



INTEGRAL UNIVERSITY, LUCKNOW

INTEGRALINSTITUTE OF ALLIED HEALTH SCIENCES & RESEARCH

DEPARTMENT OF BASIC MEDICAL SCIENCES

**BACHELOR OF SCIENCE IN MEDICAL MICROBIOLOGY
(B.Sc. MM)**

SYLLABUS

YEAR/SEMESTER: I/I



Integral University, Lucknow
Department of Paramedical Sciences
Study and Evaluation Scheme

Program: B.Sc. MM

Semester-I

S. N.	Course code	Course Title	Type of Paper	Period Per hr./week/sem.			Evaluation Scheme				Sub. Total	Credit	Total Credits
				L	T	P	CT	TA	Total	ESE			
THEORIES													
1	MM101	Human Anatomy-I	Core	3	1	0	40	20	60	40	100	3:1:0	4
2	MM102	Human Physiology-I	Core	3	1	0	40	20	60	40	100	3:1:0	4
3	MM103	Basic of Biochemistry	Core	3	1	0	40	20	60	40	100	3:1:0	4
4	MM104	Basic Preventive Medicine & Community HealthCare	Core	3	1	0	40	20	60	40	100	3:1:0	4
5	LN101	Basic Professional Communication	Core	2	1	0	40	20	60	40	100	2:1:0	3
6	CS103	Introduction to Computers	Core	2	1	0	40	20	60	40	100	2:1:0	3
PRACTICAL													
1	MM105	Human Anatomy-I Lab	Core	0	0	2	40	20	60	40	100	0:0:1	1
2	MM106	Human Physiology-I Lab	Core	0	0	2	40	20	60	40	100	0:0:1	1
3	MM107	Basic of Biochemistry-I Lab	Core	0	0	2	40	20	60	40	100	0:0:1	1
Total				16	06	06	360	180	540	360	900	25	25

S. N.	Course code	Course Title	Type Of Paper	Attributes							United Nation Sustainable Development Goal (SDGs)
				Employability	Entrepreneurship	Skill Development	Gender Equality	Environment &Sustainability	Human Value	Professiona l Ethics	
THEORIES											
1	MM101	Human Anatomy-I	Core	√	√	√			√	√	3,4
2	MM102	Human Physiology-I	Core	√	√	√			√	√	3,4
3	MM103	Basic of Biochemistry	Core	√	√	√			√	√	3,4
4	MM104	Community Health Care Issues	Core	√	√	√			√	√	3,4
5	LN101	Basic Professional Communication	Core			√				√	3,4,6
6	CS103	Introduction to Computers	Core	√	√	√			√	√	3,4
PRACTICAL											
1	MM101	Human Anatomy-I Lab	Core	√	√	√			√	√	3,4
2	MM102	Human Physiology-I Lab	Core	√	√	√			√	√	3,4
3	MM103	Basic of Biochemistry-I Lab	Core	√	√	√			√	√	3,4

L: Lecture **T:** Tutorials **P:** Practical **CT:** Class Test **TA:** Teacher Assessment **ESE:** End Semester Examination,
AE=Ability enhancement, **DSE=**Discipline Specific Elective, **Sessional Total:** Class Test + Teacher Assessment **Subject Total:** Sessional Total +End Semester Examination (ESE)



Integral University, Lucknow

Effective from Session: 2023-24							
Course Code	MM101	Title of the Course	HUMANANATOMY-I	L	T	P	C
Year	I	Semester	I	3	1	0	4
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	The student will be able to demonstrate knowledge in human anatomy as needed for the study and practice of medical Laboratory technology.						

Course Outcomes	
CO1	To learn about anatomical nomenclature, position, location & their function.
CO2	To study about classification of bone, Ossification of bone, type of cartilage, classifications of joints.
CO3	To learn about classification & function about Muscles, nervous & cardiovascular system
CO4	To learn about superior extremity muscles & superior extremity joints.
CO5	To learn about inferior extremity muscles & inferior extremity joints.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	GENERAL ANATOMY	a. Introduction and subdivisions of Anatomy. b. Anatomical nomenclature: Terms of Planes, Positions, Body parts and movements. c. Basic tissues of the body: Definition, location and their function.	6	CO1
2	OSTEOLOGY & ARTHROLOGY (Brief)	a. Introduction, axial & appendicular skeleton, classification of bone based on shape and structure, structure of growing and adult long bone, ossification of bone, Types of cartilage, their characteristics features with example. b. Introduction to Arthrology: Definition and classifications of joints with example. Details of synovial joint - characteristics features, type with example, close pack and loose pack position.	7	CO2
3	SYSTEMIC ANATOMY	a. Brief About Myology: Classification of muscles and its characteristics features, Gross features of skeletal muscle, classification of muscle according to shape and fascicular architecture, action of muscles. b. Brief About Neurology: Subdivision of nervous system, structural organization of nervous system including types of neurons, ganglion. Introduction to spinal nerves, cranial nerves and autonomic nervous system. c. Brief About Cardiovascular System: Components of CVS, types of anastomoses, types of circulation, and components of lymphatic systems and its functions.	7	CO3
4	SUPERIOR EXTREMITY	a. Surface and marks and Introduction to superior extremity. b. Brief about Muscles and fascia, Pectoral region: Pectoral muscles, Scapular region and Back, Muscles of Arm, Forearm and Hand. c. Brief about Joints of superior extremity: Brief of shoulder joint, brief about the elbow joint & wrist joint and radioulnar joint.	10	CO4
5	INFERIORE XTREMITY	a. Introduction and surface and marks of lower extremity. b. Brief about Muscles and fascia: Thigh: Brief account of thigh muscles. c. Brief about Gluteal region: Muscles of Gluteal region. d. Compartment of leg, name of the muscles of leg, their action and nerve supply. e. Brief about Joints: Details of Hip and Knee joint, subtalar, tibio fibular joints.	10	CO5

Reference Books:

- 1 B.D. Chaurasia's, Human Anatomy-Volume I, 2, 3 CBS Publishers & Distributors.
- 2 Inderbir Singh, Textbook of Anatomy with Colour Atlas-Vol. I, 2, 3 Jaypee Brothers.
- 3 Snell-Clinical Anatomy by regions-Lippincott.
- 4 Mc Minn's Last's Anatomy-Regional and applied, Churchill Living stone.
- 5 Cunningham Manual of Practical Anatomy Vol. I, II, III, Churchill Livingstone.
- 6 Williams & Warwick, Gray's Anatomy-Churchill Living stone.
- 7 Basic Anatomy & Physiology by Smout and McDowell

e-Learning Source:

1. <https://youtu.be/X5RUFXXZBH4>
2. https://youtu.be/06o_XNKwuOE
3. <https://youtube/4Sab-2E4ZDI>

PO-PSO CO	Course Articulation Matrix:(Mapping of Cos with Pos and PSOs)																
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	3	1	2	-	-	-	1	2	1	-	2	2	1	2	-	3
CO2	2	3	2	2	-	-	-	1	3	1	-	3	2	2	1	-	2
CO3	1	3	1	2	-	-	-	1	2	-	-	2	2	1	2	-	3
CO4	2	3	1	2	-	-	-	1	3	-	-	3	2	2	3	-	3
CO5	1	3	1	2	-	-	-	1	2	1	-	2	2	1	2	-	3

1-Low Correlation; 2-Moderate Correlation; 3-Substantial Correlation

Attributes & SDGs									
Course Code	Course Title	Attributes							SDGs No.
MM101	HUMANANATOMY-I	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment& Sustainability	Human Value	Professional Ethics	
		√	√	√			√	√	
									3,4



Integral University, Lucknow

Effective from Session: 2023-24							
Course Code	MM102	Title of the Course	HUMAN PHYSIOLOGY-I	L	T	P	C
Year	I	Semester	I	3	1	0	4
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	The student will be able to demonstrate knowledge in human physiology as needed for the study and practice of medical Laboratory technology.						

Course Outcomes	
CO1	To learn about Cell and cell division, Cellular movement, Osmosis, Dialysis.
CO2	To study about composition of blood, morphology of cells, Hemoglobin, ESR, MCV, MCH, MCHC, PT, APTT, BT, CT, ABO, Cross matching, etc.
CO3	Introduction of Respiratory System, Respiration measures, Regulation of respiration.
CO4	To learn about basic physiology of heart, blood circulation, Cardiac Cycle, etc.
CO5	To learn about introduction and physiology of digestive system.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	GENERAL AND CELL PHYSIOLOGY	1. Cell and cell division-Structure, Function and classification of cell. 2. Cellular Movements: Endocytosis and Exocytosis, Molecules of cell. 3. Transport across the cell membrane, Homeostasis. 4. Diffusion, Osmosis, Bonding, Filtration, Dialysis, Surface Tension, Adsorption, Colloid.	8	CO1
2	BLOOD	1. Introduction of blood, Composition and function of blood, Blood cells morphology and development. 2. Blood cells types and function, Composition and function of blood plasma and Blood clotting factor, Hemoglobin-structure, normal content, function, types. Erythropoiesis. 3. Erythrocytes Di mentation rate (ESR) and its significance, Hematocrit, PCV, MCV, MCH, MCHC, Blood volume, Prothrombin time, Clotting time, Bleeding time, Blood Group, ABO and Rh factor, Cross matching, Coagulation and Anticoagulants.	8	CO2
3	RESPIRATION	1. Respiratory System Introduction, Structure, Function and Mechanics of Breathing. 2. Respiration measures (Vital capacity, Total Volume, Reserve volume, Total lung capacity), Mechanism of respiration. 3. Regulation of respiration, pulmonary function test, physiological changes in altitude & acclimatization, hypoxia.	8	CO3
4	CARDIOVASCULAR SYSTEM	1. Basic Physiology of Heart, Blood circulation, Arteries and veins, properties and structure of heart muscle. 2. Cardiac Cycle and heart sounds. 3. Conductive system of heart, Blood Pressure definition, Regulation factor affecting blood Pressure.	8	CO4
5	DIGESTIVE SYSTEM	1. Digestive system introduction, structure and function. 2. Basic physiology of organs of digestive systems (Salivary glands, Gastric glands, Pancreas, Liver, Gallbladder). 3. Composition and function of all digestive juices, Digestion and Absorption of carbohydrate, fat and proteins.	8	CO5

Reference Books:

1. Concise Medical Physiology by Chaudhuri, 4th Edition; New Central Book Agency.
2. Human Physiology, SeMMulingam; 4th ed, Jaypee Brothers.
3. A Text book of Practical Physiology, Ghai CL, Jaypee Brothers.
4. Practical physiology by Vijaya Joshi; Vora Medical Publication.
5. Human Physiology, Chatterjee. Vol:1 & 2; 10th Edition; Medical & Allied Agency
6. Textbook of Medical Physiology by Guyton & Hall, 11th Edition; Elsevier Publication
7. Principles of Anatomy & Physiology, Tortora, 8th Edition; Harper & Row Publication
8. Text book of Physiology: Ganong

e-Learning Source:

1. <https://youtu.be/JuhDx9hQAx8>
2. https://youtu.be/Ta_vWU5rjho
3. <https://youtu.be/h1qSFZ9aw94>
4. https://youtu.be/uYm4l_aVVV0
5. <https://youtu.be/VWamhZ8vTL4>

PO-PSO CO	Course Articulation Matrix: (Mapping of Cos with Pos and PSOs)																	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	1	3	1	2	-	-	-	1	2	-	-	2	2	1	-	1	-	1
CO2	1	3	1	3	-	-	-	1	3	-	-	3	3	2	-	2	-	1
CO3	1	3	1	2	-	-	-	1	2	-	-	2	3	1	-	1	-	1
CO4	1	3	1	2	-	-	-	1	3	-	-	3	2	1	-	1	-	1
CO5	1	3	1	2	-	-	-	1	2	-	-	2	2	1	-	1	-	1

1-Low Correlation; 2-Moderate Correlation; 3-Substantial Correlation

Course Code	Course Title	Attributes							SDGs No.
		Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	
MM102	HUMAN PHYSIOLOGY-I	√	√	√			√	√	3,4



Integral University, Lucknow

Effective from Session: 2023-24

Course Code	MM103	Title of the Course	BASIC OF BIOCHEMISTRY	L	T	P	C
Year	I	Semester	I	3	1	0	4
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	The student will be able to demonstrate knowledge in clinical as needed for the study and practice of medical laboratory Technology.						

Course Outcomes: After the successful course completion, learners will develop following attributes:

CO1	Introduction, Molecular & Functional organization of cells, Amino acid, Lipids, Proteins
CO2	To study about classification, definition and metabolism of carbohydrates
CO3	To learn about RNS & DNA, Advances in Genetic Engineering.
CO4	To learn about Definition, classification & function of fat- & water-soluble vitamins, classification of enzyme, definition and classification of hormones.
CO5	To learn about Introduction, role and requirement of nutrition.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	CELL & CHEMISTRY OF BIMOLECULES	1. Introduction, Molecular & functional organization of a cell & its sub cellular components- Cell membrane, Cytosol, Endoplasmic reticulum, Golgi apparatus, Lysosomes, Peroxisomes, Mitochondria & Nucleus. 2. Definition, Classification, properties & functions of amino acids. 3. Brief about Definition, Classification & functions of lipids. 4. Brief about structure of proteins, Amino acid & protein metabolism.	8	CO1
2	CARBOHYDRATE	Definition, Classification & Metabolism Glycolysis. Citric Acid cycle, Gluconeogenesis, glycol Genesis, Glycogenolysis, Pentose Phosphate Pathway. Blood Sugar level & its homeostasis, glucose tolerance & glycosuria.	8	CO2
3	NUCLEIC ACID	1. Brief about structure of DNA & RNA, DNA Replication, & Transcription, Advances in Genetic Engineering.	8	CO3
4	VITAMINS (FAT & WATER SOLUBLE) & ENZYMES & HORMONES	1. VITAMINS (FAT & WATER SOLUBLE): Definition, classification, functions dietary sources, daily requirement & Deficiency disorders. 2. ENZYMES & HORMONES: Definition, Classification of enzymes, properties, mechanism of action, Clinical importance & regulation of activity. Introduction Definition & Classification of hormones. Mechanism of hormone action, Effects of hormones on various Metabolism & hormonal disorders.	8	CO4
5	NUTRITION & SPECIAL TOPICS	1. Introduction of Nutrition, Nutrients of their role in human, Nutritional requirements, Balance diet, nutritional disorder, SDA (special dynamic action). 2. Respiratory quotient (RQ) & Basal Metabolism rate (BMR). Water electrolyte balance & Acid base balance.	8	CO5

Reference Books:

1. Fundamentals of Biochemistry-by Dr. Deb Jyoti Das,
2. Essentials of Bio-chemistry by U. Satyanarayan, 1st Edition, Books and Allied Publications.
3. Textbook of Biochemistry- Chatterjee and Shinde
4. Textbook of Medical Bio-Chemistry- Dr. M.N. Chatterjee, 5th Edition, Jaypee Publication.
5. Fundamentals of Bio-Chemistry- Dr. A.C. Deb, 5th Edition, Central Publication.
6. Bio-Chemistry introduction- Meke, 2nd Edition, McGraw-Hill Publication.

e-Learning Source:

1. <https://youtu.be/t5DvF5OVr1Y>
2. <https://youtu.be/gggC9vctvBQ>
3. <https://youtu.be/ufvZ8bYtyQ8>
4. <https://youtu.be/Q6R4o-oECxs>

	Course Articulation Matrix:(Mapping of Cos with Pos and PSOs)																
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO																	
CO1	1	3	2	2	-	-	-	1	2	1	-	2	2	1	-	1	-
CO2	1	3	1	3	-	-	-	2	3	-	-	3	3	2	-	2	-
CO3	1	3	1	2	-	-	-	1	2	2	-	2	3	1	-	1	-
CO4	1	3	1	2	-	-	-	1	3	-	-	3	2	1	-	1	-
CO5	1	3	1	2	-	-	-	1	2	1	-	2	2	1	-	1	-

1-Low Correlation; 2-Moderate Correlation; 3-Substantial Correlation

Attributes & SDGs

Course Code	Course Title	Attributes							SDGs No.
MM103	BASICS OF BIOCHEMISTRY	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	3,4
		√	√	√			√	√	



Integral University, Lucknow

Effective from Session: 2023-24

Course Code	MM104	Title of the Course	BASIC PREVENTIVE MEDICINE & COMMUNITY HEALTH CARE	L	3	T	1	P	0	C	4
Year	I	Semester	I								
Pre-Requisite	Nil	Co-requisite	Nil								
Course Objectives	Get knowledge of Basic concepts of community healthcare and community issues.										

Course Outcomes

CO1	To learn about Definition, Determinants and indicator of health& population of India.
CO2	To study about family, community & population problems in India.
CO3	To learn about communicable diseases & their prevention
CO4	To learn about national health policy programs & nutrition.
CO5	To learn about WHO, UNICEF, FAO, Indian red cross society, World bank etc.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	HEALTH & POPULATION	1. Health: Definition and Determinants, Health Indicators of India, Health Team Concept and Health problem in India. 2. Population of India and Family welfare programs in India. a. Environment and health.	8	CO1
2	FAMILY & COMMUNITY	1. Family, meaning and definitions, Functions of types of family, changing family patterns. 2. Rural and tribal community, Meaning and features & Health hazards. 3. Urban community, Meaning and features, Health hazards of urbanities Population, problems of population growth, birth rates, death rates, fertility rates & MMR.	8	CO2
3	COMMUNICABLE DISEASES	a. Epidemiology, etiology, pathogenesis and control of communicable diseases like malaria, cholera, tuberculosis, leprosy, diarrhea, poliomyelitis, viral hepatitis, measles, dengue, rabies, AIDS.	8	CO3
4	NHPP & NUTRITION	1. National Health Policy and Programs, DOTS, National AIDS control program, National cancer control program, universal immunization program etc. a. Nutrition and major nutritional problems, etiology, manifestations and prevention, components of RCH care.	8	CO4
5	HEALTH GOVERNING BODIES	a. Objectives and goals of WHO, UNICEF, Indian Red Cross Society, UNFPA, FAO, ILO	8	CO5

Reference Books:

1. K. Perks, Sunder Lal, Adarsh Pandey, Textbook of Preventive Social Medicine.
2. Basic Concepts of Community Health Nursing by JAYPEE Publication.

e-Learning Source:

1. <https://www.britannica.com/topic/family-kinship>
2. <https://en.wikipedia.org/wiki/Community>

Course Articulation Matrix:(Mapping of Cos with Pos and PSOs)

PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	3	2	2	-	-	-	1	2	-	-	2	3	1	2	3	-
CO2	1	3	1	3	-	-	-	2	3	-	-	3	3	-	1	2	-
CO3	1	3	1	2	-	-	-	1	2	-	-	2	2	2	1	2	2
CO4	1	3	1	2	-	-	-	1	3	1	-	3	2	3	1	3	2
CO5	1	3	1	2	-	-	-	1	2	2	-	2	3	1	2	2	2

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation
Attributes &SDGs

Course Code	Course Title	Attributes							SDGs No.
MM104	Basic Preventive Medicine & Community HealthCare	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment& Sustainability	Human Value	Professional Ethics	3,4
		√	√	√			√	√	



Integral University, Lucknow

Effective from Session: 2023-24

Course Code	CS103	Title of the Course	INTRODUCTION TO COMPUTERS	L	T	P	C
Year	I	Semester	I	2	1	0	3
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	The main objective of the course is to provide fundamental knowledge of computers, windows, MS word, and PowerPoint.						

Course Outcomes

CO1	After studying this course, the students will know–The fundamentals of computers and computer systems.
CO2	After studying this course, the students will know–Understanding the basic concepts of DOS commands.
CO3	After studying this course, the students will know–A Basic understanding of the windows.
CO4	After studying this course, the students will know–Understanding MS Word.
CO5	After studying this course, the students will know–Knowledge, understanding, and basic concepts of presentation software.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	COMPUTER FUNDAMENTALS	What is a computer? Components of a computer system. Classification of computers. Types of computers. A brief history of the evolution of computers and generation of computers. Computer hardware and software. Input/ Output devices.	6	CO1
2	DOS	Elementary knowledge of DOS commands DIR, CLS, DATE, TIME, MD, CD, RD, RENAME, DEL, BACKUP, RESTORE, COPY, SCANDISK, CHKDSK.	6	CO2
3	WINDOWS	Difference between windows and DOS. Basic Features - Date, Time, Time Zone, Display, Screen Saver, Fonts, Mouse, and mouse pointers. Using accessories such as a calculator, paint brush, CD player, etc. Use of Windows Explorer for moving and copying files. Introduction to MS Office and its integrated nature.	6	CO3
4	MS-WORD	Starting Word, new documents, entering text, changing text, aligning, underlining, and justifying text. Use of tabs. Tables-creation, add in rows and columns, splitting, and coMMining cells, Borders. Saving, closing, and operating documents. Adding headers and footers. Print preview, and print a document. Mail merge: creating main document and data Source. Adding and removing fields from the data source.	6	CO4
5	POWERPOINT (PRESENTATION SOFTWARE)	The basic concept of presentation software. Standard, Formatting, and drawing toolbars in PowerPoint and their use. Creating and opening a presentation. Creating, deleting, opening, and copying slides. Closing and saving a presentation. Use of slide sorter, adding header/ footer. Use of master slides and color box. Use of animation features. Inserting Pictures, resizing pictures. Inserting organization chart. Use of auto content wizard.	6	CO5

Reference Books:

1. A First Course in Computers: Saxena, Vikas Publishing House.
2. Fundamentals of Computer science -M. Afshar Alam.
3. Fundamental of Information Technology by D.S. Yadav-New age International.

e-Learning Source:

1. https://youtu.be/ME_F9yypzsw
2. <https://youtu.be/FZqKyhfD7-E>
3. <https://youtu.be/S4Zio6b8P8>
4. https://youtu.be/eEo_aacpwCw

Course Articulation Matrix:(Mapping of Cos with Pos and PSOs)

PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	2	2	2	-	-	-	1	2	1	-	2	-	2	2	1	-
CO2	1	-	1	3	-	-	-	2	3	-	-	3	-	1	1	1	-
CO3	1	3	1	2	-	-	-	1	2	2	-	2	-	1	1	1	-
CO4	1	2	1	2	-	-	-	1	3	-	-	3	-	1	2	1	-
CO5	1	2	1	2	-	-	-	1	2	1	-	2	-	1	1	1	-

1-LowCorrelation;2-Moderate Correlation;3-SubstantialCorrelation

Attributes & SDGs

Course Code	Course Title	Attributes							SDGs No.
CS103	INTRODUCTION TO COMPUTERS	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment& Sustainability	Human Value	Professional Ethics	3,4,11



Integral University, Lucknow

Effective from Session:2023-24

Course Code	LN101	Title of the Course	BASICS OF PROFESSIONAL COMMUNICATION	L	T	P	C
Year	I	Semester	I	2	1	0	3
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	The major objective of the course is to develop professional communication skills among the students.						

Course Outcomes

CO1	After studying this course, the students will know–The meaning & importance of professional communication as well as effective Professional communication.
CO2	After studying this course, the students will know –Understanding the language through literature like essays and short stories.
CO3	After studying this course, the students will know–Basic concepts and knowledge of vocabulary.
CO4	After studying this course, the students will know–Understanding and practice of basic grammar.
CO5	After studying this course, the students will know–Knowledge, understanding, and skills in report writing &business letter writing.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	PROFESSIONAL COMMUNICATION	a. Professional Communication: Meaning & importance b. Essentials of Effective Communication c. Barriers to Effective Communication	6	CO1
2	LANGUAGE THROUGH LITERATURE	a. Essays: “The Effect of the Scientific Temper on Man” by Bertrand Russell “The Aims of Science and Humanities” by Moody E. Prior b. Short Stories: “The Meeting Pool” by Ruskin Bond “The Portrait of a Lady” by Khushwant Singh	6	CO2
3	BASIC VOCABULARY	a. Euphemism, One-word Substitution, Synonyms, Antonyms b. Homophones, Idioms and Phrases, Common mistakes c. Confusable words and expressions	6	CO3
4	BASICGRAMMAR	a. Articles, Prepositions, Tenses b. Concord (Subject-Verb agreement), Verbs: kinds & uses c. Degrees of Comparison	6	CO4
5	BASICS OF COMPOSITION	a. Report writing: What is a report? Kinds and objectives of reports, writing reports b. Business Letter Writing: Introduction to business letters, types of business letters, Layout of business letters, Letter of Enquiry/Complaint	6	CO5

Reference Books:

1. Lata, Pushp &Kumar, Sanjay. Communication Skills, Oxford University Press-2012
2. Quintanilla, Kelly M. & Wahl, Shawn T. Business and Professional Communication, Sage Publications India Pvt.Ltd-2011
3. Juneja, Om P & Mujumdar, Aarati. Business Communication: Techniques and Methods, Orient Black Swan-2010
4. Arora, V.N. & Chandra, Lakshmi. Improve Your Writing: From Comprehensive to Effective Writing, Oxford University Press-2010 (For the prescribed essays- “The Effect of the Scientific Temper on Man” by Bertr and Russell& “The Aims of Science and Humanities” by Moody E.Prior)

e-Learning Source:

1. https://www.youtube.com/watch?v=jOx_jZxdCbs
2. <https://www.sciencedirect.com/topics/psychology/linguistictheory#:~:text=Linguistic%20Theory%20was%20formed%20by,to%20all%20typically%20developing%20humans>
3. <https://linguistics.ucla.edu/undergraduate/what-is-linguistics/>
4. <https://www.thoughtco.com/noam-chomsky-4769113>

Course Articulation Matrix:(Mapping of Cos with Pos and PSOs)

PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	1	1	2	2	1	2	3	3	1	2	2	3	2	2	3	2
CO2	3	3	2	2	2	2	2	1	2	2	2	3	2	2	3	3	3
CO3	3	2	2	3	2	3	3	2	2	3	2	3	2	3	3	3	3
CO4	2	3	1	2	3	1	2	2	3	3	3	3	3	3	2	2	2
CO5	3	2	2	1	2	3	3	3	2	3	2	2	3	2	2	3	3

1-LowCorrelation;2-Moderate Correlation;3-SubstantialCorrelation

Attributes & SDGs

Course Code	Course Title	Attributes							SDGs No.
LN101	BASICSOFP PROFESSIONALC OMMUNICATION	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment& Sustainability	Human Value	Professional Ethics	3,4,11
				√					



Integral University, Lucknow

Effective from Session:2023-24

Course Code	MM105	Title of the Course	HUMAN ANATOMY-I LAB	L	T	P	C
Year	I	Semester	I	0	0	2	1
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	The student will be able to demonstrate knowledge in human anatomy as needed for the study and practice of physiotherapy.						

Course Outcomes

CO1	To identify anatomical aspect of the level of organization of the human body practically.
CO2	To identify anatomical and functional aspect of muscles, bones and joints of the various regions practically.
CO3	To identify and practically apply various terms related to human different system of the body.
CO4	To identify anatomical and functional aspect of neuro musculoskeletal structure of superior extremity.
CO5	To identify anatomical and functional aspect of neuromusculoskeletal structure of inferior extremity.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	GENERAL ANATOMY & ARTHROLOGY (Brief) SYSTEMIC ANATOMY SUPERIORE XTREMITY INFERIORE XTREMITY	1. Identification and description of all Anatomical structures.	30	CO1-5
2		2. The learning of Anatomy is by demonstration only through dummy dissected parts, slides, models, charts etc.		
3		3. Demonstration of dummy dissected parts (upper extremity, lower extremity, thoracic & abdominal viscera, face and brain).		
4		4. Demonstration of skeleton-articulated and disarticulated.		
5		5. Demo of all bones showing its parts, radiographs of normal bones & joints. Demonstration of all muscles of the body.		
6		6. Demonstration of heart and vessels in the body.		
7		7. Demonstration of parts of respiratory system, Normal radiographs of chest.		
8		8. Demonstration of all plexuses and nerves in the body.		
9		9. Demonstration of all part of brain.		

Reference Books:

1. B. D. Chaurasia's, Human Anatomy-Volume 1,2,3 CBS Publishers & Distributors.
2. Inderbir Singh, Textbook of Anatomy with Colour Atlas-Vol. 1,2,3 Jaypee Brothers.
3. Snell-Clinical Anatomy by regions -Lippincott.
4. Mc Minn's Last's Anatomy- Regional and applied, Churchill Livingstone.
5. Cunningham Manual of Practical Anatomy Vol. I, II, III, Churchill Livingstone.
6. Williams & Warwick, Gray's Anatomy- Churchill Livingstone.
7. Extremities by Quining Wasb
8. Basic Anatomy & Physiology by Smout and Mc Dowell

e-Learning Source:

1. <https://youtu.be/X5RUFXXZBH4>
2. https://youtu.be/06o_XNKwuOE
3. <https://youtu.be/4Sab-2E4ZDI>

Course Articulation Matrix:(Mapping of Cos with Pos and PSOs)

PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	3	1	2	-	-	-	1	2	1	-	2	-	1	2	-	3
CO2	2	3	2	2	-	-	-	1	3	1	-	3	-	2	1	-	2
CO3	1	3	1	2	-	-	-	1	2	-	-	2	-	1	2	-	3
CO4	2	3	1	2	-	-	-	1	3	-	-	3	-	2	3	-	3
CO5	1	3	1	2	-	-	-	1	2	1	-	2	-	1	2	-	3

1-Low Correlation; 2-Moderate Correlation; 3-Substantial Correlation

Attributes & SDGs

Course Code	Course Title	Attributes							SDGs No.
MM105	HUMAN ANATOMY-ILAB	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	3,4
		√	√	√			√	√	



Integral University, Lucknow

Effective from Session:2023-24

Effective from Session:2023-24							
Course Code	MM106	Title of the Course	HUMAN PHYSIOLOGY- ILAB	L	T	P	C
Year	I	Semester	I	0	0	2	1
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	The student will be able to demonstrate the practical knowledge in human anatomy as needed for the study and practice of physiotherapy.						

Course Outcomes

CO1	To understand about general physiology & its application.
CO2	To understand the nerve, muscle physiology & its application.
CO3	To understand about basics of hematology & its application.
CO4	To understand about respiratory system & its application.
CO5	To understand about cardio vascular system.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	GENERAL AND CELL PHYSIOLOGY BLOOD RESPIRATION CARDIOVASCULAR SYSTEM DIGESTIVE SYSTEM	1.Measurement of Pulse rate, Heart rate, blood pressure.	30	CO1-5
2		2.Auscultation for Heart Sounds and Normal respiratory sounds.		
3		3.Introduction of Microscope, Identification of blood cells by study of peripheral Blood smears.		
4		4.D.L.C Differential Leucocytes count.		
5		5.T.L.C Total Leukocytes Count.		
6		6.R.B.C. Count.		
7		7.Estimation of Hemoglobin.		
8		8.Estimation of bleeding time & clotting time.		
9		9.Blood Group, ABO and Rh factor.		
10		10.Hemoglobinometry, various methods of estimation of Hb, errors involved and standardization of instrument for adaptation for Hb estimation.		

Reference Books:

- 1.Textbook of Physiology: Guyton.
- 2.Textbook of Physiology: Ganon
- 3.Human Physiology: A. K. Jain.
- 4.Essentials of Medical Physiology: K. Semubulingam, Jaypee Publishers.

e-Learning Source:

1. <https://youtu.be/X5RUFXXZBH4>
2. https://youtu.be/06o_XNKwuOE
3. <https://youtu.be/4Sab-2E4ZDI>
4. https://youtu.be/uYm4l_alVV0

Course Articulation Matrix:(Mapping of Cos with Pos and PSOs)

PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	3	1	2	-	-	-	1	2	-	-	2	-	1	-	1	-
CO2	1	3	1	3	-	-	-	1	3	-	-	3	-	2	-	2	-
CO3	1	3	1	2	-	-	-	1	2	-	-	2	-	1	-	1	-
CO4	1	3	1	2	-	-	-	1	3	-	-	3	-	1	-	1	-
CO5	1	3	1	2	-	-	-	1	2	-	-	2	-	1	-	1	-

1-LowCorrelation;2-ModerateCorrelation;3-SubstantialCorrelation

Attributes & SDGs

Course Code	Course Title	Attributes							SDGs No.
MM106	HUMANPHYSIOLOGY- ILAB	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	3,4
		√	√	√			√	√	



Integral University, Lucknow

Effective from Session:2023-24

Course Code	MM107	Title of the Course	BASICS OF BIOCHEMISTRY-I LAB	L	0	T	0	P	2	C	1
Year	I	Semester	I								
Pre-Requisite	Nil	Co-requisite	Nil								
Course Objectives											

Course Outcomes

CO1	Introduction, Molecular & Functional organization of cells, Amino acid, Lipids, Proteins
CO2	To study about classification, definition and metabolism of carbohydrates
CO3	To learn about RNS & DNA, Advances in genetic engineering.
CO4	To learn about Definition, classification & function of fat- & water-soluble vitamins, classification of enzyme, definition and classification of hormones.
CO5	To learn about Introduction, role and requirement of nutrition.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	CELL & CHEMISTRY OF BIMOLECULES CARBOHYDRATE NUCLEIC ACID VITAMINS (FAT & WATER SOLUBLE) & ENZYMES & HORMONES NUTRITION & SPECIAL TOPICS	1. Basic Introduction, Safety in clinical biochemistry, Laboratory Sample collection, specimen, labelling and routine tests.	30	CO1-5
2		2. Cleaning of laboratory Glassware, Composition of Glassware and General Glassware.		
3		1. Qualitative estimation of carbohydrates: • Benedict's test • Molish's 3. Phenol Sulfuric acid		
4		2. Quantitative estimation of proteins: • Lowry Method 4. Bradford's assay		
5		3. Quantitative Estimation of: • Glucose concentration • Urea concentration 5. Cholesterol Concentration		
6		4. Chromatography 6. TLC (Thin layer chromatography) & Paper chromatography		

Reference Books:

1. Fundamentals of Biochemistry-by Dr. Deb Jyoti Das,
2. Essentials of Bio-chemistry by U. Satyanarayan, 1st Edition, Books and Allied Publications.
3. Textbook of Biochemistry- Chatterjee and Shinde
4. Textbook of Medical Bio-Chemistry- Dr. M.N. Chatterjee, 5th Edition, Jaypee Publication.
5. Fundamentals of Bio-Chemistry- Dr. A. C. Deb, 5th Edition, Central Publication.

e-Learning Source:

1. <https://youtu.be/t5DvF5OVr1Y>
2. <https://youtu.be/gggC9vctvBQ>
3. <https://youtu.be/ufvZ8bYtyO8>
4. <https://youtu.be/Q6R4o-oECxs>

Course Articulation Matrix: (Mapping of Cos with Pos and PSOs)

PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	3	2	2	-	-	-	1	2	1	-	2	-	2	2	1	-
CO2	1	3	1	3	-	-	-	2	3	-	-	3	-	1	1	1	-
CO3	1	3	1	2	-	-	-	1	2	2	-	2	-	1	1	1	-
CO4	1	3	1	2	-	-	-	1	3	-	-	3	-	1	2	1	-
CO5	1	3	1	2	-	-	-	1	2	1	-	2	-	1	1	1	-

1-Low Correlation; 2-Moderate Correlation; 3-Substantial Correlation

Attributes & SDGs

Course Code	Course Title	Attributes							SDGs No.
MM107	BASICS OF BIOCHEMISTRY- ILAB	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	3,4
		√	√	√			√	√	



INTEGRAL UNIVERSITY, LUCKNOW

INTEGRAL INSTITUTE OF ALLIED HEALTH SCIENCES & RESEARCH

DEPARTMENT OF BASIC MEDICAL SCIENCES

**BACHELOR OF SCIENCE IN MEDICAL MICROBIOLOGY
(B.Sc. MM)**

SYLLABUS

YEAR/SEMESTER: I/II



Integral University, Lucknow
Department of Paramedical Sciences
Study and Evaluation Scheme

Program: B.Sc. MM

Semester-II

S. N.	Course code	Course Title	Type of paper	Period Per hr./week/sem.			Evaluation Scheme				Sub. Total	Credit	Total Credits
				L	T	P	CT	TA	Total	ESE			
THEORIES													
1	MM108	Human Anatomy-II	Core	2	1	0	40	20	60	40	100	2:1:0	3
2	MM109	Human Physiology-II	Core	2	1	0	40	20	60	40	100	2:1:0	3
3	MM110	Medical Biochemistry	Core	3	1	0	40	20	60	40	100	3:1:0	4
4	MM111	Introduction to Microbiology	Core	3	1	0	40	20	60	40	100	3:1:0	4
5	MM112	Medical Law & Ethics	Core	3	1	0	40	20	60	40	100	3:1:0	4
6	LN131	Effective Communication and Media Studies in English	Core	2	1	0	40	20	60	40	100	2:1:0	3
PRACTICAL													
1	MM113	Human Anatomy-II-Lab	Core	0	0	2	40	20	60	40	100	0:0:1	1
2	MM114	Human Physiology-II-Lab	Core	0	0	2	40	20	60	40	100	0:0:1	1
3	MM115	Medical Biochemistry-I-Lab	Core	0	0	2	40	20	60	40	100	0:0:1	1
4	MM116	Introduction to Microbiology Lab	Core	0	0	2	40	20	60	40	100	0:0:1	1
Total				15	06	08	400	200	600	400	1000	25	25

S. N.	Course code	Course Title	Type of paper	Attributes							United Nation Sustainable Development Goal (SDGs)
				Employability	Entrepreneurship	Skill Development	Gender Equality	Environment &Sustainability	Human Value	Professional Ethics	
THEORIES											
1	MM108	Human Anatomy-II	Core	√	√	√			√	√	3,4
2	MM109	Human Physiology-II	Core	√	√	√			√	√	3,4
3	MM110	Medical Biochemistry	Core	√	√	√			√	√	3,4
4	MM111	Introduction to Microbiology	Core	√	√	√			√	√	3,4
5	MA112	Medical Law & Ethics	Core	√	√	√			√	√	3,4,6
6	LN131	Effective Communication and Media Studies in English	Core			√				√	3,4
PRACTICAL											
1	MM113	Human Anatomy-II-Lab	Core	√	√	√			√	√	3,4
2	MM114	Human Physiology-II-Lab	Core	√	√	√			√	√	3,4
3	MM115	Medical Biochemistry-I-Lab	Core	√	√	√			√	√	3,4
4	MM116	Introduction to Microbiology-Lab	Core	√	√	√			√	√	3,4

L: Lecture **T:** Tutorials **P:** Practical **CT:** Class Test **TA:** Teacher Assessment **ESE:** End Semester Examination,
AE=Ability enhancement, **DSE=**Discipline Specific Elective, **Sessional Total:** Class Test + Teacher Assessment **Subject Total:** Sessional Total + End Semester Examination (ESE)



Integral University, Lucknow

Effective from Session: 2023-24							
Course Code	MM108	Title of the Course	HUMAN ANATOMY-II	L	T	P	C
Year	I	Semester	II	2	1	0	3
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	This syllabus is extension of the part-I. The syllabus justifiably divides the body systems into two semesters to ensure complete and comprehensive knowledge of all functionalities of the body.						

Course Outcomes	
CO1	To study about Respiratory System with details of Function and its importance in paramedical Sciences.
CO2	To know about Digestive System with details of Function and its importance in paramedical Sciences.
CO3	To know about the process of Urinary System with details of Function and its importance in paramedical Sciences.
CO4	To learn about Endocrine gland with details of Function and its importance in paramedical Sciences.
CO5	To study about Lymphatic System with details of Function and its importance in paramedical Sciences.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	RESPIRATORY SYSTEM	1. Orientation of Thoracic cage- boundaries, inlet, outlet & wall. 2. Inter costal muscles- origin, insertion, nerve supply. 3. Diaphragm-origin, insertion, nerve supply. 4. Nose, pharynx, Larynx—extent, walls. Enumerate associated cartilages & muscles. 5. Trachea- extent & brief structure, concept of trachea bronchial tree. 6. Lungs-Surfaces, borders, lobes, fissures. 7. Joints of Thorax-enumerate and its type.	6	CO1
2	DIGESTIVE SYSTEM	1. Oral cavities (boundaries), tongue - parts, enumerate muscles & papillae, salivary glands- brief enumerate & discuss in brief its opening). 2. Pharynx (extent, parts & boundaries) and Esophagus (parts, extent, constrictions, sphincters). 3. Stomach-location, parts, surfaces, curvatures, nerve supply. 4. Small Intestine parts, difference between duodenum, jejunum & ileum, nerve supply. 5. Large intestine- parts & their features in brief. 6. Liver- location, surfaces, border, lobes, Gall bladder-location, parts & function, Pancreas- location, parts, surfaces, borders & its ducts. 7. Blood vessel and layers of GIT.	6	CO2
3	URINARY SYSTEM	1. Introduction and Parts of Urinary system. 2. Kidney-Structure (surfaces, poles, borders, hilum) & function. 3. Structure of nephron. 4. Ureter (length, parts, constrictions), Urinary bladder (location, capacity, surfaces, borders, parts, openings) and Urethra (parts).	6	CO3
4	ENDOCRINE GLAND	1. Introduction and function of Endocrine Gland. 2. Pituitary gland-location, parts, enumerates types of cells & hormones secreted. 3. Thyroid gland- location, parts, features & blood supply. 4. Parathyroid gland- location, enumerate types of cells & hormones secreted. 5. Adrenal gland locations, shape, enumerate its components & hormones.	6	CO4
5	LYMPHATIC SYSTEM	1. Introduction to Lymphatic System. 2. Lymph nodes- structure and functions. 3. Spleen-location, surfaces, borders, poles, hilum. 4. Thymus- location, structure & functions. 5. Tonsil—types according to location, palatine tonsil in brief.	6	CO5

Reference Books:

- 1 B.D. Chaurasia's, Human Anatomy-Volume1,2,3 CBS Publishers & Distributors.
- 2 Inderbir Singh, Textbook of Anatomy with ColourAtlas-Vol.1,2,3Jaypee Brothers.
- 3 Snell-Clinical Anatomy by regions-Lippincott.
- 4 B.D. Chaurasia's, Human Anatomy-Volume1,2,3CBSPublishers&Distributors.
- 5 Inderbir Singh, Textbook of AnatomywithColourAtlas-Vol.1,2,3JaypeeBrothers.
- 6 Snell-Clinical Anatomy by regions-Lippincott.

e-Learning Source:

1. <https://youtu.be/X5RUFXXZBH4>
2. https://youtu.be/06o_XNKwuOE
3. <https://youtu.be/4Sab-2E4ZDI>

	Course Articulation Matrix: (Mapping of Cos with Pos and PSOs)																
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO																	
CO1																	
CO2																	
CO3																	
CO4																	
CO5																	

1-LowCorrelation;2-ModerateCorrelation;3-SubstantialCorrelation

Course Code		Course Title		Attributes						SDGs No.	
MM108		HUMANANATOMY-II		Employability	Entrepreneurship	Skill Development	Gender Equality	Environment& Sustainability	Human Value	Professional Ethics	
				√	√	√			√	√	3,4



Integral University, Lucknow

Effective from Session: 2023-24

Effective from Session: 2023-24							
Course Code	MM109	Title of the Course	HUMAN PHYSIOLOGY- II	L	T	P	C
Year	I	Semester	II	2	1	0	3
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	This subject imparts the knowledge of the structure and function of included organs and organ systems in normal human body.						

Course Outcomes

CO1	To understand about gastrointestinal tract & its application in practice of Paramedical Sciences.
CO2	To understand about Nervous system and special senses & its application in practice of Paramedical Sciences.
CO3	To understand about Endocrine system & its application in practice of Paramedical Sciences.
CO4	To understand about Reproductive system & its application in practice of Paramedical Sciences.
CO5	To understand about excretory function & its application in practice of Paramedical Sciences.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	DIGESTIVE SYSTEM	1. Digestive system introduction, structure of GI wall and functions. 2. Basic physiology of organs of digestive system (Salivary glands, Gastric glands, Pancreas, Liver, Gallbladder). 3. Physiological functions of Liver. 4. Digestion and Absorption of carbohydrate, fat and proteins.	6	CO1
2	CENTRAL NERVOUS SYSTEM	1. Nervous System: general organization of CNS, function of important structure and spinal cord, neuron, nerve impulse, type of nerves according to function, Autonomic nervous system- organization & function. 2. Special senses-general organization & functions.	6	CO2
3	ENDOCRINE GLAND	1. Introduction of Endocrine system. 2. Physiological Functions of Glucagon, Prolactin, Growth Hormones, insulin, oxytocin, ADH, Adrenal PTH, Thyroxin, calcitonin, Vitamin D.	6	CO3
4	REPRODUCTIVE SYSTEM	1. Introduction of Reproductive Systems in human. 2. Spermatogenesis and Oogenesis. 3. Physiological functions of Male and female Reproductive Hormones. 4. Menstrual Cycle. 5. Placental Hormone (Physiological Function).	6	CO4
5	EXCRETORY SYSTEM	Functions anatomy of Kidneys, Urine formation, (Glomerular filtration and tubular Reabsorption), Electrolytes: their balances and imbalances Introduction of acidosis and alkalosis.	6	CO5

Reference Books:

1. Guyton and Hall, (2011) Textbook of Medical Physiology, 12th Edition, Saunderson/Elsevier.
2. Sujit Chaudhury, (2011), Concise Medical Physiology, 6th edition, NCBA.
3. Seemul Mungam, (2012), Essentials of Medical Physiology, 6th edition, Jaypee Publications
4. Gerard Tortora and Bryan H. Derrickson, (Principles of Anatomy and Physiology, 14th edition, Wiley publications).

e-Learning Source:

1. <https://youtu.be/JuhDx9hQAx8>
2. https://youtu.be/Ta_vWU5rjho
3. <https://youtu.be/h1qSFZ9aw94>

Course Articulation Matrix: (Mapping of Cos with Pos and PSOs)

PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	3	1	2	-	-	-	1	2	-	-	2	2	1	-	1	1
CO2	1	3	1	3	-	-	-	1	3	-	-	3	3	2	-	1	1
CO3	1	3	1	2	-	-	-	1	2	-	-	2	3	1	-	1	1
CO4	1	3	1	2	-	-	-	1	3	-	-	3	2	1	-	1	1
CO5	1	3	1	2	-	-	-	1	2	-	-	2	2	1	-	1	1

1-Low Correlation; 2-Moderate Correlation; 3-Substantial Correlation

Attributes & SDGs

Course Code	Course Title	Attributes							SDGs No.
MM109	HUMAN PHYSIOLOGY- II	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	3,4
		√	√	√			√	√	



Integral University, Lucknow

Effective from Session: 2023-24							
Course Code	MM110	Title of the Course	MEDICAL BIOCHEMISTRY	L	T	P	C
Year	I	Semester	II	3	1	0	4
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	The following syllabus has been developed to impart knowledge of Equipment, Apparatus, Glassware, Reagents used in Clinical Biochemistry Laboratory along with laboratory hazards and safety measures.						

Course Outcomes	
CO1	To learn about management and responsibilities in biochemistry lab.
CO2	To know about various glassware & equipment used in biochemistry lab.
CO3	To know about preparation & properties of solutions.
CO4	To learn about sample collection, handling & preservation.
CO5	To learn about urine examination.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	INTRODUCTION OF CLINICAL BIOCHEMISTRY	1. Introduction to Clinical Biochemistry, Role and Responsibility of Medical Lab Technologist. 2. Laboratory ethics, Medical Legal concerns. 3. Laboratory Hazards, Safety measures and Prevention, First aid in Laboratory Accidents. 4. Units of measurement: SI units, Reference range, Conversion factors, units for measurement of Biomolecule, enzymes, protein, drugs, hormones, vitamins.	8	CO1
2	INSTRUMENT & APPARATUS USE IN BIOCHEMISTRY.	1. Glassware's and plastic ware's used in laboratory. 2. Calibration of Pipettes and Volumetric apparatus. 3. Cleaning, Care, Maintenance and Storage of Laboratory Glassware. 4. Chemicals, Purity of Chemicals and Hygroscopic substances. 5. Principle, Working, Care, Maintenance and Calibration of Weighing Balance, Hot Plate, Magnetic Stirrer, Centrifuge, Incubator, Hot Air Oven, Colorimeter, Spectrophotometer, pH meter, Distillation Plant and De ionizers.	8	CO2
3	PREPARATION OF SOLUTION AND REAGENT.	1. Preparation of Solutions and Reagents: Normal solutions, Molar solutions, Percent solutions, Buffer solutions, Dilutions, w/v, v/v, Standard solutions, Aqueous solutions. 2. Inter conversion of concentration- Normal, Molar, Molal and Percentage solution. 3. Concept of Acid and Base, Henderson Hassel balch equation.	8	CO3
4	SPECIMEN COLLECTION AND PROCESSING.	1. Specimen collection and Processing of Blood, Urine and CSF, Separation of Serum and Plasma for Biochemical Analysis. 2. Deproteinization of sample, Handling of specimens for Testing, Transport of specimen. 3. Preservation of specimen, Factors affecting the Clinical results, Effects of Storage on sample.	8	CO4
5	URINE ANALYSIS	1. Physical, Chemical and Microscopic examination of urine. 2. Bence Jones Protein urea and its clinical significance. 3. Qualitative test of Urine for Reducing sugars, Proteins, Ketone bodies, Bile salts, Bile pigments, Urobilinogen, Occult blood, Uric acid, Urea and Creatinine. 4. Quantitative estimation of 24hrs urine for protein and their clinical significance.	8	CO5

Reference Books:

1. Bishop, Fody and Schoeff, Clinical Chemistry, techniques, principles and correlations.
2. Dr Ramnik Sood, Medical Laboratory Technology: Methods and Interpretations.
3. Singh & Sahni, Introductory Practical Biochemistry.
4. Praful B. Godkar, Darshan P. Godkar, Textbook of Medical Laboratory Technology.

e-Learning Source:

1. <https://youtu.be/t5DvF5OVr1Y>
2. <https://youtu.be/gggC9vctvBQ>
3. <https://youtu.be/ufvZ8bYtyQ8>
4. <https://youtu.be/Q6R4o-oECxs>

	Course Articulation Matrix: (Mapping of Cos with Pos and PSOs)																
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	-	2	1	-	-	-	1	1	-	1	2	1	3	2	1
CO2	1	3	-	2	-	-	-	-	1	-	-	1	2	1	3	2	1
CO3	2	3	-	2	-	-	-	-	1	1	-	1	2	1	3	2	1
CO4	1	3	-	1	-	-	-	-	1	-	-	1	2	1	3	2	1
CO5	2	3	-	1	-	-	-	-	1	-	-	1	2	1	3	2	1

1-Low Correlation; 2-Moderate Correlation; 3-Substantial Correlation

Attributes & SDGs

Course Code	Course Title	Attributes							SDGs No.
MM110	MEDICAL BIOCHEMISTRY	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	3,4
		√	√	√			√	√	



Integral University, Lucknow

Effective from Session:2023-24								
Course Code	MM111	Title of the Course	INTRODUCTION TO MICROBIOLOGY		L	T	P	C
Year	I	Semester	II		3	1	0	4
Pre-Requisite	Nil	Co-requisite	Nil					
Course Objectives	The student will be able to demonstrate basic concepts of microbiology as needed for the study and practice of Medical Microbiology.							

Course Outcomes	
CO1	To know the Introduction, History and Instrumentation Technique
CO2	To know about Bacteria, Viruses, Fungi and Microbial Reproduction Methods.
CO3	To learn the skills of Staining techniques and Identification methods (Manual and Automated)
CO4	To learn the different Culture media and Sterilization techniques
CO5	To know the Infection control and Biomedical Waste Management Techniques

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Introduction, History and Instrumentation Technique	Discovery of microorganisms, Spontaneous generation, Germ theory of disease, Germ theory of Fermentation, Types and Principles of Light microscope, Phase contrast microscope, Electron microscope, Dark field microscope.	8	CO1
2	General introduction about Bacteria, Viruses, Fungi and Microbial Reproduction Methods.	Different groups of microorganisms, general characteristics, morphology and types of microorganisms and their reproductive strategy.	8	CO2
3	Staining techniques and Identification methods (Manual and Automated)	Gram staining (Gram-positive and Gram-negative bacteria) concerning cell wall, capsular, endospore and flagellar staining. Introduction and principle of biochemical tests (Catalase test, coagulase, indole, MR, VP, urease, TSIA), introduction about Antibiotic Susceptibility Testing (AST).	8	CO3
4	Introduction to Culture media and Sterilization techniques	Introduction, classification of culture media, automation and quality control in culture media, definition, types and Principles of sterilization techniques (Physical and Chemical).	8	CO4
5	Infection control and Biomedical Waste Management techniques	Introduction and classification of infection, transmission including hospital-acquired infection and preventive measures, Biomedical waste techniques.	8	CO5

Reference Books:

1. Ananthanarayan R. and Paniker C.K.J. (2009) Textbook of Microbiology. 8th edition, University Press Publication.
2. Brooks G.F., Carroll K.C., Butel J.S., Morse S.A. and Mietzner, T.A. (2013)
3. Adelberg's Medical Microbiology. 26th edition. McGraw Hill Publication
4. Willey JM, Sherwood LM, and Woolverton C.J. (2013) Prescott, Harley and Klein's Microbiology. 9th edition. McGraw Hill Higher Education
5. Goldsby RA, Kindt TJ, Osborne BA. (2007). Kuby's Immunology. 6th edition W.H. Freeman and Company, New York.
6. review of medical microbiology and immunology; Lange ASM press microbiology New York

e-Learning Source:

1. https://www.babcock.edu.ng/oer/lecture_notes/mlsc/MLSC%20417%20HISTORY%20OF%20MICROBIOLOGY.ppt
2. https://www.tru.ca/_shared/assets/Microbiology_Lab_Safety39696.pdf
3. <https://www.healthline.com/health/what-is-antiseptic>

Course Articulation Matrix: (Mapping of Cos with Pos and PSOs)																	
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	3	1	2	-	-	-	1	2	1	-	2	2	1	2	-	3
CO2	2	3	2	2	-	-	-	1	3	1	-	3	2	2	1	-	2
CO3	1	3	1	2	-	-	-	1	2	-	-	2	2	1	2	-	3
CO4	2	3	1	2	-	-	-	1	3	-	-	3	2	2	3	-	3
CO5	1	3	1	2	-	-	-	1	2	1	-	2	2	1	2	-	3

1-Low Correlation; 2-Moderate Correlation; 3-Substantial Correlation

Attributes & SDGs

Course Code	Course Title	Attributes								SDGs No.
MM111	INTRODUCTION TO MICROBIOLOGY	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics		
		√	√	√			√	√		3,4



Integral University, Lucknow

Effective from Session:2023-24

Course Code	MM112	Title of the Course	MEDICAL LAW & ETHICS	L	T	P	C
Year	I	Semester	I	3	1	0	4
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	Legal and ethical considerations are firmly believed to be an integral part of medical practice in planning patient care. Advances in medical sciences, growing sophistication of the modern society's legal framework, increasing awareness of human rights and changing moral principles of the community at large, now result in frequent occurrences of healthcare professionals Being caught in dilemmas over aspects arising from daily practice.						

Course Outcomes	
CO1	To learn about basic principles of medical ethics.
CO2	To learn about right of patients Care.
CO3	To learn about medicolegal aspects.
CO4	To learn about development of standardized protocol.
CO5	To learn about emergency care and life support skill.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	MEDICAL ETHICS	1. Medical ethics, Definition, Goal, Scope. 2. Introduction to Code of conduct. 3. Basic principles of medical ethics, Confidentiality. 4. Malpractice and negligence, Rational and irrational drug therapy.	8	CO1
2	RIGHT OF PATIENTS CARE	1. Autonomy and informed consent. 2. Right of patients Care of the terminally. 3. Euthanasia Organ transplantation, ethics and law.	8	CO2
3	MEDICO LEGAL ASPECTS AND MEDICAL RECORDS	1. Medicolegal aspects of medical records, Medicolegal case and type. 2. Records and document related to MLC ownership of medical records. 3. Confidentiality Privilege communication, Release of medical information. 4. Unauthorized disclosure, retention of medical records, other various aspects.	8	CO3
4	STANDARD PROTOCOL	1. Professional Indemnity insurance policy. 2. Development of standardized protocol to avoid near Miss sentinel events obtaining an informed consent.	8	CO4
5	EMERGENCY AND LIFECARE SUPPORT.	1. Basics of emergency care and life support skill. 2. Vital signs and primary assessment, Basic emergency care, first aid and triage. 3. Ventilations including use of bag-valve-masks (BVMs), Choking, rescue breathing methods. 4. One and Two rescuer CPR, using an AED (Automated external defibrillator), Managing an emergency including moving a patient.	8	CO5

Reference Books:

- 1.KennedyI, GrubbA. Medical law. London: Butterworths;2000.
- 2.JacksonE.Medicallaw:text, cases, and materials. Oxford University Press.
- 3.RecentTrends in Medical Imaging (CT, MRI and USG).
- 4.Bontrager KL, Lampugnano J. Bontrager's Handbook of Radiographic Positioning and Techniques-E-BOOK. Elsevier Health Sciences; 2017 Feb10

e-Learning Source:

1. <https://www.themedicportal.com/application-guide/medical-school-interview/medical-ethics/>
2. <https://www.slideshare.net/RameezShah5/medico-legal-aspect-of-medical-records>
3. <https://www.slideshare.net/imangalal/basic-life-support-33344827>

PO-PSO CO	Course Articulation Matrix: (Mapping of Cos with Pos and PSOs)																
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	-	-	-	-	-	2	-	2	-	-	-	2	-	-	-	-	-
CO2	-	-	-	-	-	2	-	-	-	-	-	2	-	-	-	-	-
CO3	-	-	-	-	-	2	-	1	-	1	-	2	-	-	-	-	-
CO4	-	-	-	-	-	2	2	-	-	-	-	2	-	-	-	-	-
CO5	-	-	-	-	-	2	1	1	-	-	1	2	-	-	-	1	1

1-LowCorrelation;2-Moderate Correlation;3-SubstantialCorrelation

Attributes & SDGs

Course Code	Course Title	Attributes							SDGs No.
MM112	MEDICAL LAW & ETHICS	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	3,4,6



Integral University, Lucknow

Effective from Session: 2023-2024							
Course Code	LN131	Title of the Course	EFFECTIVE COMMUNICATION AND MEDIA STUDIES IN ENGLISH	L	T	P	C
Year	I	Semester	II	2	1	0	3
Pre-Requisite	10+2	Co-requisite	UG				
Course Objectives	The students will be able to: <ul style="list-style-type: none">• Developing the art of communication and learning basic skills of conversation.• Knowledge of Professional and Media Skill Development, Career enhancement tips and goal-oriented learning.• Basic concept of Phonetics, Voice and Accent.• Students will learn academic learning and descriptive writing.						
Course Outcomes							
CO1	Students will be able to develop Formal and Informal Spoken skills, learn career development skills and learn to have clear idea of goal setting.						
CO2	Students will learn about the importance and usage of mass media and ways to develop their media skills.						
CO3	Academic Writing will help students to format and structure the content they create which will help them to be professional writers and bloggers.						
CO4	The unit will help students to learn and develop better conversation skills in formal and informal setup. They will learn the proper usage and pronunciation in various accent enabling them to converse in competitive environment.						
CO5	The unit enables students to put all the theoretical knowledge to practice, assuring complete learning and implementation.						

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	COMMUNICATION IN PRACTICE	Dos and Don'ts of Formal and Informal Communication Tips on Career Management-Setting Clear Goals, Skill Development, Network Building and Professional Relationship Etiquette, Knowing Aptitude and Values. Classroom Practice-JAM (Just A Minute) Extempore, Rebuttal, Forum, Role Play.	7hrs	CO1
2	MASS COMMUNICATION AND JOURNALISM	Introduction to Mass Communication. Types of Mass Communication/ Mass Media Impact of Globalization on Mass Media Socio Political Impact of Digital Media. Advertisement- Ethical and Unethical Advertisement, Jingles, Tag Lines, Punch Lines, Media Writing.	7hrs	CO2
3	FUNDAMENTALS OF ACADEMIC WRITING	The four main types of academic writing- Descriptive, Analytical, Persuasive and Critical. Writing Book Review, Introduction to Descriptive Writing Techniques and Features of Descriptive Writing -Character, Place and Travel Description, Event, Movie and Food description.	7hrs	CO3
4	CONVERSATION SKILLS	Phonetics-Learning Speech Mechanism (Voice and Accent) • Introduction-Self and Other-Guest Speaker/ Colleague • Polite Conversational Etiquette • Varieties of English Language; their difference in terms of Pronunciation, Vocabulary and Spelling: -British -American	7hrs	CO4
5	ACADEMIC PROJECT	<ul style="list-style-type: none"> Creating News Bytes Writing News Report Creating Jingles and Tag Lines for Famous Brands. Writing Editorial on a Topical Subject Writing Film Reviews Travelogue 	4hrs	CO5

Reference Books:

- Kumar, Sanjay and Pushp Lata. Communication Skills. Oxford University Press, Oxford 2011.
- Raman, Meenakshi, and Sangeeta Sharma. *Technical Communication: Principles and Practice*. Second Edition, Oxford University Press, 2012.
- Raina, Roshan Lal, Iftikhar Alam, and Faizia Siddiqui. *Professional Communication*. Himalaya Publication House 2012.
- Agarwal, Malti. *Professional Communication*. Krishna's Educational Publishers. 2016.
- Carnegie, Dale. *How to Win Friends and Influence People in the Digital Age*. Simon and Schuster. 2012.
- Covey, Stephen R. *The Seven Habits of Highly Successful People*. Free Press. 1989.
- Verma, K.C. *The Art of Communication*. Kalpaz. 2013.
- Alred, G.J., Brusaw, C.T., & Oliu, W. E. (2011). *Handbook of Technical Writing*, Tenth Edition (10th ed.) St. Martin's Press
- Sherman, Barbara. (2014). *Skimming and Scanning Techniques*. Liberty University Press.
- Barker, Alan. (2011). *Improve Your Communication Skills*. Kogan Page Pub. [later edited version To be added if any]
- Seely, John. (1998). *The Oxford Guide to Effective Writing and Speaking*. Oxford UP.

e-Learning Source:

- <http://www.uptunotes.com/notes-professional-communication-unit-i-nas-104...>
- <https://www.docsity.com/en/subjects/professional-communication/>
- <https://lecturenotes.in/download/note/22690-note-for-communication-skills-for-profession...>
- https://www.files.ethz.ch/isn/125396/1154_trystnehr.pdf
- <https://kr.useMMassy.gov/martin-luther-king-jr-dream-speech-1963/#::~:~:text=I%20have%20a%20dream%20that,skin%20but%20by%20their%20>

	Course Articulation Matrix: (Mapping of Cos with Pos and PSOs)																	
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO4	PSO5	PSO6	PSO7
CO1	3	1	1	2	2	1	2	3	3	1	2	2	3	2	2	3	2	3
CO2	3	3	2	2	2	2	2	1	2	2	2	3	2	2	3	3	3	3
CO3	3	2	2	3	2	3	3	2	2	3	2	3	2	3	3	3	3	3
CO4	2	3	1	2	3	1	2	2	3	3	3	3	3	3	2	2	2	2
CO5	3	2	2	1	2	3	3	3	2	3	2	2	3	2	2	3	3	2

1-LowCorrelation;2-Moderate Correlation;3-SubstantialCorrelation
Attributes & SDGs

Course Code	Course Title	Attributes							SDGs No.
LN131	Effective Communication and Media Studies in English	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment& Sustainability	Human Value	Professional Ethics	3,4,6
		√	√	√				√	



Integral University, Lucknow

Effective from Session: 2023-24							
Course Code	MM113	Title of the Course	HUMAN ANATOMY- II LAB	L	T	P	C
Year	I	Semester	II	0	0	2	1
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	The curriculum aims to prepare students in basic understanding of Human anatomy of practical aspects.						

Course Outcomes	
CO1	Students are able to learn about human thorax.
CO2	Students are able to learn about human Abdomen.
CO3	Students are able to learn about human Urinary system.
CO4	Students are able to learn about human Head.
CO5	Students are able to learn about human Practical aspect of Visceral Anatomy

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	RESPIRATORY SYSTEM DIGESTIVE SYSTEM URINARY SYSTEM ENDOCRINE GLAND LYMPHATIC SYSTEM	1. Sternum 2. Ribs 3. Vertebrae 4. Demonstration of Lungs 5. Demonstration of Chest X-ray	30	CO1-CO5
2		1. LuMMar vertebrae 2. Stomach 3. Liver, Gall bladder and Pancreas 4. Intestine		
3		1. Sacrum 2. Articulated Pelvis 3. Kidney & Urinary bladder		
4		1. Pituitary gland-location, parts. 2. Thyroid gland- location, parts, features & blood supply. 3. Parathyroid gland-location 4. Adrenal gland locations, shape.		
5		1. Lymph nodes-structure 2. Spleen-location, surfaces, borders, poles, hilum. 3. Thymus -location, structure. 4. Tonsil-types according to location.		

Reference Books:

- Ross & Wilson, (2014), Anatomy & Physiology in health&illness, 11th edition, Elsevier Publications
- Chaurasia BD, (2016), HumanAnatomy, 7th edition, CBS publishers
- Gerard J. Tortora and Bryan H. Derrickson, (Principles of Anatomy and Physiology, 14th edition, Wiley publications.

e-Learning Source:

- <https://youtu.be/X5RUFXZZBH4>
- https://youtu.be/06o_XNKwuOE
- <https://youtu.be/4Sab-2E4ZDI>

PO-PSO CO	Course Articulation Matrix: (Mapping of Cos with Pos and PSOs)																
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	3	1	2	-	-	-	1	2	-	-	2	2	1	-	1	1
CO2	1	3	1	3	-	-	-	1	3	-	-	3	3	2	-	1	1
CO3	1	3	1	2	-	-	-	1	2	-	-	2	3	1	-	1	1
CO4	1	3	1	2	-	-	-	1	3	-	-	3	2	1	-	1	1
CO5	1	3	1	2	-	-	-	1	2	-	-	2	2	1	-	1	1

1-LowCorrelation;2-ModerateCorrelation;3-SubstantialCorrelation

Attributes & SDGs

Course Code	Course Title	Attributes							SDGs No.
MM113	HUMAN ANATOMY- IILAB	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment& Sustainability	Human Value	Professional Ethics	3,4
		√	√	√			√	√	



Integral University, Lucknow

Effective from Session:2023-24

Effective from Session:2023-24							
Course Code	MM114	Title of the Course	HUMAN PHYSIOLOGY- II LAB	L	T	P	C
Year	I	Semester	II	0	0	2	1
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	The curriculum aims to prepare students in basic understanding of Human Physiology of practical aspects.						

Course Outcomes: After the successful course completion, learners will develop following attributes:

CO1	To learn about patient history, pulse rate, blood pressure.
CO2	To learn about respiratory sound
CO3	To learn about IUD
CO4	To learn about body temperature.
CO5	To learn about nutritional balance

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	DIGESTIVE SYSTEM CENTRAL NERVOUS SYSTEM ENDOCRINE GLAND REPRODUCTIVE SYSTEM EXCRETORY SYSTEM	1.Historytakingandgeneralexamination.	30	CO1-CO5
2		2.Examination of Pulse.		
3		3.Measurement of Blood Pressure.		
4		4.Auscultation for heart sounds and normal respiratory sounds.		
5		5.To study about in trauterine contraceptive devices.		
6		6.To measure temperature.		
7		7.Calculation & evaluation of daily energy & nutrient intake.		

Reference Books:

- 1.GuytonandHall, (2011) Textbook of Medical Physiology,12th Edition, Saunder/Elsevier.
- 2.Sujit Chaudhury, (2011), Concise Medical Physiology,6th edition, NCBA.
- 3.SeMMulingam k, (2012), Essentials of Medical Physiology, 6th edition, Jaypee Publications.
- 4.Gerard J. Tortora and Bryan H. Derrickson, (Principles of Anatomy and Physiology,14th edition, Wiley publications.
- 5.Sujit Chaudhury, (2011), Concise Medical Physiology,6th edition, NCBA.

e-Learning Source:

1. <https://youtu.be/JuhDx9hQAx8>
2. https://youtu.be/Ta_vWU5rjho
3. <https://youtu.be/h1qSFZ9aw94>

Course Articulation Matrix: (Mapping of Cos with Pos and PSOs)

PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	-	2	1	-	-	-	1	1	-	1	2	1	3	2	1
CO2	1	3	-	2	-	-	-	-	1	-	-	1	2	1	3	2	1
CO3	2	3	-	2	-	-	-	-	1	1	-	1	2	1	3	2	1
CO4	1	3	-	1	-	-	-	-	1	-	-	1	2	1	3	2	1
CO5	2	3	-	1	-	-	-	-	1	-	-	1	2	1	3	2	1

1- LowCorrelation;2-ModerateCorrelation;3-Substantial Correlation

Attributes & SDGs

Course Code	Course Title	Attributes							SDGs No.
MM114	HUMAN PHYSIOLOGY-II LAB	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment& Sustainability	Human Value	Professional Ethics	3,4
		√	√	√			√	√	



Integral University, Lucknow

Effective from Session: 2023-24							
Course Code	MM115	Title of the Course	MEDICAL BIOCHEMISTRY LAB	L	T	P	C
Year	I	Semester	II	0	0	2	1
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	The curriculum aims to prepare students in basic understanding of medical biochemistry of practical aspects.						

Course Outcomes: After the successful course completion, learners will develop following attributes:	
CO1	Students are able to learn about lab safety rules, lab apparatus & colorimeter.
CO2	Students are able to learn about spectrophotometer, pH meter & incubator.
CO3	Students are able to learn about centrifuge machine, weight machine & blood collection
CO4	Students are able to learn about sample separation, solution preparation of different cons.
CO5	Students are able to learn about normal and abnormal constituents of urine.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	INTRODUCTION OF CLINICAL BIOCHEMISTRY INSTRUMENT & APPARATUS USE IN BIOCHEMISTRY. PREPARATION OF SOLUTION AND REAGENT. SPECIMEN COLLECTION AND PROCESSING. URINE ANALYSIS	1. To Study General Laboratory Safety Rules.	30	CO1-CO5
2		2. To Demonstrate Glassware, Apparatus and Plastic wares used in Laboratory.		
3		3. Demonstration of Working of Colorimeter.		
4		4. Demonstration of Working of Spectrophotometer.		
5		5. Demonstration of Working of pH meter.		
6		6. Demonstration of Working of Incubator.		
7		7. Demonstration of Working of Cyclomixer.		
8		8. Demonstration of Working of Centrifuge, Weight Balance.		
9		9. Collection of Blood sample.		
10		10. Deproteinization of Blood sample.		
11		11. To separate Serum and Plasma.		
12		12. Preparation of Saturated solutions, Percent solutions, Buffer solutions.		
13		13. Preparation of Normal and Molar solutions (0.1N NaOH, 0.2N HCl, 0.1M H ₂ SO ₄).		
14		14. Analysis of Normal Constituents of Urine.		
15		15. Analysis of Abnormal Constituents of Urine.		

Reference Books:

1. Bishop, Fody and Schoeff, Clinical Chemistry, techniques, principles and correlations.
2. Dr Rannik Sood, Medical Laboratory Technology: Methods and Interpretations.
3. Singh & Sahni, Introductory Practical Biochemistry.
4. Praful B. Godkar, Darshan P. Godkar, Textbook of Medical Laboratory Technology.
5. Ranjna Chawla, Practical Clinical Biochemistry: Methods and Interpretations.

e-Learning Source:

1. <https://youtu.be/t5DvF5OVr1Y>
2. <https://youtu.be/gggC9vctvBQ>
3. <https://youtu.be/ufvZ8bYtyO8>

Course Articulation Matrix: (Mapping of Cos with Pos and PSOs)																	
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	-	2	1	-	-	-	1	1	-	1	2	1	3	2	1
CO2	1	3	-	2	-	-	-	-	1	-	-	1	2	1	3	2	1
CO3	2	3	-	2	-	-	-	-	1	1	-	1	2	1	3	2	1
CO4	1	3	-	1	-	-	-	-	1	-	-	1	2	1	3	2	1
CO5	2	3	-	1	-	-	-	-	1	-	-	1	2	1	3	2	1

1-Low Correlation; 2-Moderate Correlation; 3-Substantial Correlation

Attributes & SDGs

Course Code	Course Title	Attributes							SDGs No.
MM115	MEDICAL BIOCHEMISTRY LAB	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	3,4
		√	√	√			√	√	



Integral University, Lucknow

Effective from Session: 2023-24

Course Code	MM116	Title of the Course	INTRODUCTION TO MICROBIOLOGY LAB	L	T	P	C
Year	I	Semester	II	0	0	2	1
Pre-Requisite	Nil	Co-requisite	Nil				
Course Objectives	Students are able to demonstrate different techniques to identify and culture microorganisms. Students are able to learn skills of laboratory work culture under aseptic conditions.						

Course Outcomes: After the successful course completion, learners will develop following attributes:

CO1	To learn microscopy sterilization, antiseptics and disinfectants biomedical waste management in a medical microbiology laboratory
CO2	To learn culture media and stains
CO3	To know biochemical tests for bacterial identification
CO4	To learn antibiotic susceptibility testing in bacteriology
CO5	To know the general biological rules

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Microscopy Sterilization, Antiseptics and Disinfectants Biomedical Waste Management in A Medical Microbiology Laboratory	Study and handling of binocular microscope types and principles of sterilization methods, heat (dry heat, moist heat with special reference to autoclave) use of various disinfectants, precautions while using the disinfectants - qualities of a good disinfectant, testing efficiency of various disinfectants types of the waste generated – segregation – treatment – disposal.	30	CO1-5
2	Culture Media and Stains	Quality control in culture media, automation in culture media preparation, concepts, staining principle, different stains used in bacteriology		
3	Biochemical Tests for Bacterial Identification	Identification of different bacteria: - catalase, coagulase, indole, methyl red, urease citrate, oxidase, TSIA, carbohydrate		
4	Antibiotic Susceptibility Testing in Bacteriology	Definition of antibiotics, culture medium used for antibiotic susceptibility testing, various methods of antibiotic susceptibility testing		
5	General Biological Rules	Introduction to fundamental rules during laboratory practical's.		

Reference Books:

1. Willey JM, Sherwood LM, and Woolverton CJ. (2013) Prescott, Harley and Klein's Microbiology. 9th edition. McGraw Hill Higher Education
2. Macckey and mackarty practical microbiology 4th edition

e-Learning Source:

- 1 https://www.babcock.edu.ng/oer/lecture_notes/mlsc/MLSC%20417%20HISTORY%20OF%20MICROBIOLOGY.ppt
- 2 https://www.tru.ca/_shared/assets/Microbiology_Lab_Safety39696.pdf
- 3 <https://www.healthline.com/health/what-is-antiseptic>

PO-PSO CO	Course Articulation Matrix:(Mapping of Cos with PoS and PSOs)																
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	-	2	1	-	-	-	1	1	-	1	2	1	3	2	1
CO2	1	3	-	2	-	-	-	-	1	-	-	1	2	1	3	2	1
CO3	2	3	-	2	-	-	-	-	1	1	-	1	2	1	3	2	1
CO4	1	3	-	1	-	-	-	-	1	-	-	1	2	1	3	2	1
CO5	2	3	-	1	-	-	-	-	1	-	-	1	2	1	3	2	1

Low Correlation; 2-Moderate Correlation; 3-Substantial Correlation

Attributes & SDGs

Course Code	Course Title	Attributes							SDGs No.
MM116	INTRODUCTION TO MICROBIOLOGY LAB	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment Sustainability	Human Value	Professional Ethics	
		√	√	√			√	√	3,4