

**FACULTY OF MEDICAL SCIENCES
UNIVERSITY OF DELHI**

16.07.2026

PhD COURSE WORK

Ph.D. Course Work Requirements

All candidates enrolled in the Ph.D. Programme of the Faculty of Medical Sciences, University of Delhi, are required to complete the prescribed coursework for the requisite credits in accordance with the applicable regulations.

Each Ph.D. scholar shall maintain a **Course Work Log Book** documenting attendance and completion of the prescribed coursework.

Candidates are required to complete a **minimum of 320 hours** of coursework, equivalent to **12–16 credits**, during the **first two semesters** of the Ph.D. programme.

The coursework shall comprise the following **Compulsory and Optional Courses**:

Note:

1. **Course Content – Topics 1 to 9** are **compulsory** for all Ph.D. scholars.
2. In addition, each candidate shall complete **a minimum of four topics** from the optional topics.
3. Individual Departments may prescribe additional subject-specific coursework or topics, as deemed appropriate for candidates registered in their respective Ph.D. disciplines.
4. The coursework is aligned with the **end-of-second-semester Ph.D. Course Work Examination**, which shall comprise the following papers. The syllabus for each paper shall be as specified in the **Course Work Syllabus**:

Paper I: Course Content listed under **Serial Nos. 1–3**

Paper II: Course Content listed under **Serial Nos. 4–6**

Paper III: Course Content listed under **Serial Nos. 7–9**

Paper IV: Subject-specific topics and/or optional topics, including any additional department-prescribed coursework, as applicable.

Coursework Syllabus

S. No.	Compulsory Topic		Hours	Methods
1.	Research Methodology	i. Framing a Research Question ii. Epidemiological methods in Research iii. Qualitative Research Methods iv. Quantitative Research Methods	35	Lectures, Seminar, Workshop
2.	Ethics in biomedical Research	i. Theories and Principles of Ethics. ii. Concepts in research ethics - confidentiality and privacy, informed consent, vulnerable subjects and special treatment, standards of care - principles, review processes etc. iii Involving human subjects iv. Involving animals v. Involving living tissues vi. Guidelines ICMR, CPCSEA, GCP, etc	35	Lectures, Seminar, Workshop
3	Intellectual Property Rights (IPR)	Definition and objectives Application of IPR in research & development and disadvantages Benefits and critics associated with IPR implementation Patent application	10	Lectures, Seminar, Workshop.
4.	Biostatistics	i. Hypothesis testing ii. Estimating sample size for a cross-sectional survey and case control study iii. Standard measures iv. Confidence interval v. Parametric & Non Parametric methods vi. General methodology in Biostatistics	40	Lectures, Seminar, Exercise, Workshop
		Vii. Metanalysis/systematic review Viii. Introduction to data analysis – introduction to various data analysis software such as SPSS etc.		

5.	Good Clinical laboratory practices (GCLP)	Introduction, objectives and key requirements	20	Lectures, Seminar, Workshop, Field visits
		History of GCLP and Relation to other regulations		
		Role of GCLP in basic research and drug discovery		
		Principle, procedure and applications of 'accreditation' as per guidelines of Accreditation bodies like ISO, NABH, NABL, IPHS, WHO etc.		
6	Bio-safety/Waste Management	Rationale, definition and classification of bio-hazardous/Biomedical waste	20	Lectures, Seminar, Workshop, Field visits
		Impact of different types of waste generated in a healthcare facility		
		Legislative-regulatory policy aspects		
		Standard procedures for proper handling storage and transportation of medical waste		
		Bio-safety issues with:- Chemical, Radiation, Microbiological waste etc.		
7.	Protocol preparation	Choosing a research topic for the Ph.D. thesis, framing research questions and formulating a hypothesis	50	Lectures, Seminar, Workshop.
		Literature Search. Identifying Aims & Objectives of Research Methodology		
		Various study designs including cross-sectional, case control and cohort etc.		
		Sample selection procedure and inclusion / exclusion criteria.		
		Translational value		
8.	Scientific communication	- Conference presentations - Scientific communication. - How to write a scientific paper. - Indexing of Journals - Bibliography - Preparing a Research Grant proposal. - Critical Review of Scientific articles	30	Lectures, Seminar, Workshop.

9.	Computer Skills	• MS Excel • Power Point • MS Words • Photoshop etc.	10	Lecture, Seminar, Course work at computer centre.
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Optional Topics:

Note: The Candidate may select four topics from here.

In addition, the department may specify other topics as relevant for the candidate's work.

S. No	Optional Topics		Hours	Methods
10.	Bioinformatics	• Introduction to Bioinformatics • Primer designing • Analysis of DNA sequences and their interpretation • ORF finder	20	Lecture, Seminar, Demonstration Lab Work.
11.	Assays	• Principles and uses of spectrophotometer, luminescence assay • ELISA and its principles • Flow cytometry its methodology & use • HPLC: Procedure and analysis • FISH: Methods and applications • Other analytical methods	20	Lecture, Seminar, workshop laboratory work whenever applicable field visits
12.	Molecular Biology Techniques	• Immunohistochemistry methods – manual & automated • Electrophoresis of DNA/RNA • Quantitative Real Time polymerase chain reactor • Sequencing technique – sangers, NGS • Cell/Tissue Culture methods • Electron Microscopy/confocal microscopy	20	Lecture, Seminar, workshop laboratory work whenever applicable field visits
13	Drug development & discovery	• Process of drug discovery & development • Pharmacokinetic/Pharmacodynamic • Methods of preparing plant extracts. • Standardization & Characterization of drug from plants	20	Lecture, Seminar, workshop laboratory work whenever applicable
14	Clinical trials	Definition, type & conduct of clinical trials guidelines GCP guidelines Pharmacovigilance	16	Lecture, Seminar, workshop laboratory work whenever applicable

15.	Immunology basic Issues	Molecular concepts of Immunology, innate and adaptive immunity.	16	Lecture, Seminar, workshop laboratory work whenever applicable
		Use of hematopoietic stem cells: extraction, Culture Techniques & guidelines		
		Transplantation: Acute & Chronic rejection and their mechanism		
		Immune dysfunction: Autoimmune and hypersensitivity diseases		
		Vaccines: development and recent advances		
		Applications of immunological principles in immunotherapy of cancer and immune diagnostics of diseases.		
16.	Nutrition	Principles of Nutrition	8	Lecture Seminar
17.	National Health Programs	National Health Program Disease prevention and control	16	Lecture Seminar
18	Other topics	As decided by the individual departments		

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