	Advanced Research Methodology	Core	4	3	1	0
PHD-DSC-102	Discipline Specific Course	Elective	4	3	1	0
PHD-RPE-103	Research and Publication Ethics	Core	2	1	1	0
PHD-SEM-104	Academic Writing, Literature Review and Seminar	Skill	2	0	1	2
	Total		12			

IX. All Ph.D., entrants irrespective of discipline, shall be trained in teaching proficiency related to teaching/education/pedagogy/writing related to their chosen Ph.D. subject during their doctoral training period, that include assigning 4-6 hours per week of teaching/ research assistantship for conducting tutorial or laboratory work and evaluations.

X. Courses PHD-SEM 104 includes research work on research article writing, seminar presentation and course PHD-TP 105 includes pedagogical training. Both these courses will be assessed internally without Semester End Examination.

XI. CoE will conduct Term/ Semester End Exam in PHD-ARM-101, PHD-DSC-102, and PHD-RPE-103.

XII. PHD-TP 105 is a non-credit course and internal assessment will be marked on the detailed mark card of the course work.

XIII. Advance Research Methodology course will include common research methodology and subject specific research methodology.

XIV. Research Advisory Committee may provide choices in selecting the courses/ credits that facilitates the entrepreneur in the monetization of IP thus generated.

XV. RAC can also recommend UGC recognized online courses as part of the credit requirements for the Ph.D. program.

XVI.   Paper- will comprise of the following two activities:
  (a) External Assessment: Written Question Paper 70/39
  (b) Internal Assessment: 30/16
  Marks will be converted into letter grade and grade point as per following table:

Marks	Letter Grade	Grade Point
81-100	A+	10
76-80	A	9
66-75	B+	8
61-65	B	7
55-60	C	6
Less than 55	F	0

The computation of the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA) shall be done as per University Examination Ordinance or Examination Rules & Regulations issued time to time.

The result and grade sheet for the course work will carry pass/ fail result.

COURSE WORK PAPER

I.   Candidates who already hold an M. Phil. degree and have been accepted into the Ph.D. program, or those who have finished their M.Phil. Coursework and have been given permission to continue on to the Ph.D. in an integrated course, may be exempted from the Ph.D. course requirements by the Department. All additional applicants accepted into the Ph.D. program must complete the Ph.D. coursework required by the Department.

II.   The NIILM University attendance rules, a minimum 75% attendance is must require, will be applied to all full-time research scholars. For the duration of their coursework, part-time research researchers must, nevertheless, adhere to the same rules.

III. A Ph.D. scholar has to obtain a minimum of 55% of marks or a minimum CGPA of 6.0 in the UGC 10-point scale (or an equivalent grade/CGPA in a point scale wherever grading system is followed) in the course work in order to be eligible to continue in the program and submit the thesis.

IV.   Registration will be automatically canceled if the required course work is not completed with a minimum of 55% of marks/a minimum CGPA of 6.0 within the allotted time. If the course work is not finished within a year, the RAC and DRC may suggest a six-month extension or suggest that the registration be canceled with the DRC.

V.   There is no provision of improvement or special supplementary exam to be conducted. Coursework will be offered in four semesters of first two years with regular & supplementary exams to avail the opportunity to clear the coursework in 2 years. **Failure to complete the course in 2 years means that the student has to leave the program.**

Course Structure:

PHD-ARM-101	Advance Research Methodology in History	Credit Distribution: L:3, T:1, P:0=4
Course Objectives:	To acquaint the students with research process. To train them in the research methods and designs and to equip them to take up researches	

	independently.
Unit 1	**Introduction to Research** a. Nature and aims of research b. Dimensions and types of research c. Theory and research d. The meaning of methodology e. Types of Methods of Research
Unit 2	**Research Planed Data Collection** a. Concept, logic, and research question/issues b. Variables, causal theory, and hypothesis c. Research Design and Collection of Data d. Sampling: Methods, Size, Errors e. Probability and non-probability f. Measurement and Scaling Techniques g. Issues in measurement: Qualitative and quantitative
Unit 3	**Data Processing** a. Analysis of quantitative data introduction to higher order statistics b. Editing, Coding and Classification of Data c. Analysis of qualitative data and Tabulation d. Introduction to advanced statistical techniques using SPSS e. Statistical Derivatives and Measures of Central Tendency f. Measures of Variation and Skewness g. Correlation and Simple Regression h. Diagrammatic and Graphic Presentation of Data
Unit 4	**Research Report Writing** a. Ethical issues in research b. APA style of writing concept c. APA style of writing: Referencing d. d. Research article writing
Unit 5	**Computer Application in Research** a. Introduction to MS Excel, Using Formulas and Functions b. Hand on to SPSS c. Features for Statistical Data Analysis d. Generating Charts/Graphs e. Introduction to MS Word, Features and Functions, Writing Report in MS Word f. Introduction to Open Office or Latex g. Creating Presentation in MS PowerPoint h. Introduction to Internet-Based Search i. Use of Advanced Research Techniques.

Recommended Readings:

1. Bayard, P. & Grayson, A. (1976). Introducing psychological research. London: McMillan.

2. Bordens, K.S. & Abbot, B.B. (2005). Research design and methods. New Delhi: Tata McGraw Hill.

3. Breakwell, G.M. Hammond, S. & Fife-Schaw, C. (1995). Research Methods in Psychology. New Delhi: Sage Publications.

4. Cresswell, J.W. (1994) Research design: L Qualitative and quantitative approaches. Thousand Oaks, CA: Sage Publication.

5. Drew, C.J.: Hardman, M.L. & Hart, W.A. (1996). Designing and conducting research: Inquiry in education and social science. New York: Allyn & Bacon.

6. Kerlinger, F.N. (1982). Foundations of behavioural research. Delhi: Subject Publication.

7. Nation, J.R. (1997). Research Methods. New Jersey: Prentice Hall.

8. Willing, C. & Stainton-Rogers, W. (Eds.) (2008). The Sage Handbook of Qualitative Research in Psychology. New Delhi: Sage Publications.

PHD-DSC-102	Discipline Specific Course (History)	Credit Distribution: L:3, T:1, P:0=4
Learning Outcomes	• Understand the **foundations and significance** of ancient Indian culture, including its values, practices, and influence on modern India. • Study the **Vedic culture** in the context of the Aryan migration theory and evaluate this theory with new archaeological findings and excavations. • Study the **position of women** in ancient India, including their roles in family, society, and religion, and changes over time.	
Unit 1	• Introduction to Ancient Indian Culture. • Sources and Approaches – Literary Sources, Archaeological Sources. • Indus Valley Civilization • Vedic Culture – Aryan theory in the light of new excavations • Varna – Caste System • Ashram System • Hindu Sanskars.	
Unit 2	• Position of Women in Ancient India • Social change in India (e 500 – 1200 AD) • Guild: Their organization, function and their role in social and economic life.	
Unit 3	• Political, Social and Cultural History of India • Pre Mauryan and Mauryan Period • Sunga Period • Sakas – Satavahana • Kushana Period • Indo Greek.	
Unit 4	Political, Social and Cultural History of India Pre Gupta and Gupta Period : Origin and Developments, Chandra Gupta I, Samudragupta, Chandra Gupta II, Kumar Gupta I & Skandagupta 2. Vakataks.	

Unit 5	• Gurjara Pratihar
	• Rashtrakuta.
	• Pallavas
	• Chandel Dynasty.
	• Chalukyas.
	• Badami.
	• Alhole.
	• Paintings – Elora Painting, Ajanta Painting, Bagha Painting.

Suggested Readings:

1) 1988 Childe, V.G.: What happened in History, Penguin Pub, 1967.

2) Durrant Will: an age of Faith, 1950, reprint 1980.

3) Durrant Will: Our Oriental Heritage: The Story of Civilization, II Volume.

4) Frankfart Henri: The Birth of Civilization to the Near East, Indians Uni, Press,

5) 1951. Goyal, S.R: Vishwa Ki Pracheen Sabhyatayen, Kusumanjali Prakashan, 1963.

6) Nicholas, David: The Evolution of the Medieval World, Society, Government And thought in Europe, 312-1500, Rout ledge, 1992. Ray, U.N.: Vishwa Sabhyata Ka Itihas, Lok Bharti Prakashan, 2017.

7) Swain J.E: A History of World Civilization, McGraw Book, New York, 1938,

8) Reprint, S. Chand, New Delhi 2000. Trever, A. Albert: History of Ancient Civilization Harcourt, Brace, 1936.

9) Wells, H.G: The Outline of History, George Newness Revised Edition 1971.

10) Sharma, Manoj: History of World Civilization, Anmol Pub, New Delhi, 2005

11) Arnold J Toynbe: A study of History, Vol I to XII, 1934-1961, Reprint; OUP USA,

PHD-RPE-103	Research and Publication Ethics	Credit Distribution: L:1, T:1, P:0=2
Learning Outcomes	1. To have awareness about the publication ethics and publication misconducts. 2. To understand indexing and citation databases, open access publications, research metrics (citations, h-index, impact factor etc) 3. Develop hands-on skills to identify research misconduct and predatory publications.	

Unit 1	**Philosophy and Ethics (4 hrs)**
	1. Introduction to philosophy: definition, nature and scope, concept, branches
	2. Ethics: definition, moral philosophy, nature of moral judgements and reactions
Unit 2	**Scientific Conduct (4 hrs)**
	1. Ethics with respect to science and research
	2. Intellectual honesty and research integrity
	3. Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP)
	4. Redundant publications: duplicate and overlapping publications, salami slicing
	5. Selective reporting and misrepresentation of data
Unit 3	**Publication Ethics (7 hrs)**
	1. Publication ethics: definition, introduction and importance
	2. Best practices / standards setting initiatives and guidelines: COPE, WAME, etc.
	3. Conflicts of interest
	4. Publication misconduct: definition, concept, problems that lead to unethical behavior
	and vice versa, types
	5. Violation of publication ethics, authorship and contributor ship
	6. Identification of publication misconduct, complaints and appeals
	7. Predatory publishers and journals
Unit 4 Practice	**Open Access Publishing (4 hrs)**
	1. Open access publications and initiatives
	2. SHERPA/ROMEO online resource to check publisher copyright & self-archiving policies
	3. Software tool to identify predatory publications developed by SPPU
	4. Journal finder / journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer
	Journal Suggester, etc.
Unit 5 Practice	**Publication Misconduct (4 hrs)**
	A. Group Discussions (2 hrs.)
	1. Subject specific ethical issues, FFP, authorship
	2. Conflicts of interest
	3. Complaints and appeals: examples and fraud from India and abroad
	B. Software tools (2 hrs.)
	Use of plagiarism software like Turnitin, Urkund and other open source software tools
Unit 6 Practice	**Databases and Research Metrics (7 hrs)**
	A. Databases (4 hrs.)
	1. Indexing databases

	2. Citation databases: Web of Science, Scopus etc. B. Research Metrics (3 hrs.) 1. Impact Factor of journal as per Journal Citation Report, SNIP, SJR, IPP, Cite Score 2. Metrics: h-index, g-index, i10 index, altmetrics

Suggested Readings

1. Bird, A. (2006). Philosophy of Science. Routledge.
2. MacIntyre, A. (1967) A Short History of Ethics. London.
3. P. Chaddah, (2018) Ethics in Competitive Research: Do not get scooped; do not get plagiarized, ISBN:978-9387480865
4. National Academy of Sciences, National Academy of Engineering and Institute of Medicine. (2009). On Being a Scientist: A Guide to Responsible Conduct in Research: Third Edition. National Academies Press.
5. Rensik, D. B. (2011). What is ethics in research & why is it important. National Institute of Environmental Health Sciences, 1-10. Retrieved from https://www.niehs.nih.gov/resources/biothics/whatis/index.cfm
6. Beall, J. (2012). Predatory publishers are corrupting open access. Nature, 489(7415), 179-179. https://doi.org/10.1038/489179a

NIILM UNIVERSITY

Ph.D. Course Work in Home Science

Academic Session 2024-25

Ph.D. Regulations Regarding Course Work

Clause 18: Ph.D. Ordinance NIILM University as per UGC Minimum Standards and Procedure for Award of Ph.D. Degrees Regulations 2022 with effect from academic session 2024-25

I.   The coursework shall be treated as a prerequisite for Ph.D. preparation. In the first year of registration, all research scholars are required to complete the course work for one semester following their provisional registration as a part of the Ph.D. program. It is mandatory to complete the course work in first 4 semesters to stay in the Ph.D. program.

If a student fails to complete the coursework in first 4 semesters, will have to leave the program.

II.   Earning a minimum of 12 total credits and a maximum of 16, is required.

III.   Usually a course refers to a 'paper' and is a component of an academic program. Courses in Ph.D. course work shall be of two kinds: Core and Elective.

IV.   A core course is a compulsory paper to be studied by all the scholars to complete the requirements of the Ph.D. degree.

V.   Elective course is a course which is discipline specific and provided by the particular department from the main discipline or from a sister/related discipline which supports the main discipline, on mutual consent of the concerned departments.

VI.   One credit equal to 15 contact hours for theory-based teaching or 30 hours of contact time for practical or activity-based teaching.

VII. The number of credits is given in the form L: T: P, where L indicates the number of contact hours of lecture, and T the number of contact hours for tutorials, P stands for laboratory credits.

VIII. The credits are distributed as follows:

Paper Code	Paper	Course type	Credit	L	T	P
PHD-ARM-101	Advanced Research Methodology	Core	4	3	1	0
PHD-DSC-102	Discipline Specific Course	Elective	4	3	1	0
PHD-RPE-103	Research and Publication Ethics	Core	2	1	1	0
PHD-SEM-104	Academic Writing, Literature Review and Seminar	Skill	2	0	1	2
	Total		12			

IX.   All Ph.D., entrants irrespective of discipline, shall be trained in teaching proficiency related to teaching/education/pedagogy/writing related to their chosen Ph.D. subject during their doctoral training period, that include assigning 4-6 hours per week of teaching/ research assistantship for conducting tutorial or laboratory work and evaluations.

X.   Courses PHD-SEM 104 includes research work on research article writing, seminar presentation and course PHD-TP 105 includes pedagogical training. Both these courses will be assessed internally without Semester End Examination.

XI.   CoE will conduct Term/ Semester End Exam in PHD-ARM-101, PHD-DSC-102, and PHD-RPE-103.

XII. PHD-TP 105 is a non-credit course and internal assessment will be marked on the detailed mark card of the course work.

XIII. Advance Research Methodology course will include common research methodology and subject specific research methodology.

XIV. Research Advisory Committee may provide choices in selecting the courses/ credits that facilitates the entrepreneur in the monetization of IP thus generated.

XV.   RAC can also recommend UGC recognized online courses as part of the credit requirements for the Ph.D. program.

XVI.   Paper- will comprise of the following two activities:
   (a) External Assessment: Written Question Paper 70/39
   (b) Internal Assessment: 30/16
   Marks will be converted into letter grade and grade point as per following table:

Marks	Letter Grade	Grade Point
81-100	A+	10
76-80	A	9
66-75	B+	8
61-65	B	7
55-60	C	6
Less than 55	F	0

The computation of the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA) shall be done as per University Examination Ordinance or Examination Rules & Regulations issued time to time.

The result and grade sheet for the course work will carry pass/ fail result.

COURSE WORK PAPER

I.   Candidates who already hold an M. Phil. degree and have been accepted into the Ph.D. program, or those who have finished their M.Phil. Coursework and have been given permission to continue on to the Ph.D. in an integrated course, may be exempted from the Ph.D. course requirements by the Department. All additional applicants accepted into the Ph.D. program must complete the Ph.D. coursework required by the Department.

II.   The NIILM University attendance rules, a minimum 75% attendance is must require, will be applied to all full-time research scholars. For the duration of their coursework, part-time research researchers must, nevertheless, adhere to the same rules.

III. A Ph.D. scholar has to obtain a minimum of 55% of marks or a minimum CGPA of 6.0 in the UGC 10-point scale (or an equivalent grade/CGPA in a point scale wherever grading system is followed) in the course work in order to be eligible to continue in the program and submit the thesis.

IV.   Registration will be automatically canceled if the required course work is not completed with a minimum of 55% of marks/a minimum CGPA of 6.0 within the allotted time. If the course work is not finished within a year, the RAC and DRC may suggest a six-month extension or suggest that the registration be canceled with the DRC.

V.   There is no provision of improvement or special supplementary exam to be conducted. Coursework will be offered in four semesters of first two years with regular & supplementary exams to avail the opportunity to clear the coursework in 2 years. **Failure to complete the course in 2 years means that the student has to leave the program.**

Course Structure:

PHD-ARM-101	Advance Research Methodology in Home Science	Credit Distribution: L:3, T:1, P:0=4
Course Objectives:	To acquaint the students with research process. To train them in the research methods and designs and to equip them to take up researches	

	independently.
Unit 1	**Introduction to Research** a. Nature and aims of research b. Dimensions and types of research c. Theory and research d. The meaning of methodology e. Types of Methods of Research
Unit 2	**Research Planed Data Collection** a. Concept, logic, and research question/issues b. Variables, causal theory, and hypothesis c. Research Design and Collection of Data d. Sampling: Methods, Size, Errors e. Probability and non-probability f. Measurement and Scaling Techniques g. Issues in measurement: Qualitative and quantitative
Unit 3	**Data Processing** a. Analysis of quantitative data introduction to higher order statistics b. Editing, Coding and Classification of Data c. Analysis of qualitative data and Tabulation d. Introduction to advanced statistical techniques using SPSS e. Statistical Derivatives and Measures of Central Tendency f. Measures of Variation and Skewness g. Correlation and Simple Regression h. Diagrammatic and Graphic Presentation of Data
Unit 4	**Research Report Writing** a. Ethical issues in research b. APA style of writing concept c. APA style of writing: Referencing d. d. Research article writing
Unit 5	**Computer Application in Research** a. Introduction to MS Excel, Using Formulas and Functions b. Hand on to SPSS c. Features for Statistical Data Analysis d. Generating Charts/Graphs e. Introduction to MS Word, Features and Functions, Writing Report in MS Word f. Introduction to Open Office or Latex g. Creating Presentation in MS PowerPoint h. Introduction to Internet-Based Search i. Use of Advanced Research Techniques.

Recommended Readings:

1. Bayard, P. & Grayson, A. (1976). Introducing psychological research. London: McMillan.

2. Bordens, K.S. & Abbot, B.B. (2005). Research design and methods. New Delhi: Tata McGraw Hill.

3. Breakwell, G.M. Hammond, S. & Fife-Schaw, C. (1995). Research Methods in Psychology. New Delhi: Sage Publications.

4. Cresswell, J.W. (1994) Research design: L Qualitative and quantitative approaches. Thousand Oaks, CA: Sage Publication.

5. Drew, C.J.: Hardman, M.L. & Hart, W.A. (1996). Designing and conducting research: Inquiry in education and social science. New York: Allyn & Bacon.

6. Kerlinger, F.N. (1982). Foundations of behavioural research. Delhi: Subject Publication.

7. Nation, J.R. (1997). Research Methods. New Jersey: Prentice Hall.

8. Willing, C. & Stainton-Rogers, W. (Eds.) (2008). The Sage Handbook of Qualitative Research in Psychology. New Delhi: Sage Publications.

PHD-DSC-102	Discipline Specific Course (Advance studies in Home Science)	Credit Distribution: L:3, T:0, P:1=4
Learning Outcomes	- To gain knowledge on basic principles of food fortifications, and food and microbial interaction. - To understand human health implications of organic food and role of antioxidants in preventing degenerative diseases. - To develop idea about origin, history and growth of Indian traditional textile. - To relate various concepts of consumer education, entrepreneurship and develop entrepreneurship potential. - To gain the in-depth knowledge on childhood assessment tools, parenting, geriatric care and families on 21st century.	
Unit 1	**Food and Nutrition** - Food Fortification: Objectives and need for food fortification; types of food fortification; Food fortification programs- iodized salt, fortification of vitamin A and D, iron fortification; fortification of infant's foods. - Ant- Oxidants: Free radicals, Anti-oxidants and diseases. Sources of anti-oxidants. Role of antioxidants in combating free radicals and preventing degenerative diseases; effect of cooking on anti-oxidants. - Organic Foods: Characteristics and importance of organic foods; Types and principles of organic farming; Difference between organic and conventional farming; Classification of organic products. - Food Quality Assessment: Causes of spoilage. Safety & Care of Food Supply- Microbial hazards, Residue Pollutants, Natural toxicants in Foods, Food Poisoning	
Unit 2	**Textiles & Clothing** - Theories of the Origin of clothing: Modesty theory, immodesty theory, adornment theory, Protective theory - Wardrobe Planning for the family: Colour combination in apparels of	

	men, women and children belong to Hindu, Muslim and Christian communities for different occasions such as Marriage, death, festivals, casual wear and professional wear. • Socio-psychological aspect of Clothing: Perception Behaviour, Choice, Motivation, Shopping behaviour and satisfaction, age differences. Designs in dress- Personality, figure, the material, prevailing style, suitable decorations • Woven Textiles from Northern and southern India- Origin, material & techniques used Rajasthan- Kota Doria Gujarat- sujani, Tangaliya, Pachhedi Madhya Pradesh- Chandero, Maheshwari Uttar Pradesh-Brocades West Bengal- Dacca muslin, Baluchari Tangail; Shawls from Kashmir , Assam and Nagaland. Odisha's Sambalpuri, maniabandh; Maharashtra; Paithani, Himroo Andhra Pradesh and Telengana-Dharvaram, Venkatgiri, Gadwal and Naryanpet Karnataka-IIkal, Khann Tamil Nadu- Kanjeevaram
Unit 3	**Human Development and Family Studies** • Childhood Assessment Tools and Techniques used for children's overall Developments Physical, social, emotional, Speech and Intellectual potentials. • Parenting and Parenthood: Meaning and significance, foundation of parenthood in Indian Family Life- Traditional and contemporary. Parental Roles- Determinants of parenting behaviour; Role of father and mother. Stages of Parenthood- Prenatal stage, infancy, childhood, adolescence, adulthood and old age (grand parenting). Challenges of Parenting- Role stress, work-family balance, disagreements and conflicts between the spouses, having children with disability/chronic illness. • Ageing and Well-Being- Demographic profile of elderly in Odisha and India. Living arrangements (intergenrated families, old age homes, institutes etc.) and new models of care giving. Overcoming mental health challenges (loneliness, depression, anxiety, dementia, other age-related diseases etc.). Life style changes and holistic health (physical well-being, food choice, yoga and restorative fitness, counselling and therapy, social and interpersonal support systems). Technology and aging (use of internet, advances in health and medical treatment, gadgets supporting safety and security of elderly) Lesiure time activities and innovative models of developmental intervention. • Preparing families for 21st century- Contemporary family problems, effect, coping strategies and possible prevention. Family life Enrichment-Meaning, need and aspects of family Life enrichment. Individual's right to have a family; Family's Rights and Responsibility with reference to the environment scope of family life enrichment.
Unit 4	**Entrepreneurship Development and Consumer Education:** • Developing a business plan- Market survey, resource survey, entrepreneur

	survey, identification of business opportunity
	• Some business areas for entrepreneurial venture- Agriculture, horticulture, fishery, animal husbandry, eco-tourism, retail marking, food processing, dress designing, fashion designing.
	• Introduction to Consumer Behavior- Defining consumer behavior, Nature and scope of consumer behavior, characteristics of Indian Consumers; consumer decision making. Changing Patterns of Consumer Behavior- Demographic Trends, technological trends; implications of technological trends on consumer behavior; Trends in Public Policy.
	• Environmental determinants of consumer behavior- Influence of culture; Group influence on consumption. Family Buying decisions.

Books recommended for Reference:

- B.Sreelakhsmi- Food Science
- B. Sreelakhsmi- Nutrition Science
- Manay,S.N and Shadaksharaswamy (2017) Foods: Facts and Principles, Third Revised Edition, New Age International (P) Publishers, NewDelhi
- Potter,N.N. and Hotchkiss, J.H (2006), Food Sciences, fifth edition, CBS Publishers and• Distributors, New Delhi
- Swaminathan M (2007), Essentials of Food and Nutrition. An advanced Textbook Vol.I and II, the Bangalore Printing and publishing Co. Ltd, Bangalore.
- Davidson S.R. Passmore, J.F. Brock and A Trasw ill Human Nutrition and dietetics, English language book society and Churchill livingstone 1975
- N. Shakuntala many ama M. Shadaksharaswamy, New Age International publication Food facts and principles.
- Robinson C.H: Normal and Therapeutic Nutrition memillan and Co.
- Behum Rehena: A textbook of foods Nutrition and Dietetics, sterling publications Pvt Ltd.
- Subhangini A Joshi, Tata- McGraw Hill Publishing Company Ltd. New Delhi. Nutrition and Dietetics
- M.S Bamji, N.P Rao and V. Reddy- Oxford and IBH publishing Co. Pvt Ltd. Textbook of Human Nutrition
- Textile Fiber to fabric 0 Bernad P Corbamn
- Our Clothing J.N Lippincott, Newyork
- Clothing for Moderns: Mac Millan Company, New York
- Modern Textiles: L.S. Dorathy, John wiley, New York
- Indian families at the Cross Roads- edited book David K Carson, Cecyle K. Carson, Aparajita Chowdhury Gyan Publishing House, New Delhi
- Textbook on Child Development and Family Relationship- Dr. Aparajita Chowdhury, Published by Academic Excellence, New Delhi
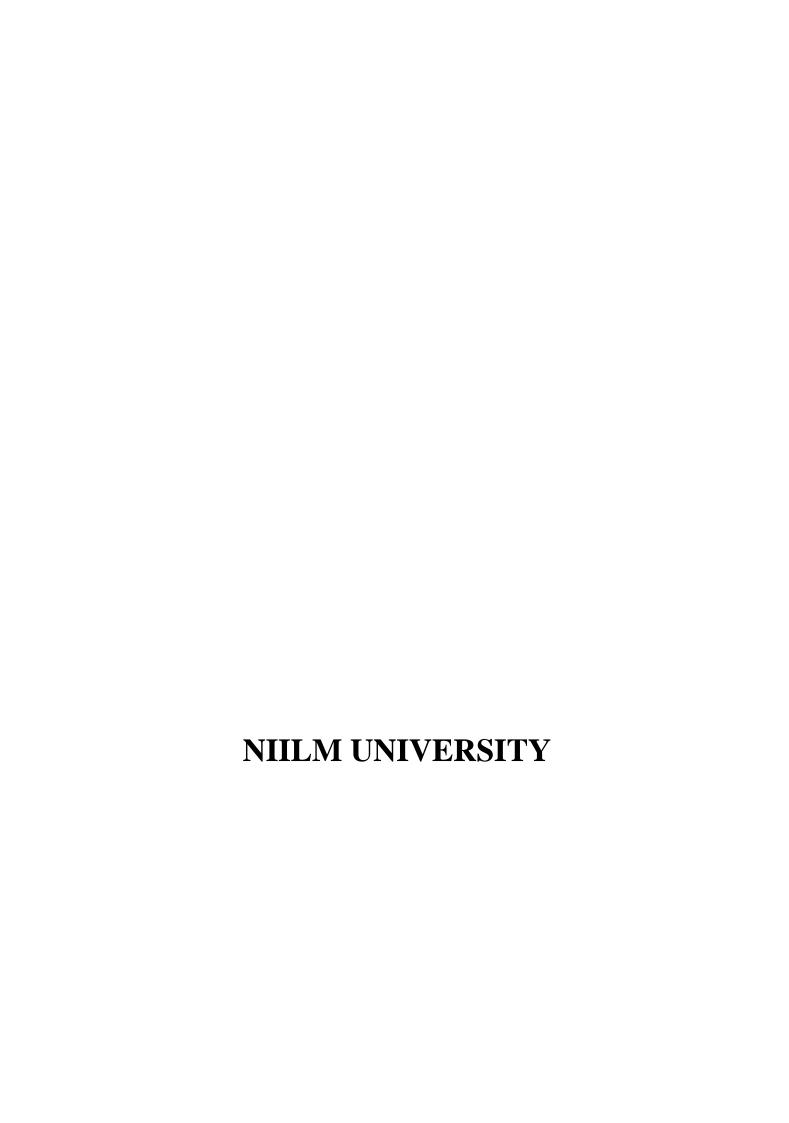
- Family Life Education in India- Perspectives, Challenges and Applications- edited book by David K Carson, Cecyle K. Carson, Aparajita Chowdhury Rawat Publication New Delhi
- Human Development- Diane E. Papalia, Mc Graw Hill Publication
- Lamb, S. E (Ed). (2012) Aging and the Indian diaspora: Cosmopolitian families in Indian and abroad. New Delhi Orient Blackswan
- Cavanaugh, J. & Blanchard- Fields F. (2011) Ault developmeny amd aging (7th ed) Stanford, C.T: Cengage Learning
- Kekar, S.(Ed). (1993) identify and adulthood. NewDelhi Oxford University Press
- Extension Communication and Management- G.L.Ray
- Extension Education and Communication – V.K.Dubey & Indira Bishnoi
- Communication & Social Change- Chhabraf
- Social Problems & Social Disorganization- C.B Memoria

PHD-RPE-103	Research and Publication Ethics	Credit Distribution: L:1, T:1, P:0=2
Learning Outcomes	1. To have awareness about the publication ethics and publication misconducts. 2. To understand indexing and citation databases, open access publications, research metrics (citations, h-index, impact factor etc) 3. Develop hands-on skills to identify research misconduct and predatory publications.	
Unit 1	**Philosophy and Ethics (4 hrs)** 1. Introduction to philosophy: definition, nature and scope, concept, branches 2. Ethics: definition, moral philosophy, nature of moral judgements and reactions	
Unit 2	**Scientific Conduct (4 hrs)** 1. Ethics with respect to science and research 2. Intellectual honesty and research integrity 3. Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP) 4. Redundant publications: duplicate and overlapping publications, salami slicing 5. Selective reporting and misrepresentation of data	
Unit 3	**Publication Ethics (7 hrs)** 1. Publication ethics: definition, introduction and importance 2. Best practices / standards setting initiatives and guidelines: COPE, WAME, etc. 3. Conflicts of interest 4. Publication misconduct: definition, concept, problems that lead to	

	unethical behavior and vice versa, types 5. Violation of publication ethics, authorship and contributor ship 6. Identification of publication misconduct, complaints and appeals 7. Predatory publishers and journals
Unit 4 Practice	**Open Access Publishing (4 hrs)** 1. Open access publications and initiatives 2. SHERPA/ROMEO online resource to check publisher copyright & self-archiving policies 3. Software tool to identify predatory publications developed by SPPU 4. Journal finder / journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer Journal Suggester, etc.
Unit 5 Practice	**Publication Misconduct (4 hrs)** A. Group Discussions (2 hrs.) 1. Subject specific ethical issues, FFP, authorship 2. Conflicts of interest 3. Complaints and appeals: examples and fraud from India and abroad B. Software tools (2 hrs.) Use of plagiarism software like Turnitin, Urkund and other open source software tools
Unit 6 Practice	**Databases and Research Metrics (7 hrs)** A. Databases (4 hrs.) 1. Indexing databases 2. Citation databases: Web of Science, Scopus etc. B. Research Metrics (3 hrs.) 1. Impact Factor of journal as per Journal Citation Report, SNIP, SJR, IPP, Cite Score 2. Metrics: h-index, g-index, i10 index, altmetrics

Suggested Readings

1. Bird, A. (2006). Philosophy of Science. Routledge.
2. MacIntyre, A. (1967) A Short History of Ethics. London.
3. P. Chaddah, (2018) Ethics in Competitive Research: Do not get scooped; do not get plagiarized, ISBN:978-9387480865
4. National Academy of Sciences, National Academy of Engineering and Institute of Medicine. (2009). On Being a Scientist: A Guide to Responsible Conduct in Research: Third Edition. National Academies Press.
5. Rensik, D. B. (2011). What is ethics in research & why is it important. National Institute of Environmental Health Sciences, 1-10. Retrieved from https://www.niehs.nih.gov/resources/biothics/whatis/index.cfm
6. Beall, J. (2012). Predatory publishers are corrupting open access. Nature, 489(7415), 179-179. https://doi.org/10.1038/489179a

NIILM UNIVERSITY

Ph.D. Course Work in Hotel Management

Academic Session 2024-25

Ph.D. Regulations Regarding Course Work

Clause 18: Ph.D. Ordinance NIILM University as per UGC Minimum Standards and Procedure for Award of Ph.D. Degrees Regulations 2022 with effect from academic session 2024-25

I. The coursework shall be treated as a prerequisite for Ph.D. preparation. In the first year of registration, all research scholars are required to complete the course work for one semester following their provisional registration as a part of the Ph.D. program. It is mandatory to complete the course work in first 4 semesters to stay in the Ph.D. program.

If a student fails to complete the coursework in first 4 semesters, will have to leave the program.

II. Earning a minimum of 12 total credits and a maximum of 16, is required.

III. Usually a course refers to a 'paper' and is a component of an academic program. Courses in Ph.D. course work shall be of two kinds: Core and Elective.

IV. A core course is a compulsory paper to be studied by all the scholars to complete the requirements of the Ph.D. degree.

V. Elective course is a course which is discipline specific and provided by the particular department from the main discipline or from a sister/related discipline which supports the main discipline, on mutual consent of the concerned departments.

VI. One credit equal to 15 contact hours for theory-based teaching or 30 hours of contact time for practical or activity-based teaching.

VII. The number of credits is given in the form L: T: P, where L indicates the number of contact hours of lecture, and T the number of contact hours for tutorials, P stands for laboratory credits.

VIII. The credits are distributed as follows:

Paper Code	Paper	Course type	Credit	L	T	P
PHD-ARM-101	Advanced Research Methodology	Core	4	3	1	0
PHD-DSC-102	Discipline Specific Course	Elective	4	3	1	0
PHD-RPE-103	Research and Publication Ethics	Core	2	1	1	0
PHD-SEM-104	Academic Writing, Literature Review and Seminar	Skill	2	0	1	2
	Total		12			

IX. All Ph.D., entrants irrespective of discipline, shall be trained in teaching proficiency related to teaching/education/pedagogy/writing related to their chosen Ph.D. subject during their doctoral training period, that include assigning 4-6 hours per week of teaching/ research assistantship for conducting tutorial or laboratory work and evaluations.

X. Courses PHD-SEM 104 includes research work on research article writing, seminar presentation and course PHD-TP 105 includes pedagogical training. Both these courses will be assessed internally without Semester End Examination.

XI. CoE will conduct Term/ Semester End Exam in PHD-ARM-101, PHD-DSC-102, and PHD-RPE-103.

XII. PHD-TP 105 is a non-credit course and internal assessment will be marked on the detailed mark card of the course work.

XIII. Advance Research Methodology course will include common research methodology and subject specific research methodology.

XIV. Research Advisory Committee may provide choices in selecting the courses/ credits that facilitates the entrepreneur in the monetization of IP thus generated.

XV. RAC can also recommend UGC recognized online courses as part of the credit requirements for the Ph.D. program.

XVI.   Paper- will comprise of the following two activities:
   (a) External Assessment: Written Question Paper 70/39
   (b) Internal Assessment: 30/16
   Marks will be converted into letter grade and grade point as per following table:

Marks	Letter Grade	Grade Point
81-100	A+	10
76-80	A	9
66-75	B+	8
61-65	B	7
55-60	C	6
Less than 55	F	0

The computation of the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA) shall be done as per University Examination Ordinance or Examination Rules & Regulations issued time to time.

The result and grade sheet for the course work will carry pass/ fail result.

COURSE WORK PAPER

I.   Candidates who already hold an M. Phil. degree and have been accepted into the Ph.D. program, or those who have finished their M.Phil. Coursework and have been given permission to continue on to the Ph.D. in an integrated course, may be exempted from the Ph.D. course requirements by the Department. All additional applicants accepted into the Ph.D. program must complete the Ph.D. coursework required by the Department.

II. The NIILM University attendance rules, a minimum 75% attendance is must require, will be applied to all full-time research scholars. For the duration of their coursework, part-time research researchers must, nevertheless, adhere to the same rules.

III. A Ph.D. scholar has to obtain a minimum of 55% of marks or a minimum CGPA of 6.0 in the UGC 10-point scale (or an equivalent grade/CGPA in a point scale wherever grading system is followed) in the course work in order to be eligible to continue in the program and submit the thesis.

IV. Registration will be automatically canceled if the required course work is not completed with a minimum of 55% of marks/a minimum CGPA of 6.0 within the allotted time. If the course work is not finished within a year, the RAC and DRC may suggest a six-month extension or suggest that the registration be canceled with the DRC.

V.   There is no provision of improvement or special supplementary exam to be conducted. Coursework will be offered in four semesters of first two years with regular & supplementary exams to avail the opportunity to clear the coursework in 2 years. **Failure to complete the course in 2 years means that the student has to leave the program.**

Course Structure:

PHD-ARM-101	Advance Research Methodology in Hotel Management	Credit Distribution: L:3, T:1, P:0=4
Course Objectives:	To acquaint the students with research process. To train them in the research methods and designs and to equip them to take up researches	

	independently.
Unit 1	**Introduction to Research** a. Nature and aims of research b. Dimensions and types of research c. Theory and research d. The meaning of methodology e. Types of Methods of Research
Unit 2	**Research Planed Data Collection** a. Concept, logic, and research question/issues b. Variables, causal theory, and hypothesis c. Research Design and Collection of Data d. Sampling: Methods, Size, Errors e. Probability and non-probability f. Measurement and Scaling Techniques g. Issues in measurement: Qualitative and quantitative
Unit 3	**Data Processing** a. Analysis of quantitative data introduction to higher order statistics b. Editing, Coding and Classification of Data c. Analysis of qualitative data and Tabulation d. Introduction to advanced statistical techniques using SPSS e. Statistical Derivatives and Measures of Central Tendency f. Measures of Variation and Skewness g. Correlation and Simple Regression h. Diagrammatic and Graphic Presentation of Data
Unit 4	**Research Report Writing** a. Ethical issues in research b. APA style of writing concept c. APA style of writing: Referencing d. d. Research article writing
Unit 5	**Computer Application in Research** a. Introduction to MS Excel, Using Formulas and Functions b. Hand on to SPSS c. Features for Statistical Data Analysis d. Generating Charts/Graphs e. Introduction to MS Word, Features and Functions, Writing Report in MS Word f. Introduction to Open Office or Latex g. Creating Presentation in MS PowerPoint h. Introduction to Internet-Based Search i. Use of Advanced Research Techniques.

Recommended Readings:

1. Bayard, P. & Grayson, A. (1976). Introducing psychological research. London: McMillan.

2. Bordens, K.S. & Abbot, B.B. (2005). Research design and methods. New Delhi: Tata McGraw Hill.

3. Breakwell, G.M. Hammond, S. & Fife-Schaw, C. (1995). Research Methods in Psychology. New Delhi: Sage Publications.

4. Cresswell, J.W. (1994) Research design: L Qualitative and quantitative approaches. Thousand Oaks, CA: Sage Publication.

5. Drew, C.J.: Hardman, M.L. & Hart, W.A. (1996). Designing and conducting research: Inquiry in education and social science. New York: Allyn & Bacon.

6. Kerlinger, F.N. (1982). Foundations of behavioural research. Delhi: Subject Publication.

7. Nation, J.R. (1997). Research Methods. New Jersey: Prentice Hall.

8. Willing, C. & Stainton-Rogers, W. (Eds.) (2008). The Sage Handbook of Qualitative Research in Psychology. New Delhi: Sage Publications.

PHD-DSC-102	Discipline Specific Course (Hotel Management)	Credit Distribution: L:3, T:1, P:0=4
Learning Outcomes	• Understand the fundamental concepts of **measurement theory**, which underpins the process of quantifying variables. • Study the key measures of central tendency such as **mean**, **median**, and **mode**. • Understand **SEM** and its application in analysing relationships between multiple variables.	
Unit 1	Introduction Scientific investigation, Statistics in scientific inquiry, Basic research, Development and applied research, Starter terminology, Research design and internal validity, Research strategy: qualitative and quantitative, The research process, Planning a research project and formulating research questions, Structuring the research proposal, Review of literature, Issue of plagiarism, Case study approach.	
Unit 2	Measurement and Scaling Theory of measurement, Comparative scaling, Primary scales of measurement, Non-comparative scaling, Questionnaire design: Questionnaire design process, Focus group discussion, Pre-testing questionnaire, Construct validity and reliability.	
Unit 3	Sample Design and Data Collection Census and sample, Sampling design process and external validity, Classification of sampling techniques: probability and non-probability sampling techniques, Sample size determination, Data collection process, Online data collection, and Interaction content on web.	
Unit 4	Descriptive Statistics Data preparation, Data analysis strategy and conclusion validity, Measures of Central Tendency, Measures of Dispersion-range, Quartile Deviation, Mean Deviation, Standard Deviation, Skewness & Kurtosis, Probability concepts, Theoretical Distributions: Binomial Distributions, Normal Distribution, and Poisson distribution, Correlation and Covariance, Statistical software packages.	
Unit 5	Inferential Statistics and Multivariate Methods Sampling Distribution, 1-	

	Sample Kolmogorov-Smirnov, z-test, Test of significance, t-test, Analysis of Variance(ANOVA), Simple linear regression, Multivariate regression, Moderation and mediation, Classification methods, Logistic, Binary, Probit, Factor Analysis, Cluster Analysis, Multi-Dimensional scaling, MANOVA, Structured Equation Modelling.
Unit 6	Nonparametric Statistics Chi-Square Distributions, Wilcoxon rank-sum test and Mann-Whitney test, Kruskal-Wallis test, Rank Correlation, Goodness-of-Fit Tests.

SUGGESTED READING

1) Reference Books V. Kumar: International Marketing Research; Prentice Hall of India

2) Hair, Anderson, Tatham and Black; Multivariate Data Analysis; Pearson Education

3) Michael, S. Lewis-Beck, Bryman, Alan E. and Tim, Futing Liao; The Sage encyclopedia of

4) Social Science Research Methods; Sage Publications Sherri, L. Jackson; Research Methods: A Modular Approach; Thomson Wadsworth

5) Yin, Robert K.; The Case Study Anthology; Sage Publications

6) Kaplan, David; Structural Equation Modeling: Foundations and Extensions; Sage

7) Publications

8) Sweet Stephen A.; Data analysis with SPSS; Allyn and Bacon

9) Barbara M. Byrne; Structural Equation Modeling with AMOS: Basic Concepts, Applications and Programming; Routledge

PHD-RPE-103	**Research and Publication Ethics**	**Credit Distribution: L:1, T:1, P:0=2**
Learning Outcomes	1. To have awareness about the publication ethics and publication misconducts. 2. To understand indexing and citation databases, open access publications, research metrics (citations, h-index, impact factor etc) 3. Develop hands-on skills to identify research misconduct and predatory publications.	
Unit 1	**Philosophy and Ethics (4 hrs)** 1. Introduction to philosophy: definition, nature and scope, concept, branches 2. Ethics: definition, moral philosophy, nature of moral judgements and	

	reactions
Unit 2	**Scientific Conduct (4 hrs)** 1. Ethics with respect to science and research 2. Intellectual honesty and research integrity 3. Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP) 4. Redundant publications: duplicate and overlapping publications, salami slicing 5. Selective reporting and misrepresentation of data
Unit 3	**Publication Ethics (7 hrs)** 1. Publication ethics: definition, introduction and importance 2. Best practices / standards setting initiatives and guidelines: COPE, WAME, etc. 3. Conflicts of interest 4. Publication misconduct: definition, concept, problems that lead to unethical behavior and vice versa, types 5. Violation of publication ethics, authorship and contributor ship 6. Identification of publication misconduct, complaints and appeals 7. Predatory publishers and journals
Unit 4 Practice	**Open Access Publishing (4 hrs)** 1. Open access publications and initiatives 2. SHERPA/ROMEO online resource to check publisher copyright & self-archiving policies 3. Software tool to identify predatory publications developed by SPPU 4. Journal finder / journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer Journal Suggester, etc.
Unit 5 Practice	**Publication Misconduct (4 hrs)** A. Group Discussions (2 hrs.) 1. Subject specific ethical issues, FFP, authorship 2. Conflicts of interest 3. Complaints and appeals: examples and fraud from India and abroad B. Software tools (2 hrs.) Use of plagiarism software like Turnitin, Urkund and other open source software tools
Unit 6 Practice	**Databases and Research Metrics (7 hrs)** A. Databases (4 hrs.) 1. Indexing databases 2. Citation databases: Web of Science, Scopus etc. B. Research Metrics (3 hrs.) 1. Impact Factor of journal as per Journal Citation Report, SNIP, SJR, IPP, Cite Score

	2. Metrics: h-index, g-index, i10 index, altmetrics

Suggested Readings

1. Bird, A. (2006). Philosophy of Science. Routledge.
2. MacIntyre, A. (1967) A Short History of Ethics. London.
3. P. Chaddah, (2018) Ethics in Competitive Research: Do not get scooped; do not get plagiarized, ISBN:978-9387480865
4. National Academy of Sciences, National Academy of Engineering and Institute of Medicine. (2009). On Being a Scientist: A Guide to Responsible Conduct in Research: Third Edition. National Academies Press.
5. Rensik, D. B. (2011). What is ethics in research & why is it important. National Institute of Environmental Health Sciences, 1-10. Retrieved from https://www.niehs.nih.gov/resources/biothics/whatis/index.cfm
6. Beall, J. (2012). Predatory publishers are corrupting open access. Nature, 489(7415), 179-179. https://doi.org/10.1038/489179a

NIILM UNIVERSITY

Ph.D. Course Work in Journalism and Mass Communication

Academic Session 2024-25

Ph.D. Regulations Regarding Course Work

Clause 18: Ph.D. Ordinance NIILM University as per UGC Minimum Standards and Procedure for Award of Ph.D. Degrees Regulations 2022 with effect from academic session 2024-25

I. The coursework shall be treated as a prerequisite for Ph.D. preparation. In the first year of registration, all research scholars are required to complete the course work for one semester following their provisional registration as a part of the Ph.D. program. It is mandatory to complete the course work in first 4 semesters to stay in the Ph.D. program.

If a student fails to complete the coursework in first 4 semesters, will have to leave the program.

II. Earning a minimum of 12 total credits and a maximum of 16, is required.

III. Usually a course refers to a 'paper' and is a component of an academic program. Courses in Ph.D. course work shall be of two kinds: Core and Elective.

IV. A core course is a compulsory paper to be studied by all the scholars to complete the requirements of the Ph.D. degree.

V. Elective course is a course which is discipline specific and provided by the particular department from the main discipline or from a sister/related discipline which supports the main discipline, on mutual consent of the concerned departments.

VI. One credit equal to 15 contact hours for theory-based teaching or 30 hours of contact time for practical or activity-based teaching.

VII. The number of credits is given in the form L: T: P, where L indicates the number of contact hours of lecture, and T the number of contact hours for tutorials, P stands for laboratory credits.

VIII. The credits are distributed as follows:

Paper Code	Paper	Course type	Credit	L	T	P
PHD-ARM-101	Advanced Research Methodology	Core	4	3	1	0
PHD-DSC-102	Discipline Specific Course	Elective	4	3	1	0
PHD-RPE-103	Research and Publication Ethics	Core	2	1	1	0
PHD-SEM-104	Academic Writing, Literature Review and Seminar	Skill	2	0	1	2
	Total		12			

IX. All Ph.D., entrants irrespective of discipline, shall be trained in teaching proficiency related to teaching/education/pedagogy/writing related to their chosen Ph.D. subject during their doctoral training period, that include assigning 4-6 hours per week of teaching/ research assistantship for conducting tutorial or laboratory work and evaluations.

X. Courses PHD-SEM 104 includes research work on research article writing, seminar presentation and course PHD-TP 105 includes pedagogical training. Both these courses will be assessed internally without Semester End Examination.

XI. CoE will conduct Term/ Semester End Exam in PHD-ARM-101, PHD-DSC-102, and PHD-RPE-103.

XII. PHD-TP 105 is a non-credit course and internal assessment will be marked on the detailed mark card of the course work.

XIII. Advance Research Methodology course will include common research methodology and subject specific research methodology.

XIV. Research Advisory Committee may provide choices in selecting the courses/ credits that facilitates the entrepreneur in the monetization of IP thus generated.

XV. RAC can also recommend UGC recognized online courses as part of the credit requirements for the Ph.D. program.

XVI. Paper- will comprise of the following two activities:
   (a) External Assessment: Written Question Paper 70/39
   (b) Internal Assessment: 30/16
   Marks will be converted into letter grade and grade point as per following table:

Marks	Letter Grade	Grade Point
81-100	A+	10
76-80	A	9
66-75	B+	8
61-65	B	7
55-60	C	6
Less than 55	F	0

The computation of the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA) shall be done as per University Examination Ordinance or Examination Rules & Regulations issued time to time.

The result and grade sheet for the course work will carry pass/ fail result.

COURSE WORK PAPER

I. Candidates who already hold an M. Phil. degree and have been accepted into the Ph.D. program, or those who have finished their M.Phil. Coursework and have been given permission to continue on to the Ph.D. in an integrated course, may be exempted from the Ph.D. course requirements by the Department. All additional applicants accepted into the Ph.D. program must complete the Ph.D. coursework required by the Department.

II. The NIILM University attendance rules, a minimum 75% attendance is must require, will be applied to all full-time research scholars. For the duration of their coursework, part-time research researchers must, nevertheless, adhere to the same rules.

III. A Ph.D. scholar has to obtain a minimum of 55% of marks or a minimum CGPA of 6.0 in the UGC 10-point scale (or an equivalent grade/CGPA in a point scale wherever grading system is followed) in the course work in order to be eligible to continue in the program and submit the thesis.

IV. Registration will be automatically canceled if the required course work is not completed with a minimum of 55% of marks/a minimum CGPA of 6.0 within the allotted time. If the course work is not finished within a year, the RAC and DRC may suggest a six-month extension or suggest that the registration be canceled with the DRC.

V. There is no provision of improvement or special supplementary exam to be conducted. Coursework will be offered in four semesters of first two years with regular & supplementary exams to avail the opportunity to clear the coursework in 2 years. **Failure to complete the course in 2 years means that the student has to leave the program.**

Course Structure:

PHD-ARM-101	Advance Research Methodology in Journalism and Mass Communication	Credit Distribution: L:3, T:1, P:0=4
Course Objectives:	To acquaint the students with research process. To train them in the research methods and designs and to equip them to take up researches	

	independently.
Unit 1	**Introduction to Research** a. Nature and aims of research b. Dimensions and types of research c. Theory and research d. The meaning of methodology e. Types of Methods of Research
Unit 2	**Research Planed Data Collection** a. Concept, logic, and research question/issues b. Variables, causal theory, and hypothesis c. Research Design and Collection of Data d. Sampling: Methods, Size, Errors e. Probability and non-probability f. Measurement and Scaling Techniques g. Issues in measurement: Qualitative and quantitative
Unit 3	**Data Processing** a. Analysis of quantitative data introduction to higher order statistics b. Editing, Coding and Classification of Data c. Analysis of qualitative data and Tabulation d. Introduction to advanced statistical techniques using SPSS e. Statistical Derivatives and Measures of Central Tendency f. Measures of Variation and Skewness g. Correlation and Simple Regression h. Diagrammatic and Graphic Presentation of Data
Unit 4	**Research Report Writing** a. Ethical issues in research b. APA style of writing concept c. APA style of writing: Referencing d. d. Research article writing
Unit 5	**Computer Application in Research** a. Introduction to MS Excel, Using Formulas and Functions b. Hand on to SPSS c. Features for Statistical Data Analysis d. Generating Charts/Graphs e. Introduction to MS Word, Features and Functions, Writing Report in MS Word f. Introduction to Open Office or Latex g. Creating Presentation in MS PowerPoint h. Introduction to Internet-Based Search i. Use of Advanced Research Techniques.

Recommended Readings:

1. Bayard, P. & Grayson, A. (1976). Introducing psychological research. London: McMillan.

2. Bordens, K.S. & Abbot, B.B. (2005). Research design and methods. New Delhi: Tata McGraw Hill.

3. Breakwell, G.M. Hammond, S. & Fife-Schaw, C. (1995). Research Methods in Psychology. New Delhi: Sage Publications.

4. Cresswell, J.W. (1994) Research design: L Qualitative and quantitative approaches. Thousand Oaks, CA: Sage Publication.

5. Drew, C.J.: Hardman, M.L. & Hart, W.A. (1996). Designing and conducting research: Inquiry in education and social science. New York: Allyn & Bacon.

6. Kerlinger, F.N. (1982). Foundations of behavioural research. Delhi: Subject Publication.

7. Nation, J.R. (1997). Research Methods. New Jersey: Prentice Hall.

8. Willing, C. & Stainton-Rogers, W. (Eds.) (2008). The Sage Handbook of Qualitative Research in Psychology. New Delhi: Sage Publications.

PHD-DSC-102	Discipline Specific Course (Journalism and Mass Communication)	Credit Distribution: L:3, T:1, P:0=4
Learning Outcomes	• Understand the fundamentals of communication and media research. • Understand how the social, economic, cultural, technological, and political contexts influence communication research. • Study news and politics, ideological effects of media, media and violence, and media's influence on sexual behavior.	
Unit 1	**Introduction to Communication and Media Research** Sources and Methods of Acquiring Knowledge Perception, Inductive and Deductive Logics Meaning and Concept of Media and Communication Research Context in Communication Research Social, Economic, Cultural, Technological and Political, Development of Mass Media Research Evolution of Communication Research: Global Perspective; Communication Research in India	
Unit 2	**Communication Theories and Models** Theories in Communication: Normative Theories Theories in Learning-perception, Persuasion, Attitude and Public Opinion formation and Change - Dissonance Effects of Mass Communication Bullet Theory; Limited Effects Theory, Uses and Gratifications, Agenda Setting, Cultivation Theory, Diffusion of Innovations theory, Gerber Jacobson New approaches to communication theory -Dominant Paradigm, The paradigm shift. Aristotle, Shannon and Weaver and Lasswell's model, Braddock's model (1958), Schramm & Osgood's model (1954) Newcomb's model (1953) Berlo's model (1960) Dance's model (1967),Spiral of Silence model (1974), Convergence model (1981),	
Unit 3	**Areas of Research in Media and Communication** Research in Print Media- Content, Readership and Coverage Media Framing and Priming, Audience Research-Radio-Television- New	

	Media
	Socio-Political Impact of the Internet Production, Audience Uses of Media, Studying Media Use Among Different Social Groups, Media Socialization and Group Identity
	Effects Research: News and Politics, Researching the Nature of News, Ideological Effects of the Media; Media and Violence, Media and Sexual Behaviour
	Research on Television Ratings, Advertising Research, Public Relations Research
	New Media Research
	Research in Traditional Folk and Alternative Media
	Ethical issues in media research
	Media research as a tool of reporting
Unit 4	**Steps and Process in Media Research**
	Study the situation
	Identification of research problem, Setting research objectives, Formulation of hypothesis
	Review of literature, deciding research design, Features of a good research design
	data collection, data analysis, Finding results
	Inference and outcomes, suggestion for further research
	Importance and significance of Reference and Bibliography in research
	Ethical issues in research: Plagiarism

Books and References:

1) R. John Bittner, Mass Communication, an Introduction, Theory and practice of mass media in society, Prentice Hall, 1989

2) Jensen, Klaus Bruhn, A Handbook of Media and Communication Research: Qualitative and Quantitative Methodologies, London: Routledge, 2002

3) Denis McQuail, Mass Communication Theory-An Introduction, Sage Publication, 2010

4) Arthur Asa Berger, Essentials of Mass Communication Theory, Sage Publication Inc, 1995.

5) Uma Narula, Dynamics of Mass Communication (Theory and practice), Atlantic Publisher, 2006.

6) C.R Kothari, Research Methodology: Methods and Techniques, New Age International, 2004

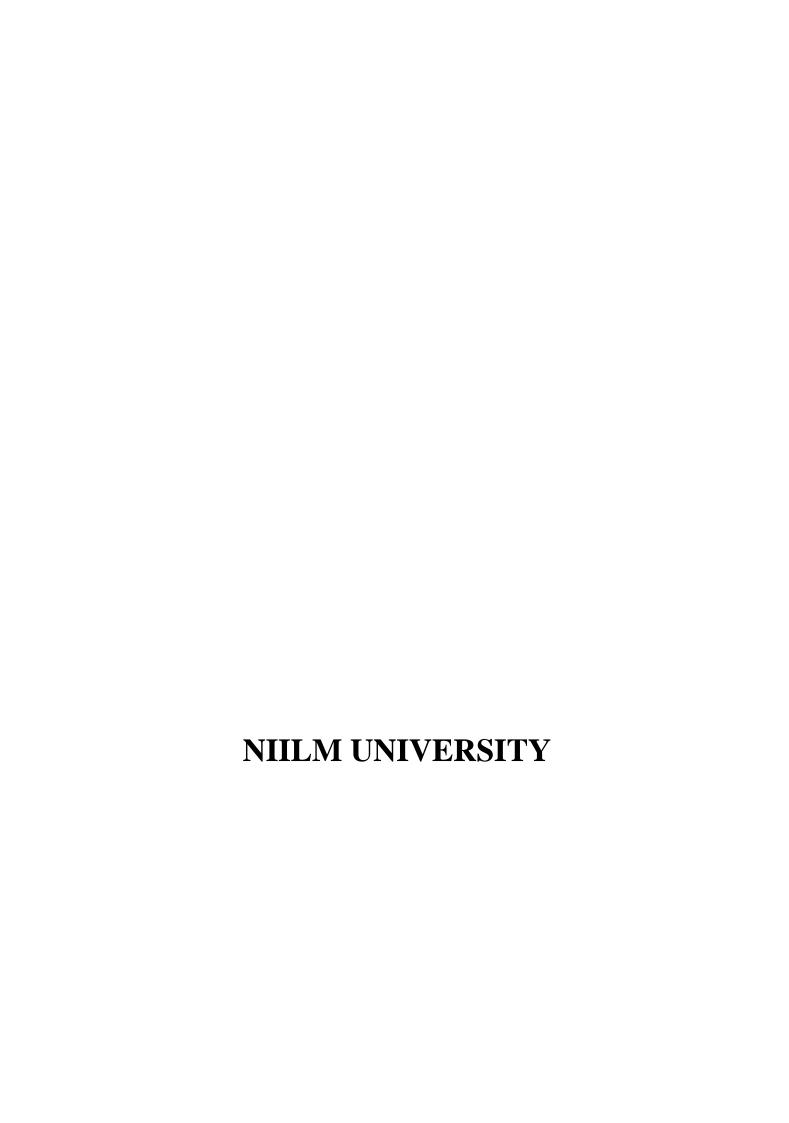7) J.S Yadava, Communication Research: Some reflections, IIMC Mineo

8) Ranjit Kumar, Research Methodology- A Step-by-Step Guide for Beginners, Pearson, 2005

9) Gerard Guhrie, Basic Research Methods: An Entry to Social Science Research, SAGE, 2010

10) Horning Priest Susanna - Doing Media Research, SAGE, 1996

11) Arthur Asa Berger, Media and Communication Research Methods: An Introduction to Qualitativeand Quantitative Approaches, Sage Publications, 2000

PHD-RPE-103	Research and Publication Ethics	Credit Distribution: L:1, T:1, P:0=2
Learning Outcomes	1. To have awareness about the publication ethics and publication misconducts. 2. To understand indexing and citation databases, open access publications, research metrics (citations, h-index, impact factor etc) 3. Develop hands-on skills to identify research misconduct and predatory publications.	
Unit 1	**Philosophy and Ethics (4 hrs)** 1. Introduction to philosophy: definition, nature and scope, concept, branches 2. Ethics: definition, moral philosophy, nature of moral judgements and reactions	
Unit 2	**Scientific Conduct (4 hrs)** 1. Ethics with respect to science and research 2. Intellectual honesty and research integrity 3. Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP) 4. Redundant publications: duplicate and overlapping publications, salami slicing 5. Selective reporting and misrepresentation of data	
Unit 3	**Publication Ethics (7 hrs)** 1. Publication ethics: definition, introduction and importance 2. Best practices / standards setting initiatives and guidelines: COPE, WAME, etc. 3. Conflicts of interest 4. Publication misconduct: definition, concept, problems that lead to unethical behavior and vice versa, types 5. Violation of publication ethics, authorship and contributor ship 6. Identification of publication misconduct, complaints and appeals	

	7. Predatory publishers and journals
Unit 4 Practice	**Open Access Publishing (4 hrs)** 1. Open access publications and initiatives 2. SHERPA/ROMEO online resource to check publisher copyright & self-archiving policies 3. Software tool to identify predatory publications developed by SPPU 4. Journal finder / journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer Journal Suggester, etc.
Unit 5 Practice	**Publication Misconduct (4 hrs)** A. Group Discussions (2 hrs.) 1. Subject specific ethical issues. FFP, authorship 2. Conflicts of interest 3. Complaints and appeals: examples and fraud from India and abroad B. Software tools (2 hrs.) Use of plagiarism software like Turnitin, Urkund and other open source software tools
Unit 6 Practice	**Databases and Research Metrics (7 hrs)** A. Databases (4 hrs.) 1. Indexing databases 2. Citation databases: Web of Science, Scopus etc. B. Research Metrics (3 hrs.) 1. Impact Factor of journal as per Journal Citation Report, SNIP, SJR, IPP, Cite Score 2. Metrics: h-index, g-index, i10 index, altmetrics

Suggested Readings

1. Bird, A. (2006). Philosophy of Science. Routledge.
2. MacIntyre, A. (1967) A Short History of Ethics. London.
3. P. Chaddah, (2018) Ethics in Competitive Research: Do not get scooped; do not get plagiarized, ISBN:978-9387480865
4. National Academy of Sciences, National Academy of Engineering and Institute of Medicine. (2009). On Being a Scientist: A Guide to Responsible Conduct in Research: Third Edition. National Academies Press.
5. Rensik, D. B. (2011). What is ethics in research & why is it important. National Institute of Environmental Health Sciences, 1-10. Retrieved from https://www.niehs.nih.gov/resources/biothics/whatis/index.cfm
6. Beall, J. (2012). Predatory publishers are corrupting open access. Nature, 489(7415), 179-179. https://doi.org/10.1038/489179a

NIILM UNIVERSITY

Ph.D. Course Work in Law

Academic Session 2024-25

Ph.D. Regulations Regarding Course Work

Clause 18: Ph.D. Ordinance NIILM University as per UGC Minimum Standards and Procedure for Award of Ph.D. Degrees Regulations 2022 with effect from academic session 2024-25

I. The coursework shall be treated as a prerequisite for Ph.D. preparation. In the first year of registration, all research scholars are required to complete the course work for one semester following their provisional registration as a part of the Ph.D. program. It is mandatory to complete the course work in first 4 semesters to stay in the Ph.D. program.

If a student fails to complete the coursework in first 4 semesters, will have to leave the program.

II.   Earning a minimum of 12 total credits and a maximum of 16, is required.

III. Usually a course refers to a 'paper' and is a component of an academic program. Courses in Ph.D. course work shall be of two kinds: Core and Elective.

IV.   A core course is a compulsory paper to be studied by all the scholars to complete the requirements of the Ph.D. degree.

V.   Elective course is a course which is discipline specific and provided by the particular department from the main discipline or from a sister/related discipline which supports the main discipline, on mutual consent of the concerned departments.

VI.   One credit equal to 15 contact hours for theory-based teaching or 30 hours of contact time for practical or activity-based teaching.

VII. The number of credits is given in the form L: T: P, where L indicates the number of contact hours of lecture, and T the number of contact hours for tutorials, P stands for laboratory credits.

VIII. The credits are distributed as follows:

Paper Code	Paper	Course type	Credit	L	T	P
PHD-ARM-101	Advanced Research Methodology	Core	4	3	1	0
PHD-DSC-102	Discipline Specific Course	Elective	4	3	1	0
PHD-RPE-103	Research and Publication Ethics	Core	2	1	1	0
PHD-SEM-104	Academic Writing, Literature Review and Seminar	Skill	2	0	1	2
	Total		12			

IX.   All Ph.D., entrants irrespective of discipline, shall be trained in teaching proficiency related to teaching/education/pedagogy/writing related to their chosen Ph.D. subject during their doctoral training period, that include assigning 4-6 hours per week of teaching/ research assistantship for conducting tutorial or laboratory work and evaluations.

X.   Courses PHD-SEM 104 includes research work on research article writing, seminar presentation and course PHD-TP 105 includes pedagogical training. Both these courses will be assessed internally without Semester End Examination.

XI.   CoE will conduct Term/ Semester End Exam in PHD-ARM-101, PHD-DSC-102, and PHD-RPE-103.

XII. PHD-TP 105 is a non-credit course and internal assessment will be marked on the detailed mark card of the course work.

XIII. Advance Research Methodology course will include common research methodology and subject specific research methodology.

XIV. Research Advisory Committee may provide choices in selecting the courses/ credits that facilitates the entrepreneur in the monetization of IP thus generated.

XV.   RAC can also recommend UGC recognized online courses as part of the credit requirements for the Ph.D. program.

XVI.   Paper- will comprise of the following two activities:
   (a) External Assessment: Written Question Paper 70/39
   (b) Internal Assessment: 30/16
   Marks will be converted into letter grade and grade point as per following table:

Marks	Letter Grade	Grade Point
81-100	A+	10
76-80	A	9
66-75	B+	8
61-65	B	7
55-60	C	6
Less than 55	F	0

The computation of the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA) shall be done as per University Examination Ordinance or Examination Rules & Regulations issued time to time.

The result and grade sheet for the course work will carry pass/ fail result.

COURSE WORK PAPER

I.   Candidates who already hold an M. Phil. degree and have been accepted into the Ph.D. program, or those who have finished their M.Phil. Coursework and have been given permission to continue on to the Ph.D. in an integrated course, may be exempted from the Ph.D. course requirements by the Department. All additional applicants accepted into the Ph.D. program must complete the Ph.D. coursework required by the Department.

II.   The NIILM University attendance rules, a minimum 75% attendance is must require, will be applied to all full-time research scholars. For the duration of their coursework, part-time research researchers must, nevertheless, adhere to the same rules.

III.   A Ph.D. scholar has to obtain a minimum of 55% of marks or a minimum CGPA of 6.0 in the UGC 10-point scale (or an equivalent grade/CGPA in a point scale wherever grading system is followed) in the course work in order to be eligible to continue in the program and submit the thesis.

IV.   Registration will be automatically canceled if the required course work is not completed with a minimum of 55% of marks/a minimum CGPA of 6.0 within the allotted time. If the course work is not finished within a year, the RAC and DRC may suggest a six-month extension or suggest that the registration be canceled with the DRC.

V.   There is no provision of improvement or special supplementary exam to be conducted. Coursework will be offered in four semesters of first two years with regular & supplementary exams to avail the opportunity to clear the coursework in 2 years. **Failure to complete the course in 2 years means that the student has to leave the program.**

Course Structure:

PHD-ARM-101	Advance Research Methodology in Law	Credit Distribution: L:3, T:1, P:0=4
Course Objectives:	To acquaint the students with research process. To train them in the research methods and designs and to equip them to take up researches	

	independently.
Unit 1	**Introduction to Research**
	a. Nature and aims of research
	b. Dimensions and types of research
	c. Theory and research
	d. The meaning of methodology
	e. Types of Methods of Research
Unit 2	**Research Planed Data Collection**
	a. Concept, logic, and research question/issues
	b. Variables, causal theory, and hypothesis
	c. Research Design and Collection of Data
	d. Sampling: Methods, Size, Errors
	e. Probability and non-probability
	f. Measurement and Scaling Techniques
	g. Issues in measurement: Qualitative and quantitative
Unit 3	**Data Processing**
	a. Analysis of quantitative data introduction to higher order statistics
	b. Editing, Coding and Classification of Data
	c. Analysis of qualitative data and Tabulation
	d. Introduction to advanced statistical techniques using SPSS
	e. Statistical Derivatives and Measures of Central Tendency
	f. Measures of Variation and Skewness
	g. Correlation and Simple Regression
	h. Diagrammatic and Graphic Presentation of Data
Unit 4	**Research Report Writing**
	a. Ethical issues in research
	b. APA style of writing concept
	c. APA style of writing: Referencing
	d. d. Research article writing
Unit 5	**Computer Application in Research**
	a. Introduction to MS Excel, Using Formulas and Functions
	b. Hand on to SPSS
	c. Features for Statistical Data Analysis
	d. Generating Charts/Graphs
	e. Introduction to MS Word, Features and Functions, Writing Report in MS Word
	f. Introduction to Open Office or Latex
	g. Creating Presentation in MS PowerPoint
	h. Introduction to Internet-Based Search
	i. Use of Advanced Research Techniques.

Recommended Readings:

1. Bayard, P. & Grayson, A. (1976). Introducing psychological research. London: McMillan.

2. Bordens, K.S. & Abbot, B.B. (2005). Research design and methods. New Delhi: Tata McGraw Hill.

3. Breakwell, G.M. Hammond, S. & Fife-Schaw, C. (1995). Research Methods in Psychology. New Delhi: Sage Publications.

4. Cresswell, J.W. (1994) Research design: L Qualitative and quantitative approaches. Thousand Oaks, CA: Sage Publication.

5. Drew, C.J.: Hardman, M.L. & Hart, W.A. (1996). Designing and conducting research: Inquiry in education and social science. New York: Allyn & Bacon.

6. Kerlinger, F.N. (1982). Foundations of behavioural research. Delhi: Subject Publication.

7. Nation, J.R. (1997). Research Methods. New Jersey: Prentice Hall.

8. Willing, C. & Stainton-Rogers, W. (Eds.) (2008). The Sage Handbook of Qualitative Research in Psychology. New Delhi: Sage Publications.

PHD-DSC-102	Discipline Specific Course (LAW:- Concepts Developments and Social Changes)	Credit Distribution: L:3, T:1, P:0=4
Learning Outcomes	• Understand the philosophical foundations of Classical Natural Law theory. • Analyze international obligations for safeguarding human rights during conflict and displacement. • Study significant reforms influenced by legal scholars and the judiciary in India.	
Unit 1	1) Classical Natural LAW Theory 2) Analytical LAW Theory 3) Doctrine of Social Solidarity and Social Engineering 4) Realist Theory	
Unit 2	1) Meaning and Definition and generation of Human Rights. 2) Human Rights of Women, elderly people. 3) Rights of refuges prisoners of War, under Public International Law 4) Role of UNO and NGO's under International and Internal laws	
Unit 3	1) Role of Law commission of India and Role of judges and jurists in legal Reforms: 2) Legal Research and legal developments	
Unit 4	1) Trends in Banking System in India 2) Information Technology automation and legal aspects 3) Smart card 4) Use of Expert system	

References:

1) A.V. Dias: Textbook on Jurisprudence
2) Paton: Legal Theory
3) B.N. Tripathi: Jurisprudence
4) Salmond: Jurisprudence
5) Oppenheim: public international Law

6) M.P. tandon: Public International Law
7) H.O. Aggarwal: International Law and human rights.
8) H.O. Aggarwal: Human Rights.
9) Deports of Law Commission of India

PHD-DSC-102	Discipline Specific Course (Recant trends in Law)	Credit Distribution: L:3, T:1, P:0=4
Learning Outcomes	• Understand the evolution of criminal law in response to modern societal challenges. • Understand the role of modern tools in improving efficiency, accuracy, and justice in the criminal justice system. • Study the role of the judiciary in interpreting and shaping personal law in response to societal changes.	
Unit 1	1) Recent Trends in criminal Law 2) Modern Techniques in criminal investigations 3) Criminal justice in India: Primitivism to Post modernism	
Unit 2	1) Information Technology Issues and Challenges 2) Key concepts in ADR 3) IPR- Recent Trends	
Unit 3	1) Envision mental legislation and Policies 2) Contemporary issues relating to person laws in India 3) Emerging political issues in legal parlance India Legislative response	
Unit 4	1) Recent Trends and Challenges in International Law. 2) Globalization and its Impact on subjects 3) Cyber-warfare and Global health	

Reference:

1) Jain M.D. Constitution of India.
2) Jayapalan: Women and Human Rights
3) Leela krishnan P. Environment Law case-Book, levis nexis, 2006 (Reprint 2010)
4) Sutherland Edwin: Criminology and panology
5) P. Narayan on Intellectual Prosperty Law
6) B.L. Wodhera on Patent, Tradmarks and copyright Law
7) Pavan Guggal: Textbook on Cyber law.
8) Lecutes on Cyber Law by prof.: R S Rao ISBNI13 Gogia Law Agency.

PHD-DSC-102	Discipline Specific Course (Indian Constitutional Law and the New Challenges)	Credit Distribution: L:3, T:1, P:0=4
Learning Outcomes	• Understand the dynamics of coalition governments and the role of power politics in decision-making.	

	• Understand the balance between equality before the law and the need for social justice for marginalized groups. • Study the scope of these duties and how they complement the Fundamental Rights of citizens.
Unit 1	1) The Executive- Union & States Parliamentary/Presidential form of Governments- Suitability. President/Governor & Council of Ministers-Relationship. Coalition government, Power Politics. 2) Parliament & State Legislatures Composition of Legislature, Elections, Corrupt Practices. Role of the Legislature, Elections, Corrupt Practices 3) Judiciary in India, Independence of Judiciary, Appointment, Removal of the Judges, Code of Conduct for Judges. Power of Judicial Review, Writ Jurisdiction & other powers of the court, Judicial Activism. Separation of Powers, Relationship of Executive, Legislature & Courts.
Unit 2	1) Fundamental Rights, Definitions of State and Law. 2) Right to Equality, Reverse discrimination. 3) Political Freedoms of the citizen reasonableness of restrictions. 4) Right to life & personal liberty, various dimensions of the right to life and personal liberty. Secularism, right of the minorities.
Unit 3	1) Socio-economic rights, Directive principles of state policy-enforcement by the state relationship between directive principles & fundamental rights. 2) Doctrine of eminent domain, right to property 4. Parliamentary Privileges & Fundamental Rights. 3) Fundamental duties of the citizen.
Unit 4	1) Federalism, Co-operative federalism. 2) Legislative and Administrative relations. 3) Distribution of financial resources, Inter-State trade and commerce. 4) Amendment of the Constitution, Basic structure theory.

Reference:

1) Seervai, H.M.: Constitutional Law of India (3 Volumes).
2) Jain, M.P.: Indian Constitutional Law
3) Shukla, V.N.: Constitution of India
4) Basu, D.D.: Constitution of India
5) Bar Council of India: Constitution of India (Edited by Hidayatulla)
6) Ex. C.J. of India
7) Dr. Pal, Chander: Centre-State Relation and Co-operative Federalism.
8) Gupta, R.K: Centre State Fiscal Relation under the Indian Constitutional Law
9) Wheare, K.C.: Federal Government (1963)

PHD-RPE-103	Research and Publication Ethics	Credit Distribution: L:1, T:1, P:0=2
Learning Outcomes	1. To have awareness about the publication ethics and publication misconducts. 2. To understand indexing and citation databases, open access publications, research metrics (citations, h-index, impact factor etc) 3. Develop hands-on skills to identify research misconduct and predatory publications.	
Unit 1	**Philosophy and Ethics (4 hrs)** 1. Introduction to philosophy: definition, nature and scope, concept, branches 2. Ethics: definition, moral philosophy, nature of moral judgements and reactions	
Unit 2	**Scientific Conduct (4 hrs)** 1. Ethics with respect to science and research 2. Intellectual honesty and research integrity 3. Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP) 4. Redundant publications: duplicate and overlapping publications, salami slicing 5. Selective reporting and misrepresentation of data	
Unit 3	**Publication Ethics (7 hrs)** 1. Publication ethics: definition, introduction and importance 2. Best practices / standards setting initiatives and guidelines: COPE, WAME, etc. 3. Conflicts of interest 4. Publication misconduct: definition, concept, problems that lead to unethical behavior and vice versa, types 5. Violation of publication ethics, authorship and contributor ship 6. Identification of publication misconduct, complaints and appeals 7. Predatory publishers and journals	
Unit 4 Practice	**Open Access Publishing (4 hrs)** 1. Open access publications and initiatives 2. SHERPA/ROMEO online resource to check publisher copyright & self-archiving policies 3. Software tool to identify predatory publications developed by SPPU 4. Journal finder / journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer Journal Suggester, etc.	
Unit 5 Practice	**Publication Misconduct (4 hrs)** A. Group Discussions (2 hrs.)	

	1. Subject specific ethical issues, FFP, authorship
	2. Conflicts of interest
	3. Complaints and appeals: examples and fraud from India and abroad
	B. Software tools (2 hrs.)
	Use of plagiarism software like Turnitin, Urkund and other open source software tools
Unit 6 Practice	**Databases and Research Metrics (7 hrs)**
	A. Databases (4 hrs.)
	1. Indexing databases
	2. Citation databases: Web of Science, Scopus etc.
	B. Research Metrics (3 hrs.)
	1. Impact Factor of journal as per Journal Citation Report, SNIP, SJR, IPP, Cite Score
	2. Metrics: h-index, g-index, i10 index, altmetrics

Suggested Readings

1. Bird, A. (2006). Philosophy of Science. Routledge.
2. MacIntyre, A. (1967) A Short History of Ethics. London.
3. P. Chaddah, (2018) Ethics in Competitive Research: Do not get scooped; do not get plagiarized, ISBN:978-9387480865
4. National Academy of Sciences, National Academy of Engineering and Institute of Medicine. (2009). On Being a Scientist: A Guide to Responsible Conduct in Research: Third Edition. National Academies Press.
5. Rensik, D. B. (2011). What is ethics in research & why is it important. National Institute of Environmental Health Sciences, 1-10. Retrieved from https://www.niehs.nih.gov/resources/biothics/whatis/index.cfm
6. Beall, J. (2012). Predatory publishers are corrupting open access. Nature, 489(7415), 179-179. https://doi.org/10.1038/489179a

NIILM UNIVERSITY

Ph.D. Course Work in Library and Info. Science

Academic Session 2024-25

Ph.D. Regulations Regarding Course Work

Clause 18: Ph.D. Ordinance NIILM University as per UGC Minimum Standards and Procedure for Award of Ph.D. Degrees Regulations 2022 with effect from academic session 2024-25

I. The coursework shall be treated as a prerequisite for Ph.D. preparation. In the first year of registration, all research scholars are required to complete the course work for one semester following their provisional registration as a part of the Ph.D. program. It is mandatory to complete the course work in first 4 semesters to stay in the Ph.D. program. If a student fails to complete the coursework in first 4 semesters, will have to leave the program.

II. Earning a minimum of 12 total credits and a maximum of 16, is required.

III. Usually a course refers to a 'paper' and is a component of an academic program. Courses in Ph.D. course work shall be of two kinds: Core and Elective.

IV. A core course is a compulsory paper to be studied by all the scholars to complete the requirements of the Ph.D. degree.

V. Elective course is a course which is discipline specific and provided by the particular department from the main discipline or from a sister/related discipline which supports the main discipline, on mutual consent of the concerned departments.

VI. One credit equal to 15 contact hours for theory-based teaching or 30 hours of contact time for practical or activity-based teaching.

VII. The number of credits is given in the form L: T: P, where L indicates the number of contact hours of lecture, and T the number of contact hours for tutorials, P stands for laboratory credits.

VIII. The credits are distributed as follows:

Paper Code	Paper	Course type	Credit	L	T	P
PHD-ARM-101	Advanced Research Methodology	Core	4	3	1	0
PHD-DSC-102	Discipline Specific Course	Elective	4	3	1	0
PHD-RPE-103	Research and Publication Ethics	Core	2	1	1	0
PHD-SEM-104	Academic Writing, Literature Review and Seminar	Skill	2	0	1	2
	Total		12			

IX. All Ph.D., entrants irrespective of discipline, shall be trained in teaching proficiency related to teaching/education/pedagogy/writing related to their chosen Ph.D. subject during their doctoral training period, that include assigning 4-6 hours per week of teaching/ research assistantship for conducting tutorial or laboratory work and evaluations.

X. Courses PHD-SEM 104 includes research work on research article writing, seminar presentation and course PHD-TP 105 includes pedagogical training. Both these courses will be assessed internally without Semester End Examination.

XI. CoE will conduct Term/ Semester End Exam in PHD-ARM-101, PHD-DSC-102, and PHD-RPE-103.

XII. PHD-TP 105 is a non-credit course and internal assessment will be marked on the detailed mark card of the course work.

XIII. Advance Research Methodology course will include common research methodology and subject specific research methodology.

XIV. Research Advisory Committee may provide choices in selecting the courses/ credits that facilitates the entrepreneur in the monetization of IP thus generated.

XV. RAC can also recommend UGC recognized online courses as part of the credit requirements for the Ph.D. program.

XVI. Paper- will comprise of the following two activities:

(a) **External Assessment: Written Question Paper 70/39**

(b) Internal Assessment: 30/16

Marks will be converted into letter grade and grade point as per following table:

Marks	Letter Grade	Grade Point
81-100	A+	10
76-80	A	9
66-75	B+	8
61-65	B	7
55-60	C	6
Less than 55	F	0

The computation of the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA) shall be done as per University Examination Ordinance or Examination Rules & Regulations issued time to time.

The result and grade sheet for the course work will carry pass/ fail result.

COURSE WORK PAPER

I. Candidates who already hold an M. Phil. degree and have been accepted into the Ph.D. program, or those who have finished their M.Phil. Coursework and have been given permission to continue on to the Ph.D. in an integrated course, may be exempted from the Ph.D. course requirements by the Department. All additional applicants accepted into the Ph.D. program must complete the Ph.D. coursework required by the Department.

II. The NIILM University attendance rules, a minimum 75% attendance is must require, will be applied to all full-time research scholars. For the duration of their coursework, part-time research researchers must, nevertheless, adhere to the same rules.

III. A Ph.D. scholar has to obtain a minimum of 55% of marks or a minimum CGPA of 6.0 in the UGC 10-point scale (or an equivalent grade/CGPA in a point scale wherever grading system is followed) in the course work in order to be eligible to continue in the program and submit the thesis.

IV. Registration will be automatically canceled if the required course work is not completed with a minimum of 55% of marks/a minimum CGPA of 6.0 within the allotted time. If the course work is not finished within a year, the RAC and DRC may suggest a six-month extension or suggest that the registration be canceled with the DRC.

V. There is no provision of improvement or special supplementary exam to be conducted. Coursework will be offered in four semesters of first two years with regular & supplementary exams to avail the opportunity to clear the coursework in 2 years. **Failure to complete the course in 2 years means that the student has to leave the program.**

Course Structure:

PHD-ARM-101	Advance Research Methodology in Library and Info. Science	Credit Distribution: L:3, T:1, P:0=4
Course Objectives:	To acquaint the students with research process. To train them in the research methods and designs and to equip them to take up researches independently.	
Unit 1	**Introduction to Research**	

	a. Nature and aims of research
	b. Dimensions and types of research
	c. Theory and research
	d. The meaning of methodology
	e. Types of Methods of Research
Unit 2	**Research Planed Data Collection** a. Concept, logic, and research question/issues b. Variables, causal theory, and hypothesis c. Research Design and Collection of Data d. Sampling: Methods, Size, Errors e. Probability and non-probability f. Measurement and Scaling Techniques g. Issues in measurement: Qualitative and quantitative
Unit 3	**Data Processing** a. Analysis of quantitative data introduction to higher order statistics b. Editing, Coding and Classification of Data c. Analysis of qualitative data and Tabulation d. Introduction to advanced statistical techniques using SPSS e. Statistical Derivatives and Measures of Central Tendency f. Measures of Variation and Skewness g. Correlation and Simple Regression h. Diagrammatic and Graphic Presentation of Data
Unit 4	**Research Report Writing** a. Ethical issues in research b. APA style of writing concept c. APA style of writing: Referencing d. d. Research article writing
Unit 5	**Computer Application in Research** a. Introduction to MS Excel, Using Formulas and Functions b. Hand on to SPSS c. Features for Statistical Data Analysis d. Generating Charts/Graphs e. Introduction to MS Word, Features and Functions, Writing Report in MS Word f. Introduction to Open Office or Latex g. Creating Presentation in MS PowerPoint h. Introduction to Internet-Based Search i. Use of Advanced Research Techniques.

Recommended Readings:

1. Bayard, P. & Grayson, A. (1976). Introducing psychological research. London: McMillan.
2. Bordens, K.S. & Abbot, B.B. (2005). Research design and methods. New Delhi: Tata McGraw Hill.

3. Breakwell, G.M. Hammond, S. & Fife-Schaw, C. (1995). Research Methods in Psychology. New Delhi: Sage Publications.

4. Cresswell, J.W. (1994) Research design: L Qualitative and quantitative approaches. Thousand Oaks, CA: Sage Publication.

5. Drew, C.J.: Hardman, M.L. & Hart, W.A. (1996). Designing and conducting research: Inquiry in education and social science. New York: Allyn & Bacon.

6. Kerlinger, F.N. (1982). Foundations of behavioural research. Delhi: Subject Publication.

7. Nation, J.R. (1997). Research Methods. New Jersey: Prentice Hall.

8. Willing, C. & Stainton-Rogers, W. (Eds.) (2008). The Sage Handbook of Qualitative Research in Psychology. New Delhi: Sage Publications.

PHD-DSC-102	Discipline Specific Course (Emerging trends in library and information science)	Credit Distribution: L:3, T:1, P:0=4
Learning Outcomes	- Students will understand the process of planning for digital libraries and digital information resources. - Students will gain insights into collection development, access management, and the use and evaluation of library resources. - Students will study data models, taxonomies, and faceted application of subject terminology (FAST). - Students will analyze trends in library and information science curricula, including emerging topics and research	
Unit 1	**Digital Libraries and Institutional Repositories** - Digital Library- Genesis, Definition, Objectives and Scope - Digitization process: Input Capture Devices - Digital Library Software: Greenstone and D space - Metadata: Types, Dublin Core - Institutional Repositories: Concept, Need	
Unit 2	**Information Society** - Information Society- Genesis, Characteristics and Implications - Changing Role of Library and Information Centers in Society - Information Industry: Generators, Providers and Intermediaries	
Unit 3	**Electronic Resources** - Electronic Resources- Concept, Features, Characteristics - Types of Electronic Resources - Collection Development of Electronic Resources - Access Channels for Electronic Resources	
Unit 4	**Information Services and Information Literacy** - Information services: Concept, Definition, Need - Alerting services: Computerized CAS and SDI - Information Literacy: Concept, Definition, Need - ACRL Standards for Information Literacy - Information Literacy Models	

Reference:-

1) Alman, S. W. (Ed.). (2017). *Emerging trends in library and information services: Social, mobile, and cloud-based solutions*. Rowman & Littlefield Publishers.
2) Baker, D., & Evans, W. (Eds.). (2021). *Trends, discovery, and people in the digital age: Exploring the academic and research library landscape*. Chandos Publishing.
3) Jadhav, V. (2020). *Emerging trends in library and information science*. Kalpaz Publications.
4) Hirsh, S. (Ed.). (2018). *Information services today: An introduction* (2nd Ed.). Rowman & Littlefield.
5) Gorman, M. (2015). *Our enduring values revisited: Librarianship in an ever-changing world*. ALA Editions.
6) White, M. D., & Marsh, E. E. (2006). *Content analysis: A flexible methodology*. Library Trends, 55(1), 22–45.
7) Woodsworth, A., & Penniman, W. D. (Eds.). (2013). *Advances in librarianship: Exploring the digital frontier* (Vol. 36). Emerald Group Publishing Limited.
8) Jain, P. (2022). *Trends and issues in library and information science*. Ess Ess Publications.
9) Dhamdhere, S. N. (2013). *Cloud computing in libraries*. Synergy Books.
10) Cassell, K. A., & Hiremath, U. (2020). *Reference and information services: An introduction* (5th ed.). ALA Neal-Schuman.

PHD-RPE-103	**Research and Publication Ethics**	**Credit Distribution: L:1, T:1, P:0=2**
Learning Outcomes	1. To have awareness about the publication ethics and publication misconducts. 2. To understand indexing and citation databases, open access publications, research metrics (citations, h-index, impact factor etc) 3. Develop hands-on skills to identify research misconduct and predatory publications.	
Unit 1	**Philosophy and Ethics (4 hrs)** 1. Introduction to philosophy: definition, nature and scope, concept, branches 2. Ethics: definition, moral philosophy, nature of moral judgements and reactions	
Unit 2	**Scientific Conduct (4 hrs)** 1. Ethics with respect to science and research 2. Intellectual honesty and research integrity 3. Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP)	

	4. Redundant publications: duplicate and overlapping publications, salami slicing 5. Selective reporting and misrepresentation of data
Unit 3	**Publication Ethics (7 hrs)** 1. Publication ethics: definition, introduction and importance 2. Best practices / standards setting initiatives and guidelines: COPE, WAME, etc. 3. Conflicts of interest 4. Publication misconduct: definition, concept, problems that lead to unethical behavior and vice versa, types 5. Violation of publication ethics, authorship and contributor ship 6. Identification of publication misconduct, complaints and appeals 7. Predatory publishers and journals
Unit 4 Practice	**Open Access Publishing (4 hrs)** 1. Open access publications and initiatives 2. SHERPA/ROMEO online resource to check publisher copyright & self-archiving policies 3. Software tool to identify predatory publications developed by SPPU 4. Journal finder / journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer Journal Suggester, etc.
Unit 5 Practice	**Publication Misconduct (4 hrs)** A. Group Discussions (2 hrs.) 1. Subject specific ethical issues, FFP, authorship 2. Conflicts of interest 3. Complaints and appeals: examples and fraud from India and abroad B. Software tools (2 hrs.) Use of plagiarism software like Turnitin, Urkund and other open source software tools
Unit 6 Practice	**Databases and Research Metrics (7 hrs)** A. Databases (4 hrs.) 1. Indexing databases 2. Citation databases: Web of Science, Scopus etc. B. Research Metrics (3 hrs.) 1. Impact Factor of journal as per Journal Citation Report, SNIP, SJR, IPP, Cite Score 2. Metrics: h-index, g-index, i10 index, altmetrics

Suggested Readings

1. Bird, A. (2006). Philosophy of Science. Routledge.
2. MacIntyre, A. (1967) A Short History of Ethics. London.

3. P. Chaddah, (2018) Ethics in Competitive Research: Do not get scooped; do not get plagiarized, ISBN:978-9387480865
4. National Academy of Sciences, National Academy of Engineering and Institute of Medicine. (2009). On Being a Scientist: A Guide to Responsible Conduct in Research: Third Edition. National Academies Press.
5. Rensik, D. B. (2011). What is ethics in research & why is it important. National Institute of Environmental Health Sciences, 1-10. Retrieved from https://www.niehs.nih.gov/resources/biothics/whatis/index.cfm
6. Beall, J. (2012). Predatory publishers are corrupting open access. Nature, 489(7415), 179-179. https://doi.org/10.1038/489179a

NIILM UNIVERSITY

Ph.D. Course Work in Management

Academic Session 2024-25

Ph.D. Regulations Regarding Course Work

Clause 18: Ph.D. Ordinance NIILM University as per UGC Minimum Standards and Procedure for Award of Ph.D. Degrees Regulations 2022 with effect from academic session 2024-25

I.   The coursework shall be treated as a prerequisite for Ph.D. preparation. In the first year of registration, all research scholars are required to complete the course work for one semester following their provisional registration as a part of the Ph.D. program. It is mandatory to complete the course work in first 4 semesters to stay in the Ph.D. program.

If a student fails to complete the coursework in first 4 semesters, will have to leave the program.

II. Earning a minimum of 12 total credits and a maximum of 16, is required.

III. Usually a course refers to a 'paper' and is a component of an academic program. Courses in Ph.D. course work shall be of two kinds: Core and Elective.

IV. A core course is a compulsory paper to be studied by all the scholars to complete the requirements of the Ph.D. degree.

V. Elective course is a course which is discipline specific and provided by the particular department from the main discipline or from a sister/related discipline which supports the main discipline, on mutual consent of the concerned departments.

VI. One credit equal to 15 contact hours for theory-based teaching or 30 hours of contact time for practical or activity-based teaching.

VII. The number of credits is given in the form L: T: P, where L indicates the number of contact hours of lecture, and T the number of contact hours for tutorials, P stands for laboratory credits.

VIII. The credits are distributed as follows:

Paper Code	Paper	Course type	Credit	L	T	P
PHD-ARM-101	Advanced Research Methodology	Core	4	3	1	0
PHD-DSC-102	Discipline Specific Course	Elective	4	3	1	0
PHD-RPE-103	Research and Publication Ethics	Core	2	1	1	0
PHD-SEM-104	Academic Writing, Literature Review and Seminar	Skill	2	0	1	2
	Total		12			

IX. All Ph.D., entrants irrespective of discipline, shall be trained in teaching proficiency related to teaching/education/pedagogy/writing related to their chosen Ph.D. subject during their doctoral training period, that include assigning 4-6 hours per week of teaching/ research assistantship for conducting tutorial or laboratory work and evaluations.

X. Courses PHD-SEM 104 includes research work on research article writing, seminar presentation and course PHD-TP 105 includes pedagogical training. Both these courses will be assessed internally without Semester End Examination.

XI. CoE will conduct Term/ Semester End Exam in PHD-ARM-101, PHD-DSC-102, and PHD-RPE-103.

XII. PHD-TP 105 is a non-credit course and internal assessment will be marked on the detailed mark card of the course work.

XIII. Advance Research Methodology course will include common research methodology and subject specific research methodology.

XIV. Research Advisory Committee may provide choices in selecting the courses/ credits that facilitates the entrepreneur in the monetization of IP thus generated.

XV. RAC can also recommend UGC recognized online courses as part of the credit requirements for the Ph.D. program.

XVI.   Paper- will comprise of the following two activities:
   (a) External Assessment: Written Question Paper 70/39
   (b) Internal Assessment: 30/16
   Marks will be converted into letter grade and grade point as per following table:

Marks	Letter Grade	Grade Point
81-100	A+	10
76-80	A	9
66-75	B+	8
61-65	B	7
55-60	C	6
Less than 55	F	0

The computation of the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA) shall be done as per University Examination Ordinance or Examination Rules & Regulations issued time to time.

The result and grade sheet for the course work will carry pass/ fail result.

COURSE WORK PAPER

I.   Candidates who already hold an M. Phil. degree and have been accepted into the Ph.D. program, or those who have finished their M.Phil. Coursework and have been given permission to continue on to the Ph.D. in an integrated course, may be exempted from the Ph.D. course requirements by the Department. All additional applicants accepted into the Ph.D. program must complete the Ph.D. coursework required by the Department.

II.   The NIILM University attendance rules, a minimum 75% attendance is must require, will be applied to all full-time research scholars. For the duration of their coursework, part-time research researchers must, nevertheless, adhere to the same rules.

III.   A Ph.D. scholar has to obtain a minimum of 55% of marks or a minimum CGPA of 6.0 in the UGC 10-point scale (or an equivalent grade/CGPA in a point scale wherever grading system is followed) in the course work in order to be eligible to continue in the program and submit the thesis.

IV.   Registration will be automatically canceled if the required course work is not completed with a minimum of 55% of marks/a minimum CGPA of 6.0 within the allotted time. If the course work is not finished within a year, the RAC and DRC may suggest a six-month extension or suggest that the registration be canceled with the DRC.

V.   There is no provision of improvement or special supplementary exam to be conducted. Coursework will be offered in four semesters of first two years with regular & supplementary exams to avail the opportunity to clear the coursework in 2 years. **Failure to complete the course in 2 years means that the student has to leave the program.**

Course Structure:

PHD-ARM-101	Advance Research Methodology in Management	Credit Distribution: L:3, T:1, P:0=4
Course Objectives:	To acquaint the students with research process. To train them in the research methods and designs and to equip them to take up researches	

	independently.
Unit 1	**Introduction to Research** a. Nature and aims of research b. Dimensions and types of research c. Theory and research d. The meaning of methodology e. Types of Methods of Research
Unit 2	**Research Planed Data Collection** a. Concept, logic, and research question/issues b. Variables, causal theory, and hypothesis c. Research Design and Collection of Data d. Sampling: Methods, Size, Errors e. Probability and non-probability f. Measurement and Scaling Techniques g. Issues in measurement: Qualitative and quantitative
Unit 3	**Data Processing** a. Analysis of quantitative data introduction to higher order statistics b. Editing, Coding and Classification of Data c. Analysis of qualitative data and Tabulation d. Introduction to advanced statistical techniques using SPSS e. Statistical Derivatives and Measures of Central Tendency f. Measures of Variation and Skewness g. Correlation and Simple Regression h. Diagrammatic and Graphic Presentation of Data
Unit 4	**Research Report Writing** a. Ethical issues in research b. APA style of writing concept c. APA style of writing: Referencing d. d. Research article writing
Unit 5	**Computer Application in Research** a. Introduction to MS Excel, Using Formulas and Functions b. Hand on to SPSS c. Features for Statistical Data Analysis d. Generating Charts/Graphs e. Introduction to MS Word, Features and Functions, Writing Report in MS Word f. Introduction to Open Office or Latex g. Creating Presentation in MS PowerPoint h. Introduction to Internet-Based Search i. Use of Advanced Research Techniques.

Recommended Readings:

1. Bayard, P. & Grayson, A. (1976). Introducing psychological research. London: McMillan.

2. Bordens, K.S. & Abbot, B.B. (2005). Research design and methods. New Delhi: Tata McGraw Hill.

3. Breakwell, G.M. Hammond, S. & Fife-Schaw, C. (1995). Research Methods in Psychology. New Delhi: Sage Publications.

4. Cresswell, J.W. (1994) Research design: L Qualitative and quantitative approaches. Thousand Oaks, CA: Sage Publication.

5. Drew, C.J.: Hardman, M.L. & Hart, W.A. (1996). Designing and conducting research: Inquiry in education and social science. New York: Allyn& Bacon.

6. Kerlinger, F.N. (1982). Foundations of behavioural research. Delhi: Subject Publication.

7. Nation, J.R. (1997). Research Methods. New Jersey: Prentice Hall.

8. Willing, C. & Stainton-Rogers, W. (Eds.) (2008). The Sage Handbook of Qualitative Research in Psychology. New Delhi: Sage Publications.

Select Any One from the following Elective Courses

PHD-DSC-102	Discipline Specific Course (Emerging Areas in Business Management)	Credit Distribution: L:3, T:1, P:0=4
Learning Outcomes	• Understand early writings in management and the foundations of scientific, administrative, and bureaucratic management. • Explore the structure and organization of banking in India, including the role of private and foreign banks. • Understand the regulatory framework and marketing challenges in mergers and acquisitions.	

Sr. No.	Paper Code	Course Title	
1	PHD-DSC-102	Emerging Areas in Business Management	Credit Distribution: L:3, T:1, P:0=4
2	PHD-DSC-102	Emerging areas in Accounting and Finance	Credit Distribution: L:3, T:1, P:0=4
3	PHD-DSC-102	Fundamentals of Marketing Management	Credit Distribution: L:3, T:1, P:0=4
4	PHD-DSC-102	Contemporary issues in Human Resource Management	Credit Distribution: L:3, T:1, P:0=4
Unit 1	Early Writing in Management, Classical theories: Scientific Management, Administrative management, Bureaucratic Management. Neo - Classical Theories: Behavioural Approach, Management Science Approach, System theory and Contingency Approach		

Unit 2	Accounting for Managers, methods of analysis, financial analysis and interpretation, comparative statement analysis, common-size statement, Ratio Analysis, Cash flow statement, fund flow statement, budgeting, fixed budget, flexible budget, performance budgeting, zero-base budgeting.
Unit 3	Management of Business Environment, Corporate Social Responsibility, Ethics and Values System in Indian Business.
Unit 4	Banking System in India: Organisation, Structure, Emerging scenario of Banking in India, Entry of Private and foreign Banks. Financial Innovation and Opportunities for Banks: Universal Banking, Banc assurance, Factoring and Securitization. Regulation of Banking Sector: Role of RBI: Prudential Norms and performance measurement, CRR, SLR, CRAR, NPA, Income recognition, Asset qualification and Provisioning norms, Basel accord. Risk Management in Banks, Asset liability Management Using traditional GAP and modern techniques.
Unit 5	Emerging Issues in Marketing: Green Marketing, Holistic Marketing, Network Marketing, Event Marketing, Nucleus Marketing; Mergers and Acquisitions: Regulatory Framework, Marketing Issues and Relevance in 21st century business Enterprises Competing through E-Marketing – Components of e-marketing, Impact of e-Marketing on marketing Strategy.

References:
1. Robbins, S.P. Management Concepts, Pearson Education India, New Delhi.
2. Koontz, Weilhrich, Management: A Global and Entrepreneurial Perspective, McGraw Hill.
3. Jones and George, Contemporary Management, McGraw Hill.
4. Richard L. Draft, The New Era of Management, Cengage India
5. Mullins. J, Management and OB, 8th Edn. Pearson Education
6. Stoner, J., Management, Prentice Hall of India., New Delhi
7. Koontz.Essentials of Management, Tata McGraw-Hill, 8th Ed.,
8. Chandan, J.S. Management Concepts and Strategies, Vikas Publishing House.
9. Hooda, R.P.: Statistics for Business and Economics, Macmillan, New Delhi.
10. Heinz; Kohler: Statistics for Business & Economics,. Harper Collins; New York.

PHD-DSC-102	Discipline Specific Course(Emerging areas in Accounting and Finance)	Credit Distribution: L:3, T:1, P:0=4
Learning Outcomes	• Understand concepts and applications of financial economics to decision-making. • Understand the assessment process for individuals, HUFs, firms, AOPs, and companies. • Understand international accounting and reporting standards, including human resource and environmental accounting.	
Unit 1	Accounting Concept and conventions, GAAP, Accounting Standards	

	in India, Harmonization of Indian Accounting Standards, Capital Budgeting, Methods of capital Budgeting, traditional and modern method of evaluation, working capital and management, cash management, inventory management, receivable management, Dividend decisions.
Unit 2	Changing Scenario of Indian Stock Market, Common Stock & bond Valuation Models, Fundamental Analysis, Technical Analysis., Efficient Market Theory, Capital Asset Pricing Model, Arbitrage Pricing Theory, Managed Portfolios and Performance Examination, Portfolio Revision & Portfolio Re-balancing. Concept and uses of financial economics, Financial Derivatives, Risk management.
Unit 3	Various Approaches to Corporate Valuation, Restructuring- Merger, Acquisition & Divestment, International Accounting and Reporting, International accounting standards , Human Resource Accounting: Need, Methods, Benefits Social Accounting: Environmental Accounting: Accounting for Price Level Changes
Unit 4	Direct and Indirect Taxes in India. Definitions, Residential Status and tax liability, Exempted Incomes, Computation of Income various heads of income, clubbing of income, set off and carry forward of losses, Deductions from Gross Total Income Salient features of assessment of individual, Hindu Undivided Family, Firm, Association of Person and Company. Tax deduction and source, Advanced Payment of Tax and GST. Research Papers based on the above syllabus to be discussed in the class.

Reference:

1. Ahuja, Girish& Gupta, Ravi: Practical Approach to Income Tax, Wealth Tax and Central Sales Tax, Bharat Law House Pvt. Ltd., New Delhi
2. Datey, V. S.: Indirect Taxes: Taxman Publications, New Delhi
3. Singhania, Vinod K.: Student Guide to Income Tax, Taxman Publications, New Delhi
4. Mehrotra H. C.: Income Tax Law and Accounts, Sahitya Bhawan, Agra
5. Bare Acts related to Income Tax, Central Sales Tax and Service Tax
6. Pandey, I. M., Financial management, Vikas Publishing House Pvt. Ltd., Noida, 2005, 10th ed.
7. Khan, M.Y. and Jain, P.K., Financial management Text, Cases and Problems, Tata McGraw Hill Publishing Company Ltd., New Delhi, 2007
8. Chandra, Prasanna, Financial management Theory and Practice, Tata McGraw-Hill Publishing Company Ltd., New Delhi, 2007
9. Chandra, P. 2002, Investment Analysis, Tata McGraw Hill
10. Bhalla, V.K. 2001. Investment Management: Security Analysis & Portfolio Management, S. Chand and Company, 8th Ed.
11. Fischer, D.E. and Jordan, R.J. 1995, Security Analysis & Portfolio Management, Prentice Hall of India

12. Fuller, R. J. and Farrel, J.L. 1987, Modern Investment & Security Analysis, McGraw Hill International.
13. Avdhani V.A. 1994, Security Analysis & Portfolio Management, Himalaya Publishing House
14. Hull, J.C. 1995, Introduction to Futures & Options Markets, Prentice Hall, Eaglewood Cliffs, New Jersey.
15. Levi, Maurice D: International Finance, McGraw- Hill, International Edition.
16. Singhania V.K. &SinghaniaKapil, Direct taxes law & practices, Taxmann.
17. Gupta, R. L. and Radhaswamy M.-Advanced Accoutning, S. Chand, New Delhi
18. Arunanandan and Raman-Advanced Accounting, Himalaya, Delhi
19. Maheshwari and Maheshwari-Advanced Accounting, Vikash, New Delhi
20. Hanif and Mukharjee-Advanced Accounting, Tata MacGrawHill, New Delhi
21. Jain and Narang-Advanced Accounting, Kalyani, New Delhi
22. Basu and Das-Practice in Accountancy, Rabindra Library, Kolkata

PHD-DSC-102	Discipline Specific Course (Fundamentals of Marketing Management)	Credit Distribution: L:3, T:1, P:0=4
Learning Outcomes	• Analyze how demographics, psychographics, lifestyle, society, culture, and social class influence consumer behaviour. • Understand the role and growing importance of IMC in marketing strategies. • Make strategic decisions about store location, design, layout, pricing, and promotion.	
Unit 1	**Consumer Behaviour** Introduction to Consumer Behavior; Scope & applications of Consumer Research. Demographics, Psychographics & Lifestyle; Influence of Society, Culture, Subculture and social class; Cross-Cultural Consumer Behavior; Consumer Perception; Consumer Learning; Consumer Attitudes & Beliefs: Models of Consumer Behavior.	
Unit 2	**Marketing of Services** Growth of Service Economy; Characteristics of Services; Services Classification. Service Management Trinity: Internal, External and Interactive Marketing. Service Product Development, Service Quality, Consumer Behavior in Services.	
Unit 3	**Sales and Distribution Management** Nature, Scope and objectives of Sales Management; Determination of size of sales force, Conducting sales training programs; Designing and Administering Compensation Plan; Distribution Channels: Role of Marketing Channels, Factors affecting choice of Distribution; Channel Structure; Channel Conflict and Co-ordination.	
Unit 4	**Integrated Marketing Communications**	

	The Role of IMC in Marketing, Reasons for Growing Importance of IMC, Direct Marketing; Sales and Trade Promotion; The Internet and Interactive Media; Personal Selling; Evaluating the Ethical Aspects of IMC.
Unit 5	**Product and Brand Management** Product Management: Product Concepts and Classification; Product Mix and Line Decisions; Product Development Process; New Product Launches, Concept and importance of Branding; Basic branding concepts: brand awareness, brand personality, brand image, brand identity, brand loyalty, brand equity; Major Branding Decisions: Brand Positioning and Re-launch: Brand building and communication. Brand Equity
Unit 6	**Retail Management** Retailing: Concept, Definition and Functions; Evolution of Retailing; Unorganized and organized retailing; Retailing Structure and Different Formats: Super Market, Specialty Store, Departmental Store, etc. Retail Store Location, Design and Layout Decision, Retail Pricing, Retail Promotion; Future of Retailing Research Papers based on the above syllabus to be discussed in the class.

Suggested Readings:

1. J. Zeithaml, V A and Bitner, M J. Services Marketing; 3rd edition; McGraw Hill, New Delhi; 2002.
2. Hoffman & Bateson; Essentials of Service Marketing; Thomson Learning; Mumbai.
3. Shankar, Ravi, Service Marketing, Excel, 2002.
4. Dalrymple, D J., Sales Management: Concepts and Cases. New York, John Wiley, 1989.
5. Still, R &Govoni, Sales Management, Prentice Hall Inc., 1988.
6. Khanna, K.K. Physical Distribution Management, Himalaya Publishing House, New Delhi.
7. Belch, George E and Belch, Michael A. Introduction to Advertising and Promotion. 3rd ed. Chicago; Irwin, 2002.
8. Berman. Bell & Evans, Joel R.; Retail Management; A Strategic Approach; PHI/Pearson Education; New Delhi.
9. Kenneth E. Clow and Donald Baack (2004); Integrated Advertising, Promotion and Marketing Communications; PHI Ltd., New Delhi
10. Levy Michael &WeitzBartcn W.; Retailing Management; Tata McGraw Hill. New Delhi.
11. Loudon & Loudon; Consumer Behavior; TMH; New Delhi
12. Lehman, Donald R. and Winer, Russel S., Product Management, Tata McGraw Hill, 3rd edition, 2002.

PHD-	**Discipline Specific Course(Contemporary**	**Credit Distribution:**

DSC-102	issues in Human Resource Management)	L:3, T:1, P:0=4
Learning Outcomes	- Understand the concepts, processes, and techniques of human resource planning, career planning, recruitment, and selection. - Understand the role of HRD (Human Resource Development) in improving quality of work life and fostering a positive HR climate. - Understand the role of CSR and corporate governance in HR.	
Unit 1	**Human Resource Management** Human resource planning – concepts, process and techniques, career planning, recruitment and selection, performance appraisal and performance management, compensation management –economic theory of rewards, compensation systems, tools and techniques for designing compensation packages, compensation packages of senior managers, statutory provisions and institutions related to compensation management; motivation, discipline and grievance management, retirement, HR information system, HR accounting, HR audit.	
Unit 2	**Training and Development** Learning theories, training – concepts and types, training skills, training needs assessment, action research, designing and delivering training modules, organizational change – process, factors, strategies for managing change, OD interventions and strategies, Human Resource Development – meaning, concepts, quality of work life, HRD climate, interventions, strategies, HRD practices in Indian organizations, coaching and mentoring.	
Unit 3	**Strategic and Global HRM** Strategic management and its relevance for HRM, strategic HRM – meaning, concepts, approaches and models, HR strategy formulation, implementation and integration with the business enterprise, evaluation of HR strategy. Global HRM – meaning, concepts, cross-cultural issues, organisational culture and national culture, workforce diversity, HR strategies in MNCs, global sourcing, management and compensation of human resources, HR issues and strategies in BPO sector.	
Unit 4	**Contemporary issues in HRM** Employee empowerment and participative management, employee engagement, managing creativity and innovation, TQM and HR strategies, research issues in HRM.	
Unit 5	**Ethics in HRM** Understanding Indian and western conceptualizations and theories of ethics, ethical dilemma, ethical climate, stakeholder management, CSR and corporate governance, harassment and discrimination at the workplace, ethical issues in HRM.Research papers based on the above syllabus to be discussed in the class.	

Suggested Readings:

1. 1 Adler, N.J.; International Dimensions of Organizational Behavior; Kent Pub; Boston. 1991.
2. Armstrong Michel and Murlis, Helen. Reward Management: A Handbook of Salary Administration London Kegan Paul. 1988. Arthur, M. Career Theory Handbook. Englewood Cliff, Prentice Hall Inc., 1991.
3. Beardwell and Holden, 1996, Human Resource Management, London Pitman.
4. Blanchard, P. Nick, Effective Training: Systems, Strategies and Practices, New Delhi, Pearson.
5. Dale, B. Total quality and Human Resources: An Executive Guide. Oxford, Blackwell. 1992.
6. Dayal, Ishwar. Successful Applications of HRD. New Concepts, New Delhi, 1996.
7. Dowling, P.J. etc.; International Dimensions of Human Resource Management; 2nd Ed.., Wadsworth; California; 1994.
8. Greenhaus, J H. Career Management. New York, Dryden, 1987.
9. Hofstede, G.; Cultures Consequence: International Differences in Work Related Values; 2nd edition; Sage; London; 2001.
10. Kohli, Uddesh&Sinha, Dharni P. HRD - Global Challenges & Strategies in 2000 A.D. ISTD, New Delhi, 1995.
11. Maheshwari, B L. &Sinha, Dharni P. Management of Change through HRD. Tata McGraw Hill. New Delhi, 1991.
12. Malik, P L. Handbook of Industrial Law, Eastern Book, Lucknow, 1995.
13. Mead, R; International Management: Cross Cultural Dimensions; Blackwell; Cambridge; 1994.
14. Micton, Rock. Handbook of Wages and Salary Administration. 1984.
15. Pareek, U. et al. Managing Transitions: The HRD Response. Tata McGraw Hill, New Delhi. 1992.
16. Pareek, Udai, and Rolf P Lynton, Training for Development, New Delhi, Vistaar.
17. Ramaswamy, E A. The Strategic Management of industrial Relations, Oxford University Press, New Delhi, 1994.
18. Robbins, SP and Decenzo, D. Human Resource Management. PHI Learning, New Delhi.
19. Srivastava S C. Industrial Relations and Labour Law, Vikas, New Delhi, 2007.
20. Supreme Court cases related to labour laws.

PHD-RPE-103	Research and Publication Ethics	Credit Distribution: L:1, T:1, P:0=2
Learning Outcomes	1. To have awareness about the publication ethics and publication misconducts. 2. To understand indexing and citation databases, open access publications, research metrics (citations, h-index, impact factor etc) 3. Develop hands-on skills to identify research misconduct and predatory publications.	

Unit 1	**Philosophy and Ethics (4 hrs)**
	1. Introduction to philosophy: definition, nature and scope, concept, branches
	2. Ethics: definition, moral philosophy, nature of moral judgements and reactions
Unit 2	**Scientific Conduct (4 hrs)**
	1. Ethics with respect to science and research
	2. Intellectual honesty and research integrity
	3. Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP)
	4. Redundant publications: duplicate and overlapping publications, salami slicing
	5. Selective reporting and misrepresentation of data
Unit 3	**Publication Ethics (7 hrs)**
	1. Publication ethics: definition, introduction and importance
	2. Best practices / standards setting initiatives and guidelines: COPE, WAME, etc.
	3. Conflicts of interest
	4. Publication misconduct: definition, concept, problems that lead to unethical behavior
	and vice versa, types
	5. Violation of publication ethics, authorship and contributor ship
	6. Identification of publication misconduct, complaints and appeals
	7. Predatory publishers and journals
Unit 4 Practice	**Open Access Publishing (4 hrs)**
	1. Open access publications and initiatives
	2. SHERPA/ROMEO online resource to check publisher copyright & self-archiving policies
	3. Software tool to identify predatory publications developed by SPPU
	4. Journal finder / journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer
	Journal Suggester, etc.
Unit 5 Practice	**Publication Misconduct (4 hrs)**
	A. Group Discussions (2 hrs.)
	1. Subject specific ethical issues, FFP, authorship
	2. Conflicts of interest
	3. Complaints and appeals: examples and fraud from India and abroad
	B. Software tools (2 hrs.)
	Use of plagiarism software like Turnitin, Urkund and other open source software tools
Unit 6 Practice	**Databases and Research Metrics (7 hrs)**
	A. Databases (4 hrs.)
	1. Indexing databases

	2. Citation databases: Web of Science, Scopus etc.
	B. Research Metrics (3 hrs.)
	1. Impact Factor of journal as per Journal Citation Report, SNIP, SJR, IPP, Cite Score
	2. Metrics: h-index, g-index, i10 index, altmetrics

Suggested Readings

1. Bird, A. (2006). Philosophy of Science. Routledge.
2. MacIntyre, A. (1967) A Short History of Ethics. London.
3. P. Chaddah, (2018) Ethics in Competitive Research: Do not get scooped; do not getplagiarized, ISBN:978-9387480865
4. National Academy of Sciences, National Academy of Engineering and Institute ofMedicine. (2009). On Being a Scientist: A Guide to Responsible Conduct in Research:Third Edition. National Academies Press.
5. Rensik, D. B. (2011). What is ethics in research & why is it important. National Instituteof Environmental Health Sciences, 1-10. Retrieved fromhttps://www.niehs.nih.gov/resources/biothics/whatis/index.cfm
6. Beall, J. (2012). Predatory publishers are corrupting open access. Nature, 489(7415),179-179. https://doi.org/10.1038/489179a

NIILM UNIVERSITY

Ph.D. Course Work in Mathematics

Academic Session 2024-25

Ph.D. Regulations Regarding Course Work

Clause 18: Ph.D. Ordinance NIILM University as per UGC Minimum Standards and Procedure for Award of Ph.D. Degrees Regulations 2022 with effect from academic session 2024-25

I.   The coursework shall be treated as a prerequisite for Ph.D. preparation. In the first year of registration, all research scholars are required to complete the course work for one semester following their provisional registration as a part of the Ph.D. program. It is mandatory to complete the course work in first 4 semesters to stay in the Ph.D. program. If a student fails to complete the coursework in first 4 semesters, will have to leave the program.

II.   Earning a minimum of 12 total credits and a maximum of 16, is required.

III.   Usually a course refers to a 'paper' and is a component of an academic program. Courses in Ph.D. course work shall be of two kinds: Core and Elective.

IV.   A core course is a compulsory paper to be studied by all the scholars to complete the requirements of the Ph.D. degree.

V.   Elective course is a course which is discipline specific and provided by the particular department from the main discipline or from a sister/related discipline which supports the main discipline, on mutual consent of the concerned departments.

VI.   One credit equal to 15 contact hours for theory-based teaching or 30 hours of contact time for practical or activity-based teaching.

VII.   The number of credits is given in the form L: T: P, where L indicates the number of contact hours of lecture, and T the number of contact hours for tutorials, P stands for laboratory credits.

VIII.   The credits are distributed as follows:

Paper Code	Paper	Course type	Credit	L	T	P
PHD-ARM-101	Advanced Research Methodology	Core	4	3	1	0
PHD-DSC-102	Discipline Specific Course	Elective	4	3	1	0
PHD-RPE-103	Research and Publication Ethics	Core	2	1	1	0
PHD-SEM-104	Academic Writing, Literature Review and Seminar	Skill	2	0	1	2
	Total		12			

IX.   All Ph.D., entrants irrespective of discipline, shall be trained in teaching proficiency related to teaching/education/pedagogy/writing related to their chosen Ph.D. subject during their doctoral training period, that include assigning 4-6 hours per week of teaching/ research assistantship for conducting tutorial or laboratory work and evaluations.

X.   Courses PHD-SEM 104 includes research work on research article writing, seminar presentation and course PHD-TP 105 includes pedagogical training. Both these courses will be assessed internally without Semester End Examination.

XI.   CoE will conduct Term/ Semester End Exam in PHD-ARM-101, PHD-DSC-102, and PHD-RPE-103.

XII.   PHD-TP 105 is a non-credit course and internal assessment will be marked on the detailed mark card of the course work.

XIII.   Advance Research Methodology course will include common research methodology and subject specific research methodology.

XIV.   Research Advisory Committee may provide choices in selecting the courses/ credits that facilitates the entrepreneur in the monetization of IP thus generated.

XV.   RAC can also recommend UGC recognized online courses as part of the credit requirements for the Ph.D. program.

XVI.   Paper- will comprise of the following two activities:

  (a) External Assessment: Written Question Paper 70/39

  (b) Internal Assessment: 30/16

Marks will be converted into letter grade and grade point as per following table:

Marks	Letter Grade	Grade Point
81-100	A+	10
76-80	A	9
66-75	B+	8
61-65	B	7
55-60	C	6
Less than 55	F	0

The computation of the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA) shall be done as per University Examination Ordinance or Examination Rules & Regulations issued time to time.

The result and grade sheet for the course work will carry pass/ fail result.

COURSE WORK PAPER

I. Candidates who already hold an M. Phil. degree and have been accepted into the Ph.D. program, or those who have finished their M.Phil. Coursework and have been given permission to continue on to the Ph.D. in an integrated course, may be exempted from the Ph.D. course requirements by the Department. All additional applicants accepted into the Ph.D. program must complete the Ph.D. coursework required by the Department.

II. The NIILM University attendance rules, a minimum 75% attendance is must require, will be applied to all full-time research scholars. For the duration of their coursework, part-time research researchers must, nevertheless, adhere to the same rules.

III. A Ph.D. scholar has to obtain a minimum of 55% of marks or a minimum CGPA of 6.0 in the UGC 10-point scale (or an equivalent grade/CGPA in a point scale wherever grading system is followed) in the course work in order to be eligible to continue in the program and submit the thesis.

IV. Registration will be automatically canceled if the required course work is not completed with a minimum of 55% of marks/a minimum CGPA of 6.0 within the allotted time. If the course work is not finished within a year, the RAC and DRC may suggest a six-month extension or suggest that the registration be canceled with the DRC.

V. There is no provision of improvement or special supplementary exam to be conducted. Coursework will be offered in four semesters of first two years with regular & supplementary exams to avail the opportunity to clear the coursework in 2 years. **Failure to complete the course in 2 years means that the student has to leave the program.**

Course Structure:

PHD-ARM-101	Advance Research Methodology in Mathematics	Credit Distribution: L:3, T:1, P:0=4
Course Objectives:	To acquaint the students with research process. To train them in the research methods and designs and to equip them to take up researches independently.	
Unit 1	**Introduction to Research** a. Nature and aims of research b. Dimensions and types of research c. Theory and research d. The meaning of methodology e. Types of Methods of Research	
Unit 2	**Research Planed Data Collection** a. Concept, logic, and research question/issues b. Variables, causal theory, and hypothesis c. Research Design and Collection of Data	

	d. Sampling: Methods, Size, Errors
	e. Probability and non-probability
	f. Measurement and Scaling Techniques
	g. Issues in measurement: Qualitative and quantitative
Unit 3	**Data Processing**
	a. Analysis of quantitative data introduction to higher order statistics
	b. Editing, Coding and Classification of Data
	c. Analysis of qualitative data and Tabulation
	d. Introduction to advanced statistical techniques using SPSS
	e. Statistical Derivatives and Measures of Central Tendency
	f. Measures of Variation and Skewness
	g. Correlation and Simple Regression
	h. Diagrammatic and Graphic Presentation of Data
Unit 4	**Research Report Writing**
	a. Ethical issues in research
	b. APA style of writing concept
	c. APA style of writing: Referencing
	d. d. Research article writing
Unit 5	**Computer Application in Research**
	a. Introduction to MS Excel, Using Formulas and Functions
	b. Hand on to SPSS
	c. Features for Statistical Data Analysis
	d. Generating Charts/Graphs
	e. Introduction to MS Word, Features and Functions, Writing Report in MS Word
	f. Introduction to Open Office or Latex
	g. Creating Presentation in MS PowerPoint
	h. Introduction to Internet-Based Search
	i. Use of Advanced Research Techniques.

Recommended Readings:

1. Bayard, P. & Grayson, A. (1976). Introducing psychological research. London: McMillan.
2. Bordens, K.S. & Abbot, B.B. (2005). Research design and methods. New Delhi: Tata McGraw Hill.
3. Breakwell, G.M. Hammond, S. & Fife-Schaw, C. (1995). Research Methods in Psychology. New Delhi: Sage Publications.
4. Cresswell, J.W. (1994) Research design: L Qualitative and quantitative approaches. Thousand Oaks, CA: Sage Publication.
5. Drew, C.J.: Hardman, M.L. & Hart, W.A. (1996). Designing and conducting research: Inquiry in education and social science. New York: Allyn & Bacon.
6. Kerlinger, F.N. (1982). Foundations of behavioural research. Delhi: Subject Publication.
7. Nation, J.R. (1997). Research Methods. New Jersey: Prentice Hall.

8. Willing, C. & Stainton-Rogers, W. (Eds.) (2008). The Sage Handbook of Qualitative Research in Psychology. New Delhi: Sage Publications.

PHD-DSC-102	Discipline Specific Course (Mathematics)	Credit Distribution: L:3, T:1, P:0=4
Learning Outcomes	- Learners will distinguish between finite, countable, and uncountable sets and understand the properties and examples of each. - Students will study the properties of analytic functions and the Cauchy-Riemann equations. - Students will study independent random variables, marginal and conditional distributions, and characteristic functions. - Learners will explore Hamilton's canonical equations and their applications in classical mechanics.	
Unit 1	Elementary set theory, finite, countable and uncountable sets, Real number system as a complete ordered field, Archimedean property, supremum, infimum. Sequences and series, convergence, limsup, liminf. Bolzano Weier strass theorem, Heine Borel theorem. Continuity, uniform continuity, differentiability, mean value theorem. Sequences and series of functions, uniform convergence. Riemann sums and Riemann integral, Improper Integrals. Monotonic functions.	
Unit 2	Algebra of complex numbers, the complex plane, polynomials, power series, transcendental functions such as exponential, trigonometric and hyperbolic functions. Analytic functions, Cauchy Riemann equations. Contour integral, Cauchy's theorem, Cauchy's integral formula, Liouville's theorem, Maximum modulus principle, Schwarz lemma, Open mapping theorem. Taylor series, Laurent series, calculus of residues. Conformal mappings, Mobius transformations.	
Unit 3	Permutations, combinations, pigeonhole principle, inclusion exclusion principle, derangements. Fundamental theorem of arithmetic, divisibility in Z, congruences, Chinese Remainder Theorem, Euler's Øfunction, primitive roots. Groups, subgroups, normal subgroups, quotient groups, homomorphisms, cyclic groups, permutation groups, Cayley's theorem, class equations, Sylow theorems	
Unit 4	Generalized coordinates, Lagrange's equations, Hamilton'scanonical equations, Hamilton's .Independent random variables, marginal and conditional distributions. Characteristic functions. Probability. Modes of convergence, weak and strong laws of large numbers, Central Limit theorems, Markov chains with finite and countable state space, classification of states, limiting behaviour of n step transition probabilities, stationary distribution, Poisson and birth and death processes. Standard discrete and continuous univariate distributions. Sampling distributions, standard errors and asymptotic distributions.	

References:

1. Herstein, I. N. (2003) Topics in Algebra (4th edition), Wiley Eastern Limited, New Delhi.

2. Shilov, G. E. (1998) Linear Algebra, Prentice Hall Inc.

3. Halmos, P. R. (1965) Finite Dimensional Vector Spaces, D. Van Nostr and Company Inc.

4. Finkbeiner, D. T. (2011) Introduction to Matrices and Linear Transformations (3rd edition) Dover Publications.

5. Kumaresan,S. (2001) Linear Algebra: A Geometric Approach, Prentice-Hall of India Pvt. Ltd., New Delhi.

6. 6.. Dickson, L. E. (1971) History of the Theory of Numbers (Vol. II, Diophantine Analysis) Chelsea Publishing Company, New York.

7. Hardy, G.H. and Wright, E. M.(1998) An Introduction to the Theory of Numbers (6th edition),The English Language Society and Oxford University Press.

8. Niven, I. and. Zuckerman, H. S. (1993) An Introduction to the Theory of Numbers (3rd edition), Wiley Eastern Ltd., New Delhi.

PHD-RPE-103	**Research and Publication Ethics**	**Credit Distribution: L:1, T:1, P:0=2**
Learning Outcomes	1. To have awareness about the publication ethics and publication misconducts. 2. To understand indexing and citation databases, open access publications, research metrics (citations, h-index, impact factor etc) 3. Develop hands-on skills to identify research misconduct and predatory publications.	
Unit 1	**Philosophy and Ethics (4 hrs)** 1. Introduction to philosophy: definition, nature and scope, concept, branches 2. Ethics: definition, moral philosophy, nature of moral judgements and reactions	
Unit 2	**Scientific Conduct (4 hrs)** 1. Ethics with respect to science and research 2. Intellectual honesty and research integrity 3. Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP) 4. Redundant publications: duplicate and overlapping publications,	

	salami slicing 5. Selective reporting and misrepresentation of data
Unit 3	**Publication Ethics (7 hrs)** 1. Publication ethics: definition, introduction and importance 2. Best practices / standards setting initiatives and guidelines: COPE, WAME, etc. 3. Conflicts of interest 4. Publication misconduct: definition, concept, problems that lead to unethical behavior and vice versa, types 5. Violation of publication ethics, authorship and contributor ship 6. Identification of publication misconduct, complaints and appeals 7. Predatory publishers and journals
Unit 4 Practice	**Open Access Publishing (4 hrs)** 1. Open access publications and initiatives 2. SHERPA/ROMEO online resource to check publisher copyright & self-archiving policies 3. Software tool to identify predatory publications developed by SPPU 4. Journal finder / journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer Journal Suggester, etc.
Unit 5 Practice	**Publication Misconduct (4 hrs)** A. Group Discussions (2 hrs.) 1. Subject specific ethical issues, FFP, authorship 2. Conflicts of interest 3. Complaints and appeals: examples and fraud from India and abroad B. Software tools (2 hrs.) Use of plagiarism software like Turnitin, Urkund and other open source software tools
Unit 6 Practice	**Databases and Research Metrics (7 hrs)** A. Databases (4 hrs.) 1. Indexing databases 2. Citation databases: Web of Science, Scopus etc. B. Research Metrics (3 hrs.) 1. Impact Factor of journal as per Journal Citation Report, SNIP, SJR, IPP, Cite Score 2. Metrics: h-index, g-index, i10 index, altmetrics

Suggested Readings
1. Bird, A. (2006). Philosophy of Science. Routledge.
2. MacIntyre, A. (1967) A Short History of Ethics. London.
3. P. Chaddah, (2018) Ethics in Competitive Research: Do not get scooped; do not get plagiarized, ISBN:978-9387480865

4. National Academy of Sciences, National Academy of Engineering and Institute of Medicine. (2009). On Being a Scientist: A Guide to Responsible Conduct in Research: Third Edition. National Academies Press.
5. Rensik, D. B. (2011). What is ethics in research & why is it important. National Institute of Environmental Health Sciences, 1-10. Retrieved from https://www.niehs.nih.gov/resources/biothics/whatis/index.cfm
6. Beall, J. (2012). Predatory publishers are corrupting open access. Nature, 489(7415), 179-179. https://doi.org/10.1038/489179a

NIILM UNIVERSITY

Ph.D. Course Work in Mechanical Engineering

Academic Session 2024-25

Ph.D. Regulations Regarding Course Work

Clause 18: Ph.D. Ordinance NIILM University as per UGC Minimum Standards and Procedure for Award of Ph.D. Degrees Regulations 2022 with effect from academic session 2024-25

I. The coursework shall be treated as a prerequisite for Ph.D. preparation. In the first year of registration, all research scholars are required to complete the course work for one semester following their provisional registration as a part of the Ph.D. program. It is mandatory to complete the course work in first 4 semesters to stay in the Ph.D. program. If a student fails to complete the coursework in first 4 semesters, will have to leave the program.

II. Earning a minimum of 12 total credits and a maximum of 16, is required.

III. Usually a course refers to a 'paper' and is a component of an academic program. Courses in Ph.D. course work shall be of two kinds: Core and Elective.

IV. A core course is a compulsory paper to be studied by all the scholars to complete the requirements of the Ph.D. degree.

V. Elective course is a course which is discipline specific and provided by the particular department from the main discipline or from a sister/related discipline which supports the main discipline, on mutual consent of the concerned departments.

VI. One credit equal to 15 contact hours for theory-based teaching or 30 hours of contact time for practical or activity-based teaching.

VII. The number of credits is given in the form L: T: P, where L indicates the number of contact hours of lecture, and T the number of contact hours for tutorials, P stands for laboratory credits.

VIII. The credits are distributed as follows:

Paper Code	Paper	Course type	Credit	L	T	P
PHD-ARM-101	Advanced Research Methodology	Core	4	3	1	0
PHD-DSC-102	Discipline Specific Course	Elective	4	3	1	0
PHD-RPE-103	Research and Publication Ethics	Core	2	1	1	0
PHD-SEM-104	Academic Writing, Literature Review and Seminar	Skill	2	0	1	2
	Total		12			

IX. All Ph.D., entrants irrespective of discipline, shall be trained in teaching proficiency related to teaching/education/pedagogy/writing related to their chosen Ph.D. subject during their doctoral training period, that include assigning 4-6 hours per week of teaching/ research assistantship for conducting tutorial or laboratory work and evaluations.

X. Courses PHD-SEM 104 includes research work on research article writing, seminar presentation and course PHD-TP 105 includes pedagogical training. Both these courses will be assessed internally without Semester End Examination.

XI. CoE will conduct Term/ Semester End Exam in PHD-ARM-101, PHD-DSC-102, and PHD-RPE-103.

XII. PHD-TP 105 is a non-credit course and internal assessment will be marked on the detailed mark card of the course work.

XIII. Advance Research Methodology course will include common research methodology and subject specific research methodology.

XIV. Research Advisory Committee may provide choices in selecting the courses/ credits that facilitates the entrepreneur in the monetization of IP thus generated.

XV. RAC can also recommend UGC recognized online courses as part of the credit requirements for the Ph.D. program.

XVI. Paper- will comprise of the following two activities:
   (a) External Assessment: Written Question Paper 70/39
   (b) Internal Assessment: 30/16

Marks will be converted into letter grade and grade point as per following table:

Marks	Letter Grade	Grade Point
81-100	A+	10
76-80	A	9
66-75	B+	8
61-65	B	7
55-60	C	6
Less than 55	F	0

The computation of the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA) shall be done as per University Examination Ordinance or Examination Rules & Regulations issued time to time.

The result and grade sheet for the course work will carry pass/ fail result.

COURSE WORK PAPER

I. Candidates who already hold an M. Phil. degree and have been accepted into the Ph.D. program, or those who have finished their M.Phil. Coursework and have been given permission to continue on to the Ph.D. in an integrated course, may be exempted from the Ph.D. course requirements by the Department. All additional applicants accepted into the Ph.D. program must complete the Ph.D. coursework required by the Department.

II. The NIILM University attendance rules, a minimum 75% attendance is must require, will be applied to all full-time research scholars. For the duration of their coursework, part-time research researchers must, nevertheless, adhere to the same rules.

III. A Ph.D. scholar has to obtain a minimum of 55% of marks or a minimum CGPA of 6.0 in the UGC 10-point scale (or an equivalent grade/CGPA in a point scale wherever grading system is followed) in the course work in order to be eligible to continue in the program and submit the thesis.

IV. Registration will be automatically canceled if the required course work is not completed with a minimum of 55% of marks/a minimum CGPA of 6.0 within the allotted time. If the course work is not finished within a year, the RAC and DRC may suggest a six-month extension or suggest that the registration be canceled with the DRC.

V. There is no provision of improvement or special supplementary exam to be conducted. Coursework will be offered in four semesters of first two years with regular & supplementary exams to avail the opportunity to clear the coursework in 2 years. **Failure to complete the course in 2 years means that the student has to leave the program.**

Course Structure:

PHD-ARM-101	Advance Research Methodology in Mechanical Engineering	Credit Distribution: L:3, T:1, P:0=4
Course Objectives:	To acquaint the students with research process. To train them in the research methods and designs and to equip them to take up researches independently.	
Unit 1	**Introduction to Research** a. Nature and aims of research b. Dimensions and types of research c. Theory and research d. The meaning of methodology e. Types of Methods of Research	
Unit 2	**Research Planed Data Collection** a. Concept, logic, and research question/issues b. Variables, causal theory, and hypothesis c. Research Design and Collection of Data	

	d. Sampling: Methods, Size, Errors
	e. Probability and non-probability
	f. Measurement and Scaling Techniques
	g. Issues in measurement: Qualitative and quantitative
Unit 3	**Data Processing**
	a. Analysis of quantitative data introduction to higher order statistics
	b. Editing, Coding and Classification of Data
	c. Analysis of qualitative data and Tabulation
	d. Introduction to advanced statistical techniques using SPSS
	e. Statistical Derivatives and Measures of Central Tendency
	f. Measures of Variation and Skewness
	g. Correlation and Simple Regression
	h. Diagrammatic and Graphic Presentation of Data
Unit 4	**Research Report Writing**
	a. Ethical issues in research
	b. APA style of writing concept
	c. APA style of writing: Referencing
	d. d. Research article writing
Unit 5	**Computer Application in Research**
	a. Introduction to MS Excel, Using Formulas and Functions
	b. Hand on to SPSS
	c. Features for Statistical Data Analysis
	d. Generating Charts/Graphs
	e. Introduction to MS Word, Features and Functions, Writing Report in MS Word
	f. Introduction to Open Office or Latex
	g. Creating Presentation in MS PowerPoint
	h. Introduction to Internet-Based Search
	i. Use of Advanced Research Techniques.

Recommended Readings:

1. Bayard, P. & Grayson, A. (1976). Introducing psychological research. London: McMillan.
2. Bordens, K.S. & Abbot, B.B. (2005). Research design and methods. New Delhi: Tata McGraw Hill.
3. Breakwell, G.M. Hammond, S. & Fife-Schaw, C. (1995). Research Methods in Psychology. New Delhi: Sage Publications.
4. Cresswell, J.W. (1994) Research design: L Qualitative and quantitative approaches. Thousand Oaks, CA: Sage Publication.
5. Drew, C.J.: Hardman, M.L. & Hart, W.A. (1996). Designing and conducting research: Inquiry in education and social science. New York: Allyn & Bacon.
6. Kerlinger, F.N. (1982). Foundations of behavioural research. Delhi: Subject Publication.
7. Nation, J.R. (1997). Research Methods. New Jersey: Prentice Hall.

8. Willing, C. & Stainton-Rogers, W. (Eds.) (2008). The Sage Handbook of Qualitative Research in Psychology. New Delhi: Sage Publications.

PHD-DSC-102	Discipline Specific Course (Advance I.C. Engines)	Credit Distribution: L:3, T:0, P:1=4
Learning Outcomes	• Understand convective and radiative heat transfer, and measure heat transfer rates. • Understand fuel injection systems, spray formation, and electronic injection mechanisms. • Study supercharging, turbocharging, compressors, turbines, and charge cooling.	
Unit 1	Cycle Analysis: Fuel-air cycles, variable specific heats, dissociation, effect of operating variables, comparison with air standard cycle. Actual cycles, time and heat loss factors, exhaust blow down, comparison of real engine cycle and fuel air cycle, availability analysis of engine processes. Thermochemistry of fuel-air mixtures: composition of air and fuels, first law and second law applied to combustion, unburned mixture composition, combustion charts.	
Unit 2	Heat Transfer: Heat transfer and engine energy balance, parameters affecting heat transfer, convective and radiative heat transfer, measurement of instantaneous heat transfer rate, thermal loading. Gas Exchange Processes: flow through valves and ports, exhaust gas flow rate, scavenging in two stroke engines, scavenging models, actual scavenging processes, supercharging and turbocharging, types and methods of supercharging, basic relationships, compressors, turbines, wave-compression devices, effects and limitations, charge cooling.	
Unit 3	Combustion: combustion in SI engines, thermodynamic analysis of SI engine combustion, burned and unburned mixture states, flame structure and speed, cycle variations, spark ignition, abnormal combustion, combustion in CI engines, types, CI engine combustion model, analysis of cylinder pressure data, fuel spray behavior, ignition delay, mixing controlled combustion.	
Unit 4	Fuel Injection: fuel injection systems, mechanism of spray formation, electronic injection systems, MPFI system, feedback systems, flow in intake manifolds, design requirements. Pollution Formation and Control: trends in vehicle emission standards, unburned hydrocarbon emissions, nitrogen oxides, CO, particulate emissions, exhaust gas treatment, non-exhaust emissions.	

Reference:

1. J.B. Heywood, "Internal Combustion Engine Fundamentals" McGraw Hill.
2. C.P. Taylor, "I.C. Engine Vol. I & II", MIT press.
3. V. Ganesan, "Internal Combustion Engines", Tata McGraw Hill.

4. Rowland S. Benson, J. H. Horlock & D E Winterbone, "Thermodynamics and Gas Dynamics of I.C. Engine, Vol. I & II", Oxford University press.
5. Campbell, A. S., "Thermodynamic Analysis of Combustion Engines" Krieger Publishing Company.

PHD-RPE-103	Research and Publication Ethics	Credit Distribution: L:1, T:1, P:0=2
Learning Outcomes	1. To have awareness about the publication ethics and publication misconducts. 2. To understand indexing and citation databases, open access publications, research metrics (citations, h-index, impact factor etc) 3. Develop hands-on skills to identify research misconduct and predatory publications.	
Unit 1	**Philosophy and Ethics (4 hrs)** 1. Introduction to philosophy: definition, nature and scope, concept, branches 2. Ethics: definition, moral philosophy, nature of moral judgements and reactions	
Unit 2	**Scientific Conduct (4 hrs)** 1. Ethics with respect to science and research 2. Intellectual honesty and research integrity 3. Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP) 4. Redundant publications: duplicate and overlapping publications, salami slicing 5. Selective reporting and misrepresentation of data	
Unit 3	**Publication Ethics (7 hrs)** 1. Publication ethics: definition, introduction and importance 2. Best practices / standards setting initiatives and guidelines: COPE, WAME, etc. 3. Conflicts of interest 4. Publication misconduct: definition, concept, problems that lead to unethical behavior and vice versa, types 5. Violation of publication ethics, authorship and contributor ship 6. Identification of publication misconduct, complaints and appeals 7. Predatory publishers and journals	
Unit 4 Practice	**Open Access Publishing (4 hrs)** 1. Open access publications and initiatives 2. SHERPA/ROMEO online resource to check publisher copyright & self-archiving policies 3. Software tool to identify predatory publications developed by SPPU	

	4. Journal finder / journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer Journal Suggester, etc.
Unit 5 Practice	**Publication Misconduct (4 hrs)** A. Group Discussions (2 hrs.) 1. Subject specific ethical issues, FFP, authorship 2. Conflicts of interest 3. Complaints and appeals: examples and fraud from India and abroad B. Software tools (2 hrs.) Use of plagiarism software like Turnitin, Urkund and other open source software tools
Unit 6 Practice	**Databases and Research Metrics (7 hrs)** A. Databases (4 hrs.) 1. Indexing databases 2. Citation databases: Web of Science, Scopus etc. B. Research Metrics (3 hrs.) 1. Impact Factor of journal as per Journal Citation Report, SNIP, SJR, IPP, Cite Score 2. Metrics: h-index, g-index, i10 index, altmetrics

Suggested Readings

1. Bird, A. (2006). Philosophy of Science. Routledge.
2. MacIntyre, A. (1967) A Short History of Ethics. London.
3. P. Chaddah, (2018) Ethics in Competitive Research: Do not get scooped; do not get plagiarized, ISBN:978-9387480865
4. National Academy of Sciences, National Academy of Engineering and Institute of Medicine. (2009). On Being a Scientist: A Guide to Responsible Conduct in Research: Third Edition. National Academies Press.
5. Rensik, D. B. (2011). What is ethics in research & why is it important. National Institute of Environmental Health Sciences, 1-10. Retrieved from https://www.niehs.nih.gov/resources/biothics/whatis/index.cfm
6. Beall, J. (2012). Predatory publishers are corrupting open access. Nature, 489(7415), 179-179. https://doi.org/10.1038/489179a

NIILM UNIVERSITY

Ph.D. Course Work in Microbiology

Academic Session 2024-25

Ph.D. Regulations Regarding Course Work

Clause 18: Ph.D. Ordinance NIILM University as per UGC Minimum Standards and Procedure for Award of Ph.D. Degrees Regulations 2022 with effect from academic session 2024-25

I.   The coursework shall be treated as a prerequisite for Ph.D. preparation. In the first year of registration, all research scholars are required to complete the course work for one semester following their provisional registration as a part of the Ph.D. program. It is mandatory to complete the course work in first 4 semesters to stay in the Ph.D. program. If a student fails to complete the coursework in first 4 semesters, will have to leave the program.

II.   Earning a minimum of 12 total credits and a maximum of 16, is required.

III. Usually a course refers to a 'paper' and is a component of an academic program. Courses in Ph.D. course work shall be of two kinds: Core and Elective.

IV.   A core course is a compulsory paper to be studied by all the scholars to complete the requirements of the Ph.D. degree.

V.   Elective course is a course which is discipline specific and provided by the particular department from the main discipline or from a sister/related discipline which supports the main discipline, on mutual consent of the concerned departments.

VI.   One credit equal to 15 contact hours for theory-based teaching or 30 hours of contact time for practical or activity-based teaching.

VII. The number of credits is given in the form L: T: P, where L indicates the number of contact hours of lecture, and T the number of contact hours for tutorials, P stands for laboratory credits.

VIII. The credits are distributed as follows:

Paper Code	Paper	Course type	Credit	L	T	P
PHD-ARM-101	Advanced Research Methodology	Core	4	3	1	0
PHD-DSC-102	Discipline Specific Course	Elective	4	3	1	0
PHD-RPE-103	Research and Publication Ethics	Core	2	1	1	0
PHD-SEM-104	Academic Writing, Literature Review and Seminar	Skill	2	0	1	2
	Total		12			

IX. All Ph.D., entrants irrespective of discipline, shall be trained in teaching proficiency related to teaching/education/pedagogy/writing related to their chosen Ph.D. subject during their doctoral training period, that include assigning 4-6 hours per week of teaching/ research assistantship for conducting tutorial or laboratory work and evaluations.

X. Courses PHD-SEM 104 includes research work on research article writing, seminar presentation and course PHD-TP 105 includes pedagogical training. Both these courses will be assessed internally without Semester End Examination.

XI. CoE will conduct Term/ Semester End Exam in PHD-ARM-101, PHD-DSC-102, and PHD-RPE-103.

XII. PHD-TP 105 is a non-credit course and internal assessment will be marked on the detailed mark card of the course work.

XIII. Advance Research Methodology course will include common research methodology and subject specific research methodology.

XIV. Research Advisory Committee may provide choices in selecting the courses/ credits that facilitates the entrepreneur in the monetization of IP thus generated.

XV. RAC can also recommend UGC recognized online courses as part of the credit requirements for the Ph.D. program.

XVI. Paper- will comprise of the following two activities:
(a) **External Assessment: Written Question Paper 70/39**
(b) **Internal Assessment: 30/16**

Marks will be converted into letter grade and grade point as per following table:

Marks	Letter Grade	Grade Point
81-100	A+	10
76-80	A	9
66-75	B+	8
61-65	B	7
55-60	C	6
Less than 55	F	0

The computation of the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA) shall be done as per University Examination Ordinance or Examination Rules & Regulations issued time to time.

The result and grade sheet for the course work will carry pass/ fail result.

COURSE WORK PAPER

I. Candidates who already hold an M. Phil. degree and have been accepted into the Ph.D. program, or those who have finished their M.Phil. Coursework and have been given permission to continue on to the Ph.D. in an integrated course, may be exempted from the Ph.D. course requirements by the Department. All additional applicants accepted into the Ph.D. program must complete the Ph.D. coursework required by the Department.

II. The NIILM University attendance rules, a minimum 75% attendance is must require, will be applied to all full-time research scholars. For the duration of their coursework, part-time research researchers must, nevertheless, adhere to the same rules.

III. A Ph.D. scholar has to obtain a minimum of 55% of marks or a minimum CGPA of 6.0 in the UGC 10-point scale (or an equivalent grade/CGPA in a point scale wherever grading system is followed) in the course work in order to be eligible to continue in the programme and submit the thesis.

IV. Registration will be automatically canceled if the required course work is not completed with a minimum of 55% of marks/a minimum CGPA of 6.0 within the allotted time. If the course work is not finished within a year, the RAC and DRC may suggest a six-month extension or suggest that the registration be canceled with the DRC.

V. There is no provision of improvement or special supplementary exam to be conducted. Coursework will be offered in four semesters of first two years with regular & supplementary exams to avail the opportunity to clear the coursework in 2 years. **Failure to complete the course in 2 years means that the student has to leave the program.**

Course Structure:

PHD-ARM-101	Advance Research Methodology in Microbiology	Credit Distribution: L:3, T:1, P:0=4
Course Objectives:	To acquaint the students with research process. To train them in the research methods and designs and to equip them to take up researches independently.	
Unit 1	**Introduction to Research** a. Nature and aims of research b. Dimensions and types of research c. Theory and research d. The meaning of methodology e. Types of Methods of Research	
Unit 2	**Research Planed Data Collection** a. Concept, logic, and research question/issues b. Variables, causal theory, and hypothesis c. Research Design and Collection of Data	

	d. Sampling: Methods, Size, Errors
	e. Probability and non-probability
	f. Measurement and Scaling Techniques
	g. Issues in measurement: Qualitative and quantitative
Unit 3	**Data Processing**
	a. Analysis of quantitative data introduction to higher order statistics
	b. Editing, Coding and Classification of Data
	c. Analysis of qualitative data and Tabulation
	d. Introduction to advanced statistical techniques using SPSS
	e. Statistical Derivatives and Measures of Central Tendency
	f. Measures of Variation and Skewness
	g. Correlation and Simple Regression
	h. Diagrammatic and Graphic Presentation of Data
Unit 4	**Research Report Writing**
	a. Ethical issues in research
	b. APA style of writing concept
	c. APA style of writing: Referencing
	d. d. Research article writing
Unit 5	**Computer Application in Research**
	a. Introduction to MS Excel, Using Formulas and Functions
	b. Hand on to SPSS
	c. Features for Statistical Data Analysis
	d. Generating Charts/Graphs
	e. Introduction to MS Word, Features and Functions, Writing Report in MS Word
	f. Introduction to Open Office or Latex
	g. Creating Presentation in MS PowerPoint
	h. Introduction to Internet-Based Search
	i. Use of Advanced Research Techniques.

Recommended Readings:
1. Bayard, P. & Grayson, A. (1976). Introducing psychological research. London: McMillan.
2. Bordens, K.S. & Abbot, B.B. (2005). Research design and methods. New Delhi: Tata McGraw Hill.
3. Breakwell, G.M. Hammond, S. & Fife-Schaw, C. (1995). Research Methods in Psychology. New Delhi: Sage Publications.
4. Cresswell, J.W. (1994) Research design: L Qualitative and quantitative approaches. Thousand Oaks, CA: Sage Publication.
5. Drew, C.J.: Hardman, M.L. & Hart, W.A. (1996). Designing and conducting research: Inquiry in education and social science. New York: Allyn & Bacon.
6. Kerlinger, F.N. (1982). Foundations of behavioral research. Delhi: Subject Publication.
7. Nation, J.R. (1997). Research Methods. New Jersey: Prentice Hall.

8. Willing, C. & Stainton-Rogers, W. (Eds.) (2008). The Sage Handbook of Qualitative Research in Psychology. New Delhi: Sage Publications.

PHD-DSC-102	Discipline Specific Course (Microbiology)	Credit Distribution: L:3, T:0, P:1=4
Learning Outcomes	• Learn the structure, assembly, and functions of flagella, pili, and fimbriae in bacterial movement, adhesion, and interaction. • Understand cell wall synthesis and how antibiotics inhibit it. • Explore the phylogeny and key features of archaea, and compare archaeal and bacterial cell structures.	
Unit 1	Bacterial cell structure and appendages: Overview of eubacterial cell organization: nucleoid, ribosomes, intracytoplasmic membranes and cell inclusions. Detailed account of biogenesis and function of various cell structure appendages: flagella- structure, assembly and mechanism of movement; pili and fimbriae- types, structure and their role. External cell surface structures: capsule, glycocalyx, slime layer and S-layer	
Unit 2	Bacterial cell wall and cell membrane: Overview of gram negative and gram positive bacterial cell wall, outer membrane lipopolysaccharide (LPS). Detailed account of cell wall synthesis and its inhibitors including different antibiotics.	
Unit 3	Bacterial cell division and reproduction: Binary fission and other forms of reproduction in bacteria, bacterial cell cycle, assembly, maintenance and disassembly of Z ring, endospore structure and stages involved in endospore development in Bacillus subtilis.	
Unit 4	Archaeal diversity, cell structure and model organisms: Phylogenetic diversity and key features of different phyla. General characteristics of archaeal cell structure and comparison with eubacteria. Detailed account of model archaeal organisms: Methanococcus, Halobacterium, Pyrococcus and Sulfolobus.	
Unit 5	Bacterial genome: Genome organization of E.coli and salient features of genomes of Deinococcus radiodurans, Azotobacter vinelandii, Buchnera sp., Agrobacterium tumefaciens and Epulopiscium sp.	
Unit 6	Bacterial secretion system: Introduction. Sec secretion pathway, Sec B secretion pathway, SRP pathway, Tat pathway. Protein secretion in Gram-negative bacteria: Type I Type VI. Protein secretion in Gram-positive bacteria: Type VII, Sec A2, Sortases and Injectosome. Introduction to Type VIII and Type IX secretion systems.	
Unit 7	Quorum sensing: Discovery, role as illustrated by bioluminescence (Vibrio fischeri, Vibrio harveyi), virulence (Pseudomonas aeruginosa, Staphylococcus), competence and sporulation (Bacillus subtilis) and antibiotic resistance in bacteria. Quorum quenching: impact and mechanism.	

Suggested Readings:

1. Prescott's Microbiology by J. Willey, L. Sherwood, C. J. Woolverton. 10th edition. McGraw Hill Education. 2017.
2. Brock Biology of Microorganisms by M. Madigan, K. Bender, D. Buckley, W. Sattley, D. Stahl. 15th Edition. Pearson Education. 2018.
3. Alcamo's Fundamentals of Microbiology by J. C. Pommerville. 10th Edition. Jones and Bartlett Learning. 2013.
4. Archaea Molecular and Cellular Biology by Ricardo Cavicchioli. American Society of Microbiology. 2007.
5. The Physiology and Biochemistry of Prokaryotes by D. White, J. Drummond, C. Fuqua. 4 th Edition. Oxford University Press. 2011.

PHD-RPE-103	Research and Publication Ethics	Credit Distribution: L:1, T:1, P:0=2
Learning Outcomes	1. To have awareness about the publication ethics and publication misconducts. 2. To understand indexing and citation databases, open access publications, research metrics (citations, h-index, impact factor etc) 3. Develop hands-on skills to identify research misconduct and predatory publications.	
Unit 1	**Philosophy and Ethics (4 hrs)** 1. Introduction to philosophy: definition, nature and scope, concept, branches 2. Ethics: definition, moral philosophy, nature of moral judgements and reactions	
Unit 2	**Scientific Conduct (4 hrs)** 1. Ethics with respect to science and research 2. Intellectual honesty and research integrity 3. Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP) 4. Redundant publications: duplicate and overlapping publications, salami slicing 5. Selective reporting and misrepresentation of data	
Unit 3	**Publication Ethics (7 hrs)** 1. Publication ethics: definition, introduction and importance 2. Best practices / standards setting initiatives and guidelines: COPE, WAME, etc. 3. Conflicts of interest 4. Publication misconduct: definition, concept, problems that lead to unethical behavior and vice versa, types 5. Violation of publication ethics, authorship and contributor ship	

	6. Identification of publication misconduct, complaints and appeals
	7. Predatory publishers and journals
Unit 4 Practice	**Open Access Publishing (4 hrs)**
	1. Open access publications and initiatives
	2. SHERPA/ROMEO online resource to check publisher copyright & self-archiving policies
	3. Software tool to identify predatory publications developed by SPPU
	4. Journal finder / journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer
	Journal Suggester, etc.
Unit 5 Practice	**Publication Misconduct (4 hrs)**
	A. Group Discussions (2 hrs.)
	1. Subject specific ethical issues. FFP, authorship
	2. Conflicts of interest
	3. Complaints and appeals: examples and fraud from India and abroad
	B. Software tools (2 hrs.)
	Use of plagiarism software like Turnitin, Urkund and other open source software tools
Unit 6 Practice	**Databases and Research Metrics (7 hrs)**
	A. Databases (4 hrs.)
	1. Indexing databases
	2. Citation databases: Web of Science, Scopus etc.
	B. Research Metrics (3 hrs.)
	1. Impact Factor of journal as per Journal Citation Report, SNIP, SJR, IPP, Cite Score
	2. Metrics: h-index, g-index, i10 index, altmetrics

Suggested Readings

1. Bird, A. (2006). Philosophy of Science. Routledge.
2. MacIntyre, A. (1967) A Short History of Ethics. London.
3. P. Chaddah, (2018) Ethics in Competitive Research: Do not get scooped; do not get plagiarized, ISBN:978-9387480865
4. National Academy of Sciences, National Academy of Engineering and Institute of Medicine. (2009). On Being a Scientist: A Guide to Responsible Conduct in Research: Third Edition. National Academies Press.
5. Rensik, D. B. (2011). What is ethics in research & why is it important. National Institute of Environmental Health Sciences, 1-10. Retrieved from https://www.niehs.nih.gov/resources/biothics/whatis/index.cfm
6. Beall, J. (2012). Predatory publishers are corrupting open access. Nature, 489(7415), 179-179. https://doi.org/10.1038/489179a

NIILM UNIVERSITY

Ph.D. Course Work in Music

Academic Session 2024-25

Ph.D. Regulations Regarding Course Work

Clause 18: Ph.D. Ordinance NIILM University as per UGC Minimum Standards and Procedure for Award of Ph.D. Degrees Regulations 2022 with effect from academic session 2024-25

I.   The coursework shall be treated as a prerequisite for Ph.D. preparation. In the first year of registration, all research scholars are required to complete the course work for one semester following their provisional registration as a part of the Ph.D. program. It is mandatory to complete the course work in first 4 semesters to stay in the Ph.D. program. If a student fails to complete the coursework in first 4 semesters, will have to leave the program.

II. Earning a minimum of 12 total credits and a maximum of 16, is required.

III. Usually a course refers to a 'paper' and is a component of an academic program. Courses in Ph.D. course work shall be of two kinds: Core and Elective.

IV. A core course is a compulsory paper to be studied by all the scholars to complete the requirements of the Ph.D. degree.

V.   Elective course is a course which is discipline specific and provided by the particular department from the main discipline or from a sister/related discipline which supports the main discipline, on mutual consent of the concerned departments.

VI. One credit equal to 15 contact hours for theory-based teaching or 30 hours of contact time for practical or activity-based teaching.

VII. The number of credits is given in the form L: T: P, where L indicates the number of contact hours of lecture, and T the number of contact hours for tutorials, P stands for laboratory credits.

VIII. The credits are distributed as follows:

Paper Code	Paper	Course type	Credit	L	T	P
PHD-ARM-101	Advanced Research Methodology	Core	4	3	1	0
PHD-DSC-102	Discipline Specific Course	Elective	4	3	1	0
PHD-RPE-103	Research and Publication Ethics	Core	2	1	1	0
PHD-SEM-104	Academic Writing, Literature Review and Seminar	Skill	2	0	1	2
	Total		12			

IX. All Ph.D., entrants irrespective of discipline, shall be trained in teaching proficiency related to teaching/education/pedagogy/writing related to their chosen Ph.D. subject during their doctoral training period, that include assigning 4-6 hours per week of teaching/ research assistantship for conducting tutorial or laboratory work and evaluations.

X. Courses PHD-SEM 104 includes research work on research article writing, seminar presentation and course PHD-TP 105 includes pedagogical training. Both these courses will be assessed internally without Semester End Examination.

XI. CoE will conduct Term/ Semester End Exam in PHD-ARM-101, PHD-DSC-102, and PHD-RPE-103.

XII. PHD-TP 105 is a non-credit course and internal assessment will be marked on the detailed mark card of the course work.

XIII. Advance Research Methodology course will include common research methodology and subject specific research methodology.

XIV. Research Advisory Committee may provide choices in selecting the courses/ credits that facilitates the entrepreneur in the monetization of IP thus generated.

XV. RAC can also recommend UGC recognized online courses as part of the credit requirements for the Ph.D. program.

XVI. Paper- will comprise of the following two activities:
   (a) External Assessment: Written Question Paper 70/39
   (b) Internal Assessment: 30/16
   Marks will be converted into letter grade and grade point as per following table:

Marks	Letter Grade	Grade Point
81-100	A+	10
76-80	A	9
66-75	B+	8
61-65	B	7
55-60	C	6
Less than 55	F	0

The computation of the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA) shall be done as per University Examination Ordinance or Examination Rules & Regulations issued time to time.

The result and grade sheet for the course work will carry pass/ fail result.

COURSE WORK PAPER

I. Candidates who already hold an M. Phil. degree and have been accepted into the Ph.D. program, or those who have finished their M.Phil. Coursework and have been given permission to continue on to the Ph.D. in an integrated course, may be exempted from the Ph.D. course requirements by the Department. All additional applicants accepted into the Ph.D. program must complete the Ph.D. coursework required by the Department.

II. The NIILM University attendance rules, a minimum 75% attendance is must require, will be applied to all full-time research scholars. For the duration of their coursework, part-time research researchers must, nevertheless, adhere to the same rules.

III. A Ph.D. scholar has to obtain a minimum of 55% of marks or a minimum CGPA of 6.0 in the UGC 10-point scale (or an equivalent grade/CGPA in a point scale wherever grading system is followed) in the course work in order to be eligible to continue in the program and submit the thesis.

IV. Registration will be automatically canceled if the required course work is not completed with a minimum of 55% of marks/a minimum CGPA of 6.0 within the allotted time. If the course work is not finished within a year, the RAC and DRC may suggest a six-month extension or suggest that the registration be canceled with the DRC.

V. There is no provision of improvement or special supplementary exam to be conducted. Coursework will be offered in four semesters of first two years with regular & supplementary exams to avail the opportunity to clear the coursework in 2 years. **Failure to complete the course in 2 years means that the student has to leave the program.**

Course Structure:

PHD-ARM-101	Advance Research Methodology in Music	Credit Distribution: L:3, T:1, P:0=4
Course Objectives:	To acquaint the students with research process. To train them in the research methods and designs and to equip them to take up researches independently.	
Unit 1	**Introduction to Research** a. Nature and aims of research b. Dimensions and types of research c. Theory and research d. The meaning of methodology e. Types of Methods of Research	
Unit 2	**Research Planed Data Collection** a. Concept, logic, and research question/issues b. Variables, causal theory, and hypothesis c. Research Design and Collection of Data	

	d. Sampling: Methods, Size, Errors
	e. Probability and non-probability
	f. Measurement and Scaling Techniques
	g. Issues in measurement: Qualitative and quantitative
Unit 3	**Data Processing**
	a. Analysis of quantitative data introduction to higher order statistics
	b. Editing, Coding and Classification of Data
	c. Analysis of qualitative data and Tabulation
	d. Introduction to advanced statistical techniques using SPSS
	e. Statistical Derivatives and Measures of Central Tendency
	f. Measures of Variation and Skewness
	g. Correlation and Simple Regression
	h. Diagrammatic and Graphic Presentation of Data
Unit 4	**Research Report Writing**
	a. Ethical issues in research
	b. APA style of writing concept
	c. APA style of writing: Referencing
	d. d. Research article writing
Unit 5	**Computer Application in Research**
	a. Introduction to MS Excel, Using Formulas and Functions
	b. Hand on to SPSS
	c. Features for Statistical Data Analysis
	d. Generating Charts/Graphs
	e. Introduction to MS Word, Features and Functions, Writing Report in MS Word
	f. Introduction to Open Office or Latex
	g. Creating Presentation in MS PowerPoint
	h. Introduction to Internet-Based Search
	i. Use of Advanced Research Techniques.

Recommended Readings:

1. Bayard, P. & Grayson, A. (1976). Introducing psychological research. London: McMillan.

2. Bordens, K.S. & Abbot, B.B. (2005). Research design and methods. New Delhi: Tata McGraw Hill.

3. Breakwell, G.M. Hammond, S. & Fife-Schaw, C. (1995). Research Methods in Psychology. New Delhi: Sage Publications.

4. Cresswell, J.W. (1994) Research design: L Qualitative and quantitative approaches. Thousand Oaks, CA: Sage Publication.

5. Drew, C.J.: Hardman, M.L. & Hart, W.A. (1996). Designing and conducting research: Inquiry in education and social science. New York: Allyn & Bacon.

6. Kerlinger, F.N. (1982). Foundations of behavioural research. Delhi: Subject Publication.

7. Nation, J.R. (1997). Research Methods. New Jersey: Prentice Hall.

8. Willing, C. & Stainton-Rogers, W. (Eds.) (2008). The Sage Handbook of Qualitative Research in Psychology. New Delhi: Sage Publications.

PHD-DSC-102	Discipline Specific Course (Recent Advances in Music)	Credit Distribution: L:3, T:0, P:1=4
Learning Outcomes	• Learners will gain insight into the psychological effects of music on the human mind, exploring how music influences emotions, cognition, and behaviour. • Learners will engage in discussions on the philosophical aspects of music, exploring questions of aesthetics, meaning, and the nature of music as an art form. • Learners will study the role of music in promoting national unity, public awareness, and social causes, including its use in community mobilization and campaigns for social change.	
Unit 1	**Understanding of Music theory** i. Comparative study of commentaries by different scholars on a selected Sanskrit Musical Treatise. ii. Discussions on Psychology of Music. iii. Interrelationship between Indian Classical Music and Indigenous Music of India. iv. General Pedagogy of Music	
Unit 2	**Dimensions of Music** i. Sociology of Music: Dimensions of Music and Gender, Music in Social Culture ii. Philosophy and Music iii. Discussions on Cultural transmission, Culture Change, Diversity in Music iv. Music in the Digital Age and internationalization of Indian Music.	
Unit 3	**Additional Applications of Music** i. Music in Psychotherapeutic Process. ii. Music in Film Industry. iii. Music in Advertising. iv. Music for National Integrity, Public Awareness Building, Community Mobilization, etc	
Unit 4	**Aids and Tools for music research** i. Music Analysis: Musical content analysis and musical effect analysis. ii. Devanagari to Roman transliteration systems, Harvard-Kyoto, ITRANS, IAST, etc. iii. General understanding of word processing, database, CAQDAS, citation and reference related computer applications. iv. Searching and using scholarly resources on the Internet.	

References:

1. Hracs. Brian J, Seman Michael, Virani Tarek E. (Ed); The Production and Consumption of music in the Digital Age, Routledge, New York, 2016.
2. Jahan, Dr. Ishrat, Sociology of Culture and Music, Kanishka Publishers, New Delhi, 2011.
3. Martin, Peter J., Music and the Sociological Gaze - Art Worlds and Cultural Production, Manchester University Press, Manchester, 2016.
4. Farell Gerry; South Asian Music Teaching in Change, David Fulton Publisher, 1994.
5. Lieb. Kristin J; Gender, Branding and the Modern Music Industry, Routledge, NewYork, 2013.
6. Margulis, Elizabeth Hellmuth, The Psychology of Music: A Very Short Introduction, Oxford University Press, London, 2018
7. Singh, Dr. Thakur Jaidev, Indian music, Sangeet Research Academy, Calcutta, 1995
8. Bunt, Leslie; Brynjulf Stige, Music Therapy - An art beyond words, Routledge, New York, 2014.
9. Silverman, Michael J., Music therapy in mental health for illness management and recovery, Oxford University Press, New York, 2015.
10. Davis, William B.; Gfeller, Kate E.; Thaut, Michael H., An Introduction to Music Therapy: Theory and Practice, American Music Therapy Association, Maryland, 2008.

PHD-RPE-103	Research and Publication Ethics	Credit Distribution: L:1, T:1, P:0=2
Learning Outcomes	1. To have awareness about the publication ethics and publication misconducts. 2. To understand indexing and citation databases, open access publications, research metrics (citations, h-index, impact factor etc) 3. Develop hands-on skills to identify research misconduct and predatory publications.	
Unit 1	**Philosophy and Ethics (4 hrs)** 1. Introduction to philosophy: definition, nature and scope, concept, branches 2. Ethics: definition, moral philosophy, nature of moral judgements and reactions	
Unit 2	**Scientific Conduct (4 hrs)** 1. Ethics with respect to science and research 2. Intellectual honesty and research integrity 3. Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP) 4. Redundant publications: duplicate and overlapping publications, salami slicing 5. Selective reporting and misrepresentation of data	

Unit 3	**Publication Ethics (7 hrs)** 1. Publication ethics: definition, introduction and importance 2. Best practices / standards setting initiatives and guidelines: COPE, WAME, etc. 3. Conflicts of interest 4. Publication misconduct: definition, concept, problems that lead to unethical behavior and vice versa, types 5. Violation of publication ethics, authorship and contributor ship 6. Identification of publication misconduct, complaints and appeals 7. Predatory publishers and journals
Unit 4 Practice	**Open Access Publishing (4 hrs)** 1. Open access publications and initiatives 2. SHERPA/ROMEO online resource to check publisher copyright & self-archiving policies 3. Software tool to identify predatory publications developed by SPPU 4. Journal finder / journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer Journal Suggester, etc.
Unit 5 Practice	**Publication Misconduct (4 hrs)** A. Group Discussions (2 hrs.) 1. Subject specific ethical issues, FFP, authorship 2. Conflicts of interest 3. Complaints and appeals: examples and fraud from India and abroad B. Software tools (2 hrs.) Use of plagiarism software like Turnitin, Urkund and other open source software tools
Unit 6 Practice	**Databases and Research Metrics (7 hrs)** A. Databases (4 hrs.) 1. Indexing databases 2. Citation databases: Web of Science, Scopus etc. B. Research Metrics (3 hrs.) 1. Impact Factor of journal as per Journal Citation Report, SNIP, SJR, IPP, Cite Score 2. Metrics: h-index, g-index, i10 index, altmetrics

Suggested Readings
1. Bird, A. (2006). Philosophy of Science. Routledge.
2. MacIntyre, A. (1967) A Short History of Ethics. London.
3. P. Chaddah, (2018) Ethics in Competitive Research: Do not get scooped; do not get plagiarized, ISBN:978-9387480865

4. National Academy of Sciences, National Academy of Engineering and Institute of Medicine. (2009). On Being a Scientist: A Guide to Responsible Conduct in Research: Third Edition. National Academies Press.
5. Rensik, D. B. (2011). What is ethics in research & why is it important. National Institute of Environmental Health Sciences, 1-10. Retrieved from https://www.niehs.nih.gov/resources/biothics/whatis/index.cfm
6. Beall, J. (2012). Predatory publishers are corrupting open access. Nature, 489(7415), 179-179. https://doi.org/10.1038/489179a

NIILM UNIVERSITY

Ph.D. Course Work in Performing and Fine Arts

Academic Session 2024-25

Ph.D. Regulations Regarding Course Work

Clause 18: Ph.D. Ordinance NIILM University as per UGC Minimum Standards and Procedure for Award of Ph.D. Degrees Regulations 2022 with effect from academic session 2024-25

I.   The coursework shall be treated as a prerequisite for Ph.D. preparation. In the first year of registration, all research scholars are required to complete the course work for one semester following their provisional registration as a part of the Ph.D. program. It is mandatory to complete the course work in first 4 semesters to stay in the Ph.D. program. If a student fails to complete the coursework in first 4 semesters, will have to leave the program.

II.   Earning a minimum of 12 total credits and a maximum of 16, is required.

III.   Usually a course refers to a 'paper' and is a component of an academic program. Courses in Ph.D. course work shall be of two kinds: Core and Elective.

IV.   A core course is a compulsory paper to be studied by all the scholars to complete the requirements of the Ph.D. degree.

V.   Elective course is a course which is discipline specific and provided by the particular department from the main discipline or from a sister/related discipline which supports the main discipline, on mutual consent of the concerned departments.

VI.   One credit equal to 15 contact hours for theory-based teaching or 30 hours of contact time for practical or activity-based teaching.

VII. The number of credits is given in the form L: T: P, where L indicates the number of contact hours of lecture, and T the number of contact hours for tutorials, P stands for laboratory credits.

VIII. The credits are distributed as follows:

Paper Code	Paper	Course type	Credit	L	T	P
PHD-ARM-101	Advanced Research Methodology	Core	4	3	1	0
PHD-DSC-102	Discipline Specific Course	Elective	4	3	1	0
PHD-RPE-103	Research and Publication Ethics	Core	2	1	1	0
PHD-SEM-104	Academic Writing, Literature Review and Seminar	Skill	2	0	1	2
	Total		12			

IX. All Ph.D., entrants irrespective of discipline, shall be trained in teaching proficiency related to teaching/education/pedagogy/writing related to their chosen Ph.D. subject during their doctoral training period, that include assigning 4-6 hours per week of teaching/ research assistantship for conducting tutorial or laboratory work and evaluations.

X. Courses PHD-SEM 104 includes research work on research article writing, seminar presentation and course PHD-TP 105 includes pedagogical training. Both these courses will be assessed internally without Semester End Examination.

XI. CoE will conduct Term/ Semester End Exam in PHD-ARM-101, PHD-DSC-102, and PHD-RPE-103.

XII. PHD-TP 105 is a non-credit course and internal assessment will be marked on the detailed mark card of the course work.

XIII. Advance Research Methodology course will include common research methodology and subject specific research methodology.

XIV. Research Advisory Committee may provide choices in selecting the courses/ credits that facilitates the entrepreneur in the monetization of IP thus generated.

XV. RAC can also recommend UGC recognized online courses as part of the credit requirements for the Ph.D. program.

XVI. Paper- will comprise of the following two activities:

(a) **External Assessment: Written Question Paper 70/39**

(b) **Internal Assessment: 30/16**

Marks will be converted into letter grade and grade point as per following table:

Marks	Letter Grade	Grade Point
81-100	A+	10
76-80	A	9
66-75	B+	8
61-65	B	7
55-60	C	6
Less than 55	F	0

The computation of the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA) shall be done as per University Examination Ordinance or Examination Rules & Regulations issued time to time.

The result and grade sheet for the course work will carry pass/ fail result.

COURSE WORK PAPER

I.   Candidates who already hold an M. Phil. degree and have been accepted into the Ph.D. program, or those who have finished their M.Phil. Coursework and have been given permission to continue on to the Ph.D. in an integrated course, may be exempted from the Ph.D. course requirements by the Department. All additional applicants accepted into the Ph.D. program must complete the Ph.D. coursework required by the Department.

II.   The NIILM University attendance rules, a minimum 75% attendance is must require, will be applied to all full-time research scholars. For the duration of their coursework, part-time research researchers must, nevertheless, adhere to the same rules.

III.   A Ph.D. scholar has to obtain a minimum of 55% of marks or a minimum CGPA of 6.0 in the UGC 10-point scale (or an equivalent grade/CGPA in a point scale wherever grading system is followed) in the course work in order to be eligible to continue in the program and submit the thesis.

IV.   Registration will be automatically canceled if the required course work is not completed with a minimum of 55% of marks/a minimum CGPA of 6.0 within the allotted time. If the course work is not finished within a year, the RAC and DRC may suggest a six-month extension or suggest that the registration be canceled with the DRC.

V.   There is no provision of improvement or special supplementary exam to be conducted. Coursework will be offered in four semesters of first two years with regular & supplementary exams to avail the opportunity to clear the coursework in 2 years. **Failure to complete the course in 2 years means that the student has to leave the program.**

Course Structure:

PHD-ARM-101	Advance Research Methodology in Performing and Fine Arts	Credit Distribution: L:3, T:1, P:0=4
Course Objectives:	To acquaint the students with research process. To train them in the research methods and designs and to equip them to take up researches independently.	
Unit 1	**Introduction to Research** a. Nature and aims of research b. Dimensions and types of research c. Theory and research d. The meaning of methodology e. Types of Methods of Research	
Unit 2	**Research Planed Data Collection** a. Concept, logic, and research question/issues b. Variables, causal theory, and hypothesis c. Research Design and Collection of Data	

	d. Sampling: Methods, Size, Errors
	e. Probability and non-probability
	f. Measurement and Scaling Techniques
	g. Issues in measurement: Qualitative and quantitative
Unit 3	**Data Processing**
	a. Analysis of quantitative data introduction to higher order statistics
	b. Editing, Coding and Classification of Data
	c. Analysis of qualitative data and Tabulation
	d. Introduction to advanced statistical techniques using SPSS
	e. Statistical Derivatives and Measures of Central Tendency
	f. Measures of Variation and Skewness
	g. Correlation and Simple Regression
	h. Diagrammatic and Graphic Presentation of Data
Unit 4	**Research Report Writing**
	a. Ethical issues in research
	b. APA style of writing concept
	c. APA style of writing: Referencing
	d. d. Research article writing
Unit 5	**Computer Application in Research**
	a. Introduction to MS Excel, Using Formulas and Functions
	b. Hand on to SPSS
	c. Features for Statistical Data Analysis
	d. Generating Charts/Graphs
	e. Introduction to MS Word, Features and Functions, Writing Report in MS Word
	f. Introduction to Open Office or Latex
	g. Creating Presentation in MS PowerPoint
	h. Introduction to Internet-Based Search
	i. Use of Advanced Research Techniques.

Recommended Readings:

1. Bayard, P. & Grayson, A. (1976). Introducing psychological research. London: McMillan.
2. Bordens, K.S. & Abbot, B.B. (2005). Research design and methods. New Delhi: Tata McGraw Hill.
3. Breakwell, G.M. Hammond, S. & Fife-Schaw, C. (1995). Research Methods in Psychology. New Delhi: Sage Publications.
4. Cresswell, J.W. (1994) Research design: L Qualitative and quantitative approaches. Thousand Oaks, CA: Sage Publication.
5. Drew, C.J.: Hardman, M.L. & Hart, W.A. (1996). Designing and conducting research: Inquiry in education and social science. New York: Allyn & Bacon.
6. Kerlinger, F.N. (1982). Foundations of behavioural research. Delhi: Subject Publication.
7. Nation, J.R. (1997). Research Methods. New Jersey: Prentice Hall.

8. Willing, C. & Stainton-Rogers, W. (Eds.) (2008). The Sage Handbook of Qualitative Research in Psychology. New Delhi: Sage Publications.

PHD-DSC-102	Discipline Specific Course (Contemporary Approaches and Trends in Research in Performing Arts)	Credit Distribution: L:3, T:0, P:1=4
Learning Outcomes	• Students will gain a comprehensive understanding of contemporary theories and methodologies influencing performing arts research, positioning them at the forefront of current trends • Students will demonstrate an ability to integrate insights from various disciplines into their performing arts research, fostering a holistic and nuanced approach. • To evaluate and interpret diverse forms of performing arts through a scholarly lens.	
Unit 1	**Foundations of Contemporary Performing Arts Research** • Performing Arts and Performance Studies • Key research paradigms in Performing Arts • Historical evolution of research methodologies in Performing Arts • Theoretical frameworks shaping contemporary trends	
Unit 2	**Contemporary Performing Arts Research Approaches** • Performance Ethnography, Neuroaesthetics, Intermediality, Ecocriticism in Performance, Post-dramatic Theatre, Visual Cultural Studies, Performativity, Digital Performance Studies, Corporeal Dramaturgy, Performance Philosophy	
Unit 3	**Interdisciplinary Approaches in Performing Arts Research** • Exploration of interdisciplinary connections in performing arts • Integration of methodologies from other disciplines	
Unit 4	**Technology and Innovation in Performing Arts Research** • Utilization of digital tools and technology in research • Impact of innovation on performance analysis and documentation • Virtual performances and their implications for research methodologies	
Unit 5	**Contemporary Issues and Debates in Performing Arts Research** • Exploration of current debates within the field • Ethical considerations in performing arts research • Emerging trends and future directions in the discipline	

Recommended Books:

1. "Research Methodology For Performing Arts" by Sreelatha Vinod
2. "Research Methods in Theatre and Performance" edited by Baz Kershaw And Helen Nicholson

3. "The Routledge Companion to Research in the Arts" edited by Michael Biggs and Henrik Karlsson
4. "Performance Studies: An Introduction" by Richard Schechner
5. "Performing Ethnomusicology: Teaching and Representation in World Music Ensembles" by Ted Solís

PHD-RPE-103	Research and Publication Ethics	Credit Distribution: L:1, T:1, P:0=2
Learning Outcomes	1. To have awareness about the publication ethics and publication misconducts. 2. To understand indexing and citation databases, open access publications, research metrics (citations, h-index, impact factor etc) 3. Develop hands-on skills to identify research misconduct and predatory publications.	
Unit 1	**Philosophy and Ethics (4 hrs)** 1. Introduction to philosophy: definition, nature and scope, concept, branches 2. Ethics: definition, moral philosophy, nature of moral judgements and reactions	
Unit 2	**Scientific Conduct (4 hrs)** 1. Ethics with respect to science and research 2. Intellectual honesty and research integrity 3. Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP) 4. Redundant publications: duplicate and overlapping publications, salami slicing 5. Selective reporting and misrepresentation of data	
Unit 3	**Publication Ethics (7 hrs)** 1. Publication ethics: definition, introduction and importance 2. Best practices / standards setting initiatives and guidelines: COPE, WAME, etc. 3. Conflicts of interest 4. Publication misconduct: definition, concept, problems that lead to unethical behavior and vice versa, types 5. Violation of publication ethics, authorship and contributor ship 6. Identification of publication misconduct, complaints and appeals 7. Predatory publishers and journals	
Unit 4 Practice	**Open Access Publishing (4 hrs)** 1. Open access publications and initiatives 2. SHERPA/ROMEO online resource to check publisher copyright &	

	self-archiving policies 3. Software tool to identify predatory publications developed by SPPU 4. Journal finder / journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer Journal Suggester, etc.
Unit 5 Practice	**Publication Misconduct (4 hrs)** A. Group Discussions (2 hrs.) 1. Subject specific ethical issues, FFP, authorship 2. Conflicts of interest 3. Complaints and appeals: examples and fraud from India and abroad B. Software tools (2 hrs.) Use of plagiarism software like Turnitin, Urkund and other open source software tools
Unit 6 Practice	**Databases and Research Metrics (7 hrs)** A. Databases (4 hrs.) 1. Indexing databases 2. Citation databases: Web of Science, Scopus etc. B. Research Metrics (3 hrs.) 1. Impact Factor of journal as per Journal Citation Report, SNIP, SJR, IPP, Cite Score 2. Metrics: h-index, g-index, i10 index, altmetrics

Suggested Readings

1. Bird, A. (2006). Philosophy of Science. Routledge.
2. MacIntyre, A. (1967) A Short History of Ethics. London.
3. P. Chaddah, (2018) Ethics in Competitive Research: Do not get scooped; do not get plagiarized, ISBN:978-9387480865
4. National Academy of Sciences, National Academy of Engineering and Institute of Medicine. (2009). On Being a Scientist: A Guide to Responsible Conduct in Research: Third Edition. National Academies Press.
5. Rensik, D. B. (2011). What is ethics in research & why is it important. National Institute of Environmental Health Sciences, 1-10. Retrieved from https://www.niehs.nih.gov/resources/biothics/whatis/index.cfm
6. Beall, J. (2012). Predatory publishers are corrupting open access. Nature, 489(7415), 179-179. https://doi.org/10.1038/489179a

NIILM UNIVERSITY

Ph.D. Course Work in Physical Education

Academic Session 2024-25

Ph.D. Regulations Regarding Course Work

Clause 18: Ph.D. Ordinance NIILM University as per UGC Minimum Standards and Procedure for Award of Ph.D. Degrees Regulations 2022 with effect from academic session 2024-25

I. The coursework shall be treated as a prerequisite for Ph.D. preparation. In the first year of registration, all research scholars are required to complete the course work for one semester following their provisional registration as a part of the Ph.D. program. It is mandatory to complete the course work in first 4 semesters to stay in the Ph.D. program. If a student fails to complete the coursework in first 4 semesters, will have to leave the program.

II. Earning a minimum of 12 total credits and a maximum of 16, is required.

III. Usually a course refers to a 'paper' and is a component of an academic program. Courses in Ph.D. course work shall be of two kinds: Core and Elective.

IV. A core course is a compulsory paper to be studied by all the scholars to complete the requirements of the Ph.D. degree.

V. Elective course is a course which is discipline specific and provided by the particular department from the main discipline or from a sister/related discipline which supports the main discipline, on mutual consent of the concerned departments.

VI. One credit equal to 15 contact hours for theory-based teaching or 30 hours of contact time for practical or activity-based teaching.

VII. The number of credits is given in the form L: T: P, where L indicates the number of contact hours of lecture, and T the number of contact hours for tutorials, P stands for laboratory credits.

VIII. The credits are distributed as follows:

Paper Code	Paper	Course type	Credit	L	T	P
PHD-ARM-101	Advanced Research Methodology	Core	4	3	1	0
PHD-DSC-102	Discipline Specific Course	Elective	4	3	1	0
PHD-RPE-103	Research and Publication Ethics	Core	2	1	1	0
PHD-SEM-104	Academic Writing, Literature Review and Seminar	Skill	2	0	1	2
	Total		12			

IX. All Ph.D., entrants irrespective of discipline, shall be trained in teaching proficiency related to teaching/education/pedagogy/writing related to their chosen Ph.D. subject during their doctoral training period, that include assigning 4-6 hours per week of teaching/ research assistantship for conducting tutorial or laboratory work and evaluations.

X. Courses PHD-SEM 104 includes research work on research article writing, seminar presentation and course PHD-TP 105 includes pedagogical training. Both these courses will be assessed internally without Semester End Examination.

XI. CoE will conduct Term/ Semester End Exam in PHD-ARM-101, PHD-DSC-102, and PHD-RPE-103.

XII. PHD-TP 105 is a non-credit course and internal assessment will be marked on the detailed mark card of the course work.

XIII. Advance Research Methodology course will include common research methodology and subject specific research methodology.

XIV. Research Advisory Committee may provide choices in selecting the courses/ credits that facilitates the entrepreneur in the monetization of IP thus generated.

XV. RAC can also recommend UGC recognized online courses as part of the credit requirements for the Ph.D. program.

XVI. Paper- will comprise of the following two activities:

(a) **External Assessment: Written Question Paper 70/39**

(b) **Internal Assessment: 30/16**

Marks will be converted into letter grade and grade point as per following table:

Marks	Letter Grade	Grade Point
81-100	A+	10
76-80	A	9
66-75	B+	8
61-65	B	7
55-60	C	6
Less than 55	F	0

The computation of the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA) shall be done as per University Examination Ordinance or Examination Rules & Regulations issued time to time.

The result and grade sheet for the course work will carry pass/ fail result.

COURSE WORK PAPER

I. Candidates who already hold an M. Phil. degree and have been accepted into the Ph.D. program, or those who have finished their M.Phil. Coursework and have been given permission to continue on to the Ph.D. in an integrated course, may be exempted from the Ph.D. course requirements by the Department. All additional applicants accepted into the Ph.D. program must complete the Ph.D. coursework required by the Department.

II. The NIILM University attendance rules, a minimum 75% attendance is must require, will be applied to all full-time research scholars. For the duration of their coursework, part-time research researchers must, nevertheless, adhere to the same rules.

III. A Ph.D. scholar has to obtain a minimum of 55% of marks or a minimum CGPA of 6.0 in the UGC 10-point scale (or an equivalent grade/CGPA in a point scale wherever grading system is followed) in the course work in order to be eligible to continue in the program and submit the thesis.

IV. Registration will be automatically canceled if the required course work is not completed with a minimum of 55% of marks/a minimum CGPA of 6.0 within the allotted time. If the course work is not finished within a year, the RAC and DRC may suggest a six-month extension or suggest that the registration be canceled with the DRC.

V. There is no provision of improvement or special supplementary exam to be conducted. Coursework will be offered in four semesters of first two years with regular & supplementary exams to avail the opportunity to clear the coursework in 2 years. **Failure to complete the course in 2 years means that the student has to leave the program.**

Course Structure:

PHD-ARM-101	Advance Research Methodology in Physical Education	Credit Distribution: L:3, T:1, P:0=4
Course Objectives:	To acquaint the students with research process. To train them in the research methods and designs and to equip them to take up researches independently.	
Unit 1	**Introduction to Research** a. Nature and aims of research b. Dimensions and types of research c. Theory and research d. The meaning of methodology e. Types of Methods of Research	
Unit 2	**Research Planed Data Collection** a. Concept, logic, and research question/issues b. Variables, causal theory, and hypothesis c. Research Design and Collection of Data	

	d. Sampling: Methods, Size, Errors
	e. Probability and non-probability
	f. Measurement and Scaling Techniques
	g. Issues in measurement: Qualitative and quantitative
Unit 3	**Data Processing**
	a. Analysis of quantitative data introduction to higher order statistics
	b. Editing, Coding and Classification of Data
	c. Analysis of qualitative data and Tabulation
	d. Introduction to advanced statistical techniques using SPSS
	e. Statistical Derivatives and Measures of Central Tendency
	f. Measures of Variation and Skewness
	g. Correlation and Simple Regression
	h. Diagrammatic and Graphic Presentation of Data
Unit 4	**Research Report Writing**
	a. Ethical issues in research
	b. APA style of writing concept
	c. APA style of writing: Referencing
	d. d. Research article writing
Unit 5	**Computer Application in Research**
	a. Introduction to MS Excel, Using Formulas and Functions
	b. Hand on to SPSS
	c. Features for Statistical Data Analysis
	d. Generating Charts/Graphs
	e. Introduction to MS Word, Features and Functions, Writing Report in MS Word
	f. Introduction to Open Office or Latex
	g. Creating Presentation in MS PowerPoint
	h. Introduction to Internet-Based Search
	i. Use of Advanced Research Techniques.

Recommended Readings:

1. Bayard, P. & Grayson, A. (1976). Introducing psychological research. London: McMillan.

2. Bordens, K.S. & Abbot, B.B. (2005). Research design and methods. New Delhi: Tata McGraw Hill.

3. Breakwell, G.M. Hammond, S. & Fife-Schaw, C. (1995). Research Methods in Psychology. New Delhi: Sage Publications.

4. Cresswell, J.W. (1994) Research design: L Qualitative and quantitative approaches. Thousand Oaks, CA: Sage Publication.

5. Drew, C.J.: Hardman, M.L. & Hart, W.A. (1996). Designing and conducting research: Inquiry in education and social science. New York: Allyn & Bacon.

6. Kerlinger, F.N. (1982). Foundations of behavioural research. Delhi: Subject Publication.

7. Nation, J.R. (1997). Research Methods. New Jersey: Prentice Hall.

8. Willing, C. & Stainton-Rogers, W. (Eds.) (2008). The Sage Handbook of Qualitative Research in Psychology. New Delhi: Sage Publications.

PHD-DSC-102	Discipline Specific Course (Current Trends in Physical Education & Sports)	Credit Distribution: L:3, T:0, P:1=4
Learning Outcomes	- Students will study how aspiration levels influence sports performance and the role of emotions and aggression. - Students will be introduced to the use of force platforms to measure ground reaction forces during physical activities. - Students will gain an understanding of the structure and function of the musculoskeletal system and how exercise affects muscle contraction, joint function, and skeletal strength.	
Unit 1	**Introduction: Issues dealing with philosophy and purposes of physical Education and sports:** Physical education as a discipline, Interdisciplinary approach in Physical education, Olympic Movement and Olympic character: Basic understanding and sanctity of its preamble and statues. Olympic Guidelines and Indian Government view points on administration of Indian, Olympic Associations and Indian Sports Federations, Social Exclusion (Women, challenged groups) despite of Inclusive Policies of Physical Education and Sports in India, Various commissions and committees for physical education and Sports in India, their recommendations and impediments thereof, Discipline Elective-I (Any one of the following) PHY101 Current Trends in Physical Education & Sports Discipline Elective L T P Cr 4 0 0 4 PHY102 Sports Physiology, Psychology, and Biomechanics PHY103 Science of Sports Training and Conditioning Total 4 0 0 4 Comprehensive Sports Policy of India 2007 and National sports development code of India. Role of AIU. Introduction of Khelo India and Fit India.	
Unit 2	**Issues Dealing With Health Fitness and Wellness:** Role of International bodies namely United Nations, World Health Organization, and UNESCO in the promotion of physical activity for Health, Fitness and Wellness. Role of educational institutions, semi government agencies, Non- government organizations and private/ corporate groups and sectors in the promotion of Health awareness and physical Education/ activity & sports among masses.	
Unit 3	**Physical education professional issues- accreditation, Certification and nomenclature norms and quality standards of courses in physical education:** NAAC, UGC v/s NCTE acts in relation to physical education courses. Physical education ethics and commercialization. Role of International and National Associations of Physical Education and Sports in shaping the profession of physical education	
Unit 4	**Issue dealing with media, sports industry and marketing:** Role of Media in the promotion of Health, physical education and sports: Print, electronic and social media including internet. Sports industry & marketing in physical education curriculum in India.	

References:

1. Bucher A Charles and Deborah A Wuest. Foundations of Physical Education and Sports. B.I. Publication Pvt. Ltd, New Delhi, 1991.
2. Government of India. 34th Report of Rajya Sabha, Rajya Sabha Secretriate, 1995.
3. Government of India. All India council of sports: Agenda Papers, 2003.
4. Government of India. Ministry of Youth Affairs and Sports, Department of India, Draft Comprehensive Sports Policy, 2007.
5. Government of India. National Sports Development Code of India, Ministry of Youth Affairs and Sports, Department of Sports, 2011.
6. Government of India. Programme of Action, National Sports Policy, 1992.
7. Government of India. Recommendations of Central Advisory Board of Physical Education and Recreation, 1950

PHD-RPE-103	Research and Publication Ethics	Credit Distribution: L:1, T:1, P:0=2
Learning Outcomes	1. To have awareness about the publication ethics and publication misconducts. 2. To understand indexing and citation databases, open access publications, research metrics (citations, h-index, impact factor etc) 3. Develop hands-on skills to identify research misconduct and predatory publications.	
Unit 1	**Philosophy and Ethics (4 hrs)** 1. Introduction to philosophy: definition, nature and scope, concept, branches 2. Ethics: definition, moral philosophy, nature of moral judgements and reactions	
Unit 2	**Scientific Conduct (4 hrs)** 1. Ethics with respect to science and research 2. Intellectual honesty and research integrity 3. Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP) 4. Redundant publications: duplicate and overlapping publications, salami slicing 5. Selective reporting and misrepresentation of data	
Unit 3	**Publication Ethics (7 hrs)** 1. Publication ethics: definition, introduction and importance 2. Best practices / standards setting initiatives and guidelines: COPE, WAME, etc. 3. Conflicts of interest	

	4. Publication misconduct: definition, concept, problems that lead to unethical behavior and vice versa, types 5. Violation of publication ethics, authorship and contributor ship 6. Identification of publication misconduct, complaints and appeals 7. Predatory publishers and journals
Unit 4 Practice	**Open Access Publishing (4 hrs)** 1. Open access publications and initiatives 2. SHERPA/ROMEO online resource to check publisher copyright & self-archiving policies 3. Software tool to identify predatory publications developed by SPPU 4. Journal finder / journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer Journal Suggester, etc.
Unit 5 Practice	**Publication Misconduct (4 hrs)** A. Group Discussions (2 hrs.) 1. Subject specific ethical issues. FFP, authorship 2. Conflicts of interest 3. Complaints and appeals: examples and fraud from India and abroad B. Software tools (2 hrs.) Use of plagiarism software like Turnitin, Urkund and other open source software tools
Unit 6 Practice	**Databases and Research Metrics (7 hrs)** A. Databases (4 hrs.) 1. Indexing databases 2. Citation databases: Web of Science, Scopus etc. B. Research Metrics (3 hrs.) 1. Impact Factor of journal as per Journal Citation Report, SNIP, SJR, IPP, Cite Score 2. Metrics: h-index, g-index, i10 index, altmetrics

Suggested Readings

1. Bird, A. (2006). Philosophy of Science. Routledge.
2. MacIntyre, A. (1967) A Short History of Ethics. London.
3. P. Chaddah, (2018) Ethics in Competitive Research: Do not get scooped; do not get plagiarized, ISBN:978-9387480865
4. National Academy of Sciences, National Academy of Engineering and Institute of Medicine. (2009). On Being a Scientist: A Guide to Responsible Conduct in Research: Third Edition. National Academies Press.
5. Rensik, D. B. (2011). What is ethics in research & why is it important. National Institute of Environmental Health Sciences, 1-10. Retrieved from https://www.niehs.nih.gov/resources/biothics/whatis/index.cfm

6. Beall, J. (2012). Predatory publishers are corrupting open access. Nature, 489(7415), 179-179. https://doi.org/10.1038/489179a

NIILM UNIVERSITY

Ph.D. Course Work in Physics

Academic Session 2024-25

Ph.D. Regulations Regarding Course Work

Clause 18: Ph.D. Ordinance NIILM University as per UGC Minimum Standards and Procedure for Award of Ph.D. Degrees Regulations 2022 with effect from academic session 2024-25

I. The coursework shall be treated as a prerequisite for Ph.D. preparation. In the first year of registration, all research scholars are required to complete the course work for one semester following their provisional registration as a part of the Ph.D. program. It is mandatory to complete the course work in first 4 semesters to stay in the Ph.D. program. If a student fails to complete the coursework in first 4 semesters, will have to leave the program.

II. Earning a minimum of 12 total credits and a maximum of 16, is required.

III. Usually a course refers to a 'paper' and is a component of an academic program. Courses in Ph.D. course work shall be of two kinds: Core and Elective.

IV. A core course is a compulsory paper to be studied by all the scholars to complete the requirements of the Ph.D. degree.

V. Elective course is a course which is discipline specific and provided by the particular department from the main discipline or from a sister/related discipline which supports the main discipline, on mutual consent of the concerned departments.

VI. One credit equal to 15 contact hours for theory-based teaching or 30 hours of contact time for practical or activity-based teaching.

VII. The number of credits is given in the form L: T: P, where L indicates the number of contact hours of lecture, and T the number of contact hours for tutorials, P stands for laboratory credits.

VIII. The credits are distributed as follows:

Paper Code	Paper	Course type	Credit	L	T	P
PHD-ARM-101	Advanced Research Methodology	Core	4	3	1	0
PHD-DSC-102	Discipline Specific Course	Elective	4	3	1	0
PHD-RPE-103	Research and Publication Ethics	Core	2	1	1	0
PHD-SEM-104	Academic Writing, Literature Review and Seminar	Skill	2	0	1	2
	Total		12			

IX. All Ph.D., entrants irrespective of discipline, shall be trained in teaching proficiency related to teaching/education/pedagogy/writing related to their chosen Ph.D. subject during their doctoral training period, that include assigning 4-6 hours per week of teaching/ research assistantship for conducting tutorial or laboratory work and evaluations.

X. Courses PHD-SEM 104 includes research work on research article writing, seminar presentation and course PHD-TP 105 includes pedagogical training. Both these courses will be assessed internally without Semester End Examination.

XI. CoE will conduct Term/ Semester End Exam in PHD-ARM-101, PHD-DSC-102, and PHD-RPE-103.

XII. PHD-TP 105 is a non-credit course and internal assessment will be marked on the detailed mark card of the course work.

XIII. Advance Research Methodology course will include common research methodology and subject specific research methodology.

XIV. Research Advisory Committee may provide choices in selecting the courses/ credits that facilitates the entrepreneur in the monetization of IP thus generated.

XV. RAC can also recommend UGC recognized online courses as part of the credit requirements for the Ph.D. program.

XVI. Paper- will comprise of the following two activities:

(a) **External Assessment: Written Question Paper 70/39**

(b) **Internal Assessment: 30/16**

Marks will be converted into letter grade and grade point as per following table:

Marks	Letter Grade	Grade Point
81-100	A+	10
76-80	A	9
66-75	B+	8
61-65	B	7
55-60	C	6
Less than 55	F	0

The computation of the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA) shall be done as per University Examination Ordinance or Examination Rules & Regulations issued time to time.

The result and grade sheet for the course work will carry pass/ fail result.

COURSE WORK PAPER

I. Candidates who already hold an M. Phil. degree and have been accepted into the Ph.D. program, or those who have finished their M.Phil. Coursework and have been given permission to continue on to the Ph.D. in an integrated course, may be exempted from the Ph.D. course requirements by the Department. All additional applicants accepted into the Ph.D. program must complete the Ph.D. coursework required by the Department.

II. The NIILM University attendance rules, a minimum 75% attendance is must require, will be applied to all full-time research scholars. For the duration of their coursework, part-time research researchers must, nevertheless, adhere to the same rules.

III. A Ph.D. scholar has to obtain a minimum of 55% of marks or a minimum CGPA of 6.0 in the UGC 10-point scale (or an equivalent grade/CGPA in a point scale wherever grading system is followed) in the course work in order to be eligible to continue in the programme and submit the thesis.

IV. Registration will be automatically canceled if the required course work is not completed with a minimum of 55% of marks/a minimum CGPA of 6.0 within the allotted time. If the course work is not finished within a year, the RAC and DRC may suggest a six-month extension or suggest that the registration be canceled with the DRC.

V. There is no provision of improvement or special supplementary exam to be conducted. Coursework will be offered in four semesters of first two years with regular & supplementary exams to avail the opportunity to clear the coursework in 2 years. **Failure to complete the course in 2 years means that the student has to leave the program.**

Course Structure:

PHD-ARM-101	Advance Research Methodology in Physics	Credit Distribution: L:3, T:1, P:0=4
Course Objectives:	To acquaint the students with research process. To train them in the research methods and designs and to equip them to take up researches independently.	
Unit 1	**Introduction to Research** a. Nature and aims of research b. Dimensions and types of research c. Theory and research d. The meaning of methodology e. Types of Methods of Research	
Unit 2	**Research Planed Data Collection** a. Concept, logic, and research question/issues b. Variables, causal theory, and hypothesis c. Research Design and Collection of Data	

	d. Sampling: Methods, Size, Errors
	e. Probability and non-probability
	f. Measurement and Scaling Techniques
	g. Issues in measurement: Qualitative and quantitative
Unit 3	**Data Processing**
	a. Analysis of quantitative data introduction to higher order statistics
	b. Editing, Coding and Classification of Data
	c. Analysis of qualitative data and Tabulation
	d. Introduction to advanced statistical techniques using SPSS
	e. Statistical Derivatives and Measures of Central Tendency
	f. Measures of Variation and Skewness
	g. Correlation and Simple Regression
	h. Diagrammatic and Graphic Presentation of Data
Unit 4	**Research Report Writing**
	a. Ethical issues in research
	b. APA style of writing concept
	c. APA style of writing: Referencing
	d. d. Research article writing
Unit 5	**Computer Application in Research**
	a. Introduction to MS Excel, Using Formulas and Functions
	b. Hand on to SPSS
	c. Features for Statistical Data Analysis
	d. Generating Charts/Graphs
	e. Introduction to MS Word, Features and Functions, Writing Report in MS Word
	f. Introduction to Open Office or Latex
	g. Creating Presentation in MS PowerPoint
	h. Introduction to Internet-Based Search
	i. Use of Advanced Research Techniques.

Recommended Readings:
1. Bayard, P. & Grayson, A. (1976). Introducing psychological research. London: McMillan.
2. Bordens, K.S. & Abbot, B.B. (2005). Research design and methods. New Delhi: Tata McGraw Hill.
3. Breakwell, G.M. Hammond, S. & Fife-Schaw, C. (1995). Research Methods in Psychology. New Delhi: Sage Publications.
4. Cresswell, J.W. (1994) Research design: L Qualitative and quantitative approaches. Thousand Oaks, CA: Sage Publication.
5. Drew, C.J.: Hardman, M.L. & Hart, W.A. (1996). Designing and conducting research: Inquiry in education and social science. New York: Allyn & Bacon.
6. Kerlinger, F.N. (1982). Foundations of behavioral research. Delhi: Subject Publication.
7. Nation, J.R. (1997). Research Methods. New Jersey: Prentice Hall.

8. Willing, C. & Stainton-Rogers, W. (Eds.) (2008). The Sage Handbook of Qualitative Research in Psychology. New Delhi: Sage Publications.

PHD-DSC-102	Discipline Specific Course (Physics)	Credit Distribution: L:3, T:0, P:1=4
Learning Outcomes	• Understand emerging trends in simulation for complex systems. • Comprehend Fourier transforms for analyzing continuous and discrete signals in communication systems. • Understand techniques like TGA, DSC, NMR, ESR, and impedance spectroscopy to assess material behaviours under various conditions.	
Unit 1	Introduction: Fermions and bosons, Particles and antiparticles, Quarks and leptons, Yukawa picture, Types of fundamental interactions - electromagnetic, weak, strong and gravitational, HEP Units, Bound states of quarks, Hadron, Mesons and Baryons.	
Unit 2	Invariance Principles and Conservation Laws: Interactions and fields in particle physics, Invariance in classical mechanics and in quantum mechanics, types of symmetries and their breaking, Parity, Pion parity, Charge conjugation, Time reversal invariance, CP violation, CPT theorem.	
Unit 3	Hadron-Hadron Interactions: Cross section and decay rates, Pion spin, Isospin, Two-nucleon system, Pion-nucleon system, Strangeness and Isospin, and Hypercharge, Static Quark model of Hadrons: The Eightfold way, Meson nonet, Baryon octet, Baryon Decupled, hypothesis of quarks, SU (3) symmetry, Quark spin and color, Quark-antiquark combinations. Weak Interactions: Classification of weak interactions, Fermi theory, Parity non-conservation in β-decay, Helicity of neutrino, Experimental verification of parity violation.	
Unit 4	Experimental Methods in Particle Physics: Detector systems for high energy experiments: Collider physics (brief account), Particle Accelerators (brief account), Secondary beams, Beam transport, Modern Hybrid experiments- LHS, CMS and ALICE.	

Reference:-

1. Richard Fernow, 'Introduction to Experimental Particle Physics, Cambridge University Press, 2001.
2. W.R. Leo, 'Techniques in Nuclear and Particle Experiments', Springer, 1994.
3. Perkins, D.H., Introduction to High Energy Physics, Cambridge University Press, (2000).
4. Hughes, I.S., Elementary Particles, Cambridge University Press, (1991).
5. Close, F.E., Introduction to Quarks and Partons, Academic Press, (1979).

PHD-RPE-103	Research and Publication Ethics	Credit Distribution: L:1, T:1, P:0=2

Learning Outcomes	1. To have awareness about the publication ethics and publication misconducts. 2. To understand indexing and citation databases, open access publications, research metrics (citations, h-index, impact factor etc) 3. Develop hands-on skills to identify research misconduct and predatory publications.
Unit 1	**Philosophy and Ethics (4 hrs)** 1. Introduction to philosophy: definition, nature and scope, concept, branches 2. Ethics: definition, moral philosophy, nature of moral judgements and reactions
Unit 2	**Scientific Conduct (4 hrs)** 1. Ethics with respect to science and research 2. Intellectual honesty and research integrity 3. Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP) 4. Redundant publications: duplicate and overlapping publications, salami slicing 5. Selective reporting and misrepresentation of data
Unit 3	**Publication Ethics (7 hrs)** 1. Publication ethics: definition, introduction and importance 2. Best practices / standards setting initiatives and guidelines: COPE, WAME, etc. 3. Conflicts of interest 4. Publication misconduct: definition, concept, problems that lead to unethical behavior and vice versa, types 5. Violation of publication ethics, authorship and contributor ship 6. Identification of publication misconduct, complaints and appeals 7. Predatory publishers and journals
Unit 4 Practice	**Open Access Publishing (4 hrs)** 1. Open access publications and initiatives 2. SHERPA/ROMEO online resource to check publisher copyright & self-archiving policies 3. Software tool to identify predatory publications developed by SPPU 4. Journal finder / journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer Journal Suggester, etc.
Unit 5 Practice	**Publication Misconduct (4 hrs)** A. Group Discussions (2 hrs.) 1. Subject specific ethical issues, FFP, authorship 2. Conflicts of interest

	3. Complaints and appeals: examples and fraud from India and abroad **B. Software tools (2 hrs.)** Use of plagiarism software like Turnitin, Urkund and other open source software tools
Unit 6 Practice	**Databases and Research Metrics (7 hrs)** A. Databases (4 hrs.) 1. Indexing databases 2. Citation databases: Web of Science, Scopus etc. B. Research Metrics (3 hrs.) 1. Impact Factor of journal as per Journal Citation Report, SNIP, SJR, IPP, Cite Score 2. Metrics: h-index, g-index, i10 index, altmetrics

Suggested Readings

1. Bird, A. (2006). Philosophy of Science. Routledge.
2. MacIntyre, A. (1967) A Short History of Ethics. London.
3. P. Chaddah, (2018) Ethics in Competitive Research: Do not get scooped; do not get plagiarized, ISBN:978-9387480865
4. National Academy of Sciences, National Academy of Engineering and Institute of Medicine. (2009). On Being a Scientist: A Guide to Responsible Conduct in Research: Third Edition. National Academies Press.
5. Rensik, D. B. (2011). What is ethics in research & why is it important. National Institute of Environmental Health Sciences, 1-10. Retrieved from https://www.niehs.nih.gov/resources/biothics/whatis/index.cfm
6. Beall, J. (2012). Predatory publishers are corrupting open access. Nature, 489(7415), 179-179. https://doi.org/10.1038/489179a

NIILM UNIVERSITY

Ph.D. Course Work in Political Science

Academic Session 2024-25

Ph.D. Regulations Regarding Course Work

Clause 18: Ph.D. Ordinance NIILM University as per UGC Minimum Standards and Procedure for Award of Ph.D. Degrees Regulations 2022 with effect from academic session 2024-25

I.   The coursework shall be treated as a prerequisite for Ph.D. preparation. In the first year of registration, all research scholars are required to complete the course work for one semester following their provisional registration as a part of the Ph.D. program. It is mandatory to complete the course work in first 4 semesters to stay in the Ph.D. program. If a student fails to complete the coursework in first 4 semesters, will have to leave the program.

II. Earning a minimum of 12 total credits and a maximum of 16, is required.

III. Usually a course refers to a 'paper' and is a component of an academic program. Courses in Ph.D. course work shall be of two kinds: Core and Elective.

IV. A core course is a compulsory paper to be studied by all the scholars to complete the requirements of the Ph.D. degree.

V.   Elective course is a course which is discipline specific and provided by the particular department from the main discipline or from a sister/related discipline which supports the main discipline, on mutual consent of the concerned departments.

VI. One credit equal to 15 contact hours for theory-based teaching or 30 hours of contact time for practical or activity-based teaching.

VII.   The number of credits is given in the form L: T: P, where L indicates the number of contact hours of lecture, and T the number of contact hours for tutorials, P stands for laboratory credits.

VIII.   The credits are distributed as follows:

Paper Code	Paper	Course type	Credit	L	T	P
PHD-ARM-101	Advanced Research Methodology	Core	4	3	1	0
PHD-DSC-102	Discipline Specific Course	Elective	4	3	1	0
PHD-RPE-103	Research and Publication Ethics	Core	2	1	1	0
PHD-SEM-104	Academic Writing, Literature Review and Seminar	Skill	2	0	1	2
	Total		12			

IX.   All Ph.D., entrants irrespective of discipline, shall be trained in teaching proficiency related to teaching/education/pedagogy/writing related to their chosen Ph.D. subject during their doctoral training period, that include assigning 4-6 hours per week of teaching/ research assistantship for conducting tutorial or laboratory work and evaluations.

X.   Courses PHD-SEM 104 includes research work on research article writing, seminar presentation and course PHD-TP 105 includes pedagogical training. Both these courses will be assessed internally without Semester End Examination.

XI.   CoE will conduct Term/ Semester End Exam in PHD-ARM-101, PHD-DSC-102, and PHD-RPE-103.

XII.   PHD-TP 105 is a non-credit course and internal assessment will be marked on the detailed mark card of the course work.

XIII.   Advance Research Methodology course will include common research methodology and subject specific research methodology.

XIV.   Research Advisory Committee may provide choices in selecting the courses/ credits that facilitates the entrepreneur in the monetization of IP thus generated.

XV.   RAC can also recommend UGC recognized online courses as part of the credit requirements for the Ph.D. program.

XVI.   Paper- will comprise of the following two activities:

   (a) **External Assessment: Written Question Paper 70/39**
   (b) **Internal Assessment: 30/16**

Marks will be converted into letter grade and grade point as per following table:

Marks	Letter Grade	Grade Point
81-100	A+	10
76-80	A	9
66-75	B+	8
61-65	B	7
55-60	C	6
Less than 55	F	0

The computation of the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA) shall be done as per University Examination Ordinance or Examination Rules & Regulations issued time to time.

The result and grade sheet for the course work will carry pass/ fail result.

COURSE WORK PAPER

I. Candidates who already hold an M. Phil. degree and have been accepted into the Ph.D. program, or those who have finished their M.Phil. Coursework and have been given permission to continue on to the Ph.D. in an integrated course, may be exempted from the Ph.D. course requirements by the Department. All additional applicants accepted into the Ph.D. program must complete the Ph.D. coursework required by the Department.

II. The NIILM University attendance rules, a minimum 75% attendance is must require, will be applied to all full-time research scholars. For the duration of their coursework, part-time research researchers must, nevertheless, adhere to the same rules.

III. A Ph.D. scholar has to obtain a minimum of 55% of marks or a minimum CGPA of 6.0 in the UGC 10-point scale (or an equivalent grade/CGPA in a point scale wherever grading system is followed) in the course work in order to be eligible to continue in the program and submit the thesis.

IV. Registration will be automatically canceled if the required course work is not completed with a minimum of 55% of marks/a minimum CGPA of 6.0 within the allotted time. If the course work is not finished within a year, the RAC and DRC may suggest a six-month extension or suggest that the registration be canceled with the DRC.

V. There is no provision of improvement or special supplementary exam to be conducted. Coursework will be offered in four semesters of first two years with regular & supplementary exams to avail the opportunity to clear the coursework in 2 years. **Failure to complete the course in 2 years means that the student has to leave the program.**

Course Structure:

PHD-ARM-101	Advance Research Methodology in Political Science	Credit Distribution: L:3, T:1, P:0=4
Course Objectives:	To acquaint the students with research process. To train them in the research methods and designs and to equip them to take up researches independently.	
Unit 1	**Introduction to Research** a. Nature and aims of research b. Dimensions and types of research c. Theory and research d. The meaning of methodology e. Types of Methods of Research	
Unit 2	**Research Planed Data Collection** a. Concept, logic, and research question/issues b. Variables, causal theory, and hypothesis c. Research Design and Collection of Data	

	d. Sampling: Methods, Size, Errors
	e. Probability and non-probability
	f. Measurement and Scaling Techniques
	g. Issues in measurement: Qualitative and quantitative
Unit 3	**Data Processing**
	a. Analysis of quantitative data introduction to higher order statistics
	b. Editing, Coding and Classification of Data
	c. Analysis of qualitative data and Tabulation
	d. Introduction to advanced statistical techniques using SPSS
	e. Statistical Derivatives and Measures of Central Tendency
	f. Measures of Variation and Skewness
	g. Correlation and Simple Regression
	h. Diagrammatic and Graphic Presentation of Data
Unit 4	**Research Report Writing**
	a. Ethical issues in research
	b. APA style of writing concept
	c. APA style of writing: Referencing
	d. d. Research article writing
Unit 5	**Computer Application in Research**
	a. Introduction to MS Excel, Using Formulas and Functions
	b. Hand on to SPSS
	c. Features for Statistical Data Analysis
	d. Generating Charts/Graphs
	e. Introduction to MS Word, Features and Functions, Writing Report in MS Word
	f. Introduction to Open Office or Latex
	g. Creating Presentation in MS PowerPoint
	h. Introduction to Internet-Based Search
	i. Use of Advanced Research Techniques.

Recommended Readings:

1. Bayard, P. & Grayson, A. (1976). Introducing psychological research. London: McMillan.
2. Bordens, K.S. & Abbot, B.B. (2005). Research design and methods. New Delhi: Tata McGraw Hill.
3. Breakwell, G.M. Hammond, S. & Fife-Schaw, C. (1995). Research Methods in Psychology. New Delhi: Sage Publications.
4. Cresswell, J.W. (1994) Research design: L Qualitative and quantitative approaches. Thousand Oaks, CA: Sage Publication.
5. Drew, C.J.: Hardman, M.L. & Hart, W.A. (1996). Designing and conducting research: Inquiry in education and social science. New York: Allyn & Bacon.
6. Kerlinger, F.N. (1982). Foundations of behavioural research. Delhi: Subject Publication.
7. Nation, J.R. (1997). Research Methods. New Jersey: Prentice Hall.

8. Willing, C. & Stainton-Rogers, W. (Eds.) (2008). The Sage Handbook of Qualitative Research in Psychology. New Delhi: Sage Publications.

PHD-DSC-102	Discipline Specific Course (Recent Trends and Issues in Indian Politics)	Credit Distribution: L:3, T:1, P:0=4
Learning Outcomes	• Learners will define political theory and understand its role in the study of politics, examining its historical development and key concepts such as power, authority, justice, and governance. • Students will grasp the foundational aspects of political theory, including its role in shaping political discourse, and will be able to differentiate between normative and empirical political theory. • Students will learn about the emergence of behavioralism in political science, which emphasizes empirical research, systematic observation, and the scientific study of political behavior.	
Unit 1	Recent trends in India federalism; Demands of State Autonomy and Separatist Movement, Tension areas in Centre-State Relations, Impact of Planning and Party System on Federalism.	
Unit 2	Tradition and Modernity in India, Politics of Reservation, Political Corruption, Criminalization of Politics, Terrorism, Politics of Violence, Globalization and its implication for India.	
Unit 3	Election Commission and Electoral Reforms, Electoral Politics and Voting Behaviour.	
Unit 4	Rise of Hindu Nationalization and Discourse on Hindutva, Discourse on Secularism, Dalit and Backward Caste Politics, Women Politics and Gender Debate.	

Essential Readings

Paul R. Brass — The Politics of India since Independence.
A. R. Desai(ed.) — Peasant Struggles
Atul Kohli — Democracy and Discontent: India's growing crisis of Governability
A. K. Java(ed.) — Indian Politics at the cross roads
A.S. Narang — Indian Government & Politics
Azam, Kausar, J. — Political Aspects of National Integration.
C. P. Bhambri — Indian State Government & Politics
C. P. Bhambri — Indian Politics Since Independence
Desai A.R. — Recent Trends in Indian Nationalism
K. Seshadri — Studies in Indian Polity
Mekhala Kulapati — Political Disputes and Nation
Building in Srinivas, M.N. — Independent India
Smith Donald E. — India as a Secular State
Sharma, B.A.V. — Reservation Policy in Indian
Kharkunis. Ready, K.M. Eds. — Indian Politics and the Role of the Press
Dhavan, Rajeev — The Supreme Court of Indian and Parliamentary

PHD-DSC-102	Discipline Specific Course (Contemporary Indian political thought)	Credit Distribution: L:3, T:1, P:0=4
Learning Outcomes	• Learners will define political theory and understand its role in the study of politics, examining its historical development and key concepts such as power, authority, justice, and governance. • Students will grasp the foundational aspects of political theory, including its role in shaping political discourse, and will be able to differentiate between normative and empirical political theory. • Students will learn about the emergence of behavioralism in political science, which emphasizes empirical research, systematic observation, and the scientific study of political behavior.	
Unit 1	Indian Liberalism: Dada bhai Naoro ji, M.G .Ranade and G.K. Gokhale.	
Unit 2	Militant Nationalism: B.G. Tilak, B.C. Pal, Laj pat Rai, Aurobindo Ghosh. Indian Socialism: Narendra Deva, J.P. Narayan and Ram Manohar Lohia Humanism: M.N. Roy.	
Unit 3	Gandhian Political Thought: M.K.Gandhi, J.P.Narain and Vinoba Bhave.	
Unit 4	Hindu Nationalism : Savarkar Composite Nationalism: Jawahar lal Nehru Critique of Caste System: Ambedkar.	

Books Recommended:

- Rawls, J. A Theory of Justice
- Daniels, N. (ed.) Reading Rawls
- Hook, Sydney From Hegal to Marx
- Bains, J.S. (ed) Perspectives in Political Theory
- Charles worth, James C The Limits of Behavioralism in Political Science (New York: ASS Ps. (1963)
- Easton, David Varieties of Political Theories (Englewood Cliffs :
- Prentice Hall, (1968)
- Hacker, Andrew Political Theory : Science and Ideology (New York :
- Macmillan, (1961)
- Jankin, Thomas, P. The Study of Political Theory (New York Doubleday (1965)
- Gandhi, Madan G. Modern Political Analysis (Oxford & IBH, Delhi, (1982)
- Gandhi, Madan G. Modern Political Theory (Oxford & IBH, Delhi, (1982)

PHD-DSC-102	Discipline Specific Course (Political Theory: Theoretical Perspectives)	Credit Distribution: L:3, T:1, P:0=4
Learning Outcomes	• It enhances to critically apply theories, methodologies, assumptions and epistemology to address fundamental questions in the chosen area of research. • Enable researcher to pursue excellence in revealing truths and facts. • To promote ability to exercise independent and objective judgment in deriving inferences and generalization and come out with socially relevant thesis and dissertation and article.	
Unit 1	Political Theory what is Political Theory? Nature and Significance of Political Theory; Behavioral Movement and Post Behaviouralism; Decline and Resurgence of Political Theory	
Unit 2	Enlightenment and Liberal Traditions What is enlightenment? Liberty; Equality; Justice; Capabilities as Freedom; Democracy.	
Unit 3	Radical Traditions Marxism – Basic Tenets, Materialist Dialectics, Historical Materialism; Theory of Alienation.	
Unit 4	Critical Traditions Multiculturalism; Feminism.	

Essential Readings:

- Berlin, Isaiah. (1969). Four Essays on Concepts of Liberty. Oxford: Oxford University Press
- Bhargava, Rajiv and Acharya Ashok. (ed.), (2008). Political Theory: An Introduction. New Delhi: Pearson.
- Chatterjee, Partha. (2013). Lineages of Political Society. Orient Blackswan. Farrelly, Colin. (ed.), (2004). Contemporary Political Theory: A Reader. New Delhi: Sage Publications.
- Gaus, Gerald F. and kukathas, Chandran. (ed.), (2004). Handbook of Political Theory. New Delhi: Sage Publications.
- Goodin, Robert E. and Pettit, Philip. (1993). A Companion to Contemporary Political Philosophy. Oxford: Oxford University Press.
- Gutman, Amy. (ed.), (1994). Multiculturalism: Examining the Politics of Recognition. Princeton: Princeton University Press.
- Heywood, Andrew. (2004). Political Theory: An Introduction (Third Edition). New York: Palgrave Macmillan.
- Kymlicka, Will. (2002). Contemporary Political Philosophy: An Introduction. New Delhi: Oxford University Press

PHD-RPE-	Research and Publication Ethics	Credit Distribution:

103		L:1, T:1, P:0=2
Learning Outcomes	1. To have awareness about the publication ethics and publication misconducts. 2. To understand indexing and citation databases, open access publications, research metrics (citations, h-index, impact factor etc) 3. Develop hands-on skills to identify research misconduct and predatory publications.	
Unit 1	**Philosophy and Ethics (4 hrs)** 1. Introduction to philosophy: definition, nature and scope, concept, branches 2. Ethics: definition, moral philosophy, nature of moral judgements and reactions	
Unit 2	**Scientific Conduct (4 hrs)** 1. Ethics with respect to science and research 2. Intellectual honesty and research integrity 3. Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP) 4. Redundant publications: duplicate and overlapping publications, salami slicing 5. Selective reporting and misrepresentation of data	
Unit 3	**Publication Ethics (7 hrs)** 1. Publication ethics: definition, introduction and importance 2. Best practices / standards setting initiatives and guidelines: COPE, WAME, etc. 3. Conflicts of interest 4. Publication misconduct: definition, concept, problems that lead to unethical behavior and vice versa, types 5. Violation of publication ethics, authorship and contributor ship 6. Identification of publication misconduct, complaints and appeals 7. Predatory publishers and journals	
Unit 4 Practice	**Open Access Publishing (4 hrs)** 1. Open access publications and initiatives 2. SHERPA/ROMEO online resource to check publisher copyright & self-archiving policies 3. Software tool to identify predatory publications developed by SPPU 4. Journal finder / journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer Journal Suggester, etc.	
Unit 5 Practice	**Publication Misconduct (4 hrs)** A. Group Discussions (2 hrs.) 1. Subject specific ethical issues, FFP, authorship	

	2. Conflicts of interest
	3. Complaints and appeals: examples and fraud from India and abroad
	B. Software tools (2 hrs.)
	Use of plagiarism software like Turnitin, Urkund and other open source software tools
Unit 6 Practice	**Databases and Research Metrics (7 hrs)**
	A. Databases (4 hrs.)
	1. Indexing databases
	2. Citation databases: Web of Science, Scopus etc.
	B. Research Metrics (3 hrs.)
	1. Impact Factor of journal as per Journal Citation Report, SNIP, SJR, IPP, Cite Score
	2. Metrics: h-index, g-index, i10 index, altmetrics

Suggested Readings

1. Bird, A. (2006). Philosophy of Science. Routledge.
2. MacIntyre, A. (1967) A Short History of Ethics. London.
3. P. Chaddah, (2018) Ethics in Competitive Research: Do not get scooped; do not get plagiarized, ISBN:978-9387480865
4. National Academy of Sciences, National Academy of Engineering and Institute of Medicine. (2009). On Being a Scientist: A Guide to Responsible Conduct in Research: Third Edition. National Academies Press.
5. Rensik, D. B. (2011). What is ethics in research & why is it important. National Institute of Environmental Health Sciences, 1-10. Retrieved from https://www.niehs.nih.gov/resources/biothics/whatis/index.cfm
6. Beall, J. (2012). Predatory publishers are corrupting open access. Nature, 489(7415), 179-179. https://doi.org/10.1038/489179a

NIILM UNIVERSITY

Ph.D. Course Work in Psychology

Academic Session 2024-25

Ph.D. Regulations Regarding Course Work

Clause 18: Ph.D. Ordinance NIILM University as per UGC Minimum Standards and Procedure for Award of Ph.D. Degrees Regulations 2022 with effect from academic session 2024-25

I. The coursework shall be treated as a prerequisite for Ph.D. preparation. In the first year of registration, all research scholars are required to complete the course work for one semester following their provisional registration as a part of the Ph.D. program. It is mandatory to complete the course work in first 4 semesters to stay in the Ph.D. program. If a student fails to complete the coursework in first 4 semesters, will have to leave the program.
II. Earning a minimum of 12 total credits and a maximum of 16, is required.
III. Usually a course refers to a 'paper' and is a component of an academic program. Courses in Ph.D. course work shall be of two kinds: Core and Elective.
IV. A core course is a compulsory paper to be studied by all the scholars to complete the requirements of the Ph.D. degree.
V. Elective course is a course which is discipline specific and provided by the particular department from the main discipline or from a sister/related discipline which supports the main discipline, on mutual consent of the concerned departments.
VI. One credit equal to 15 contact hours for theory-based teaching or 30 hours of contact time for practical or activity-based teaching.

VII. The number of credits is given in the form L: T: P, where L indicates the number of contact hours of lecture, and T the number of contact hours for tutorials, P stands for laboratory credits.

VIII. The credits are distributed as follows:

Paper Code	Paper	Course type	Credit	L	T	P
PHD-ARM-101	Advanced Research Methodology	Core	4	3	1	0
PHD-DSC-102	Discipline Specific Course	Elective	4	3	1	0
PHD-RPE-103	Research and Publication Ethics	Core	2	1	1	0
PHD-SEM-104	Academic Writing, Literature Review and Seminar	Skill	2	0	1	2
	Total		12			

IX. All Ph.D., entrants irrespective of discipline, shall be trained in teaching proficiency related to teaching/education/pedagogy/writing related to their chosen Ph.D. subject during their doctoral training period, that include assigning 4-6 hours per week of teaching/ research assistantship for conducting tutorial or laboratory work and evaluations.

X. Courses PHD-SEM 104 includes research work on research article writing, seminar presentation and course PHD-TP 105 includes pedagogical training. Both these courses will be assessed internally without Semester End Examination.

XI. CoE will conduct Term/ Semester End Exam in PHD-ARM-101, PHD-DSC-102, and PHD-RPE-103.

XII. PHD-TP 105 is a non-credit course and internal assessment will be marked on the detailed mark card of the course work.

XIII. Advance Research Methodology course will include common research methodology and subject specific research methodology.

XIV. Research Advisory Committee may provide choices in selecting the courses/ credits that facilitates the entrepreneur in the monetization of IP thus generated.

XV. RAC can also recommend UGC recognized online courses as part of the credit requirements for the Ph.D. program.

XVI. Paper- will comprise of the following two activities:
(a) **External Assessment: Written Question Paper 70/39**
(b) **Internal Assessment: 30/16**

Marks will be converted into letter grade and grade point as per following table:

Marks	Letter Grade	Grade Point
81-100	A+	10
76-80	A	9
66-75	B+	8
61-65	B	7
55-60	C	6
Less than 55	F	0

The computation of the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA) shall be done as per University Examination Ordinance or Examination Rules & Regulations issued time to time.

The result and grade sheet for the course work will carry pass/ fail result.

COURSE WORK PAPER

I. Candidates who already hold an M. Phil. degree and have been accepted into the Ph.D. program, or those who have finished their M.Phil. Coursework and have been given permission to continue on to the Ph.D. in an integrated course, may be exempted from the Ph.D. course requirements by the Department. All additional applicants accepted into the Ph.D. program must complete the Ph.D. coursework required by the Department.

II. The NIILM University attendance rules, a minimum 75% attendance is must require, will be applied to all full-time research scholars. For the duration of their coursework, part-time research researchers must, nevertheless, adhere to the same rules.

III. A Ph.D. scholar has to obtain a minimum of 55% of marks or a minimum CGPA of 6.0 in the UGC 10-point scale (or an equivalent grade/CGPA in a point scale wherever grading system is followed) in the course work in order to be eligible to continue in the program and submit the thesis.

IV. Registration will be automatically canceled if the required course work is not completed with a minimum of 55% of marks/a minimum CGPA of 6.0 within the allotted time. If the course work is not finished within a year, the RAC and DRC may suggest a six-month extension or suggest that the registration be canceled with the DRC.

V. There is no provision of improvement or special supplementary exam to be conducted. Coursework will be offered in four semesters of first two years with regular & supplementary exams to avail the opportunity to clear the coursework in 2 years. **Failure to complete the course in 2 years means that the student has to leave the program.**

Course Structure:

PHD-ARM-101	Advance Research Methodology in Psychology	Credit Distribution: L:3, T:1, P:0=4
Course Objectives:	To acquaint the students with research process. To train them in the research methods and designs and to equip them to take up researches independently.	
Unit 1	**Introduction to Research** a. Nature and aims of research b. Dimensions and types of research c. Theory and research d. The meaning of methodology e. Types of Methods of Research	
Unit 2	**Research Planed Data Collection** a. Concept, logic, and research question/issues b. Variables, causal theory, and hypothesis c. Research Design and Collection of Data	

	d. Sampling: Methods, Size, Errors
	e. Probability and non-probability
	f. Measurement and Scaling Techniques
	g. Issues in measurement: Qualitative and quantitative
Unit 3	**Data Processing**
	a. Analysis of quantitative data introduction to higher order statistics
	b. Editing, Coding and Classification of Data
	c. Analysis of qualitative data and Tabulation
	d. Introduction to advanced statistical techniques using SPSS
	e. Statistical Derivatives and Measures of Central Tendency
	f. Measures of Variation and Skewness
	g. Correlation and Simple Regression
	h. Diagrammatic and Graphic Presentation of Data
Unit 4	**Research Report Writing**
	a. Ethical issues in research
	b. APA style of writing concept
	c. APA style of writing: Referencing
	d. d. Research article writing
Unit 5	**Computer Application in Research**
	a. Introduction to MS Excel, Using Formulas and Functions
	b. Hand on to SPSS
	c. Features for Statistical Data Analysis
	d. Generating Charts/Graphs
	e. Introduction to MS Word, Features and Functions, Writing Report in MS Word
	f. Introduction to Open Office or Latex
	g. Creating Presentation in MS PowerPoint
	h. Introduction to Internet-Based Search
	i. Use of Advanced Research Techniques.

Recommended Readings:

1. Bayard, P. & Grayson, A. (1976). Introducing psychological research. London: McMillan.

2. Bordens, K.S. & Abbot, B.B. (2005). Research design and methods. New Delhi: Tata McGraw Hill.

3. Breakwell, G.M. Hammond, S. & Fife-Schaw, C. (1995). Research Methods in Psychology. New Delhi: Sage Publications.

4. Cresswell, J.W. (1994) Research design: L Qualitative and quantitative approaches. Thousand Oaks, CA: Sage Publication.

5. Drew, C.J.: Hardman, M.L. & Hart, W.A. (1996). Designing and conducting research: Inquiry in education and social science. New York: Allyn & Bacon.

6. Kerlinger, F.N. (1982). Foundations of behavioural research. Delhi: Subject Publication.

7. Nation, J.R. (1997). Research Methods. New Jersey: Prentice Hall.

8. Willing, C. & Stainton-Rogers, W. (Eds.) (2008). The Sage Handbook of Qualitative Research in Psychology. New Delhi: Sage Publications.

PHD-DSC-102	Discipline Specific Course (Psychology)	Credit Distribution: L:3, T:1, P:0=4
Learning Outcomes	• Learners will gain expertise in gathering detailed case histories to identify patterns, behaviours, and relevant background information for clinical assessments. • Learners will gain knowledge on diagnosing and treating conduct disorders, focusing on aggressive and antisocial behaviours in children. • Learners will study the causes, signs, and impacts of child abuse and neglect, including emotional, physical, and sexual abuse.	
Unit 1	Clinical Assessment: Observation, Interview, Case history, psychological tests, Neurological and Psycho neurological examination.	
Unit 2	Mental Disorders diagnosed in Childhood: Causes, Symptoms, and treatment of: Specific developmental disorders; Pervasive and other developmental disorders; Attention deficit disorders; Conduct disorders	
Unit 3	Causes, Symptoms, and treatment of Tic and Elimination Disorders: Tic disorders; Nonorganic enuresis and encopresis; Emotional disorders (Anxiety dis.; School refusal; Sibling rivalry; Phobic dis.; OCD, Somatoform dis.; Depressive dis.; Suicide and Para-suicide; Child abuse; Feeding and eating dis.; PTSD, Panic dis.); Impulse control disorders	
Unit 4	Child Abuse and Neglect: Child Mal treatment and Non accidental trauma	

Essential References:

1) Kapur, M. (1995). Mental Health of Indian Children. New Delhi: Sage Publication. Kronenberger, W.G. & Mayer, R.G. (2001). The Child Clinicians Handbook. London: Allyn and Bacon.

2) Lewis, M. (1991). Child and Adolescent Psychiatry. London: Williams and Wilkins. Malhotra, S. (2002). Child Psychiatry in India. New Delhi: MacMillan. Mash, E.J. & Wolfe, D.A. (2005). Abnormal Child Psychology. Singapore: Thomson Wadsworth.

3) Sadock, B.J. & Sadock, V.A. (2008). Kaplan and Sadock's Synopsis of Psychiatry: Behavioural Sciences/Clinical Psychology. New York: Wolters Kluwer/Lippincott Williams and Wilkins.

4) Sharma, N., Kalia, A.K. Husain, A. (2008). Counselling: Theory, Research and Practice. New Delhi: Global Vision.

5) Sue, B., Sue, D.W., Sue, S. (2003). Understanding abnormal behaviour. New York: Houghton Mifflin. Thapa, K., Van der A

PHD-RPE-103	Research and Publication Ethics	Credit Distribution: L:1, T:1, P:0=2
Learning Outcomes	1. To have awareness about the publication ethics and publication misconducts. 2. To understand indexing and citation databases, open access publications, research metrics (citations, h-index, impact factor etc) 3. Develop hands-on skills to identify research misconduct and predatory publications.	
Unit 1	**Philosophy and Ethics (4 hrs)** 1. Introduction to philosophy: definition, nature and scope, concept, branches 2. Ethics: definition, moral philosophy, nature of moral judgements and reactions	
Unit 2	**Scientific Conduct (4 hrs)** 1. Ethics with respect to science and research 2. Intellectual honesty and research integrity 3. Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP) 4. Redundant publications: duplicate and overlapping publications, salami slicing 5. Selective reporting and misrepresentation of data	
Unit 3	**Publication Ethics (7 hrs)** 1. Publication ethics: definition, introduction and importance 2. Best practices / standards setting initiatives and guidelines: COPE, WAME, etc. 3. Conflicts of interest 4. Publication misconduct: definition, concept, problems that lead to unethical behavior and vice versa, types 5. Violation of publication ethics, authorship and contributor ship 6. Identification of publication misconduct, complaints and appeals 7. Predatory publishers and journals	
Unit 4 Practice	**Open Access Publishing (4 hrs)** 1. Open access publications and initiatives 2. SHERPA/ROMEO online resource to check publisher copyright & self-archiving policies 3. Software tool to identify predatory publications developed by SPPU 4. Journal finder / journal suggestion tools viz. JANE, Elsevier Journal	

	Finder, Springer Journal Suggester, etc.
Unit 5 Practice	**Publication Misconduct (4 hrs)** A. Group Discussions (2 hrs.) 1. Subject specific ethical issues, FFP, authorship 2. Conflicts of interest 3. Complaints and appeals: examples and fraud from India and abroad B. Software tools (2 hrs.) Use of plagiarism software like Turnitin, Urkund and other open source software tools
Unit 6 Practice	**Databases and Research Metrics (7 hrs)** A. Databases (4 hrs.) 1. Indexing databases 2. Citation databases: Web of Science, Scopus etc. B. Research Metrics (3 hrs.) 1. Impact Factor of journal as per Journal Citation Report, SNIP, SJR, IPP, Cite Score 2. Metrics: h-index, g-index, i10 index, altmetrics

Suggested Readings

1. Bird, A. (2006). Philosophy of Science. Routledge.
2. MacIntyre, A. (1967) A Short History of Ethics. London.
3. P. Chaddah, (2018) Ethics in Competitive Research: Do not get scooped; do not get plagiarized, ISBN:978-9387480865
4. National Academy of Sciences, National Academy of Engineering and Institute of Medicine. (2009). On Being a Scientist: A Guide to Responsible Conduct in Research: Third Edition. National Academies Press.
5. Rensik, D. B. (2011). What is ethics in research & why is it important. National Institute of Environmental Health Sciences, 1-10. Retrieved from https://www.niehs.nih.gov/resources/biothics/whatis/index.cfm
6. Beall, J. (2012). Predatory publishers are corrupting open access. Nature, 489(7415), 179-179. https://doi.org/10.1038/489179a

NIILM UNIVERSITY

Ph.D. Course Work in Public Administration

Academic Session 2024-25

Ph.D. Regulations Regarding Course Work

Clause 18: Ph.D. Ordinance NIILM University as per UGC Minimum Standards and Procedure for Award of Ph.D. Degrees Regulations 2022 with effect from academic session 2024-25

I. The coursework shall be treated as a prerequisite for Ph.D. preparation. In the first year of registration, all research scholars are required to complete the course work for one semester following their provisional registration as a part of the Ph.D. program. It is mandatory to complete the course work in first 4 semesters to stay in the Ph.D. program. If a student fails to complete the coursework in first 4 semesters, will have to leave the program.

II. Earning a minimum of 12 total credits and a maximum of 16, is required.

III. Usually a course refers to a 'paper' and is a component of an academic program. Courses in Ph.D. course work shall be of two kinds: Core and Elective.

IV. A core course is a compulsory paper to be studied by all the scholars to complete the requirements of the Ph.D. degree.

V. Elective course is a course which is discipline specific and provided by the particular department from the main discipline or from a sister/related discipline which supports the main discipline, on mutual consent of the concerned departments.

VI. One credit equal to 15 contact hours for theory-based teaching or 30 hours of contact time for practical or activity-based teaching.

VII. The number of credits is given in the form L: T: P, where L indicates the number of contact hours of lecture, and T the number of contact hours for tutorials, P stands for laboratory credits.

VIII. The credits are distributed as follows:

Paper Code	Paper	Course type	Credit	L	T	P
PHD-ARM-101	Advanced Research Methodology	Core	4	3	1	0
PHD-DSC-102	Discipline Specific Course	Elective	4	3	1	0
PHD-RPE-103	Research and Publication Ethics	Core	2	1	1	0
PHD-SEM-104	Academic Writing, Literature Review and Seminar	Skill	2	0	1	2
	Total		12			

IX. All Ph.D., entrants irrespective of discipline, shall be trained in teaching proficiency related to teaching/education/pedagogy/writing related to their chosen Ph.D. subject during their doctoral training period, that include assigning 4-6 hours per week of teaching/ research assistantship for conducting tutorial or laboratory work and evaluations.

X. Courses PHD-SEM 104 includes research work on research article writing, seminar presentation and course PHD-TP 105 includes pedagogical training. Both these courses will be assessed internally without Semester End Examination.

XI. CoE will conduct Term/ Semester End Exam in PHD-ARM-101, PHD-DSC-102, and PHD-RPE-103.

XII. PHD-TP 105 is a non-credit course and internal assessment will be marked on the detailed mark card of the course work.

XIII. Advance Research Methodology course will include common research methodology and subject specific research methodology.

XIV. Research Advisory Committee may provide choices in selecting the courses/ credits that facilitates the entrepreneur in the monetization of IP thus generated.

XV. RAC can also recommend UGC recognized online courses as part of the credit requirements for the Ph.D. program.

XVI. Paper- will comprise of the following two activities:

 (a) **External Assessment: Written Question Paper 70/39**

 (b) **Internal Assessment: 30/16**

Marks will be converted into letter grade and grade point as per following table:

Marks	Letter Grade	Grade Point
81-100	A+	10
76-80	A	9
66-75	B+	8
61-65	B	7
55-60	C	6
Less than 55	F	0

The computation of the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA) shall be done as per University Examination Ordinance or Examination Rules & Regulations issued time to time.

The result and grade sheet for the course work will carry pass/ fail result.

COURSE WORK PAPER

I. Candidates who already hold an M. Phil. degree and have been accepted into the Ph.D. program, or those who have finished their M.Phil. Coursework and have been given permission to continue on to the Ph.D. in an integrated course, may be exempted from the Ph.D. course requirements by the Department. All additional applicants accepted into the Ph.D. program must complete the Ph.D. coursework required by the Department.

II. The NIILM University attendance rules, a minimum 75% attendance is must require, will be applied to all full-time research scholars. For the duration of their coursework, part-time research researchers must, nevertheless, adhere to the same rules.

III. A Ph.D. scholar has to obtain a minimum of 55% of marks or a minimum CGPA of 6.0 in the UGC 10-point scale (or an equivalent grade/CGPA in a point scale wherever grading system is followed) in the course work in order to be eligible to continue in the program and submit the thesis.

IV. Registration will be automatically canceled if the required course work is not completed with a minimum of 55% of marks/a minimum CGPA of 6.0 within the allotted time. If the course work is not finished within a year, the RAC and DRC may suggest a six-month extension or suggest that the registration be canceled with the DRC.

V. There is no provision of improvement or special supplementary exam to be conducted. Coursework will be offered in four semesters of first two years with regular & supplementary exams to avail the opportunity to clear the coursework in 2 years. **Failure to complete the course in 2 years means that the student has to leave the program.**

Course Structure:

PHD-ARM-101	Advance Research Methodology in Public Administration	Credit Distribution: L:3, T:1, P:0=4
Course Objectives:	To acquaint the students with research process. To train them in the research methods and designs and to equip them to take up researches independently.	
Unit 1	**Introduction to Research** a. Nature and aims of research b. Dimensions and types of research c. Theory and research d. The meaning of methodology e. Types of Methods of Research	
Unit 2	**Research Planed Data Collection** a. Concept, logic, and research question/issues b. Variables, causal theory, and hypothesis c. Research Design and Collection of Data	

	d. Sampling: Methods, Size, Errors
	e. Probability and non-probability
	f. Measurement and Scaling Techniques
	g. Issues in measurement: Qualitative and quantitative
Unit 3	**Data Processing**
	a. Analysis of quantitative data introduction to higher order statistics
	b. Editing, Coding and Classification of Data
	c. Analysis of qualitative data and Tabulation
	d. Introduction to advanced statistical techniques using SPSS
	e. Statistical Derivatives and Measures of Central Tendency
	f. Measures of Variation and Skewness
	g. Correlation and Simple Regression
	h. Diagrammatic and Graphic Presentation of Data
Unit 4	**Research Report Writing**
	a. Ethical issues in research
	b. APA style of writing concept
	c. APA style of writing: Referencing
	d. d. Research article writing
Unit 5	**Computer Application in Research**
	a. Introduction to MS Excel, Using Formulas and Functions
	b. Hand on to SPSS
	c. Features for Statistical Data Analysis
	d. Generating Charts/Graphs
	e. Introduction to MS Word, Features and Functions, Writing Report in MS Word
	f. Introduction to Open Office or Latex
	g. Creating Presentation in MS PowerPoint
	h. Introduction to Internet-Based Search
	i. Use of Advanced Research Techniques.

Recommended Readings:

1. Bayard, P. & Grayson, A. (1976). Introducing psychological research. London: McMillan.
2. Bordens, K.S. & Abbot, B.B. (2005). Research design and methods. New Delhi: Tata McGraw Hill.
3. Breakwell, G.M. Hammond, S. & Fife-Schaw, C. (1995). Research Methods in Psychology. New Delhi: Sage Publications.
4. Cresswell, J.W. (1994) Research design: L Qualitative and quantitative approaches. Thousand Oaks, CA: Sage Publication.
5. Drew, C.J.: Hardman, M.L. & Hart, W.A. (1996). Designing and conducting research: Inquiry in education and social science. New York: Allyn & Bacon.
6. Kerlinger, F.N. (1982). Foundations of behavioural research. Delhi: Subject Publication.
7. Nation, J.R. (1997). Research Methods. New Jersey: Prentice Hall.

8. Willing, C. & Stainton-Rogers, W. (Eds.) (2008). The Sage Handbook of Qualitative Research in Psychology. New Delhi: Sage Publications.

PHD-DSC-102	Discipline Specific Course (Public policy : theoretical perspectives)	Credit Distribution: L:3, T:1, P:0=4
Learning Outcomes	• This course begins by presenting a brief analysis of the literature from the traditional policy schools. • It then evaluates the specific theoretical frame work adopted in understanding the theoretical works.	
Unit 1	**Introduction** • Nature, Scope and Importance of Public Policy • Evolution of Public Policy and Policy Sciences • Global Policy Process and the role of Transnational Actors • Impact of Globalization on Policy Making	
Unit 2	**Approaches to Public Policy Analysis** • The Logical Positivist Approach • The Phenomenological Approach • The Participatory Approach • The Normative Approach	
Unit 3	**Policy Implementation and Evaluation** • Concept of Policy Implementation • Techniques of Policy Implementation • Concept of Policy Evaluation • Constraints of Public Policy Evaluation	
Unit 4	**Constraints on Public Policy** • Economic Constraints on Public Policy • Political Feasibility: Interests and Power • Institutional Constraints on Policy • Social and Cultural Factors: Constraining and Enabling Policy Reversals	

References:

1. AndersonJ.E.,(2006)PublicPolicy-aking:AnIntroduction,Boston,Houghton
2. Ashford, Doug(ed.),(1992),History and Context in Comparative Public Policy
3. Dye Thomas (2008), Understanding Public Policy, Singapore, Pearson Education
4. Fischer, Frank, (1995), Evaluating Public Policy Chicago: Nelson Hall.
5. Gerston Larry N.,(2004), Public Policy Making: Process and Principles, Armonk,
6. M.E. Sharpe Hill Michael, (2005), the Public Policy Process Harlow, UK; Pearson Education, 5thEdition.
7. Lind blom, C.E., and E.J., Woodhouse, (1993), The Policy making Process, 3rd ed., New Jersey., Prentice - Hall.
8. McCool, Daniel C. (ed.), (1995), Public Policy Theories, Models, and Concepts: An Anthology, N J: Prentice-Hall.

9. Moran Mitchel and Robert Goodin, (2006), The Oxford Handbook of Public Policy, Oxford University Press, New York. Nachmias, David, (1979),Public Policy
10. Evaluation: Approaches and Methods, New York: St. Martin's Press.
11. Thomas A. Birkland, (2005), An Introduction to the Policy Process, Theories, concepts and models of Public Policy Making,: M.E. Sharpe

PHD-DSC-102	Discipline Specific Course (Public administration: theoretical perspectives)	Credit Distribution: L:3, T:1, P:0=4
Learning Outcomes	• Demonstrate a comprehensive understanding of the paradigms, approaches, and emerging trends in Public Administration. • Critically analyze the evolution and present status of Public Administration in the context of global dynamics. • Apply theoretical frameworks to analyze real-world administrative challenges and propose effective solutions.	
Unit 1	**Introduction** • Paradigms of Public Administration. • State and Evolution of Public Administration and Present Status. • Globalization and Public Administration. • Post-Modern Public Administration. • Public Administration and Public Policy. • Public Administration and Governance.	
Unit 2	**Approaches** • Classical Approach. • Bureaucratic Approach. • Human Relations and Behavioral Approach. • Ecological Approach.	
Unit 3	**Modern Approaches** • Public Choice Approach. • New Public Management Approach. • Minnow brook – I,II & III d) Critical Theory • Public Administration and Governance.	
Unit 4	**Emerging Trends** • New Public Service. • Good Governance. • E-Governance. • Future of Public Administration. • Public Accountability and Social Accountability.	

Select References:

- Arguden, Yilmaz (2011), Keys to Governance: Strategic Leadership for Quality of Life, Macmillan, Hampshire.
- Bhattacharya, Mohit (2013), New Horizons of Public Administration, Jawahar Publishers, New Delhi.
- Donald Menzel and Harvey White (eds) 2011. The State of Public Administration: Issues, Challenges and Opportunity.
- M. E. Sharpe. Henry, Nicholas (2006), Public Administration and Public Affairs, Prentice Hall of India, New Delhi.
- Ravindra Prasad, D. Prasad, VS, Satyanarayana P and Pardhasaradhi, Y. (eds.,) (2013), Administrative Thinkers, Sterling, New Delhi.
- Riggs, F.W. (2011), the Ecology of Public Administration, 50th Anniversary Edition, IIPA, New Delhi.
- Robert T. Golembiewski (1974), Public Administration as a Field: Four Developmental Phases, Politics & Policy, Volume 2, pp. 21–49
- Donald Menzel (eds) (2011). The State of Public Administration: Issues, Challenges and Opportunity. New York:
- M. E. Sharpe. Frank J. Goodnow, Politics and Administration: A Study in Government, Transaction Publishers, New York, 2003
- Martin Albrow (1970), Bureaucracy, MacMillan, London, 1970 UN, Department of Economic and Social Affairs, Development Administration: Current Approaches and Trends in Public Administration for Development, New York, UN, 1975.

PHD-DSC-102	Discipline Specific Course (Issues in Public Administration)	Credit Distribution: L:3, T:1, P:0=4
Learning Outcomes	• Understand the concept of governance, good governance, e-governance and the ethics in governance. • Get knowledge about the citizen centric governance, citizen charters and the social audit. • Understand the concept of administrative accountability, prevailing corruption in governance and the necessity of reforms in Civil Services, Police, Judiciary and Elections.	
Unit 1	Good Governance: Concept, Features E-Governance: Concept, Features, And Ethics in Governance: Concept, Features Citizen Centric Governance: Concept, Features, and Citizen Charter in India. Social Audit in India.	
Unit 2	Administrative Accountability in India; Corruption in Governance; Civil Service Reforms in India Police Reforms in India Judicial Reforms Electoral Reforms in India	
Unit 3	Financial Governance Reforms in India Public Private Partners, Labour Welfare Reforms in India, Centre-State Relations Reforms in India	

Unit 4	Administrative behavior, Criminalization of Politics and Administration in India Cyber Crime Management in India, Terrorism Control Mechanism in India Human Rights in India

Suggested Readings:

- Mohit Bhattacharya, New Horizons of Public Administration, New Delhi, Hawahar, 2001.
- David Osborne and Ted Gaebler, Reinventing Government: How the Entrepreneurial Spirit is transforming the Public Sector, USA, 1992.
- C. Pohit, Managerialism and Public Services, Oxford,1990 The World Bank, World Development Report, 1997
- Gore, From Red Tap to Results, Creating a Govt. that works better and costs Less, The Report of National Performance Review, New York, 1993.
- R.K. Gupta and H.D. Bist, Corruption in India: Origin, Causes and Solutions, New Delhi, Anamica, 2007.
- B.S. Ghuman, Anil Monga and Ramanjit Kaur Johal, Corruption and Quality of Governance: Experiences of Select Commonwealth Countries, Jaipur: Aalekh, 2012.
- Ashok Agarwal and V. Venkata Ramana, Foundations of E-Government, New Delhi: GIFT Publishers, 2008.
- G.P. Sahu, Adopting E-Governance, New Delhi: GIFT Publishers, 2008.
- G.P. Sahu, Emerging Technologies in E-Government, New Delhi: GIFT Publishers, 2009.
- C.L. Baghel and Yogendra Kumar, Good Governance: Concept and Approaches, New Delhi: Kanishka, 2006.
- D. Sundar Ram, Woman Empowerment in Political Institutions: An Indian Perspective, New Delhi: Kanishka, 2009.
- Kundu, Rajesh, and Issues in Administration, Mumbai: Centre for Distance Education, S.N.D.T. Women's University, 2014.

PHD-RPE-103	Research and Publication Ethics	Credit Distribution: L:1, T:1, P:0=2
Learning Outcomes	1. To have awareness about the publication ethics and publication misconducts. 2. To understand indexing and citation databases, open access publications, research metrics (citations, h-index, impact factor etc) 3. Develop hands-on skills to identify research misconduct and predatory publications.	
Unit 1	**Philosophy and Ethics (4 hrs)** 1. Introduction to philosophy: definition, nature and scope, concept, branches 2. Ethics: definition, moral philosophy, nature of moral judgements and reactions	

Unit 2	**Scientific Conduct (4 hrs)**
	1. Ethics with respect to science and research
	2. Intellectual honesty and research integrity
	3. Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP)
	4. Redundant publications: duplicate and overlapping publications, salami slicing
	5. Selective reporting and misrepresentation of data
Unit 3	**Publication Ethics (7 hrs)**
	1. Publication ethics: definition, introduction and importance
	2. Best practices / standards setting initiatives and guidelines: COPE, WAME, etc.
	3. Conflicts of interest
	4. Publication misconduct: definition, concept, problems that lead to unethical behavior and vice versa, types
	5. Violation of publication ethics, authorship and contributor ship
	6. Identification of publication misconduct, complaints and appeals
	7. Predatory publishers and journals
Unit 4 Practice	**Open Access Publishing (4 hrs)**
	1. Open access publications and initiatives
	2. SHERPA/ROMEO online resource to check publisher copyright & self-archiving policies
	3. Software tool to identify predatory publications developed by SPPU
	4. Journal finder / journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer Journal Suggester, etc.
Unit 5 Practice	**Publication Misconduct (4 hrs)**
	A. Group Discussions (2 hrs.)
	1. Subject specific ethical issues, FFP, authorship
	2. Conflicts of interest
	3. Complaints and appeals: examples and fraud from India and abroad
	B. Software tools (2 hrs.)
	Use of plagiarism software like Turnitin, Urkund and other open source software tools
Unit 6 Practice	**Databases and Research Metrics (7 hrs)**
	A. Databases (4 hrs.)
	1. Indexing databases
	2. Citation databases: Web of Science, Scopus etc.
	B. Research Metrics (3 hrs.)
	1. Impact Factor of journal as per Journal Citation Report, SNIP, SJR, IPP, Cite Score
	2. Metrics: h-index, g-index, i10 index, altmetrics

Suggested Readings

1. Bird, A. (2006). Philosophy of Science. Routledge.
2. MacIntyre, A. (1967) A Short History of Ethics. London.
3. P. Chaddah, (2018) Ethics in Competitive Research: Do not get scooped; do not get plagiarized, ISBN:978-9387480865
4. National Academy of Sciences, National Academy of Engineering and Institute of Medicine. (2009). On Being a Scientist: A Guide to Responsible Conduct in Research: Third Edition. National Academies Press.
5. Rensik, D. B. (2011). What is ethics in research & why is it important. National Institute of Environmental Health Sciences, 1-10. Retrieved from https://www.niehs.nih.gov/resources/biothics/whatis/index.cfm
6. Beall, J. (2012). Predatory publishers are corrupting open access. Nature, 489(7415), 179-179. https://doi.org/10.1038/489179a

NIILM UNIVERSITY

Ph.D. Course Work in Sanskrit

Academic Session 2024-25

Ph.D. Regulations Regarding Course Work

Clause 18: Ph.D. Ordinance NIILM University as per UGC Minimum Standards and Procedure for Award of Ph.D. Degrees Regulations 2022 with effect from academic session 2024-25

I.   The coursework shall be treated as a prerequisite for Ph.D. preparation. In the first year of registration, all research scholars are required to complete the course work for one semester following their provisional registration as a part of the Ph.D. program. It is mandatory to complete the course work in first 4 semesters to stay in the Ph.D. program.

If a student fails to complete the coursework in first 4 semesters, will have to leave the program.

II. Earning a minimum of 12 total credits and a maximum of 16, is required.

III. Usually a course refers to a 'paper' and is a component of an academic program. Courses in Ph.D. course work shall be of two kinds: Core and Elective.

IV. A core course is a compulsory paper to be studied by all the scholars to complete the requirements of the Ph.D. degree.

V. Elective course is a course which is discipline specific and provided by the particular department from the main discipline or from a sister/related discipline which supports the main discipline, on mutual consent of the concerned departments.

VI. One credit equal to 15 contact hours for theory-based teaching or 30 hours of contact time for practical or activity-based teaching.

VII. The number of credits is given in the form L: T: P, where L indicates the number of contact hours of lecture, and T the number of contact hours for tutorials, P stands for laboratory credits.

VIII. The credits are distributed as follows:

Paper Code	Paper	Course type	Credit	L	T	P
PHD-ARM-101	Advanced Research Methodology	Core	4	3	1	0
PHD-DSC-102	Discipline Specific Course	Elective	4	3	1	0
PHD-RPE-103	Research and Publication Ethics	Core	2	1	1	0
PHD-SEM-104	Academic Writing, Literature Review and Seminar	Skill	2	0	1	2
	Total		12			

IX. All Ph.D., entrants irrespective of discipline, shall be trained in teaching proficiency related to teaching/education/pedagogy/writing related to their chosen Ph.D. subject during their doctoral training period, that include assigning 4-6 hours per week of teaching/ research assistantship for conducting tutorial or laboratory work and evaluations.

X. Courses PHD-SEM 104 includes research work on research article writing, seminar presentation and course PHD-TP 105 includes pedagogical training. Both these courses will be assessed internally without Semester End Examination.

XI. CoE will conduct Term/ Semester End Exam in PHD-ARM-101, PHD-DSC-102, and PHD-RPE-103.

XII. PHD-TP 105 is a non-credit course and internal assessment will be marked on the detailed mark card of the course work.

XIII. Advance Research Methodology course will include common research methodology and subject specific research methodology.

XIV. Research Advisory Committee may provide choices in selecting the courses/ credits that facilitates the entrepreneur in the monetization of IP thus generated.

XV. RAC can also recommend UGC recognized online courses as part of the credit requirements for the Ph.D. program.

XVI.   Paper- will comprise of the following two activities:
   (a) External Assessment: Written Question Paper 70/39
   (b) Internal Assessment: 30/16
   Marks will be converted into letter grade and grade point as per following table:

Marks	Letter Grade	Grade Point
81-100	A+	10
76-80	A	9
66-75	B+	8
61-65	B	7
55-60	C	6
Less than 55	F	0

The computation of the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA) shall be done as per University Examination Ordinance or Examination Rules & Regulations issued time to time.

The result and grade sheet for the course work will carry pass/ fail result.

COURSE WORK PAPER
   I.   Candidates who already hold an M. Phil. degree and have been accepted into the Ph.D. program, or those who have finished their M.Phil. Coursework and have been given permission to continue on to the Ph.D. in an integrated course, may be exempted from the Ph.D. course requirements by the Department. All additional applicants accepted into the Ph.D. program must complete the Ph.D. coursework required by the Department.
  II. The NIILM University attendance rules, a minimum 75% attendance is must require, will be applied to all full-time research scholars. For the duration of their coursework, part-time research researchers must, nevertheless, adhere to the same rules.
 III. A Ph.D. scholar has to obtain a minimum of 55% of marks or a minimum CGPA of 6.0 in the UGC 10-point scale (or an equivalent grade/CGPA in a point scale wherever grading system is followed) in the course work in order to be eligible to continue in the program and submit the thesis.
 IV. Registration will be automatically canceled if the required course work is not completed with a minimum of 55% of marks/a minimum CGPA of 6.0 within the allotted time. If the course work is not finished within a year, the RAC and DRC may suggest a six-month extension or suggest that the registration be canceled with the DRC.
  V. There is no provision of improvement or special supplementary exam to be conducted. Coursework will be offered in four semesters of first two years with regular & supplementary exams to avail the opportunity to clear the coursework in 2 years. **Failure to complete the course in 2 years means that the student has to leave the program.**

Course Structure:

PHD-ARM-101	Advance Research Methodology in Sanskrit	Credit Distribution: L:3, T:1, P:0=4
Course Objectives:	To acquaint the students with research process. To train them in the research methods and designs and to equip them to take up researches	

	independently.
Unit 1	**Introduction to Research** a. Nature and aims of research b. Dimensions and types of research c. Theory and research d. The meaning of methodology e. Types of Methods of Research
Unit 2	**Research Planed Data Collection** a. Concept, logic, and research question/issues b. Variables, causal theory, and hypothesis c. Research Design and Collection of Data d. Sampling: Methods, Size, Errors e. Probability and non-probability f. Measurement and Scaling Techniques g. Issues in measurement: Qualitative and quantitative
Unit 3	**Data Processing** a. Analysis of quantitative data introduction to higher order statistics b. Editing, Coding and Classification of Data c. Analysis of qualitative data and Tabulation d. Introduction to advanced statistical techniques using SPSS e. Statistical Derivatives and Measures of Central Tendency f. Measures of Variation and Skewness g. Correlation and Simple Regression h. Diagrammatic and Graphic Presentation of Data
Unit 4	**Research Report Writing** a. Ethical issues in research b. APA style of writing concept c. APA style of writing: Referencing d. d. Research article writing
Unit 5	**Computer Application in Research** a. Introduction to MS Excel, Using Formulas and Functions b. Hand on to SPSS c. Features for Statistical Data Analysis d. Generating Charts/Graphs e. Introduction to MS Word, Features and Functions, Writing Report in MS Word f. Introduction to Open Office or Latex g. Creating Presentation in MS PowerPoint h. Introduction to Internet-Based Search i. Use of Advanced Research Techniques.

Recommended Readings:

1. Bayard, P. & Grayson, A. (1976). Introducing psychological research. London: McMillan.

2. Bordens, K.S. & Abbot, B.B. (2005). Research design and methods. New Delhi: Tata McGraw Hill.

3. Breakwell, G.M. Hammond, S. & Fife-Schaw, C. (1995). Research Methods in Psychology. New Delhi: Sage Publications.

4. Cresswell, J.W. (1994) Research design: L Qualitative and quantitative approaches. Thousand Oaks, CA: Sage Publication.

5. Drew, C.J.: Hardman, M.L. & Hart, W.A. (1996). Designing and conducting research: Inquiry in education and social science. New York: Allyn & Bacon.

6. Kerlinger, F.N. (1982). Foundations of behavioural research. Delhi: Subject Publication.

7. Nation, J.R. (1997). Research Methods. New Jersey: Prentice Hall.

8. Willing, C. & Stainton-Rogers, W. (Eds.) (2008). The Sage Handbook of Qualitative Research in Psychology. New Delhi: Sage Publications.

PHD-DSC-102	Discipline Specific Course (□□□□□□□□□□□□ □□□□□□□□□□□□□)	Credit Distribution: L:3, T:1, P:0=4
Learning Outcomes	□□□□□□□ □□ □□□□□ □□□□□□□ □□ □□□□□□□□□, □□□□□□□□ □□ □□□□□□□ □□□□□□ □□□ □□□□□□ □□□□ □□ □□□□ □□□□□□, □□□□□ □□ □□□□□ □□□ □□ □□□□□□□, □□□□□□□□ □□ □□□□□□□□□□□ □□□□□□□□ □□ □□□ □□□□□□□ □□□□□, □□□□□□, □□□□□□□□, □□□□□□, □□□□□□□□, □□□, □□□□□□ □□□ □□□□□ □□□□□□□ □□ □□□□□□ □□ □□□□ □□□□□□□□ □□ □□□□□□□□ □□□□□□ □□□□□
Unit 1	□□□□□□□□□□□□ □□□□□□□ □□□□□□□ □– □□□□□□□ □□□□□□□□□□, □□□□□□□□□,□□□□□:, □□□□□□□□□□□□ □
Unit 2	□□□□□□□□□□□□□□□ □□□□□□□□□□□ □□□□□□□□ □□□□□□□□□□□□□□□ □ □□□□□ □□□□□□□□ (□) □□□□□□: : □□□□□: (10.90), □□□□□□□□□: (10.121), □□□□□□□□ (10.129), □□□□ (10.125), □□□□□□□ - □□□□□□ (10.95), □□ □□□ - □□□□□□□□ (10.10), □□□□-□□□-□□□□□□ (10.108), □□□□□□□□□□□ □□□ □□□□□□□ (3.33)□
Unit 3	□□□□□□□□□□□□□ □□□□□□□ (□□□□□□ □□□□□□□, □□□□□□□□□, □□□□□□ □□□□□□□□, □□□,□□□□□)-
Unit 4	□□□□□□□□□□□□ : □□□□□□□□□□□- 1-3 □□□□□□□□
Unit 5	□□□□□□□□□□□□ 40) □□□□□□□□□ □□□□□□□□□] □□□ [□□□□□□ (□ (□□□□□□□□□□□□□□□) □□□□□□□□□□□□

Suggested Materials:

1. maxmuller, F: A History of Ancient Sanskrit literature(VEdic part oniy).
2. Ram Gopal: India of Vedic Kalpa Sutras.
3. Dandekar, R. N: Vedic Bibliography (Vol. I-III)

4. □□□□□ □□□□□□□□□ □□□□□ □□□□□□□ □□□ □□□□□□□□ □
5. □□□□□□□□□ □□□□ : □□□□□ □□□□□□□□□ □□□□□ □□□□□□ |
6. □□□□□□□□□□□ (□□□□□□□) : □□□□□ □□□□□□□□□□□ |
7. □□□□□□□□□ □□□□□□□□□□□ : □□□□□ □□□□□ □□□□□ □
8. □□□□□□ □□□□□□□□ : □□□□□ □□□□□ : □□□□□ □□□ □□□□□ □
9. □□□□ : □□□□□□□□□□□□□□□□□□□□ □

PHD-DSC-102	Discipline Specific Course (□□□□□□□□, □□□□□□□□□□□□□ □)	Credit Distribution: L:3, T:1, P:0=4
Learning Outcomes	• □□□□□□□□ □□□□□□ □□ □□□□□□□ □□ □□□□□□□□□□ □□ □□□□□□□□□□ □□ □□□□□ □□ □□□□□□□□ □□□□□□□ • □□□□□ □□□□□□□ □□□□□□□ □□ □□□□□□□□□ □□ □□□□ □□□ □□ □□□□□□□ □□ □□□□ □□□□□ □□□□□□□ • □□□□□□□ □□ □□□□□□□ □□□□□ □□ □□□□ □□□□□□□□ □□ □□□□□ □□□ □□□□□□ □□□□□□□ □□□□□□□	
Unit 1	□□□□□□□,□□□□□□□□□□□□□□□□□□□□: □□□□□□□□□ □□□□□□□□□□□ (□□□□□□□□□□□□□ □□□□□□□□□□□□ □□□□□□□□ □□□□□□ □□□□□□□□□□□□□□□□□ □□□□□□□□□□□□□□□□□ □)- (□) □□□□□□□□□□□□□, (□) □□□□□□□□□□ (□□□□□□□□□□□□ □□□□□□□□□□□□□□□□□□□□)□
Unit 2	□□□□□□□□□□□□: □□□□□□□ □□□□□□ □□□□□□□□□□) □□□□□ □□□□□, □□□□□□□□□□□□ □□□□ □□□□□□□□□□□□□ □- (□□□□□□□□□□ –□□□□□□□□□□□□□□ (□) –, □□□□, □□□, □□□, □□□ □□□ –□□□□□□□□□□□□□□□□ (□), □□□□□, □□□, □□□□□□ □□□□–□□□□□□□□□□□□□□ (□), □□□□, □□□, □□□ □ □□□□□□□ –□□□□□□□□□□□□ (□), □□□□□ □□□□□, □□□□□, □□□□□□, □□□, □□□□□□, □□□□□ □
Unit 3	□□□□□□□□□□:, □□□□□□□□□□□□ : (□□□□□□□□□□) – (□□□□□□□□□□□) □□□□□□□□□□ □□□□□ □□□□□□□□ (□),(□-□□□□□□□□□□□ □□□□ (□□□□□□□□–□□□□□
Unit 4	□□□□□□□□□- □□□□□□ :□□□□□□□□□□ □□□□□ □□□□□□ □ □□□□ (□) □□□□□□□□□ □,□□□□□□□□□ □□□□□□ □ □□□□□□□□□□ □□□□□ □□□□□□ : □ (□□□□□□□□□) □□□□□ □□□□□□□□ (□□□□□□□□□□)	□□□□□ □□□□□□ □□□□ □□□□□□□ □
Unit 5	□□□□□□□□□□□ □□□□□□□- □□□□□□□ □□□□□, □□□□□□ □□□□□□ □ □□□□□ □□□□□□ □□□□□□□, □□□□□□□□□ □□□□□

Suggested Materials:

1. □□□□□□, □□□□□□□□□□□□□□□□, □□□□□□ □□□□□□□□ □□□□□
2. □□□□□□□□□□□□□: □□□□□:,□□□□□□□□□□□□□, □□□□□□ □□□□□□□□ □□□□□□
3. □□□□ □□□ □□□□□□□□□□□ ,□□□□ □□□□ □□□□□□□,
   □□□□□□□□□□,□□□□□□□□□□□□□□□□□ □□□□□□□□□□1964,

PHD-DSC-102	Discipline Specific Course (□□□□□□□□□□□□ □□□□□□□□□□□□)	Credit Distribution: L:3, T:1, P:0=4
Learning Outcomes	• □□□□□ □□□□□□□ □□□□□ □□□□□ □□□□□□□□ □□ □□□□□□ □□□□□□□□□□ □□ □□□□ □□□□□□□ □□□□□□□□□□ □□ □□□□□ □□□ □□□□□□ □□□□□, □□□□ □□□□□□, □□□, □□□□□, □□□□□□□, □□□□□□ □□ □□□□□□□ □□□□ • □□□□□ □□□□□□□□□ □□ □□□□□□□□□ □□ □□□□ □□ □□□□□□□□ □□ □□□□□□□□ □□ □□□□□ □□ □□□□□ □□□ □□□□□ □□□□□, □□ □□□□□□□ □□□ □□□□□ □□ □□□□□□□ □□□ • □□□□□ □□□□□□□, □□□□□□□□□□□ □□ □□□□□□□□□□□ □□ □□□□□□□□□□ □□ □□□□□□□□ □□□□□
Unit 1	□□□□□□□□□□□□ □□□□□□□□□□□– □□□□□□□, □□□:, □□□□□□□□, □□□□□, □□□□□□ ,□□□□□□ □□□□□□□□□□□□□, □□□□□□□, □□□□□, □□□□ □ □
Unit 2	□□□□□□□□□□, □□□□□□□ □□□□□□ □□□□□□□□□□□□□□ : □□□□□□□□□□□□ :,□□□□□□□□□□ □□□□□□□ □□
Unit 3	□□□□□□□□□, □□□□□□□□□□, □□□□□□□□□□□□□□□□ : □□□□□□□□□□□□, □□□□□□□□□□ □□□□□□ □	
Unit 4	□□□□□□□□□□ □□□□□□□□□ □□□□□□□□ □□□□□□□□□□□ □□□□□□□□□□□
Unit 5	□□□□□□□□□) □□□□□□□□□□□□□□□□□□□□□ □□□□ (□□□□□□□□□□□□□□□□□,□□□□□□ 18 □□□□□□ □□□□□□□□□□ □
Unit 6	□□□□□□□□, :□□□□□□□□ (□□□□□□) :

Suggested Materials:

1. S. N. Dasgupta: History of Indian Philosophy Vol. (5-1
2. E. Fawalner: History of Indian Philosophy (Vol. (2-1
3. S. Radhakrishnan : Indian Philosophy (Vol. (2-1
4. G. N. Jha: Purvamimamsa in its Sources.
5. Ingalls, Daniel H. H.: Navya Nyaya System of Logic. Matilal, B. K.: The Navya Nyaya Doctrine of Negation.
6. □□□□□□□□, □□□□□□□□□□ □□□□□ □□□□□□□ □□□□□□□□□, □□□□□□, □□□□□□□, 1995

7. □□□□□□□□□□, □□□□□□□ □□□ □□□□□□□□□ □□□□□□□□□□□ □□□□□□□□□□, □□□□□□□, □□□□□□□

PHD-DSC-102	Discipline Specific Course (□□□□□□, □□□□□□, □□□□□□□□□□□□ □)	Credit Distribution: L:3, T:1, P:0=4
Learning Outcomes	• □□□□□ □□□□□□□ □□ □□□□□□□□□□ □□ □□□□□ □□□□ □□□ □□□□□ □□ □□□□□□□ □□ □□□□□□□□□ □□□□□□□□ □□□□ □□□ □□□□□ □□□□□□ • □□□□□ □□□□□ □□□□□□□□□ □□□□ □□□□□□□, □□□□□□□, □□□□□, □□□ □□□ □□ □□□□□□□□ □□□□□□ □□ □□□□□□□ □□ □□□□ □□□□□□□□□ □□□□□□□□ □□□□□□ • □□□□□ □□□□□□ □□□□□ □□□□□, □□□□□□□, □□□□□□□□, □□ □□□□ □□□□□ □□ □□□□□□□□ □□ □□□□□□□□ □□□□□□ □□ □□□□□ □□□□□□□□ □□□□□□
Unit 1	□□□□□□□, □□□□□□□□□□□ □□□□□□□□□□□□□□□□□□□□□ : □□□□□□□ □□□□□□□□□□, □□□□□□□□□□ □□□□□□□ □
Unit 2	□□□□□□□, □□□□□□□ □□□□□□□□□□□□ : (:□□□□□□□□) □□□□□□□□□□□ □
Unit 3	□□□□□□□, □□□□□□□ □□□□□□□□□□□□□□□, □□□□□□□□□□ □□□ :'□□□□ □□□□□□□□□□□□□:' □□□□□□□□ '□□□ □□□□□□ □□□□□□□ □□□□□□□' □□□ □□□□□□□□□ □□□□□□□ – □□□□□□□
Unit 4	□□□□□□□□□□□□□□□□□□□□□ □□□□□□□□□□ □□□□□□□, □□□□□□□□, □□□□□□□□□□□, □□□□□□□□□, □□□□□□□□□□, □□□□□□□□□□ □□□□□□□□□□□
Unit 5	□□□□□□□□ □□□□□□–□□□□□□:□□□□□ □□□□–: , :□□□□□□□□□, :□□□□□□□, :□□□, :□□□□□□□, :□□□□□□□□□□, □□□□□□□□□□□□

Suggested Materials:

1. □□□□□□□ □□□□□□ □□ □□□□□□□□□ □□□□□ –□□□□□ □ :□□□ □□□ □□□□□□□ □□□□□□□□□□– □□□□□□ □□□□□□□
2. □□□□□□ □□□□□□ □□ □□□□□□ –·□□□□□□□ □□□□□
3. □□□□□□□□□□□□□□□□□□□–□–□□□□□ .□□––□□□ –
4. □□□□□□ □□□□□□ □□ □□□□□□ – ·□□□□ □□□□□□□□□□ , □□□□□ □□□□□□
5. □□□□□□□□□, □□□□□ □□□□□□ □□,□□□□□ □□□□□□□, □□□□□, 1970
6. □□□□□□□ □□□□□ □□□□□□,: □□□□□□ □□□ □□□□□□□□ □□□□□□□□□□□□□□□□:
7. The Meghadūta of Kalidāsa, M.R. Kale, Motilal Banarsidass, Delhi-2015

PHD-RPE-103	Research and Publication Ethics	Credit Distribution: L:1, T:1, P:0=2
Learning Outcomes	1. To have awareness about the publication ethics and publication misconducts. 2. To understand indexing and citation databases, open access publications, research metrics (citations, h-index, impact factor etc) 3. Develop hands-on skills to identify research misconduct and predatory publications.	
Unit 1	**Philosophy and Ethics (4 hrs)** 1. Introduction to philosophy: definition, nature and scope, concept, branches 2. Ethics: definition, moral philosophy, nature of moral judgements and reactions	
Unit 2	**Scientific Conduct (4 hrs)** 1. Ethics with respect to science and research 2. Intellectual honesty and research integrity 3. Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP) 4. Redundant publications: duplicate and overlapping publications, salami slicing 5. Selective reporting and misrepresentation of data	
Unit 3	**Publication Ethics (7 hrs)** 1. Publication ethics: definition, introduction and importance 2. Best practices / standards setting initiatives and guidelines: COPE, WAME, etc. 3. Conflicts of interest 4. Publication misconduct: definition, concept, problems that lead to unethical behavior and vice versa, types 5. Violation of publication ethics, authorship and contributor ship 6. Identification of publication misconduct, complaints and appeals 7. Predatory publishers and journals	
Unit 4 Practice	**Open Access Publishing (4 hrs)** 1. Open access publications and initiatives 2. SHERPA/ROMEO online resource to check publisher copyright & self-archiving policies 3. Software tool to identify predatory publications developed by SPPU 4. Journal finder / journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer Journal Suggester, etc.	
Unit 5	**Publication Misconduct (4 hrs)**	

Practice	A. Group Discussions (2 hrs.)
	1. Subject specific ethical issues, FFP, authorship
	2. Conflicts of interest
	3. Complaints and appeals: examples and fraud from India and abroad
	B. Software tools (2 hrs.)
	Use of plagiarism software like Turnitin, Urkund and other open source software tools
Unit 6 Practice	**Databases and Research Metrics (7 hrs)**
	A. Databases (4 hrs.)
	1. Indexing databases
	2. Citation databases: Web of Science, Scopus etc.
	B. Research Metrics (3 hrs.)
	1. Impact Factor of journal as per Journal Citation Report, SNIP, SJR, IPP, Cite Score
	2. Metrics: h-index, g-index, i10 index, altmetrics

Suggested Readings

1. Bird, A. (2006). Philosophy of Science. Routledge.
2. MacIntyre, A. (1967) A Short History of Ethics. London.
3. P. Chaddah, (2018) Ethics in Competitive Research: Do not get scooped; do not get plagiarized, ISBN:978-9387480865
4. National Academy of Sciences, National Academy of Engineering and Institute of Medicine. (2009). On Being a Scientist: A Guide to Responsible Conduct in Research: Third Edition. National Academies Press.
5. Rensik, D. B. (2011). What is ethics in research & why is it important. National Institute of Environmental Health Sciences, 1-10. Retrieved from https://www.niehs.nih.gov/resources/biothics/whatis/index.cfm
6. Beall, J. (2012). Predatory publishers are corrupting open access. Nature, 489(7415), 179-179. https://doi.org/10.1038/489179a

NIILM UNIVERSITY

Ph.D. Course Work in Social Work

Academic Session 2024-25

Ph.D. Regulations Regarding Course Work

Clause 18: Ph.D. Ordinance NIILM University as per UGC Minimum Standards and Procedure for Award of Ph.D. Degrees Regulations 2022 with effect from academic session 2024-25

I. The coursework shall be treated as a prerequisite for Ph.D. preparation. In the first year of registration, all research scholars are required to complete the course work for one semester following their provisional registration as a part of the Ph.D. program. It is mandatory to complete the course work in first 4 semesters to stay in the Ph.D. program. If a student fails to complete the coursework in first 4 semesters, will have to leave the program.

II. Earning a minimum of 12 total credits and a maximum of 16, is required.

III. Usually a course refers to a 'paper' and is a component of an academic program. Courses in Ph.D. course work shall be of two kinds: Core and Elective.

IV. A core course is a compulsory paper to be studied by all the scholars to complete the requirements of the Ph.D. degree.

V. Elective course is a course which is discipline specific and provided by the particular department from the main discipline or from a sister/related discipline which supports the main discipline, on mutual consent of the concerned departments.

VI. One credit equal to 15 contact hours for theory-based teaching or 30 hours of contact time for practical or activity-based teaching.

VII. The number of credits is given in the form L: T: P, where L indicates the number of contact hours of lecture, and T the number of contact hours for tutorials, P stands for laboratory credits.

VIII. The credits are distributed as follows:

Paper Code	Paper	Course type	Credit	L	T	P
PHD-ARM-101	Advanced Research Methodology	Core	4	3	1	0

PHD-DSC-102	Discipline Specific Course	Elective	4	3	1	0
PHD-RPE-103	Research and Publication Ethics	Core	2	1	1	0
PHD-SEM-104	Academic Writing, Literature Review and Seminar	Skill	2	0	1	2
	Total		**12**			

IX.   All Ph.D., entrants irrespective of discipline, shall be trained in teaching proficiency related to teaching/education/pedagogy/writing related to their chosen Ph.D. subject during their doctoral training period, that include assigning 4-6 hours per week of teaching/ research assistantship for conducting tutorial or laboratory work and evaluations.

X.   Courses PHD-SEM 104 includes research work on research article writing, seminar presentation and course PHD-TP 105 includes pedagogical training. Both these courses will be assessed internally without Semester End Examination.

XI.   CoE will conduct Term/ Semester End Exam in PHD-ARM-101, PHD-DSC-102, and PHD-RPE-103.

XII.   PHD-TP 105 is a non-credit course and internal assessment will be marked on the detailed mark card of the course work.

XIII.   Advance Research Methodology course will include common research methodology and subject specific research methodology.

XIV.   Research Advisory Committee may provide choices in selecting the courses/ credits that facilitates the entrepreneur in the monetization of IP thus generated.

XV.   RAC can also recommend UGC recognized online courses as part of the credit requirements for the Ph.D. program.

XVI.   Paper- will comprise of the following two activities:

(a) External Assessment: Written Question Paper 70/39

(b) Internal Assessment: 30/16

Marks will be converted into letter grade and grade point as per following table:

Marks	Letter Grade	Grade Point
81-100	A+	10
76-80	A	9
66-75	B+	8
61-65	B	7
55-60	C	6
Less than 55	F	0

The computation of the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA) shall be done as per University Examination Ordinance or Examination Rules & Regulations issued time to time.

The result and grade sheet for the course work will carry pass/ fail result.

COURSE WORK PAPER

I.   Candidates who already hold an M. Phil. degree and have been accepted into the Ph.D. program, or those who have finished their M.Phil. Coursework and have been given

permission to continue on to the Ph.D. in an integrated course, may be exempted from the Ph.D. course requirements by the Department. All additional applicants accepted into the Ph.D. program must complete the Ph.D. coursework required by the Department.

II. The NIILM University attendance rules, a minimum 75% attendance is must require, will be applied to all full-time research scholars. For the duration of their coursework, part-time research researchers must, nevertheless, adhere to the same rules.

III. A Ph.D. scholar has to obtain a minimum of 55% of marks or a minimum CGPA of 6.0 in the UGC 10-point scale (or an equivalent grade/CGPA in a point scale wherever grading system is followed) in the course work in order to be eligible to continue in the program and submit the thesis.

IV. Registration will be automatically canceled if the required course work is not completed with a minimum of 55% of marks/a minimum CGPA of 6.0 within the allotted time. If the course work is not finished within a year, the RAC and DRC may suggest a six-month extension or suggest that the registration be canceled with the DRC.

V. There is no provision of improvement or special supplementary exam to be conducted. Coursework will be offered in four semesters of first two years with regular & supplementary exams to avail the opportunity to clear the coursework in 2 years. **Failure to complete the course in 2 years means that the student has to leave the program.**

Course Structure:

PHD-ARM-101	Advance Research Methodology in Social Work	Credit Distribution: L:3, T:1, P:0=4
Course Objectives:	To acquaint the students with research process. To train them in the research methods and designs and to equip them to take up researches independently.	
Unit 1	**Introduction to Research** a. Nature and aims of research b. Dimensions and types of research c. Theory and research d. The meaning of methodology e. Types of Methods of Research	
Unit 2	**Research Planed Data Collection** a. Concept, logic, and research question/issues b. Variables, causal theory, and hypothesis c. Research Design and Collection of Data d. Sampling: Methods, Size, Errors e. Probability and non-probability f. Measurement and Scaling Techniques g. Issues in measurement: Qualitative and quantitative	
Unit 3	**Data Processing** a. Analysis of quantitative data introduction to higher order statistics b. Editing, Coding and Classification of Data c. Analysis of qualitative data and Tabulation	

	d. Introduction to advanced statistical techniques using SPSS
	e. Statistical Derivatives and Measures of Central Tendency
	f. Measures of Variation and Skewness
	g. Correlation and Simple Regression
	h. Diagrammatic and Graphic Presentation of Data
Unit 4	**Research Report Writing** a. Ethical issues in research b. APA style of writing concept c. APA style of writing: Referencing d. d. Research article writing
Unit 5	**Computer Application in Research** a. Introduction to MS Excel, Using Formulas and Functions b. Hand on to SPSS c. Features for Statistical Data Analysis d. Generating Charts/Graphs e. Introduction to MS Word, Features and Functions, Writing Report in MS Word f. Introduction to Open Office or Latex g. Creating Presentation in MS PowerPoint h. Introduction to Internet-Based Search i. Use of Advanced Research Techniques.

Recommended Readings:

1. Bayard, P. & Grayson, A. (1976). Introducing psychological research. London: McMillan.

2. Bordens, K.S. & Abbot, B.B. (2005). Research design and methods. New Delhi: Tata McGraw Hill.

3. Breakwell, G.M. Hammond, S. & Fife-Schaw, C. (1995). Research Methods in Psychology. New Delhi: Sage Publications.

4. Cresswell, J.W. (1994) Research design: L Qualitative and quantitative approaches. Thousand Oaks, CA: Sage Publication.

5. Drew, C.J.: Hardman, M.L. & Hart, W.A. (1996). Designing and conducting research: Inquiry in education and social science. New York: Allyn & Bacon.

6. Kerlinger, F.N. (1982). Foundations of behavioural research. Delhi: Subject Publication.

7. Nation, J.R. (1997). Research Methods. New Jersey: Prentice Hall.

8. Willing, C. & Stainton-Rogers, W. (Eds.) (2008). The Sage Handbook of Qualitative Research in Psychology. New Delhi: Sage Publications.

PHD- DSC-102	Discipline Specific Course (Social work theory & emerging areas of practice)	Credit Distribution: L:3, T:1, P:0=4
Learning Outcomes	• Understand the concept, definition, objectives and functions and methods of social work. • Develop knowledge of history and development of social work in India and abroad.	

	• Understand the current trends of social work practice in India. • Develop understanding about emerging areas and trends in social work
Unit 1	**SOCIAL WORK AS PROFESSION** • **Social Work:** Definition, Concept, nature, goals and Social work and related concepts- social reform, social welfare, social development, social service, social revolution and social security. • **Social work as a profession:** Concept of occupation and profession, components of profession, Professional Ethics, Skills in Social Work profession, Status of Social Work Profession in India: National Council of Social Work (Education and Practice) Bill, 2020 • **Methods of Social Work Practice:** Social case work- concept, meaning and principles, process, Techniques, components; Social group work – concept, meaning, principles, types of Groups, group dynamics, programme planning; Community organization- concept, Meaning, principles, process, scope of community work. Social Welfare Administration: Concept, scope, principle, Social work research- concept, meaning, scope, research process, uses of social work research; Social action concepts, principles, and application
Unit 2	**APPROACHES, THEORIES & PERSPECTIVES IN SOCIAL WORK** • **Theories in Social Work:** Systems Theory, Social Learning, Psycho-social development theory; Rational choice theory, Feminist Theories; Critical and Radical Theories; Multi-culturism and Postmodern Social Work • **Approaches:** Right based Approach; strength based approach, client/person centered empowerment approach, structural social work approach, anti-oppressive practice approach, integrative approach, Evidence-based social work practice • **Perspectives/Models:** Strengths, Feminist, Eco-Systems, Intersectional; Discourse and reflexivity Social Work Practice Models: Problem Solving, Task-Centered, Solution –Focused, Narrative Therapy, Cognitive Behavioural, Crisis Intervention Model
Unit 3	**INTERNATIONAL SOCIAL WORK** • **International Social Work:** Context and Definition; Knowledge Base for International Social Work Major Concepts; Theories and Concepts Underpinning International Social Work: Globalization; The Impact of Globalization and Global Interdependence on Various Sectors; Social Work and Social Development; Human Rights as a Regime of International Law; Human Rights and Social Work; Values and Ethics for International Professional Action Universalism Versus Cultural Relativism • **Global Social Issues:** Poverty; the Status of Women; Problems of Children in Difficult Circumstances; Aging; Natural and Man-Made Disasters; Displacement and Forced Migration; • **International Organizations:** UN; ILO; WHO; UNESCO; UNHCR; IOM; UNICEF etc. Roles for Social Workers in International

	Organizations; Social Work, Civil Society, and Transformative Global Change; Social Work Roles in International Relief and Development
Unit 4	**EMERGING AREAS OF SOCIAL WORK** • **Emerging area of social work practice:** School Social Work; Corporate Social Work; CSR and Industrial Social Work. Pandemic Crisis; Development-oriented social work, Social Justice and Human Rights; Immigration; Criminal Justice; Environmental Justice; Online practice and technology. • **Resettlement and Rehabilitation:** People living with HIV/AIDS, Leprosy; Tuberculosis (TB); displaced population by Development or natural disaster; Disabled population; Juvenile Delinquents; War Victims • **Diversity and Inclusion:** Immigrant and Indigenous Populations; Sexual Minorities (LGBTIQ); Privileges, Oppression, Diversity and Social Justice; Developing culturally sensitive social work practice

Readings:

1. Bradford S W & Others (1988): Techniques and Guidelines for social work practice. Allyn and Bacon Inc, Massachusetts.
2. Briscoe C and Thomas D.N (1977) community work: Learning and Supervision, George Allen and Unwin Ltd, London.
3. Butrym Z T (1979) The Nature of Social work. The MacMillan Press Ltd,, London.
4. Clark H I (1947) Principles and practices of social work. D Appleton century- crofts Inc. New York.
5. Donald B and others (1975) Contemporary Social Work. McGraw Hill Book Company, New York.
6. Fink A.E (1971) The Field of social work. Holt Rinehart and Winston, Inc,, New York.
7. Friedlander W A (1958) Introduction to Social Work, Prentice Hall Inc, New Jersey.
8. Friedlander W A (1961) Introduction to Social Welfare, Prentice Hall Inc, New Jersey.
9. Gangrade K D (1986) Social Work and Development, Northern Book Centre, NewDelhi-2.
10. Goel and Jain (1988) Social Welfare Administration, Northern Book center, New Delhi.
11. Goldberg (1972) Social Work in General Practice, George Allen and Unwin Ltd, London.
12. Gore M S (1965) Social Work and Social Work Education, National Printing House, New Delhi.
13. Govt. of India: Indian Constitution.
14. Guens (1965) Careers in Social Work, The Bodley Head Ltd., London.
15. Herand B J (1970) Sociology and Social Work (Perspectives and Problems) Pergamon press ltd, Oxford.
16. Healy , Lynne Moore and Thomas, Rebecca Leela (2020) International Social Work: Professional Action in an Interdependent World: Oxford University Press
17. Jacob K K (1994) Social Work Education in India, Himanshu Publications, Delhi.

18. Johnson L C (1986) Social Work Practice Generalist Approach, Allen and Bacon Inc., London.
19. Krammer R M and Specht H (1975): Readings in Community Organization Practice, Prentice Hall, New Jersey

PHD-RPE-103	Research and Publication Ethics	Credit Distribution: L:1, T:1, P:0=2
Learning Outcomes	1. To have awareness about the publication ethics and publication misconducts. 2. To understand indexing and citation databases, open access publications, research metrics (citations, h-index, impact factor etc) 3. Develop hands-on skills to identify research misconduct and predatory publications.	
Unit 1	**Philosophy and Ethics (4 hrs)** 1. Introduction to philosophy: definition, nature and scope, concept, branches 2. Ethics: definition, moral philosophy, nature of moral judgements and reactions	
Unit 2	**Scientific Conduct (4 hrs)** 1. Ethics with respect to science and research 2. Intellectual honesty and research integrity 3. Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP) 4. Redundant publications: duplicate and overlapping publications, salami slicing 5. Selective reporting and misrepresentation of data	
Unit 3	**Publication Ethics (7 hrs)** 1. Publication ethics: definition, introduction and importance 2. Best practices / standards setting initiatives and guidelines: COPE, WAME, etc. 3. Conflicts of interest 4. Publication misconduct: definition, concept, problems that lead to unethical behavior and vice versa, types 5. Violation of publication ethics, authorship and contributor ship 6. Identification of publication misconduct, complaints and appeals 7. Predatory publishers and journals	
Unit 4 Practice	**Open Access Publishing (4 hrs)** 1. Open access publications and initiatives 2. SHERPA/ROMEO online resource to check publisher copyright & self-archiving policies	

	3. Software tool to identify predatory publications developed by SPPU
	4. Journal finder / journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer
	Journal Suggester, etc.
Unit 5 Practice	**Publication Misconduct (4 hrs)**
	A. Group Discussions (2 hrs.)
	1. Subject specific ethical issues, FFP, authorship
	2. Conflicts of interest
	3. Complaints and appeals: examples and fraud from India and abroad
	B. Software tools (2 hrs.)
	Use of plagiarism software like Turnitin, Urkund and other open source software tools
Unit 6 Practice	**Databases and Research Metrics (7 hrs)**
	A. Databases (4 hrs.)
	1. Indexing databases
	2. Citation databases: Web of Science, Scopus etc.
	B. Research Metrics (3 hrs.)
	1. Impact Factor of journal as per Journal Citation Report, SNIP, SJR, IPP, Cite Score
	2. Metrics: h-index, g-index, i10 index, altmetrics

Suggested Readings

1. Bird, A. (2006). Philosophy of Science. Routledge.
2. MacIntyre, A. (1967) A Short History of Ethics. London.
3. P. Chaddah, (2018) Ethics in Competitive Research: Do not get scooped; do not get plagiarized, ISBN:978-9387480865
4. National Academy of Sciences, National Academy of Engineering and Institute of Medicine. (2009). On Being a Scientist: A Guide to Responsible Conduct in Research: Third Edition. National Academies Press.
5. Rensik, D. B. (2011). What is ethics in research & why is it important. National Institute of Environmental Health Sciences, 1-10. Retrieved from https://www.niehs.nih.gov/resources/biothics/whatis/index.cfm
6. Beall, J. (2012). Predatory publishers are corrupting open access. Nature, 489(7415), 179-179. https://doi.org/10.1038/489179a

NIILM UNIVERSITY

Ph.D. Course Work in Sociology

Academic Session 2024-25

Ph.D. Regulations Regarding Course Work

Clause 18: Ph.D. Ordinance NIILM University as per UGC Minimum Standards and Procedure for Award of Ph.D. Degrees Regulations 2022 with effect from academic session 2024-25

I.   The coursework shall be treated as a prerequisite for Ph.D. preparation. In the first year of registration, all research scholars are required to complete the course work for one semester following their provisional registration as a part of the Ph.D. program. It is mandatory to complete the course work in first 4 semesters to stay in the Ph.D. program. If a student fails to complete the coursework in first 4 semesters, will have to leave the program.

II. Earning a minimum of 12 total credits and a maximum of 16, is required.

III. Usually a course refers to a 'paper' and is a component of an academic program. Courses in Ph.D. course work shall be of two kinds: Core and Elective.

IV. A core course is a compulsory paper to be studied by all the scholars to complete the requirements of the Ph.D. degree.

V.   Elective course is a course which is discipline specific and provided by the particular department from the main discipline or from a sister/related discipline which supports the main discipline, on mutual consent of the concerned departments.

VI. One credit equal to 15 contact hours for theory-based teaching or 30 hours of contact time for practical or activity-based teaching.

VII. The number of credits is given in the form L: T: P, where L indicates the number of contact hours of lecture, and T the number of contact hours for tutorials, P stands for laboratory credits.

VIII. The credits are distributed as follows:

Paper Code	Paper	Course type	Credit	L	T	P
PHD-ARM-101	Advanced Research Methodology	Core	4	3	1	0
PHD-DSC-102	Discipline Specific Course	Elective	4	3	1	0
PHD-RPE-103	Research and Publication Ethics	Core	2	1	1	0
PHD-SEM-104	Academic Writing, Literature Review and Seminar	Skill	2	0	1	2
	Total		**12**			

IX. All Ph.D., entrants irrespective of discipline, shall be trained in teaching proficiency related to teaching/education/pedagogy/writing related to their chosen Ph.D. subject during their doctoral training period, that include assigning 4-6 hours per week of teaching/ research assistantship for conducting tutorial or laboratory work and evaluations.

X. Courses PHD-SEM 104 includes research work on research article writing, seminar presentation and course PHD-TP 105 includes pedagogical training. Both these courses will be assessed internally without Semester End Examination.

XI. CoE will conduct Term/ Semester End Exam in PHD-ARM-101, PHD-DSC-102, and PHD-RPE-103.

XII. PHD-TP 105 is a non-credit course and internal assessment will be marked on the detailed mark card of the course work.

XIII. Advance Research Methodology course will include common research methodology and subject specific research methodology.

XIV. Research Advisory Committee may provide choices in selecting the courses/ credits that facilitates the entrepreneur in the monetization of IP thus generated.

XV. RAC can also recommend UGC recognized online courses as part of the credit requirements for the Ph.D. program.

XVI. Paper- will comprise of the following two activities:

(a) **External Assessment: Written Question Paper 70/39**

(b) **Internal Assessment: 30/16**

Marks will be converted into letter grade and grade point as per following table:

Marks	Letter Grade	Grade Point
81-100	A+	10
76-80	A	9
66-75	B+	8
61-65	B	7
55-60	C	6
Less than 55	F	0

The computation of the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA) shall be done as per University Examination Ordinance or Examination Rules & Regulations issued time to time.

The result and grade sheet for the course work will carry pass/ fail result.

COURSE WORK PAPER

I. Candidates who already hold an M. Phil. degree and have been accepted into the Ph.D. program, or those who have finished their M.Phil. Coursework and have been given permission to continue on to the Ph.D. in an integrated course, may be exempted from the Ph.D. course requirements by the Department. All additional applicants accepted into the Ph.D. program must complete the Ph.D. coursework required by the Department.

II. The NIILM University attendance rules, a minimum 75% attendance is must require, will be applied to all full-time research scholars. For the duration of their coursework, part-time research researchers must, nevertheless, adhere to the same rules.

III. A Ph.D. scholar has to obtain a minimum of 55% of marks or a minimum CGPA of 6.0 in the UGC 10-point scale (or an equivalent grade/CGPA in a point scale wherever grading system is followed) in the course work in order to be eligible to continue in the program and submit the thesis.

IV. Registration will be automatically canceled if the required course work is not completed with a minimum of 55% of marks/a minimum CGPA of 6.0 within the allotted time. If the course work is not finished within a year, the RAC and DRC may suggest a six-month extension or suggest that the registration be canceled with the DRC.

V. There is no provision of improvement or special supplementary exam to be conducted. Coursework will be offered in four semesters of first two years with regular & supplementary exams to avail the opportunity to clear the coursework in 2 years. **Failure to complete the course in 2 years means that the student has to leave the program.**

Course Structure:

PHD-ARM-101	Advance Research Methodology in Sociology	Credit Distribution: L:3, T:1, P:0=4
Course Objectives:	To acquaint the students with research process. To train them in the research methods and designs and to equip them to take up researches independently.	
Unit 1	**Introduction to Research** a. Nature and aims of research b. Dimensions and types of research c. Theory and research d. The meaning of methodology e. Types of Methods of Research	
Unit 2	**Research Planed Data Collection** a. Concept, logic, and research question/issues b. Variables, causal theory, and hypothesis c. Research Design and Collection of Data d. Sampling: Methods, Size, Errors e. Probability and non-probability f. Measurement and Scaling Techniques g. Issues in measurement: Qualitative and quantitative	
Unit 3	**Data Processing** a. Analysis of quantitative data introduction to higher order statistics b. Editing, Coding and Classification of Data c. Analysis of qualitative data and Tabulation d. Introduction to advanced statistical techniques using SPSS e. Statistical Derivatives and Measures of Central Tendency f. Measures of Variation and Skewness g. Correlation and Simple Regression h. Diagrammatic and Graphic Presentation of Data	
Unit 4	**Research Report Writing**	

	a. Ethical issues in research
	b. APA style of writing concept
	c. APA style of writing: Referencing
	d. d. Research article writing
Unit 5	**Computer Application in Research**
	a. Introduction to MS Excel, Using Formulas and Functions
	b. Hand on to SPSS
	c. Features for Statistical Data Analysis
	d. Generating Charts/Graphs
	e. Introduction to MS Word, Features and Functions, Writing Report in MS Word
	f. Introduction to Open Office or Latex
	g. Creating Presentation in MS PowerPoint
	h. Introduction to Internet-Based Search
	i. Use of Advanced Research Techniques.

Recommended Readings:

1. Bayard, P. & Grayson, A. (1976). Introducing psychological research. London: McMillan.

2. Bordens, K.S. & Abbot, B.B. (2005). Research design and methods. New Delhi: Tata McGraw Hill.

3. Breakwell, G.M. Hammond, S. & Fife-Schaw, C. (1995). Research Methods in Psychology. New Delhi: Sage Publications.

4. Cresswell, J.W. (1994) Research design: L Qualitative and quantitative approaches. Thousand Oaks, CA: Sage Publication.

5. Drew, C.J.: Hardman, M.L. & Hart, W.A. (1996). Designing and conducting research: Inquiry in education and social science. New York: Allyn & Bacon.

6. Kerlinger, F.N. (1982). Foundations of behavioural research. Delhi: Subject Publication.

7. Nation, J.R. (1997). Research Methods. New Jersey: Prentice Hall.

8. Willing, C. & Stainton-Rogers, W. (Eds.) (2008). The Sage Handbook of Qualitative Research in Psychology. New Delhi: Sage Publications.

PHD-DSC-102	Discipline Specific Course (Sociology)	Credit Distribution: L:3, T:1, P:0=4
Learning Outcomes	• Students will understand nature, scope, significance and origin of the sociology. • Students will make sense of basic concepts of sociology. • Students will be able to know about different social processes. • Students will learn about various social institutions.	
Unit 1	Sociology and its Basic Concepts: Nature, Scope and Significance; Development of Sociology;	
Unit 2	Basic Concepts: Society, Group, Community, Association, Social System, Social Structure; Status and Role; Socialization and Culture	
Unit 3	Sociological Theories-I: Nature and Types; Theory Construction;	

	Sociological Perspectives; Classical Theories: Positivism and Antipositivism; Structural-Functionalism; Conflict Theories
Unit 4	Sociological Theories-II: Exchange Theory; Everyday Life Approach; Critical Theory; Structuralism and Post-Structuralism
Unit 5	Historical Background of Indian Society & Basic Social Institution: Traditional Hindu Social Organization – Purushartha, Samaskara, Theory of Karma; Diversity and Unity in India; Basic Social Institutions – Family; Marriage and Kinship

Readings:-

- Abrahm, F. : History of Sociological Thought, OUP, New Delhi
- Abrahm, F. : Modern Sociological Theory, Oxford University Press, New Delhi.
- Aron, Raymond: Main Currents in Sociological Thought (Vol. I & II), Penguin; 1965/67
- Bottomore, T.B. : Sociology: A Guide to Problems and Literature, George Allen and Unwin, Delhi; 1972
- Davis, Kingsley: Human Society, Surjeet Publicaiton , New Delhi; 1981.
- Dube, S.C.: Indian Society: National Book Trust, New Delhi; 1986
- Dumont, L.: Homo Hierarchicus: The Caste System and Its Implications; University
- Fletcher, R.: The making of Sociology (Vol. I & II), Nelso, London; 1971
- Fox, R. : Kinship and Marriage; 1963
- Ghurye, G.S. : Caste and Role in India: Popular Prakashan, Bombay; 1969
- Giddens Anthony: Sociology Oxford University Press; 1989.
- insberg, M. H. Page : Sociology, Surjeet Publication, New Delhi; 1979
- Haralambos : Sociology: Themes and Perspectives, Bell and Hyman, London; 1985
- Inkeles, A : What is Sociology, Prentice hall, New Delhi; 1987
- Irawati Karve : Family, Kinship and Marriage in India, New Delhi. OUP
- Johnson, H.M. : Sociology: A Systematic Introduction, Allied Publishers, New Delhi; 1995
- Kapadia, K.M. : Marriage and Family in India, Oxford University Press, Bombay; 1980
- MacIver, R. M. and Society –An Introductory Analysis, Macmillan, New Delhi; 1974.
- Majumdar & Madan : An Introduction to Social Anthropology: Asia Publication
- Mandelbaum, D.G. : Society in India: Popular Prakashan, Bombay; 1972
- Martindale, D. : Nature and Types of Sociological Theory, Houghton-Millin, Boston; 1960
- Merton, R.K. : Social Theory and Social Structure, Amerind Publishing Co. Pvt. Ltd.; 1968
- Mills, C.W. : The Sociological Imagination, Oxford University Press; 1956
- Parsons, T. : The Social System, Free Press, New York; 1951
- Parsons, T. : The Structure of Social Action, Free Press, New York; 1949 Popular Prakashan, Bombay; 1996 Prabhu,
- P.H. : Hindu Social Organization: Popular Prakashan, Bombay; 1963
- Ritzer, G. : Sociological Theory (IIIrd Ed.), McGraw Hill Inc.; 1992
- Sharma, K.L. : Essays on Social Stratification, Rawat Publication, Jaipur; 1980
- Singer & Cohn : Structure and Change in Indian Society: Aldine Publishing Co. Chicago; 1968

- Singh, Yogendra. : Modernization of Indian Tradition: Thomson press, Faridabad; 1973
- Singh, Yogendra. : Social Stratification and change in India: Manohar publications,
- Smelser, J. : Sociology, Prentice Hall, New Delhi.
- Srinivas, M.N. : Caste in Modern India and other Essays, Asian Publishing House, Bombay; 1966 Srinivas, M.N. : India Social Structure: Hindustan Publishing Corp. New Delhi; 1980
- Turner, J.H. : The structure of Sociological Theory, Rawat Publication, Jaipur; 1978.

PHD-RPE-103	Research and Publication Ethics	Credit Distribution: L:1, T:1, P:0=2
Learning Outcomes	1. To have awareness about the publication ethics and publication misconducts. 2. To understand indexing and citation databases, open access publications, research metrics (citations, h-index, impact factor etc) 3. Develop hands-on skills to identify research misconduct and predatory publications.	
Unit 1	**Philosophy and Ethics (4 hrs)** 1. Introduction to philosophy: definition, nature and scope, concept, branches 2. Ethics: definition, moral philosophy, nature of moral judgements and reactions	
Unit 2	**Scientific Conduct (4 hrs)** 1. Ethics with respect to science and research 2. Intellectual honesty and research integrity 3. Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP) 4. Redundant publications: duplicate and overlapping publications, salami slicing 5. Selective reporting and misrepresentation of data	
Unit 3	**Publication Ethics (7 hrs)** 1. Publication ethics: definition, introduction and importance 2. Best practices / standards setting initiatives and guidelines: COPE, WAME, etc. 3. Conflicts of interest 4. Publication misconduct: definition, concept, problems that lead to unethical behavior and vice versa, types 5. Violation of publication ethics, authorship and contributor ship 6. Identification of publication misconduct, complaints and appeals 7. Predatory publishers and journals	
Unit 4	**Open Access Publishing (4 hrs)**	

Practice	1. Open access publications and initiatives
	2. SHERPA/ROMEO online resource to check publisher copyright & self-archiving policies
	3. Software tool to identify predatory publications developed by SPPU
	4. Journal finder / journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer Journal Suggester, etc.
Unit 5 Practice	**Publication Misconduct (4 hrs)**
	A. Group Discussions (2 hrs.)
	1. Subject specific ethical issues, FFP, authorship
	2. Conflicts of interest
	3. Complaints and appeals: examples and fraud from India and abroad
	B. Software tools (2 hrs.)
	Use of plagiarism software like Turnitin, Urkund and other open source software tools
Unit 6 Practice	**Databases and Research Metrics (7 hrs)**
	A. Databases (4 hrs.)
	1. Indexing databases
	2. Citation databases: Web of Science, Scopus etc.
	B. Research Metrics (3 hrs.)
	1. Impact Factor of journal as per Journal Citation Report, SNIP, SJR, IPP, Cite Score
	2. Metrics: h-index, g-index, i10 index, altmetrics

Suggested Readings

1. Bird, A. (2006). Philosophy of Science. Routledge.
2. MacIntyre, A. (1967) A Short History of Ethics. London.
3. P. Chaddah, (2018) Ethics in Competitive Research: Do not get scooped; do not get plagiarized, ISBN:978-9387480865
4. National Academy of Sciences, National Academy of Engineering and Institute of Medicine. (2009). On Being a Scientist: A Guide to Responsible Conduct in Research: Third Edition. National Academies Press.
5. Rensik, D. B. (2011). What is ethics in research & why is it important. National Institute of Environmental Health Sciences, 1-10. Retrieved from https://www.niehs.nih.gov/resources/biothics/whatis/index.cfm
6. Beall, J. (2012). Predatory publishers are corrupting open access. Nature, 489(7415), 179-179. https://doi.org/10.1038/489179a

NIILM UNIVERSITY

Ph.D. Course Work in Statistics

Academic Session 2024-25

Ph.D. Regulations Regarding Course Work

Clause 18: Ph.D. Ordinance NIILM University as per UGC Minimum Standards and Procedure for Award of Ph.D. Degrees Regulations 2022 with effect from academic session 2024-25

I. The coursework shall be treated as a prerequisite for Ph.D. preparation. In the first year of registration, all research scholars are required to complete the course work for one semester following their provisional registration as a part of the Ph.D. program. It is mandatory to complete the course work in first 4 semesters to stay in the Ph.D. program. If a student fails to complete the coursework in first 4 semesters, will have to leave the program.

II. Earning a minimum of 12 total credits and a maximum of 16, is required.

III. Usually a course refers to a 'paper' and is a component of an academic program. Courses in Ph.D. course work shall be of two kinds: Core and Elective.

IV. A core course is a compulsory paper to be studied by all the scholars to complete the requirements of the Ph.D. degree.

V. Elective course is a course which is discipline specific and provided by the particular department from the main discipline or from a sister/related discipline which supports the main discipline, on mutual consent of the concerned departments.

VI. One credit equal to 15 contact hours for theory-based teaching or 30 hours of contact time for practical or activity-based teaching.

VII. The number of credits is given in the form L: T:P, where L indicates the number of contact hours of lecture, and T the number of contact hours for tutorials, P stands for laboratory credits.

VIII. The credits are distributed as follows:

Paper Code	Paper	Course type	Credit	L	T	P
PHD-ARM-101	Advanced Research Methodology	Core	4	3	1	0
PHD-DSC-102	Discipline Specific Course	Elective	4	3	1	0
PHD-RPE-103	Research and Publication Ethics	Core	2	1	1	0
PHD-SEM-104	Academic Writing, Literature Review and Seminar	Skill	2	0	1	2
	Total		**12**			

IX. All Ph.D., entrants irrespective of discipline, shall be trained in teaching proficiency related to teaching/education/pedagogy/writing related to their chosen Ph.D. subject during their doctoral training period, that include assigning 4-6 hours per week of

teaching/ research assistantship for conducting tutorial or laboratory work and evaluations.

X. Courses PHD-SEM 104 includes research work on research article writing, seminar presentation and course PHD-TP 105 includes pedagogical training. Both these courses will be assessed internally without Semester End Examination.

XI. CoE will conduct Term/ Semester End Exam in PHD-ARM-101, PHD-DSC-102, and PHD-RPE-103.

XII. PHD-TP 105 is a non-credit course and internal assessment will be marked on the detailed mark card of the course work.

XIII. Advance Research Methodology course will include common research methodology and subject specific research methodology.

XIV. Research Advisory Committee may provide choices in selecting the courses/ credits that facilitates the entrepreneur in the monetization of IP thus generated.

XV. RAC can also recommend UGC recognized online courses as part of the credit requirements for the Ph.D. program.

XVI. Paper- will comprise of the following two activities:

(a) External Assessment: Written Question Paper 70/39

(b) Internal Assessment: 30/16

Marks will be converted into letter grade and grade point as per following table:

Marks	Letter Grade	Grade Point
81-100	A+	10
76-80	A	9
66-75	B+	8
61-65	B	7
55-60	C	6
Less than 55	F	0

The computation of the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA) shall be done as per University Examination Ordinance or Examination Rules & Regulations issued time to time.

The result and grade sheet for the course work will carry pass/ fail result.

COURSE WORK PAPER

I. Candidates who already hold an M. Phil. degree and have been accepted into the Ph.D. program, or those who have finished their M.Phil. Coursework and have been given permission to continue on to the Ph.D. in an integrated course, may be exempted from the Ph.D. course requirements by the Department. All additional applicants accepted into the Ph.D. program must complete the Ph.D. coursework required by the Department.

II. The NIILM University attendance rules, a minimum 75% attendance is must require, will be applied to all full-time research scholars. For the duration of their coursework, part-time research researchers must, nevertheless, adhere to the same rules.

III. A Ph.D. scholar has to obtain a minimum of 55% of marks or a minimum CGPA of 6.0 in the UGC 10-point scale (or an equivalent grade/CGPA in a point scale wherever grading system

is followed) in the course work in order to be eligible to continue in the program and submit the thesis.

IV. Registration will be automatically canceled if the required course work is not completed with a minimum of 55% of marks/a minimum CGPA of 6.0 within the allotted time. If the course work is not finished within a year, the RAC and DRC may suggest a six-month extension or suggest that the registration be canceled with the DRC.

V. There is no provision of improvement or special supplementary exam to be conducted. Coursework will be offered in four semesters of first two years with regular & supplementary exams to avail the opportunity to clear the coursework in 2 years. **Failure to complete the course in 2 years means that the student has to leave the program.**

Course Structure:

PHD-ARM-101	Advance Research Methodology in Statistics	Credit Distribution: L:3, T:1, P:0=4
Course Objectives:	To acquaint the students with research process. To train them in the research methods and designs and to equip them to take up researches independently.	
Unit 1	**Introduction to Research** a. Nature and aims of research b. Dimensions and types of research c. Theory and research d. The meaning of methodology e. Types of Methods of Research	
Unit 2	**Research Planed Data Collection** a. Concept, logic, and research question/issues b. Variables, causal theory, and hypothesis c. Research Design and Collection of Data d. Sampling: Methods, Size, Errors e. Probability and non-probability f. Measurement and Scaling Techniques g. Issues in measurement: Qualitative and quantitative	
Unit 3	**Data Processing** a. Analysis of quantitative data introduction to higher order statistics b. Editing, Coding and Classification of Data c. Analysis of qualitative data and Tabulation d. Introduction to advanced statistical techniques using SPSS e. Statistical Derivatives and Measures of Central Tendency f. Measures of Variation and Skewness g. Correlation and Simple Regression h. Diagrammatic and Graphic Presentation of Data	
Unit 4	**Research Report Writing** a. Ethical issues in research b. APA style of writing concept	

	c. APA style of writing: Referencing
	d. d. Research article writing
Unit 5	**Computer Application in Research**
	a. Introduction to MS Excel, Using Formulas and Functions
	b. Hand on to SPSS
	c. Features for Statistical Data Analysis
	d. Generating Charts/Graphs
	e. Introduction to MS Word, Features and Functions, Writing Report in MS Word
	f. Introduction to Open Office or Latex
	g. Creating Presentation in MS PowerPoint
	h. Introduction to Internet-Based Search
	i. Use of Advanced Research Techniques.

Recommended Readings:

1. Bayard, P. & Grayson, A. (1976). Introducing psychological research. London: McMillan.
2. Bordens, K.S. & Abbot, B.B. (2005). Research design and methods. New Delhi: Tata McGraw Hill.
3. Breakwell, G.M. Hammond, S. & Fife-Schaw, C. (1995). Research Methods in Psychology. New Delhi: Sage Publications.
4. Cresswell, J.W. (1994) Research design: L Qualitative and quantitative approaches. Thousand Oaks, CA: Sage Publication.
5. Drew, C.J.: Hardman, M.L. & Hart, W.A. (1996). Designing and conducting research: Inquiry in education and social science. New York: Allyn & Bacon.
6. Kerlinger, F.N. (1982). Foundations of behavioural research. Delhi: Subject Publication.
7. Nation, J.R. (1997). Research Methods. New Jersey: Prentice Hall.
8. Willing, C. & Stainton-Rogers, W. (Eds.) (2008). The Sage Handbook of Qualitative Research in Psychology. New Delhi: Sage Publications.

PHD-DSC-102	Discipline Specific Course (Recent Trends in Statistics)	Credit Distribution: L:3, T:1, P:0=4
Learning Outcomes	• Students will learn about the fundamentals of probability theory and point estimation theory. • To explore and apply the statistical computation via MCMC technique. • Acquire the knowledge about application of stochastic process.	
Unit 1	Probability as a measure, probability space. Conditional probability. Random variables. Distribution function continuous, discrete and mixed. Decomposition of a distribution function. Independence. Expectation. Moments. Characteristic function. Sequences of random variables. Dominated and monotone convergence theorems. Modes of stochastic convergence, laws of large numbers and central limit theorems.	
Unit 2	Review of estimation theory, point estimation, Testing of hypothesis and	

	confidence intervals, Model fitting and prediction. Introduction to Bootstrap and Jack knife methods, Markov Chain Monte Carlo Methods and applications EM algorithm, Metropolis-Hasting Algorithm, Gibbs Sampling.
Unit 3	Stochastic Processes: Markovian property, continuous time Markov Chains, Poisson Process, Birth and Death Process, Application in Insurance and Finance. Brownian Motion: Basic concepts of Stochastic Differential equations, Ito integrals, Geometric Brownian motion
Unit 4	Concept of simulation and Empirical study, Latest research paper reading and presentation. One research Principles of life and health Insurance: Types of Life insurances, Health insurance, Mortality and its role in Pricing, Solvency; Human development index, income, education, purchasing power.

References:

1. Efron, B and Tibshirani, R (1993) An Introduction to the Bootstrap, Chapman & Hill.
2. Lehmann E.L. and Romano J.P.(2005): Testing Statistical Hypotheses, Springer
3. Lehmann E.L. and Casella George.(1998): Theory of Point Estimation, Springer Inc.
4. Chernick, M. R. (2008), Bootstrap Methods: A Guide for Practioners and Researchers, John Wiley and Sons, New York.
5. Peter Hall (1997) The Bootstrap and Edgeworth Expansion, Spinger-Verlag, New York.
6. Karlin, S. and Taylor, H. M. (1975) A First Course in Stochastic Processes, Academic Press.
7. Karlin, S. and Taylor, H. M. (1981) A Second Course in Stochastic Processes, Academic Press.
8. Ross, S. (1996) Stochastic Processes, John Wiley and Sons, New York.
9. Lin Sheldon, Introductory Stochastic Analysis For Finance And Insurance, John Wiley and sons.
10. Ruppert David: Statistics and Finance: An Introduction, Springer.
11. Booth, P. M.; Chadburn, R. G.; , Modern actuarial theory and practice, CRC Press.

PHD-RPE-103	Research and Publication Ethics	Credit Distribution: L:1, T:1, P:0=2
Learning Outcomes	1. To have awareness about the publication ethics and publication misconducts. 2. To understand indexing and citation databases, open access publications, research metrics (citations, h-index, impact factor etc) 3. Develop hands-on skills to identify research misconduct and predatory publications.	
Unit 1	**Philosophy and Ethics (4 hrs)** 1. Introduction to philosophy: definition, nature and scope, concept,	

	branches
	2. Ethics: definition, moral philosophy, nature of moral judgements and reactions
Unit 2	**Scientific Conduct (4 hrs)**
	1. Ethics with respect to science and research
	2. Intellectual honesty and research integrity
	3. Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP)
	4. Redundant publications: duplicate and overlapping publications, salami slicing
	5. Selective reporting and misrepresentation of data
Unit 3	**Publication Ethics (7 hrs)**
	1. Publication ethics: definition, introduction and importance
	2. Best practices / standards setting initiatives and guidelines: COPE, WAME, etc.
	3. Conflicts of interest
	4. Publication misconduct: definition, concept, problems that lead to unethical behavior and vice versa, types
	5. Violation of publication ethics, authorship and contributor ship
	6. Identification of publication misconduct, complaints and appeals
	7. Predatory publishers and journals
Unit 4 Practice	**Open Access Publishing (4 hrs)**
	1. Open access publications and initiatives
	2. SHERPA/ROMEO online resource to check publisher copyright & self-archiving policies
	3. Software tool to identify predatory publications developed by SPPU
	4. Journal finder / journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer Journal Suggester, etc.
Unit 5 Practice	**Publication Misconduct (4 hrs)**
	A. Group Discussions (2 hrs.)
	1. Subject specific ethical issues, FFP, authorship
	2. Conflicts of interest
	3. Complaints and appeals: examples and fraud from India and abroad
	B. Software tools (2 hrs.)
	Use of plagiarism software like Turnitin, Urkund and other open source software tools
Unit 6 Practice	**Databases and Research Metrics (7 hrs)**
	A. Databases (4 hrs.)
	1. Indexing databases
	2. Citation databases: Web of Science, Scopus etc.
	B. Research Metrics (3 hrs.)

	1. Impact Factor of journal as per Journal Citation Report, SNIP, SJR, IPP, Cite Score
	2. Metrics: h-index, g-index, i10 index, altmetrics

Suggested Readings

1. Bird, A. (2006). Philosophy of Science. Routledge.
2. MacIntyre, A. (1967) A Short History of Ethics. London.
3. P. Chaddah, (2018) Ethics in Competitive Research: Do not get scooped; do not get plagiarized, ISBN:978-9387480865
4. National Academy of Sciences, National Academy of Engineering and Institute of Medicine. (2009). On Being a Scientist: A Guide to Responsible Conduct in Research: Third Edition. National Academies Press.
5. Rensik, D. B. (2011). What is ethics in research & why is it important. National Institute of Environmental Health Sciences, 1-10. Retrieved from https://www.niehs.nih.gov/resources/biothics/whatis/index.cfm
6. Beall, J. (2012). Predatory publishers are corrupting open access. Nature, 489(7415), 179-179. https://doi.org/10.1038/489179a

NIILM UNIVERSITY

Ph.D. Course Work in Tourism Management

Academic Session 2024-25

Ph.D. Regulations Regarding Course Work

Clause 18: Ph.D. Ordinance NIILM University as per UGC Minimum Standards and Procedure for Award of Ph.D. Degrees Regulations 2022 with effect from academic session 2024-25

I.   The coursework shall be treated as a prerequisite for Ph.D. preparation. In the first year of registration, all research scholars are required to complete the course work for one semester following their provisional registration as a part of the Ph.D. program. It is mandatory to complete the course work in first 4 semesters to stay in the Ph.D. program. If a student fails to complete the coursework in first 4 semesters, will have to leave the program.

II.   Earning a minimum of 12 total credits and a maximum of 16, is required.

III.   Usually a course refers to a 'paper' and is a component of an academic program. Courses in Ph.D. course work shall be of two kinds: Core and Elective.

IV.   A core course is a compulsory paper to be studied by all the scholars to complete the requirements of the Ph.D. degree.

V.   Elective course is a course which is discipline specific and provided by the particular department from the main discipline or from a sister/related discipline which supports the main discipline, on mutual consent of the concerned departments.

VI.   One credit equal to 15 contact hours for theory-based teaching or 30 hours of contact time for practical or activity-based teaching.

VII.   The number of credits is given in the form L: T: P, where L indicates the number of contact hours of lecture, and T the number of contact hours for tutorials, P stands for laboratory credits.

VIII.   The credits are distributed as follows:

Paper Code	Paper	Course type	Credit	L	T	P
PHD-ARM-101	Advanced Research Methodology	Core	4	3	1	0
PHD-DSC-102	Discipline Specific Course	Elective	4	3	1	0
PHD-RPE-103	Research and Publication Ethics	Core	2	1	1	0
PHD-SEM-104	Academic Writing, Literature Review and Seminar	Skill	2	0	1	2
	Total		**12**			

IX.   All Ph.D., entrants irrespective of discipline, shall be trained in teaching proficiency related to teaching/education/pedagogy/writing related to their chosen Ph.D. subject during their doctoral training period, that include assigning 4-6 hours per week of teaching/ research assistantship for conducting tutorial or laboratory work and evaluations.

X. Courses PHD-SEM 104 includes research work on research article writing, seminar presentation and course PHD-TP 105 includes pedagogical training. Both these courses will be assessed internally without Semester End Examination.

XI. CoE will conduct Term/ Semester End Exam in PHD-ARM-101, PHD-DSC-102, and PHD-RPE-103.

XII. PHD-TP 105 is a non-credit course and internal assessment will be marked on the detailed mark card of the course work.

XIII. Advance Research Methodology course will include common research methodology and subject specific research methodology.

XIV. Research Advisory Committee may provide choices in selecting the courses/ credits that facilitates the entrepreneur in the monetization of IP thus generated.

XV. RAC can also recommend UGC recognized online courses as part of the credit requirements for the Ph.D. program.

XVI. Paper- will comprise of the following two activities:

(a) External Assessment: Written Question Paper 70/39

(b) Internal Assessment: 30/16

Marks will be converted into letter grade and grade point as per following table:

Marks	Letter Grade	Grade Point
81-100	A+	10
76-80	A	9
66-75	B+	8
61-65	B	7
55-60	C	6
Less than 55	F	0

The computation of the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA) shall be done as per University Examination Ordinance or Examination Rules & Regulations issued time to time.

The result and grade sheet for the course work will carry pass/ fail result.

COURSE WORK PAPER

I. Candidates who already hold an M. Phil. degree and have been accepted into the Ph.D. program, or those who have finished their M.Phil. Coursework and have been given permission to continue on to the Ph.D. in an integrated course, may be exempted from the Ph.D. course requirements by the Department. All additional applicants accepted into the Ph.D. program must complete the Ph.D. coursework required by the Department.

II. The NIILM University attendance rules, a minimum 75% attendance is must require, will be applied to all full-time research scholars. For the duration of their coursework, part-time research researchers must, nevertheless, adhere to the same rules.

III. A Ph.D. scholar has to obtain a minimum of 55% of marks or a minimum CGPA of 6.0 in the UGC 10-point scale (or an equivalent grade/CGPA in a point scale wherever grading system is followed) in the course work in order to be eligible to continue in the program and submit the thesis.

IV. Registration will be automatically canceled if the required course work is not completed with a minimum of 55% of marks/a minimum CGPA of 6.0 within the allotted time. If the course work is not finished within a year, the RAC and DRC may suggest a six-month extension or suggest that the registration be canceled with the DRC.

V. There is no provision of improvement or special supplementary exam to be conducted. Coursework will be offered in four semesters of first two years with regular & supplementary exams to avail the opportunity to clear the coursework in 2 years. **Failure to complete the course in 2 years means that the student has to leave the program.**

Course Structure:

PHD-ARM-101	Advance Research Methodology in Tourism Management	Credit Distribution: L:3, T:1, P:0=4
Course Objectives:	To acquaint the students with research process. To train them in the research methods and designs and to equip them to take up researches independently.	
Unit 1	**Introduction to Research** a. Nature and aims of research b. Dimensions and types of research c. Theory and research d. The meaning of methodology e. Types of Methods of Research	
Unit 2	**Research Planed Data Collection** a. Concept, logic, and research question/issues b. Variables, causal theory, and hypothesis c. Research Design and Collection of Data d. Sampling: Methods, Size, Errors e. Probability and non-probability f. Measurement and Scaling Techniques g. Issues in measurement: Qualitative and quantitative	
Unit 3	**Data Processing** a. Analysis of quantitative data introduction to higher order statistics b. Editing, Coding and Classification of Data c. Analysis of qualitative data and Tabulation d. Introduction to advanced statistical techniques using SPSS e. Statistical Derivatives and Measures of Central Tendency f. Measures of Variation and Skewness g. Correlation and Simple Regression h. Diagrammatic and Graphic Presentation of Data	
Unit 4	**Research Report Writing** a. Ethical issues in research b. APA style of writing concept c. APA style of writing: Referencing d. d. Research article writing	

Unit 5	**Computer Application in Research**
	a. Introduction to MS Excel, Using Formulas and Functions
	b. Hand on to SPSS
	c. Features for Statistical Data Analysis
	d. Generating Charts/Graphs
	e. Introduction to MS Word, Features and Functions, Writing Report in MS Word
	f. Introduction to Open Office or Latex
	g. Creating Presentation in MS PowerPoint
	h. Introduction to Internet-Based Search
	i. Use of Advanced Research Techniques.

Recommended Readings:

1. Bayard, P. & Grayson, A. (1976). Introducing psychological research. London: McMillan.

2. Bordens, K.S. & Abbot, B.B. (2005). Research design and methods. New Delhi: Tata McGraw Hill.

3. Breakwell, G.M. Hammond, S. & Fife-Schaw, C. (1995). Research Methods in Psychology. New Delhi: Sage Publications.

4. Cresswell, J.W. (1994) Research design: L Qualitative and quantitative approaches. Thousand Oaks, CA: Sage Publication.

5. Drew, C.J.: Hardman, M.L. & Hart, W.A. (1996). Designing and conducting research: Inquiry in education and social science. New York: Allyn & Bacon.

6. Kerlinger, F.N. (1982). Foundations of behavioural research. Delhi: Subject Publication.

7. Nation, J.R. (1997). Research Methods. New Jersey: Prentice Hall.

8. Willing, C. & Stainton-Rogers, W. (Eds.) (2008). The Sage Handbook of Qualitative Research in Psychology. New Delhi: Sage Publications.

PHD-DSC-102	Discipline Specific Course (Tourism Management)	Credit Distribution: L:3, T:1, P:0=4
Learning Outcomes	• Students will demonstrate how research methods are applied across various fields such as history, geography, business, and marketing. • Students will understand the principles of selecting research problems and developing hypotheses for study. • Students will practice the art of editing and finalizing drafts for accuracy and clarity.	
Unit 1	Research – Definition – purpose – types – Interdisciplinary approach – History – Geography – Business – Marketing	
Unit 2	Steps in Research – Guiding principles in Selection of Research Problems Formulation of Research Problems – Formulation of Research Problem – Research Design – Hypothesis – Objectives – defining the method of approach – Review of Literature – Chapterisation	
Unit 3	Collection of data – Qualitative and quantitative – research tools – sampling – Hypothesis testing-Human values and Ethics – Piolet Study – Samples of	

	Participants-Semi – Structured or unstructured interviews-Objectivity-Document Analysis – Numerical Comparisons – Statistical analysis – use of Software and Questionnaires.
Unit 4	Measurement scales – Mean – Median – Mode – Standard Deviation – use of SPSS.
Unit 5	Research Report – Structure – steps in drafting reports – tables – graphs – citation and reference style – editing and evaluating the final draft – bibliography.

References:

1. Banchal S.P.Research Methodology 9 Kalyani Publications) Kothari K.R. Research Methodology (New Delhi, Himalayas)
2. Petersen, Craig H. Managerial Economics, New Delhi Pearson Education.
3. Mithani, D.M. Managerial Economics, New Delhi, Himalaya Publications.
4. Chopra, O.P. Managerial Economics. New Delhi Me Graw Hill.
5. Koutsoyiannis, A. Modern Micro Economics. New York, Macmillan.
6. M. Thea Sinclair and Mike Stabler. The Economics of Tourism. Rutledge, London and New York.
7. Peter Cullen, Economics of Hospitality Management
8. Basham, A.L., the Wonder That Was India. Rupa & Co. New Delhi
9. Thapar, Romila, A History of India: Volume 1. Penguin Book, New Delhi,
10. Basham, A.L., A Cultural History of India. Oxford University Press, USA.
11. Singh, Upinder, .A History of Ancient and Early Medieval India: From The Stone Age To The 12Th Century, Pearson Education India, New Delhi.
12. Chandra, B., History of Modern India. Orient Blackswan, New Delhi
13. Brown, P. , Indian Architecture (Buddhist and Hindu Period), Tobey Press, New York

PHD-RPE-103	Research and Publication Ethics	Credit Distribution: L:1, T:1, P:0=2
Learning Outcomes	1. To have awareness about the publication ethics and publication misconducts. 2. To understand indexing and citation databases, open access publications, research metrics (citations, h-index, impact factor etc) 3. Develop hands-on skills to identify research misconduct and predatory publications.	
Unit 1	**Philosophy and Ethics (4 hrs)** 1. Introduction to philosophy: definition, nature and scope, concept, branches 2. Ethics: definition, moral philosophy, nature of moral judgements and reactions	
Unit 2	**Scientific Conduct (4 hrs)**	

	1. Ethics with respect to science and research
	2. Intellectual honesty and research integrity
	3. Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP)
	4. Redundant publications: duplicate and overlapping publications, salami slicing
	5. Selective reporting and misrepresentation of data
Unit 3	**Publication Ethics (7 hrs)**
	1. Publication ethics: definition, introduction and importance
	2. Best practices / standards setting initiatives and guidelines: COPE, WAME, etc.
	3. Conflicts of interest
	4. Publication misconduct: definition, concept, problems that lead to unethical behavior
	and vice versa, types
	5. Violation of publication ethics, authorship and contributor ship
	6. Identification of publication misconduct, complaints and appeals
	7. Predatory publishers and journals
Unit 4 Practice	**Open Access Publishing (4 hrs)**
	1. Open access publications and initiatives
	2. SHERPA/ROMEO online resource to check publisher copyright & self-archiving policies
	3. Software tool to identify predatory publications developed by SPPU
	4. Journal finder / journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer
	Journal Suggester, etc.
Unit 5 Practice	**Publication Misconduct (4 hrs)**
	A. Group Discussions (2 hrs.)
	1. Subject specific ethical issues, FFP, authorship
	2. Conflicts of interest
	3. Complaints and appeals: examples and fraud from India and abroad
	B. Software tools (2 hrs.)
	Use of plagiarism software like Turnitin, Urkund and other open source software tools
Unit 6 Practice	**Databases and Research Metrics (7 hrs)**
	A. Databases (4 hrs.)
	1. Indexing databases
	2. Citation databases: Web of Science, Scopus etc.
	B. Research Metrics (3 hrs.)
	1. Impact Factor of journal as per Journal Citation Report, SNIP, SJR, IPP, Cite Score
	2. Metrics: h-index, g-index, i10 index, altmetrics

Suggested Readings

1. Bird, A. (2006). Philosophy of Science. Routledge.
2. MacIntyre, A. (1967) A Short History of Ethics. London.
3. P. Chaddah, (2018) Ethics in Competitive Research: Do not get scooped; do not get plagiarized, ISBN:978-9387480865
4. National Academy of Sciences, National Academy of Engineering and Institute of Medicine. (2009). On Being a Scientist: A Guide to Responsible Conduct in Research: Third Edition. National Academies Press.
5. Rensik, D. B. (2011). What is ethics in research & why is it important. National Institute of Environmental Health Sciences, 1-10. Retrieved from https://www.niehs.nih.gov/resources/biothics/whatis/index.cfm
6. Beall, J. (2012). Predatory publishers are corrupting open access. Nature, 489(7415), 179-179. https://doi.org/10.1038/489179a

NIILM UNIVERSITY

Ph.D. Course Work in Yogic Science

Academic Session 2024-25

Ph.D. Regulations Regarding Course Work

Clause 18: Ph.D. Ordinance NIILM University as per UGC Minimum Standards and Procedure for Award of Ph.D. Degrees Regulations 2022 with effect from academic session 2024-25

I.   The coursework shall be treated as a prerequisite for Ph.D. preparation. In the first year of registration, all research scholars are required to complete the course work for one semester following their provisional registration as a part of the Ph.D. program. It is mandatory to complete the course work in first 4 semesters to stay in the Ph.D. program. If a student fails to complete the coursework in first 4 semesters, will have to leave the program.

II.   Earning a minimum of 12 total credits and a maximum of 16, is required.

III.   Usually a course refers to a 'paper' and is a component of an academic programme. Courses in Ph.D. course work shall be of two kinds: Core and Elective.

IV.   A core course is a compulsory paper to be studied by all the scholars to complete the requirements of the Ph.D. degree.

V.   Elective course is a course which is discipline specific and provided by the particular department from the main discipline or from a sister/related discipline which supports the main discipline, on mutual consent of the concerned departments.

VI.   One credit equal to 15 contact hours for theory-based teaching or 30 hours of contact time for practical or activity-based teaching.

VII.   The number of credits is given in the form L: T: P, where L indicates the number of contact hours of lecture, and T the number of contact hours for tutorials, P stands for laboratory credits.

VIII.   The credits are distributed as follows:

Paper Code	Paper	Course type	Credit	L	T	P
PHD-ARM-101	Advanced Research Methodology	Core	4	3	1	0
PHD-DSC-102	Discipline Specific Course	Elective	4	3	1	0
PHD-RPE-103	Research and Publication Ethics	Core	2	1	1	0
PHD-SEM-104	Academic Writing, Literature Review and Seminar	Skill	2	0	1	2
	Total		12			

IX.   All Ph.D., entrants irrespective of discipline, shall be trained in teaching proficiency related to teaching/education/pedagogy/writing related to their chosen Ph.D. subject during their doctoral training period, that include assigning 4-6 hours per week of teaching/ research assistantship for conducting tutorial or laboratory work and evaluations.

X. Courses PHD-SEM 104 includes research work on research article writing, seminar presentation and course PHD-TP 105 includes pedagogical training. Both these courses will be assessed internally without Semester End Examination.

XI. CoE will conduct Term/ Semester End Exam in PHD-ARM-101, PHD-DSC-102, and PHD-RPE-103.

XII. PHD-TP 105 is a non-credit course and internal assessment will be marked on the detailed mark card of the course work.

XIII. Advance Research Methodology course will include common research methodology and subject specific research methodology.

XIV. Research Advisory Committee may provide choices in selecting the courses/ credits that facilitates the entrepreneur in the monetization of IP thus generated.

XV. RAC can also recommend UGC recognized online courses as part of the credit requirements for the Ph.D. program.

XVI. Paper- will comprise of the following two activities:

(a) External Assessment: Written Question Paper 70/39

(b) Internal Assessment: 30/16

Marks will be converted into letter grade and grade point as per following table:

Marks	Letter Grade	Grade Point
81-100	A+	10
76-80	A	9
66-75	B+	8
61-65	B	7
55-60	C	6
Less than 55	F	0

The computation of the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA) shall be done as per University Examination Ordinance or Examination Rules & Regulations issued time to time.

The result and grade sheet for the course work will carry pass/ fail result.

COURSE WORK PAPER

I. Candidates who already hold an M. Phil. degree and have been accepted into the Ph.D. program, or those who have finished their M.Phil. Coursework and have been given permission to continue on to the Ph.D. in an integrated course, may be exempted from the Ph.D. course requirements by the Department. All additional applicants accepted into the Ph.D. program must complete the Ph.D. coursework required by the Department.

II. The NIILM University attendance rules, a minimum 75% attendance is must require, will be applied to all full-time research scholars. For the duration of their coursework, part-time research researchers must, nevertheless, adhere to the same rules.

III. A Ph.D. scholar has to obtain a minimum of 55% of marks or a minimum CGPA of 6.0 in the UGC 10-point scale (or an equivalent grade/CGPA in a point scale wherever grading system is followed) in the course work in order to be eligible to continue in the program and submit the thesis.

IV. Registration will be automatically canceled if the required course work is not completed with a minimum of 55% of marks/a minimum CGPA of 6.0 within the allotted time. If the course work is not finished within a year, the RAC and DRC may suggest a six-month extension or suggest that the registration be canceled with the DRC.

V. There is no provision of improvement or special supplementary exam to be conducted. Coursework will be offered in four semesters of first two years with regular & supplementary exams to avail the opportunity to clear the coursework in 2 years. **Failure to complete the course in 2 years means that the student has to leave the program.**

Course Structure:

PHD-ARM-101	Advance Research Methodology in Yogic Science	Credit Distribution: L:3, T:1, P:0=4
Course Objectives:	To acquaint the students with research process. To train them in the research methods and designs and to equip them to take up researches independently.	
Unit 1	**Introduction to Research** a. Nature and aims of research b. Dimensions and types of research c. Theory and research d. The meaning of methodology e. Types of Methods of Research	
Unit 2	**Research Planed Data Collection** a. Concept, logic, and research question/issues b. Variables, causal theory, and hypothesis c. Research Design and Collection of Data d. Sampling: Methods, Size, Errors e. Probability and non-probability f. Measurement and Scaling Techniques g. Issues in measurement: Qualitative and quantitative	
Unit 3	**Data Processing** a. Analysis of quantitative data introduction to higher order statistics b. Editing, Coding and Classification of Data c. Analysis of qualitative data and Tabulation d. Introduction to advanced statistical techniques using SPSS e. Statistical Derivatives and Measures of Central Tendency f. Measures of Variation and Skewness g. Correlation and Simple Regression h. Diagrammatic and Graphic Presentation of Data	
Unit 4	**Research Report Writing** a. Ethical issues in research b. APA style of writing concept c. APA style of writing: Referencing d. d. Research article writing	

Unit 5	**Computer Application in Research**
	a. Introduction to MS Excel, Using Formulas and Functions
	b. Hand on to SPSS
	c. Features for Statistical Data Analysis
	d. Generating Charts/Graphs
	e. Introduction to MS Word, Features and Functions, Writing Report in MS Word
	f. Introduction to Open Office or Latex
	g. Creating Presentation in MS PowerPoint
	h. Introduction to Internet-Based Search
	i. Use of Advanced Research Techniques.

Recommended Readings:

1. Bayard, P. & Grayson, A. (1976). Introducing psychological research. London: McMillan.

2. Bordens, K.S. & Abbot, B.B. (2005). Research design and methods. New Delhi: Tata McGraw Hill.

3. Breakwell, G.M. Hammond, S. & Fife-Schaw, C. (1995). Research Methods in Psychology. New Delhi: Sage Publications.

4. Cresswell, J.W. (1994) Research design: L Qualitative and quantitative approaches. Thousand Oaks, CA: Sage Publication.

5. Drew, C.J.: Hardman, M.L. & Hart, W.A. (1996). Designing and conducting research: Inquiry in education and social science. New York: Allyn & Bacon.

6. Kerlinger, F.N. (1982). Foundations of behavioural research. Delhi: Subject Publication.

7. Nation, J.R. (1997). Research Methods. New Jersey: Prentice Hall.

8. Willing, C. & Stainton-Rogers, W. (Eds.) (2008). The Sage Handbook of Qualitative Research in Psychology. New Delhi: Sage Publications.

PHD-DSC-102	**Discipline Specific Course (Yogic Science)**	**Credit Distribution: L:3, T:0, P:1=4**
Learning Outcomes	• Acquire the comprehensive knowledge of subject matter of philosophical texts and scriptures.	
	• Develop basic insights of yoga contents in Patanjal Yoga Darshan, hatha yoga texts and identify the research problems.	
	• Understand the role of yoga in health and identify the research areas in yoga and therapeutic filed.	
	• Gain insight on life sketches of hatha yogis, contemporary yogis and extract the interesting research problems or topic.	
	• Know the principle of yoga education and identify the possible research areas in education settings.	
	• Deduce significant research contribution and publication in the therapeutic area of yogic science.	
Unit 1	**Philosophical Areas:** Brief introduction of Vedas, Upanishads, Indian Philosophy, Puranas,	

	Smritis, Sri Madbhagvad Gita, Mahabharata, Ramayana, Ayurveda and possible areas of their research with examples.
Unit 2	**Literary Areas:** Brief introduction of Patanjali Yoga Sutras, Hathpradipika, Gherand Samhita, Charandaskrit Bhakti-Sagar (Astangyoga), Shivswarodaya, Vashisth Samhita &Gorakh Samhita, Hathtattva Kaumudi, Hathratnavali and their possible yogic areas of research with examples.
Unit 3	**Life Sketches and their contributory Areas:** Brief Life-sketches of Saint Kabirdas, Saint Tulsidas, Swami Charandas, Swami Dayanand Saraswati, Sri Aurobindo, Swami Vivekanand,Swami ShivanandSaraswati, Swami SatyanandSaraswati, Guru Gorakshnath, PanditShriram Sharma Acharya and Swami Kuvalayananda and their contribution in yogic field with respect to possible research areas.
Unit 4	**Health and Therapeutic Areas:** Basic knowledge of Diet and Health and its norms% Health based norms of Swara Yoga and possible areas of research, Yogic Therapy- its concepts, scope and principles. Possible areas of research with examples for therapeutic research on physiological, psychosomatic and psychological disorders. Relationship of Yogic therapy with some important Alternative therapies and possible areas of its research with examples.
Unit 5	**Educational Areas:** Principles and methodology of yoga education for primary, secondary, higher education. Their possible areas of research. Essential elements for implementation of yogic education in schools /colleges, their implications, and their possible areas of research. Role of yogic education in social problems, administrative problems, physical education, Games & Sports and moral education; and their possible areas of research

Suggested Readings

1. ⬚⬚⬚⬚⬚⬚⬚⬚⬚) H+E(⬚⬚⬚⬚⬚ ⬚⬚⬚⬚⬚⬚⬚⬚ ,⬚⬚⬚⬚⬚⬚⬚, ⬚⬚⬚⬚⬚⬚⬚

2. ⬚⬚⬚⬚⬚ ⬚⬚⬚⬚⬚⬚) H+E(⬚⬚⬚⬚⬚⬚ ⬚⬚⬚⬚⬚ ,⬚⬚⬚⬚⬚⬚ ⬚⬚⬚⬚⬚

3. ⬚⬚⬚⬚ ⬚⬚⬚⬚⬚   ⬚⬚⬚⬚⬚ ⬚⬚⬚⬚⬚ ⬚⬚⬚⬚⬚⬚⬚⬚

4. ⬚⬚⬚⬚⬚⬚⬚⬚⬚⬚ ⬚⬚⬚⬚⬚⬚   ⬚⬚⬚⬚⬚⬚ ⬚⬚⬚⬚⬚ ⬚⬚⬚⬚⬚ ,⬚⬚⬚⬚⬚⬚⬚

5. ⬚⬚⬚⬚⬚⬚⬚⬚   ⬚⬚⬚ ⬚⬚⬚⬚⬚⬚ ⬚⬚⬚⬚

6. ⬚⬚⬚⬚ ⬚⬚⬚⬚⬚ ⬚⬚⬚ ⬚⬚⬚⬚⬚⬚ ⬚⬚⬚⬚⬚⬚⬚   ⬚⬚⬚ ⬚⬚⬚⬚⬚⬚ ⬚⬚⬚⬚⬚⬚ ⬚⬚⬚⬚⬚⬚

7. ⬚⬚⬚⬚⬚⬚-⬚⬚⬚⬚⬚ ⬚⬚ ⬚⬚⬚⬚⬚⬚⬚   ⬚⬚⬚⬚⬚⬚⬚⬚ ⬚⬚⬚⬚⬚⬚ ⬚⬚⬚⬚⬚⬚

8. ☐☐☐ ☐☐☐☐☐☐☐☐☐☐☐   ☐☐☐ ☐☐☐☐☐☐☐☐☐☐☐ ☐☐☐☐☐☐☐

9. ☐☐☐ ☐☐ ☐☐☐☐☐☐☐☐☐   ☐☐☐ ☐☐☐☐☐☐☐☐☐☐☐ ☐☐☐☐☐☐☐

10. ☐☐☐ ☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐☐☐☐☐   ☐☐☐☐☐ ☐☐☐☐☐☐☐ ☐☐☐☐

11. ☐☐☐ ☐☐☐☐☐☐☐☐☐☐☐)H+E(☐☐☐ ☐☐☐☐☐☐☐ ☐☐☐☐☐

PHD-RPE-103	Research and Publication Ethics	Credit Distribution: L:1, T:1, P:0=2
Learning Outcomes	1. To have awareness about the publication ethics and publication misconducts. 2. To understand indexing and citation databases, open access publications, research metrics (citations, h-index, impact factor etc) 3. Develop hands-on skills to identify research misconduct and predatory publications.	
Unit 1	**Philosophy and Ethics (4 hrs)** 1. Introduction to philosophy: definition, nature and scope, concept, branches 2. Ethics: definition, moral philosophy, nature of moral judgements and reactions	
Unit 2	**Scientific Conduct (4 hrs)** 1. Ethics with respect to science and research 2. Intellectual honesty and research integrity 3. Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP) 4. Redundant publications: duplicate and overlapping publications, salami slicing 5. Selective reporting and misrepresentation of data	
Unit 3	**Publication Ethics (7 hrs)** 1. Publication ethics: definition, introduction and importance 2. Best practices / standards setting initiatives and guidelines: COPE, WAME, etc. 3. Conflicts of interest 4. Publication misconduct: definition, concept, problems that lead to unethical behavior and vice versa, types 5. Violation of publication ethics, authorship and contributor ship 6. Identification of publication misconduct, complaints and appeals 7. Predatory publishers and journals	
Unit 4 Practice	**Open Access Publishing (4 hrs)** 1. Open access publications and initiatives	

	2. SHERPA/ROMEO online resource to check publisher copyright & self-archiving policies 3. Software tool to identify predatory publications developed by SPPU 4. Journal finder / journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer Journal Suggester, etc.
Unit 5 Practice	**Publication Misconduct (4 hrs)** A. Group Discussions (2 hrs.) 1. Subject specific ethical issues, FFP, authorship 2. Conflicts of interest 3. Complaints and appeals: examples and fraud from India and abroad B. Software tools (2 hrs.) Use of plagiarism software like Turnitin, Urkund and other open source software tools
Unit 6 Practice	**Databases and Research Metrics (7 hrs)** A. Databases (4 hrs.) 1. Indexing databases 2. Citation databases: Web of Science, Scopus etc. B. Research Metrics (3 hrs.) 1. Impact Factor of journal as per Journal Citation Report, SNIP, SJR, IPP, Cite Score 2. Metrics: h-index, g-index, i10 index, altmetrics

Suggested Readings

1. Bird, A. (2006). Philosophy of Science. Routledge.
2. MacIntyre, A. (1967) A Short History of Ethics. London.
3. P. Chaddah, (2018) Ethics in Competitive Research: Do not get scooped; do not get plagiarized, ISBN:978-9387480865
4. National Academy of Sciences, National Academy of Engineering and Institute of Medicine. (2009). On Being a Scientist: A Guide to Responsible Conduct in Research: Third Edition. National Academies Press.
5. Rensik, D. B. (2011). What is ethics in research & why is it important. National Institute of Environmental Health Sciences, 1-10. Retrieved from https://www.niehs.nih.gov/resources/biothics/whatis/index.cfm
6. Beall, J. (2012). Predatory publishers are corrupting open access. Nature, 489(7415), 179-179. https://doi.org/10.1038/489179a

NIILM UNIVERSITY

Ph.D. Course Work in Zoology

Academic Session 2024-25

Ph.D. Regulations Regarding Course Work

Clause 18: Ph.D. Ordinance NIILM University as per UGC Minimum Standards and Procedure for Award of Ph.D. Degrees Regulations 2022 with effect from academic session 2024-25

I.   The coursework shall be treated as a prerequisite for Ph.D. preparation. In the first year of registration, all research scholars are required to complete the course work for one semester following their provisional registration as a part of the Ph.D. program. It is mandatory to complete the course work in first 4 semesters to stay in the Ph.D. program. If a student fails to complete the coursework in first 4 semesters, will have to leave the program.

II.   Earning a minimum of 12 total credits and a maximum of 16, is required.

III.   Usually a course refers to a 'paper' and is a component of an academic programme. Courses in Ph.D. course work shall be of two kinds: Core and Elective.

IV.   A core course is a compulsory paper to be studied by all the scholars to complete the requirements of the Ph.D. degree.

V.   Elective course is a course which is discipline specific and provided by the particular department from the main discipline or from a sister/related discipline which supports the main discipline, on mutual consent of the concerned departments.

VI.   One credit equal to 15 contact hours for theory-based teaching or 30 hours of contact time for practical or activity-based teaching.

VII.   The number of credits is given in the form L: T:P, where L indicates the number of contact hours of lecture, and T the number of contact hours for tutorials, P stands for laboratory credits.

VIII. The credits are distributed as follows:

Paper Code	Paper	Course type	Credit	L	T	P
PHD-ARM-101	Advanced Research Methodology	Core	4	3	1	0
PHD-DSC-102	Discipline Specific Course	Elective	4	3	1	0
PHD-RPE-103	Research and Publication Ethics	Core	2	1	1	0
PHD-SEM-104	Academic Writing, Literature Review and Seminar	Skill	2	0	1	2
	Total		12			

IX.   All Ph.D., entrants irrespective of discipline, shall be trained in teaching proficiency related to teaching/education/pedagogy/writing related to their chosen Ph.D. subject during their doctoral training period, that include assigning 4-6 hours per week of teaching/ research assistantship for conducting tutorial or laboratory work and evaluations.

X.   Courses PHD-SEM 104 includes research work on research article writing, seminar presentation and course PHD-TP 105 includes pedagogical training. Both these courses will be assessed internally without Semester End Examination.

XI.   CoE will conduct Term/ Semester End Exam in PHD-ARM-101, PHD-DSC-102, and PHD-RPE-103.

XII. PHD-TP 105 is a non-credit course and internal assessment will be marked on the detailed mark card of the course work.

XIII. Advance Research Methodology course will include common research methodology and subject specific research methodology.

XIV. Research Advisory Committee may provide choices in selecting the courses/ credits that facilitates the entrepreneur in the monetization of IP thus generated.

XV. RAC can also recommend UGC recognized online courses as part of the credit requirements for the Ph.D. program.

XVI. Paper- will comprise of the following two activities:

(a) External Assessment: Written Question Paper 70/39

(b) Internal Assessment: 30/16

Marks will be converted into letter grade and grade point as per following table:

Marks	Letter Grade	Grade Point
81-100	A+	10
76-80	A	9
66-75	B+	8
61-65	B	7
55-60	C	6
Less than 55	F	0

The computation of the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA) shall be done as per University Examination Ordinance or Examination Rules & Regulations issued time to time.

The result and grade sheet for the course work will carry pass/ fail result.

COURSE WORK PAPER

I. Candidates who already hold an M. Phil. degree and have been accepted into the Ph.D. program, or those who have finished their M.Phil. Coursework and have been given permission to continue on to the Ph.D. in an integrated course, may be exempted from the Ph.D. course requirements by the Department. All additional applicants accepted into the Ph.D. program must complete the Ph.D. coursework required by the Department.

II. The NIILM University attendance rules, a minimum 75% attendance is must require, will be applied to all full-time research scholars. For the duration of their coursework, part-time research researchers must, nevertheless, adhere to the same rules.

III. A Ph.D. scholar has to obtain a minimum of 55% of marks or a minimum CGPA of 6.0 in the UGC 10-point scale (or an equivalent grade/CGPA in a point scale wherever grading system is followed) in the course work in order to be eligible to continue in the program and submit the thesis.

IV. Registration will be automatically canceled if the required course work is not completed with a minimum of 55% of marks/a minimum CGPA of 6.0 within the allotted time. If the course work is not finished within a year, the RAC and DRC may suggest a six-month extension or suggest that the registration be canceled with the DRC.

V. There is no provision of improvement or special supplementary exam to be conducted. Coursework will be offered in four semesters of first two years with regular &supplementary

exams to avail the opportunity to clear the coursework in 2 years. **Failure to complete the course in 2 years means that the student has to leave the program.**

Course Structure:

PHD-ARM-101	Advance Research Methodology in Zoology	Credit Distribution: L:3, T:1, P:0=4
Course Objectives:	To acquaint the students with research process. To train them in the research methods and designs and to equip them to take up researches independently.	
Unit 1	**Introduction to Research** a. Nature and aims of research b. Dimensions and types of research c. Theory and research d. The meaning of methodology e. Types of Methods of Research	
Unit 2	**Research Planed Data Collection** a. Concept, logic, and research question/issues b. Variables, causal theory, and hypothesis c. Research Design and Collection of Data d. Sampling: Methods, Size, Errors e. Probability and non-probability f. Measurement and Scaling Techniques g. Issues in measurement: Qualitative and quantitative	
Unit 3	**Data Processing** a. Analysis of quantitative data introduction to higher order statistics b. Editing, Coding and Classification of Data c. Analysis of qualitative data and Tabulation d. Introduction to advanced statistical techniques using SPSS e. Statistical Derivatives and Measures of Central Tendency f. Measures of Variation and Skewness g. Correlation and Simple Regression h. Diagrammatic and Graphic Presentation of Data	
Unit 4	**Research Report Writing** a. Ethical issues in research b. APA style of writing concept c. APA style of writing: Referencing d. Research article writing	
Unit 5	**Computer Application in Research** a. Introduction to MS Excel, Using Formulas and Functions b. Hand on to SPSS c. Features for Statistical Data Analysis d. Generating Charts/Graphs e. Introduction to MS Word, Features and Functions, Writing Report in	

	MS Word
	f. Introduction to Open Office or Latex
	g. Creating Presentation in MS PowerPoint
	h. Introduction to Internet-Based Search
	i. Use of Advanced Research Techniques.

Recommended Readings:

1. Bayard, P. & Grayson, A. (1976). Introducing psychological research. London: McMillan.
2. Bordens, K.S. & Abbot, B.B. (2005). Research design and methods. New Delhi: Tata McGraw Hill.
3. Breakwell, G.M. Hammond, S. & Fife-Schaw, C. (1995). Research Methods in Psychology. New Delhi: Sage Publications.
4. Cresswell, J.W. (1994) Research design: L Qualitative and quantitative approaches. Thousand Oaks, CA: Sage Publication.
5. Drew, C.J.: Hardman, M.L. & Hart, W.A. (1996). Designing and conducting research: Inquiry in education and social science. New York: Allyn& Bacon.
6. Kerlinger, F.N. (1982). Foundations of behavioural research. Delhi: Subject Publication.
7. Nation, J.R. (1997). Research Methods. New Jersey: Prentice Hall.
8. Willing, C. & Stainton-Rogers, W. (Eds.) (2008). The Sage Handbook of Qualitative Research in Psychology. New Delhi: Sage Publications.

PHD-DSC-102	Discipline Specific Course (Advances in Zoology)	Credit Distribution: L:3, T:0, P:1=4
Learning Outcomes	• Understand the uses of **physiological solution**andsterilization techniques. • Students will learn **instrumentation** and its importance in biological research. • Learn about various **endocrine secretions**, their functions, and disorders at molecular level. • Understand the use of **different animal model**in research.	
Unit 1	Biochemical and Sterilization techniques: Physiological Solutions, Buffers, Temperature, pH, osmotic pressure, ionic concentration and electrical potentials. Sterilization techniques: Physical methods (Dry heat, moist heat, radiation and filtration) and Chemical methods (alcohol, aldehyde and inorganic chemicals).	
Unit 2	Applications of Techniques in Animal Sciences: Ultracentrifugation, Chromatography, Electrophoresis, agglutination, precipitation, neutralization, ELISA, RIA; Autoradiography; flow Cytometry; immunofluorescence microscopy, ; Southern, Northern and South -Western blotting techniques; Polymerase Chain reaction; Flow cytometry, Karyotyping; FISH & GISH	
Unit 3	Endocrinology: Organs with endocrine functions; Hormones: Biosynthesis, Physiology and Regulation and Disorders, Infertility and Gynecological Disorders	

| Unit 4 | Model organisms in Biological Science: Introduction to model organism, Definition, Types, Characteristics. Model organism in biological research: *Dictyostelium discoideum*, Yeast, *Caenorhabditis elegans*, Drosophila, Mouse |
| Unit 5 | Global Environmental Problems: Climate change, Green house effect, Ozone layer depletion, Acid Rain, Deforestation, Desertification, Marine Pollution Environmental Pollution: Pollutants and their control with respect to air, water and noise. Air Quality Standards, Water Quality Standards. Waste water treatment, Ganga Action Plan, Namami Gange Project Integrated solid waste management |

References:

1) Livingstone, C. &Weesner, F. M. 1965, General Zoological Techniques. The William & Wilkins Company

2) Mahoney, R., 1966, Laboratory techniques in zoology. Laboratory techniques in zoology

3) Hadley, M.E. and Levine J.E. (2007). Endocrinology, 6th Edition. Pearson Prentice-Hall, Pearson Education Inc., New Jersey. ISBN No.-9780131876064.

4) Norris, D. O. and Carr. J. (2013). Vertebrate Endocrinology, 5th edition. Academic Press. ISBN No.9780123948151.

5) Boyer, 2005, Modern Experimental Biochemistry and Molecular Biology, Benjamin 2. Wilson & Walker, 2006, Principles of Biochemical and Molecular Biological Techniques, Cambridge Univ. Press.

6) Ankeny, R., &Leonelli, S., 2021, Model Organisms (Elements in the Philosophy of Biology). Cambridge: Cambridge University Press.

7) Front Matter." National Research Council. 2011. Guide for the Care and Use of Laboratory Animals: Eighth Edition. Washington, DC: The National Academies Press.

PHD-RPE-103	**Research and Publication Ethics**	**Credit Distribution: L:1, T:1, P:0=2**
Learning Outcomes	1. To have awareness about the publication ethics and publication misconducts. 2. To understand indexing and citation databases, open access publications, research metrics (citations, h-index, impact factor etc) 3. Develop hands-on skills to identify research misconduct and predatory publications.	
Unit 1	**Philosophy and Ethics (4 hrs)**	

	1. Introduction to philosophy: definition, nature and scope, concept, branches 2. Ethics: definition, moral philosophy, nature of moral judgements and reactions
Unit 2	**Scientific Conduct (4 hrs)** 1. Ethics with respect to science and research 2. Intellectual honesty and research integrity 3. Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP) 4. Redundant publications: duplicate and overlapping publications, salami slicing 5. Selective reporting and misrepresentation of data
Unit 3	**Publication Ethics (7 hrs)** 1. Publication ethics: definition, introduction and importance 2. Best practices / standards setting initiatives and guidelines: COPE, WAME, etc. 3. Conflicts of interest 4. Publication misconduct: definition, concept, problems that lead to unethical behavior and vice versa, types 5. Violation of publication ethics, authorship and contributorship 6. Identification of publication misconduct, complaints and appeals 7. Predatory publishers and journals
Unit 4 Practice	**Open Access Publishing (4 hrs)** 1. Open access publications and initiatives 2. SHERPA/ROMEO online resource to check publisher copyright &self-archiving policies 3. Software tool to identify predatory publications developed by SPPU 4. Journal finder / journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer Journal Suggester, etc.
Unit 5 Practice	**Publication Misconduct (4 hrs)** A. Group Discussions (2 hrs.) 1. Subject specific ethical issues, FFP, authorship 2. Conflicts of interest 3. Complaints and appeals: examples and fraud from India and abroad B. Software tools (2 hrs.) Use of plagiarism software like Turnitin, Urkundand other open source software tools
Unit 6 Practice	**Databases and Research Metrics (7 hrs)** A. Databases (4 hrs.) 1. Indexing databases 2. Citation databases: Web of Science, Scopus etc.

	B. Research Metrics (3 hrs.)
	1. Impact Factor of journal as per Journal Citation Report, SNIP, SJR, IPP, Cite Score
	2. Metrics: h-index, g-index, i10 index, altmetrics

Suggested Readings

1. Bird, A. (2006). Philosophy of Science. Routledge.
2. MacIntyre, A. (1967) A Short History of Ethics. London.
3. P. Chaddah, (2018) Ethics in Competitive Research: Do not get scooped; do not getplagiarized, ISBN:978-9387480865
4. National Academy of Sciences, National Academy of Engineering and Institute ofMedicine. (2009). On Being a Scientist: A Guide to Responsible Conduct in Research:Third Edition. National Academies Press.
5. Rensik, D. B. (2011). What is ethics in research & why is it important. National Instituteof Environmental Health Sciences, 1-10. Retrieved fromhttps://www.niehs.nih.gov/resources/biothics/whatis/index.cfm
6. Beall, J. (2012). Predatory publishers are corrupting open access. Nature, 489(7415),179-179. https://doi.org/10.1038/489179a