

The Course Content for fulfilling the credits required, Compulsory

A candidate enrolling in the Ph.D. Programme of Faculty of Medical Sciences, Delhi University will have to complete Course work for required Credits

A Log book will have to be maintained by the Ph.D. Scholar for the same

The minimum numbers of hours candidates must fulfill are 320 hours (minimum 8 to 16 credits/week) to complete Course Work for credits. These are to be covered in first two Semesters.

The Course Content for fulfilling the hours required for Ph.D. candidates (compulsory & Optional Courses) are as follows:

Note: Course Content – Topics: 01 to 09 are Compulsory for all and candidate can minimum 4 topics from (10 to 24)*

*The individual Departments may add topics suitable for candidates registered for Ph.D. in specific subjects at point 24:

S.No.	Compulsory Topic	Hours	Methods
1.	Research Methodology	35	Lectures, Seminar, Workshop
	i) Framing a Research Question		
	ii) Epidemiological methods in Research		
	(iii) Qualitative Research methods (iv) Quantative Research methods		
2.	Ethics in biomedical Research	35	Lectures, Seminar, Workshop
	(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.		
3.	Biostatistics	40	Lecture, Seminar, Exercise Workshops
	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		
	vii) Metaanalysis/systematic review		
	viii) Introduction to data analysis – introduction to various data analysis software such as SPSS etc.		

4.	Good Clinical laboratory practices (GCLP)	Introduction , Objectives and Key Requirements	20	Lecture, 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.		
5.	Bio-Safety/Waste Management	Rationale, definition and classification of bio-hazardous/Biomedical waste	20	Lecture, Seminar, Workshop Field Visits
		Impact of different types of waste generated in a health-care 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.		
6.	Intellectual Property Rights (IPR)	Definition and objectives	10	Lecture, Seminars, Workshop
		Application of IPR in research & development and disadvantages		
		Benefits and critics associated with IPR implementation		
		Patent application		
7.	Protocol Preparation	Choosing a research topic for the Ph.D. thesis, framing research questions and formulating a hypothesis	50	Lecture, 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	<ul style="list-style-type: none"> - 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	Lecture, Seminar, Workshop
9.	Computer Skills	<ul style="list-style-type: none"> - MS Excel - Power Point - MS Word - Photoshop etc. 	10	Lecture, Seminar, Course work at Computer Centre

Optional Topics:

Note: The candidate may select four topics from here. In addition the department may specify other topics as relevant for the candidates 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.	Assay: - 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/cofocal 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. - Standardisation & characterisation 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. Use of hematopoietic stem cells: extraction, Culture Techniques & guidelines Transplantation: Acute & Chronic rejection & 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	Lecture Seminar Workshop laboratory work whenever applicable

21.	Stress Biology	Environmental stresses: Introduction, definition, significance, types of stress - Noise/Air pollution and their consequences	8	Lecture Seminar Workshop laboratory work whenever applicable
		Molecular Biology of stress		
		Stress and Human Health		
22.	Nutrition	Principles of Nutrition	8	Lecture Seminar
23.	National Health Programs	National Health Program Disease prevention and Control	16	Lecture Seminar
24.	Other topics	As decided by the individual departments		
24(i)	Community Medicine	a). Epidemiology . Screening . Communicable Disease . Non Communicable Disease . Epi demological Modelling . Occupational Health b) Principles & Practice of Public Health . History & Evolution . Health Economics . Investigation of out break . Environmental & Health . Global Public Health issues . Global burden of diseases . Universal Health Coverage c). Principles & Practice of Management . Monitoring & evolution . Health Economics . Surveillance . Health care Service models . Human Resources Management		
24(ii)	Paediatrics	Paediatrics i) Paediatrics Critical Care ii) Paediatrics Non Communicable Disease especially life style related – disease iii) Paediatrics Hemotological analogical disease iv) Auto immune disorders including Type I diabetics v) Child development Disorders vi) Environmental & Toxicological disorders vii) Paediatrics Infections Diseases		