

Curriculum of Ph.D. Programmes

Center for Interdisciplinary Biomedical Research

Center for interdisciplinary research offers following Ph.D. Degree Programmes

- 1. Ph.D. Medical Biochemistry
- 2. Ph.D. Biotechnology
- 3. Ph.D. Medical Microbiology
- 4. Ph.D. Pharmaceutical Sciences
- 5. Ph.D. Dental Sciences
- 6. Ph.D. Pharmacology
- 7. Ph.D. Nursing Sciences
- 8. Ph.D. Medical Genetics
- 9. Ph.D. Human Anatomy
- 10. Ph.D. Health Professions Education
- 11. Ph.D. Community Rehabilitation
- 12. Ph.D. Human Physiology
- 13. Ph.D. Radiodiagnosis
- 14. Ph.D. Hospital Administartion
- 15. Ph.D. Audiology and Speech-Language Pathology
- 16. Ph.D. Clinical Psychology

PhD. Programme structure

- I. Course work : 1st semester
- II. Thesis work : Semester I to VI (for full time scholars), Semester I to VIII (for part time scholars)

For course work following	scheme and list of	courses will be followed:
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Type of Course	Course Title	Credit hours
Bridge courses*	(i) Human Anatomy (ANT.501)(ii) Human Physiology (PHY.501)	3 (Non credit) 3 (Non Credit)
Compulsory courses	Research Methodology and Biostatistics (RMB.701)	4
	PhD. Specialization Major Subject	4
	Seminars in the specialization (Major Subject) (CBR.799)	2
Other compulsory	Universal Human Values and Ethics (HVE.501)	2
courses	Research and Publications Ethics (RPE.701)	2
Total	Number of courses = 5	Credit hours= 14

*If not studied during master degree programme

Program Outcomes

S.No.	Programme	Programme name	Year of	Program Outcome
	code		introduction	
1.	Ph.D.MB	Ph.D. Medical Biochemistry	2013	Centre for
2.	Ph.D.BIOT	Ph.D. Biotechnology	2013	interdisciplinary
3.	Ph.D.MM	Ph.D. Medical Microbiology	2013	biomedical research
4.	Ph.D.PS	Ph.D. Pharmaceutical Sciences	2014	with aim of preparing
5.	Ph.D.DS	Ph.D. Dental Sciences	2014	outstanding professionals
6.	Ph.D.P	Ph.D. Pharmacology	2016	in their respective fields.
7.	Ph.D.NS	Ph.D. Nursing Sciences	2016	Ph.D. program imparts
8.	Ph.D.MG	Ph.D. Medical Genetics	2017	high level scientific
9.	Ph.D.HA	Ph.D. Human Anatomy	2018	training to scholars and
10.	Ph.D.HP	Ph.D. Health Professions Education	2018	polisnes their
11.	Ph.D.	Ph.D. Community Rehabilitation	2019	respective fields. The
12.	Ph.D.	Ph.D. Hospital Administration	2019	candidates completing
13.	Ph.D.	Ph.D. Human Physiology	2019	Ph.D. programme are
14.	Ph.D.	Ph.D. Radiodiagnosis	2020	able to analyze a set of
15.	Ph.D.	Audiology Speech-Language Pathology	2022	data, can assess the needs of research in their
16.	Ph.D.	Clinical Psychology	2024	discipline, can
				communicate with others and discuss the outcome of research followed, and develops competence to conduct independent research.

Course Outcome

Discipline	Code	Title	Credit	Outcomes
			Hours	
Medical Anatomy	ANT.751	Advances in Human Anatomy	4	 Understand general human anatomy. Analyse human genetics and population genetics including technologies involving their analysis. Impact of gene therapy Preventive and risk measures in population related to gene therapy Management of genetic disorders.
Medical Biochemistry	BIC.701	General Biochemistry	4	Understand basic information related to structure function
Diochemistry	BIC.702	Metabolism	4	and metabolism of bio-
	BIC.703	Nutrition	4	molecules in human system
	BIC.704	Clinical Biochemistry	4	 Understand the significance of
Distaska slasav	BIC.751	Advances in Biochemistry	4	 Understand the significance of pathways involved in metabolism at molecular and cell level. Understand the role of balanced diet in health and disease processes especially based on lifestyle. Skills related to basic biochemical tests in clinical investigations. Exhibit knowledge base in handling laboratory techniques. Understand peptidomics, glycomics and metabolimics disorders, biomarkers identification, database and pathway analysis.
BIOTECHNOLOGY	BII./01	Principles of Molecular Biology	4	 Understand the central dogma of various molecular events in
	BIT.703	Medical Genetics	4	cell and how flow of genetic
	BIT.706	Microbial Biotechnology	4	 information is regulated to control cell behavior. Understand the structure, function, organization and inheritance pattern of human genome.

				•	Assessing the genetic disorders and syndromes through genetic testing and screening and its risk assessment. Assessment of genetic disease in family history through pedigree analysis. Understand the role of various microorganisms in biotechnology e.g. their role as biocontrol agents, biomass production, their use in environmental applications, role in synthesis of recombinant vaccines etc.
Community Rehabilitation	CRP.751	Advanced Rehabilitation Sciences for Research Education and Practice	4	•	Management of rehabilitation skills for provision of healthcare in current and future environments. Understand theories, themes, models and ideas within the area of rehabilitation counseling. Broad overview of research ethics and regulations related to rehabilitation sciences. Better foundation skills in clinical research.
Dental Sciences	DTS.751	Advanced Conservative Dentistry and Endodontics	4	•	Insights into the anatomy and physiology of craniofacial structures.
	DTS.752	Advanced Orthodontics and Dental Orthopedics	4	•	Understand etiology, classification and diagnosis of
	DTS.753	Oral Pathology and Microbiology	4	•	malocclusion. Knowledge of general
	DTS.754	Advances in Dental Sciences	4	•	principles in orthodontic treatment, anchorages, corrective orthodontics and orthodontic applications. Understand basic concepts related to development of teeth and pathological conditions related to it. Identify multidisciplinary approaches in handling periodontal diseases.
Hospital	MHA.752	Advances in Hospital	4	•	Understand basic aspects of
Administration	MHA.753	Administration Advances in Health Economics and Financial Planning	4		nealth administration, demand and supply services in health care, revenue generation, medical transactions and

	MHA.754	Advanced	4		health insurance.
		Organizational		٠	Understand responsibilities as
		Behavior and			hospital manager and knowing
		Development			latest trends in medical care
					services.
				•	Skill development w.r.t. team
					work, controlled management
					and HR planning.
Health	HPE.751	Advances in Health	4	•	Promotes learner identity
Professions		Professions Education			formation.
Education				•	Assesment of teacher-learning
					process.
				•	Skill development in
					technology enhanced learning.
				•	Understand the concept of
					mentoring and coaching.
Medical	MIC.701	General Microbiology,	4	٠	Describe the underlying science
Microbiology		Immunology and			of micro organisms in human
		Bacteriology			health and diseases including
	MIC.702	General Microbiology,	4		opportunities for promoting
		Immunology and			and protecting health across
		Virology			the life of course.
	MIC.703	General Microbiology,	4	٠	Demonstrate the use of
		Immunology and			advanced research tools and
		Mycology	_		analytical microbiological
	MIC.704	General Microbiology,	4		methods to critically analyze,
		Immunology and			monitor and asses the health
		Parasitology	4		status of populations and
	WIIC.751	Advances in iviedical	4		
Modical	MCE 751	Advances in Medical	1		Understand the concents of
Genetics	NIGE.751	Genetics	4	•	inheritance general diversity
Genetics		Genetics			and genetic diseases
					Advanced knowledge in clinical
				Ū	identification of genetic
					disorders through recent
					techniques and clinical
					interpretation.
Nursing Sciences	NSC.751	Nursing Leadership in	4	•	Knowledge in field of current
		Health care Delivery			health issues and policies
		System			relevant to nursing practices.
				•	Develop decision making
					ability.
				•	Knowledge about nursing
					ethics and conduct.
				•	Professionalism among
					students.
Medical	PHC.751	Advances in Medical	4	•	Theory of pharmacokinetics
Pharmacology		Pharmacology		-	involving drug disposition, drug
Pharmaceutical	PHM.751	Pharmaceutics	4		absorption.
Sciences				1	

	PHM.752	Pharmaceutical Chemistry	4	•	Handling and care of laboratory
	PHM.753	Pharmacy Practice	4	•	CPCSEA. Understand the basic properties of new drugs for better evaluation in medical use. Apply pharmaceutics in drug designing. Knowledge pertaining to clinical trials, its documentation and correct interpretation of data. Understand the strategies of controlled drug delivery, IPR policy and different regulations. Understand the chemistry of drugs based on their structure, composition and mode of action. Knowledge related to the ethics involved in practice of pharmacy skills. Role of sponsor, investigator, vendor as well as their selection processes. Understand the clinical trials and documentation procedures along with drug safety monitoring.
	PHM.754	Advances in Pharmaceutical Sciences	4	•	Analyse and convey their skills for the benefit of health care professionals, educators, managers and employers. Drug designing and novel technologies involved in designing the same.
Medical Physiology	PHY.751	Advances in Medical Physiology	4	•	Understand performance and observations related to physiological functions in human system. Research involving significant effects on human health and patient care. Importance of yoga and meditation in clinical effectiveness in psychiatry
Radiodiagnosis	RAD.751	Advances in Radiodiagnosis	4	•	Knowledge in various imaging modalities.

				Analyse different diagnostic
	ACD 754			procedures accurately.
Audiology Speech-Language Pathology	ASP. 751	Advances in Audiology and Speech-Language Pathology	4	 Imparts knowledge and skill to identify and interpret various disorders related to audiology and speech language with advanced approaches. Emphasis on evidence based clinical practise. Understanding of cochlear and brain stem implant techniques and associated practice laws, regulations and professional ethics.
Clinical Psychology	PSY.751	Advanced Clinical Psychology	4	 Critical evaluation of various psychological parameters in testing and clinical assessment of human behaviour and personality. Emphasis on child and adult psychopathology.
Compulsory Course	RMB.701	Research Methodology and Biostatistics	4	 Basic principles involved in research and enables in selecting the most suitable methodology/ statistics while designing the research problem. Format research papers, review articles, thesis including references. Experiment design, collecting data, analysing the data and finally drawing the conclusion. Resolve the irrelevant and unnecessary technicalities. Backbone of research.
Bridge Courses	ANT.501 PHY.501	Human Anatomy Human Physiology	3 (Non credit) 3 (Non Credit)	 These courses are for the students from non-medical background. Comprehend the basic fundamental concepts as to how a human body functions.
	PSY.501 PSY.502	General Psychology Abnormal Psychology	3 (Non credit) 3 (Non Credit)	 Establishes basic understanding of human behaviour (normal and abnormal) through principles, approaches and application of psychological concepts.

Other compulsory courses	RPE.701	Research Publications Ethics	and	2	•	Understand the norms and ethics of scientific conduct in academics. Lead to authentic research among scholars by following coordinated steps with honesty and ethics. Prevent the manipulation, fabrication, plagiarism and misinterpretation of data knowingly or unknowingly. Respect the work and privacy of others
	HVE.501	Universal Hu Values and Ethics	ıman	2	•	Awareness of value and ethics in students. Moral values, understanding the coexistence of human beings, harmony and professional ethics. Build a foundation towards handling contemporary issues and technical issues in their respective fields.

501: Universal Human Values and Ethics

Unit	Content	Lectures
NO.		
1.	Introduction to Value Education: Understanding the need, basic guidelines,	1
	content and process for value Education, sen-exploration—its content and process: 'Natural Accordance' and Experiential Validation—as the	
	mechanism for self exploration	
2	Continuous Happiness and Prosperity: A look at basic human aspirations	2
2.	Right understanding, Relationship and Physical Facilities — the basic	-
	requirements for fulfillment of aspirations of every human being,	
	Understanding Happiness and Prosperity come — A critical appraisal of the	
	current scenario, Method to fulfill the above human aspirations:	
	Understanding and living in harmony at various levels.	
3.	Harmony in the Human Being: Understanding human being as a coexistence	2
	of the sentient 'I' and the material 'Body', Understanding the needs of Self	
	('I') and 'Body' Sukh and Suvidha. Body as an instrument of 'I': Being the	
	doer. seer and enjoyer, understanding the characteristics and activities of 'I'	
	and harmony in 'I', understanding the harmony of 'I' with the Body: Sanyam	
	and Svasthya; correct appraisal of physical needs, meaning of prosperity in	
	detail, programs to ensure Sanyam and Svasthya	
4.	Harmony in the Family and Society: Understanding harmony in the Family	2
	- the basic unit of human interaction, Understanding values in human-	
	numan relationship; meaning of Nyaya and program for its Tulmiment to	
	foundational values of relationship. Understanding the meaning of VISVASA:	
	Difference between intention and competence. Understanding the meaning	
	of Sammana. Difference between respect and differentiation: the other	
	salient values in relationship.	
5.	Harmony in the society: Understanding the harmony in the society (society	1
	being an extension of family): Samadhana, Samriddhi, Abhaya. Sah-astirva as	
	comprehensive Human Goals, Visualizing a universal harmonious order in	
	society — Undivided Society (AkhandSamaj), Universal Order	
	(SarvabhaumaVyavasthal - from family to world family.	
6.	Harmony in the Nature (Existence): Understanding the harmony in the	2
	Nature, Interconnectedness and mutual fulfillment among the four orders of	
	nature—recyclability and self-regulation in nature.	
7.	Understanding Sah-astitva: Co-existence of mutually interacting units in all-	1
	pervasive space, Holistic perception of harmony at all levels of existence.	
8.	Implications of the Holistic Understanding — A Look at Professional Ethics :	2
	Natural acceptance of human values, Definitiveness of Ethical Human	
	Conduct, Basis for Humanistic Education, Humanistic Constitution and	
	Universal Human Order, Competence in Protessional Ethics. Ability to utilize	
	to identify the scope and characteristics of poople friendly and ose friendly	
	noduction systems technologies and management models. Case studies of	
	to identify the scope and characteristics of people-friendly and eco-friendly production systems, technologies and management models, Case studies of	

	typical holistic technologies, management models and production systems.	
9.	Strategy for transition <i>frori</i> the present state to Universal Human Order: (a)	2
	At the level of individual: as socially and ecologically responsible engineers,	
	technologists and managers, (b) At the level of society as mutually enriching	
	institutions and organizations.	
10.	Introduction to Medical Ethics (Deontology): (a) Relationship of health	1
	workers with their patients, relatives of patients and their co-workers. (b)	
	History of Deontology (c) Principles and practice of Deontology.	
	Total	16
Practi		Number
ce	Tonio	of
sessio	горіс	sessions
n		
PS 1.	Module 1: Introduction to Value Education: Introduce yourself in detail.	1
	What are the goals in your life? How do you set your goals in your life? How	
	do you differentiate between right and wrong? What have been your salient	
	achievements and shortcomings in your life? Observe and analyze them.	
PS 2.	Now-a-days, there is a tendancy of talk about many techno-genic maladies	1
	such as energy and material resource depletion environmental pollution,	
	global warming, ozone depletion, deforestation, soil degradation, etc. — all	
	these seem to be man-made problems, threatening the survival of life on	
	Earth — What is the root cause of these maladies & what is the way out in	
	your opinion?	
	On the other hand, there is rapidly growing danger because of nuclear	
	proliferation, arms race, terrorism, criminalization of politics, large scale	
	corruption. scams, breakdown of relationships, generation gap, depression&	
	suicidal attempts etc what do you think, is the root cause of these threats	
	to human happiness and peace - what could be the way out in your opinion?	
PS 3.	1. Observe that each one of us has the faculty of 'Natural Acceptance'. based	2
	on which one can verify what is right or not right for him. (As such we are	
	not properly trained to listen to our 'Natural Acceptance' and many a time it	
	is also clouded by our strong pre-conditionings and sensory attractions).	
	Explore the following:	
	(i) What is 'Naturally Acceptable' to you in relationship—the feeling of	
	respect & disrespect for yourself and for others?	
	(ii) What is 'Naturally Acceptable' to you - to nurture or to exploit	
	others?	
	Is your living in accordance with your natural acceptance or different from	
	it?	
	2. Out of the three basic requirements for fulfillment of your aspirations-	
	right understanding, relationship and physical facilities- observe how the	
	problems in your family are related to each. Also observe how much time &	
	effort vou devote for each in vour daily routine.	
PS 4.	Module 2: Harmony in the Human Being: List down all your important	1
	desires. Observe whether the desire is related to Self ('I') or the Body. If it	_
	appears to be related to both, visualize which part of it is related to Self ('I')	

	and which part is related to Body.	
PS 5.	1. (a) Observe that any physical facility' you use, follows the given sequence	1
	with time: Necessary and tasteful unnecessary but still tasteful unnecessary	
	and tasteless —> intolerable.	
	(b) In contrast, observe that any feeling in you is either naturally acceptable	
	or not acceptable at all. If naturally acceptable, you want it continuously and	
	if not acceptable, you do not want it any moment	
	2. List down all your important activities. Observe whether the activity is of	
	'I', or of Body or with the participation of both 'I' and Body.	
	3. Observe the activities within 'I'. Identify the object of your attention for	
	different moments (over a period of say 5 to 10 minutes) and draw a line	
	diagram connecting these points. Try to observe the link between any two	
	nodes.	
PS 6	1. Chalk out some programs towards -insuring your harmony with the	1
	body - in terms of nurturing, protection and right utilisation of the	
	body.	
	2. Find out the plants and shrubs growing in and around your campus,	
	which can be useful in curing common diseases.	
PS 7	Module 3: Harmony in the Family and Society	1
137	Form small groups in the class and make them carry out a dialogue focusing	-
	on the following eight questions related to 'TRUST':	
	1a. Do I want to make myself happy?	
	2a. Do I want to make the other hanny?	
	22. Does the other want to make himself/herself hanny?	
	A. Does the other want to make me hanny?	
	4a. Does the other want to make me happy?	
	What is the answer?	
	Intention (Natural Acceptance)	
	10. Am I able to always make mysell happy?	
	2b. Am I able to always make the other happy?	
	3b. Is the other able to always make himself/herself happy?	
	4b. Is the other able to always make me happy?	
	What is the answer?	
	Competence	
	Let each student answer the questions for himself and everyone else.	
	Discuss the difference between intention and competence. Observe	
	whether you evaluate yourself and others on the basis of intention/	
	competence.	
PS 8.	1. Observe, on how many occasions, you are able to respect your related	1
	ones (by doing the right evaluation) and on how many occasions you are	
	disrespecting by way of under-evaluation, over-evaluation or otherwise	
	evaluation.	
	2. Also, observe whether your feeling of respect is based on treating the	
	other as you would treat yourself or on differentiations based on body.	
	physical facilities or beliefs	
1	physical facilities of benefs.	

PS 9.	1. Write a narration in the form of a story, poem, skit or essay to clarify a	1				
	salient Human Value to the children.					
	2. Recollect and narrate an incident in your life where you were able to					
	exhibit willful adherence to values in a difficult situation.					
PS 10.	Module 4: Harmony in the Nature (Existence)	1				
	List down some common units (things) of Nature which you come across in					
	your daily life and classify them in the four orders of Nature. Analyse and					
	explain the aspect of mutual fulfillment of each unit with other orders.					
PS 11.	Make a chart to show the whole existence as co-existence. With the help of	1				
	this chart try to identify the role and the scope of some of the courses of					
	your study. Also indicate the areas which are being either over-emphasized					
	or ignored in the present context.					
PS 12.	Module 5: Implications of the Holistic Understanding — a Look at	1				
	Professional Ethics: Identify any two important problems being faced by the					
	society today and analyze the root cause of these problems. Can these be					
	solved on the basis of natural acceptance of human values. If so, how should					
DC 4.2	one proceed in this direction from the present situation?	1				
PS 13.	Suggest ways in which you can use your knowledge of	T				
	science/rechnology/management etc. for moving towards a universal					
	Propose a broad outline for Humanistic Constitution at the level of Nation					
DS 1/	The course is going to be over view. It is time to evaluate what difference in	2				
1514.	your thinking has it made. Summarize the core message of this course	2				
	grasped by you. How has this affected you in terms of					
	a. Thought					
	h Behavior					
	c. Work and					
	c. work and					
	What practical steps are you able to visualize for the transition of the society					
	from its present state.					

RMB.701: Research Methodology and Biostatistics

Credits hours: 04

Unit No.	Content				
1.	Foundation of Research: What is research? Objectives of research, scientific				
	research, research and theory, conceptual and theoretical models.				
	Types and Methods of Research: Basic and applied research, exploring or				
	formulative research, descriptive research, diagnostic research/study,				
	evaluation research/studies, action research, experimental research, analytical				
	study of statistical method, historical research, surveys, case studies, field				
	studies.				
2.	Clinical epidemiology and types of medical research: descriptive studies,	6			
	analytic studies, interventional studies, clinical trials.				
3.	Planning of Research: planning process, selection of a problem for research,	9			
	formulation of the selected problem, hypothesis formation, measurement,				
	research design/plan.				
	Sampling: sampling techniques or methods, choice of sampling techniques,				
	sample size, sampling and non-sampling errors.				
	Methods of data collection: Meaning and importance of data, sources of data,				
	uses of secondary data, methods of collecting primary data, observation				
	method, experimentation, simulation, interviewing, panel method, mail survey,				
	projective technique, socio-metric methods.				
	roots of data conection. Type of data, construction of schedules and				
	questionnalies, measurement of scales and mulces, phot studies and pre-tests.				
		_			
4.	Field work: Nature of field work, selection and training of investigators,	5			
	sampling frame and sample selection, field operation, field administration.				
	Processing of data: Editing, classification and coding, transcription, tabulation.				
5.	Computer Basics: Course introduction, Office Applications: MS Office 2000/ XP	5			
	including MS-Word, MS Excel, MS PowerPoint and Internet. Introduction to				
6	Scientific and Tochnical writing: Descarch paper writing: Introduction Koy	c			
0.	words statement of the problem background in brief purpose and scope	0			
	Methodology and procedure. Presentation of results – tables, graphs, figures				
	and statistical analysis and drawing inferences				
	Report writing: Types of reports planning of report writing research report				
	format, principles of scientific and technical writing, documentation, data				
	analysis and reporting in a thesis, writing of report, typing of report, briefing.				
7.	Application and uses of Biostatistics as a science, as figure, scope, common	7			
	statistical terms, notations.	-			
	Measures of location-averages and percentiles: Measures of central tendency-				
	averages, mean, median, mode, measures of location-percentiles, graphics,				
	method, arithmetical method, application and uses of percentiles.				
8.	Variability and its measures: Types, biological, real, experimental, measures of	7			
	variability, range, semi-interquartile, range (Q), mean deviation, standard				
	deviation (SD), coefficient of variation (CV), standard error of mean,				
	applications and uses, standard error of difference between two means of large				
	sample, small sample, t-test unpaired, paired, variance ratio test, analysis of				
	variance.				
	Normal distribution and normal curve: Demonstration of a normal distribution,				
	normal curve, standard normal deviate(z), asymmetrical distributions.				
	Probability (chance): Addition law of probability, multiplication law, binomial				

	Total	64
	regression line, standard deviation of the Y measurement for the regression line.	
10.	Correlation and regression: Calculation of correlation coefficient from ungrouped series, regression, calculation of regression coefficient(b),	6
	binomial or multinomial samples, as a test goodness of fit, calculation of x^2 value, restrictions in application of x^2 test, Yates corrections.	
9.	The Chi-square Test: Alternate test to find significances of difference in two or more than two proportions, as a test of association between two events in	6
	or normal curve.	
	probability distribution probability shapes from shape of normal distribution	

Suggested Books					
Sr. No.	Authors/ Name of Books/Publisher				
1.	Deepak Chawla, NeenaSondhi, Research Methodology Concepts and Cases, Vikas books publishers, 2 th edition, 2016				
2.	Donald H. McBurney -Theresa L. White "Research Methods" (Cengage learning India Pvt. Ltd), 5 th edition, 2006				
3.	B. K. Mahajan, Methods in Biostatistics: for medical students and Research workers. Kothari Book Depot, Mumbai, 7 th edition				
4.	Ram AHUJA, Research Methods. Rawat Publications ISBN: 978-81-7033-653-2				
5.	RCS. Methodology in the Social, Behavioral and Life sciences: Designs, Models and Methods- Herman J Ader and Gideon J Mellenbergh. ISBN: 978-0761958840.				

Unit	Content					
No.						
1.	Theory Philosophy and Ethics- Introduction to philosophy: definition, nature and scope, concept, branches. Ethics: definition, moral philosophy, nature of moral judgments and reactions	3				
2.	. Scientific Conduct- Ethics with respect to science and research, Intellectual honesty and research integrity, Scientific misconducts: falsification, fabrication, plagiarism (FPP), Redundant publications: duplicate and overlapping publications, salami slicing, Selective reporting and misrepresentation of data					
3.	Publication Ethics- Publication ethics: definition, introduction and importance, Best practices/standards setting initiatives and guidelines: COPME, WAME etc., Conflict of interest, Publication misconduct: definition, concept, problems that lead to unethical behavior and vice versa, types, Violation of publication ethics, authorship and contributorship, Identification of publication misconduct, complaints and appeals, Predatory publishers and journals.	7				
4.	Practice Open Access Publishing- Open access publications and initiatives, SHERPA/RoMEO online resources to check publisher copyright and self- archiving policies, Software tool to identify predatory publications developed by SPPU, Journal finder/journal suggestion tools viz. JANE, Elsivier journal finder. Springer Journal Suggestor. etc.	4				
5.	Publication Misconduct- Group Discussions: Subject specific ethical issues, FFP, authorship, Conflicts of interest, Complaints and appeals: examples and fraud from India and abroad Software tools: Use of plagiarism software like Turnitin, Urkund and other	2				
	open source software tools.					
6.	Databases and Research Metrics - Databases: Indexing databases, Citation databases: Web of Science, Scopus etc. Research Metrics: Impact factor of journal as per Journal Citation Report	4				
	SNIP, SJR, IPP, Cite Score, Metrics: h-index, g-index, i 10 index, altmetrics	3				
	Total	30				
Refere	ences	•				
Sr.	Authors/ Name of Books/Publisher					
No						
1.	Bird, A. (2006). Philosphy of Science. Routledge					
2.	MacIntyre, Alasdair (1967). A Short History of Ethics. London					
3.	P. Chaddha, (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 c (2009). On Being a Scientist: A Guide to Responsible Conduct in Research: The Conduct in Research is the	of Medicine. hird Edition.				

	National Academies Press.
5.	Resnik, 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/research
	/resources/bioethics/whatis/index.cfm

PHY.501: Human Physiology (Bridge course)

Credit Hours: 03

Unit No.	D. Contents Lect				
1.	General Physiology- Homeostasis, transport across membranes				
2.	2. Body Fluids and Blood- Plasma proteins types and functions, cellular elements of blood, their formation and regulation (erythropoiesis and leucopoiesis), hemoglobi synthesis, functions, types and fate. Anemia's. Haemostatic mechanism: Intrinsic an extrinsic mechanism of coagulation, platelets and their functions. Blood groups: ABG and Rh system. Blood transfusion and Rh incompatibility, humoral and cell mediate immunity. Lymph-function				
3.	3. Nerve and Muscle- Resting membrane potential and action potential, skeletal muscle-mechanism of muscle contraction and its molecular basis: Excitation contraction coupling. Neuromuscular transmission. Smooth and cardiac muscle, structure and their properties				
4.	Gastro Intestinal Tract and Nutrition - General organization of GIT. Mastication and digestion in mouth. Composition and regulation of secretions of GIT - salivary, gastric, intestinal. Pancreatic and bile secretion, composition, function and regulation. GIT movements: Types and their regulation. Physiological basis of vomiting, diarrhea, constipation. Liver and gall bladder: Function and physiological importance				
5.	. Excretory System- Structure and function of different parts of nephron; juxta- glomerular apparatus. Glomerular filtration rate (GFR). Mechanism of urine formation. Role of kidney in water and electrolyte balance.				
6.	Skin and Body Temperature- Role of skin in temperature regulation. Heat gain and loss mechanism. Regulation of internal body temperature				
7.	Respiratory System- Mechanism of normal respiration. Lung volumes and capacities. Oxygen and carbon dioxide transport. Regulation of respiration: Neural and chemical. Hypoxia.	3			
8.	Cardiovascular System- Cardiac cycle pressure and volume changes in cardiac cycle. Heart sounds. Normal ECG. Cardiac output, heart rate. Blood pressure-factors affecting it, regulation and methods of measurement.	3			
9.	Endocrine Glands -General principles of mechanism of action, regulation of secretion of hormones. Anterior pituitary, posterior pituitary, thyroid, parathyroid pancreas, adrenal gland endocrine secretions; functions, regulation and clinical disorders.	2			
10.	Reproductive System- Male reproductive system: Spermatogenesis and its regulation. Female reproductive system-Menstrual cycle – its basis and regulation.	2			
11.	11. Nervous System- Organization of central, peripheral and autonomic nervous system Synaptic transmission. Reflexes: Monosynaptic (stretch reflex) and polysynap Motor and sensory systems. Physiology of basal ganglia and cerebellum. Physiology of thalamus, hypothalamus, and cerebral cortex				
12.	Special Senses- Fundamental knowledge of vision, hearing, taste and smell.				
	Total	30			
Recomn	nended Books				
Sr. No	Authors/ Name of Books/Publisher				
1.	Dr. A.K. Jain, Human Physiology for BDS Students, Avichal Publishing Company.				
2.	SAUNDERS				
3.	K Sembulingam, PremaSembulingam, "Essentials of Medical Physiology", JAYPEE				

ANT.501: Human Anatomy

Credit Hours: 03

Unit No.	Contents			
1.	Introduction to anatomical terms and organization of the human body			
	 Define the terms relative to the anatomical position 			
	Describe the anatomical planes			
	Define and describethe terms used to describe movements			
	 Organization of human body and structure of cell, tissues membranes and glands 			
	Describe the types ofcartilage			
	Compare and contrastthe features of skeletal, smooth and cardiac muscle			
2.	The Respiratory system			
	Describe the structure of respiratory system			
3	The Digestive system	3		
	Describe the structure of digestive system			
4.	The Circulatory and Lymphatic system	3		
	Describe the structure of circulatory and lymphatic system.			
5.	The Endocrine system	3		
	 Identify the major endocrine glands and describe the structure of endocrine Glands 			
6.	The Sensory organs	3		
	 Describe the structure of various sensory organs 			
7.	The Musculoskeletal system: The Skeletal system	3		
	 Describe anatomical position and structure f bones and joints 			
	Identify major bones that make up the axialand appendicular skeleton			
	Classify the joints			
	Describe the structure of muscle			
8.	The excretory system	3		
	Describe the structure of excretory system			
9.	The Reproductive system	3		
	Describe the structure of reproductive system			
10.	The Nervous system	3		
	• Describe the structure of nervous system including the distribution of the			
	nerves, nerve plexuses			
	Describe the ventricular system			
	Total	30		

Books recommended:-

- 1. Human Anatomy by Chaurasia, 8th Edition, Vol.-1-4-B.D. Chaurasia.
- 2. Clinical Anatomy for Medical Students, R.S Snell.
- 3. Text Book of General Anatomy B.D Chaurasia.
- 4. Text Book of Neuroanatomy Vishram Singh.
- 5. Text Book of Histology Inderbir Singh.

Compulsory courses (Ph.D. Specialization Major Subject)

The candidates may register one of the courses depending upon the specialization. The syllabus will cover discussions, seminars, assignments and class lectures on recent advances and trends in the discipline.

Sr.No.	Name of course	Course Code	Credit Hours	Discipline
1.	Advances in Human Anatomy	ANT.751	4	Medical Anatomy
2.	General Biochemistry	BIC.701	4	Medical Biochemistry
	Metabolism	BIC.702	4	
	Nutrition	BIC.703	4	
	Clinical Biochemistry	BIC.704	4	
	Advances in Biochemistry	BIC.751	4	
3.	Principles of Molecular	BIT.701	4	Biotechnology
	Biology			
	Medical Genetics	BIT.703	4	
	Microbial Biotechnology	BIT.706	4	
4.	Advanced Rehabilitation	CRP.751	4	Community
	Sciences for Research			Rehabilitation
	Education and Practice			
5.	Advanced Conservative	DTS.751	4	Dental Sciences
	Dentistry and Endodontics			
	Advanced Orthodontics and	DTS.752	4	
	Dental Orthopedics			
	Oral Pathology and	DTS.753	4	
	Microbiology			
	Advances in Dental Sciences	DTS.754	4	
6	Advances in Hespital		1	Hespital
0.	Advances in Hospital	WINA.752	4	Administration
	Administration		Λ	Administration
	Economics and Einancial	WINA.755	4	
	Planning			
	Advanced Organizational	MHA 75 <i>4</i>	л	
	Behavior and Development	WITA.7 54	-	
7	Advances in Health	HPF 751	4	Health Professions
	Professions Education			Education
8.	General Microbiology.	MIC.701	4	Medical Microbiology
•••	Immunology and			
	Bacteriology			
	General Microbiology,	MIC.702	4	
	Immunology and Virology			
	General Microbiology,	MIC.703	4	
	Immunology and Mycology			
	General Microbiology,	MIC.704	4	
	Immunology and			
	Parasitology			
	Advances in Medical	MIC.751	4	

	Microbiology				
9.	Advances in Medical Genetics	MGE.751	4	Medical Genetics	
10.	Nursing Leadership in Health care Delivery System	NSC.751	4	Nursing Sciences	
11.	Advances in Medical Pharmacology	PHC.751	4	Medical Pharmacology	
12.	Pharmaceutics	PHM.751	4	Pharmaceutical	
	Pharmaceutical Chemistry	PHM.752	4	Sciences	
	Pharmacy Practice	PHM.753	4		
	Advances in Pharmaceutical Sciences	PHM.754	4		
13.	Advances in Medical Physiology	PHY.751	4	Medical Physiology	
14.	Advances in Radiodiagnosis	RAD.751	4	Radiodiagnosis	
15.	Advances in Audiology and	ASP. 751	4	Audiology and	
	Speech-Language Pathology			Speech-Language	
				Pathology	
16.	Advanced Clinical Psychology	PSY.751	4	Clinical Psychology	