INTEGRAL UNIVERSITY, LUCKNOW

INTEGRAL INSTITUTE OF ALLIED HEALTH SCIENCES & RESEARCH

DEPARTMENT OF PARAMEDICAL SCIENCES

BACHELOR OF SCIENCE IN MEDICAL LABORATORY TECHNOLOGY (B.Sc. MLT)

SYLLABUS

YEAR/ SEMESTER: I/I

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

Program: B.Sc.MLT 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	LT101	Human Anatomy- I	Core	3	1	0	40	20	60	40	100	3:1:0	4
2	LT102	Human Physiology-I	Core	3	1	0	40	20	60	40	100	3:1:0	4
3	LT103	Basic of Biochemistry	Core	3	1	0	40	20	60	40	100	3:1:0	4
4	LT104	Community Health Care Issues	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	LT105	Human Anatomy- I Lab	Core	0	0	2	40	20	60	40	100	0:0:1	1
2	LT106	Human Physiology-I Lab	Core	0	0	2	40	20	60	40	100	0:0:1	1
3	LT107	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	Professional Ethics	
THEORIES											
1	LT101	Human Anatomy- I	Core	√	√	√	√		√	√	3,4
2	LT102	Human Physiology-I	Core	√	√	√	√		√	√	3,4
3	LT103	Basic of Biochemistry	Core	√	√	√	√		√	√	3,4
4	LT104	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	LT105	Human Anatomy- I Lab	Core	√	√	√	√		√	√	3,4
2	LT106	Human Physiology-I Lab	Core	√	√	√	√		√	√	3,4
3	LT107	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: 2017-18							
Course Code	**LT101**	**Title of the Course**	**HUMAN ANATOMY- 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, components of lymphatic systems and its functions.	7	CO3
4	**SUPERIOR EXTREMITY**	a. Surface landmarks 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 account of elbow joint & wrist joint and radioulner joint.	10	CO4
5	**INFERIOR EXTREMITY**	a. Introduction and surface landmarks 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 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 McMinn'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 Basic Anatomy & Physiology by Smout and McDowell

e-Learning Source:

1. https://youtu.be/X5RUFXZZBH4
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	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.
		Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	
LT101	HUMAN ANATOMY-I	√	√	√			√	√	**3,4**

Integral University, Lucknow

Effective from Session: 2017-18							
Course Code	**LT102**	**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. Erythropoisis. **3.** Erythrocyte sedimentation 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	**CARDIO VASCULAR 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, Sembulingam; 4th ed, Jaypee Brothers.
3. A Textbook of Practical Physiology, Ghai C L, 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. Textbook of Physiology : Ganong

e-Learning Source:

1. https://youtu.be/JuhDx9hQAx8
2. https://youtu.be/Ta_vWUsrjho
3. https://youtu.be/h1qSFZ9aw94
4. https://youtu.be/uYm4l_alVV0
5. https://youtu.be/VWamhZ8vTL4

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	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

Attributes & SDGs

Course Code	Course Title	Attributes							SDGs No.
		Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	
LT102	HUMAN PHYSIOLOGY-I	√	√	√	√		√	√	3,4

Integral University, Lucknow

Effective from Session: 2017-18							
Course Code	**LT103**	**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 & CHEMISTRYOF 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 & Metabosis Glycolsis. Citric Acid cycle, Glunconeogensis, glycogenesis, 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 &WATERSOLUBLE):** 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, utritional 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 –Chatterje and Shinde
4. Text book of Medical Bio-Chemistry – Dr. M. N. Chettergee, 5th Edition, Jaypee Publication.
5. Fundamental of Bio-Chemistry –.Dr. A. C. Deb, 5th Edition, Central Publication.
6. Bio-Chemistry introduction – Mekee, 2nd Edition, McGraw-Hill 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	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.
LT103	BASICS OF BIOCHEMISTRY	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	
		√	√	√	√		√	√	**3,4**

Integral University, Lucknow

Effective from Session: 2017-18							
Course Code	**LT104**	**Title of the Course**	**COMMUNITY HEALTH CARE ISSUES**	**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	
CO1	To learn about Definition, Determinants and indicator of health, Various Health Programme.
CO2	To study about Definition and meaning of family, Family sickness & psychosomatic disease.
CO3	To learn about Rural & Urban community with health hazards.
CO4	To learn about human adaptation and social changes.
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	**BASIC CONCEPTS OF COMMUNITY HEALTHCARE**	1. Definition of Health, Determinants of Health, Health Indicators of India, Health Team Concept. 2. National Health Policy, National Health Programmers (Briefly Objectives and Scope). 3. Population of India and Family welfare programme in India. 4. Health problem in India, Environment and health.	8	CO1
2	**FAMILY**	1. Family, meaning and definitions, Functions of types of family, changing family patterns. 2. Influence of family on Individuals Health, family and nutrition. 3. Effects of sickness in the family and psychosomatic disease. 4. Concepts of joint family.	8	CO2
3	**COMMUNITY**	1. Rural community, Meaning and features. 2. Health hazards to rural communities. 3. Health hazards to tribal community. **4.** Urban community, Meaning and features, Health hazards of urbanities.	8	CO3
4	**CULTURE AND HEALTH DISORDERS**	1. Social Change: Meaning of social changes, Factors of social changes. 2. Human adaptation and social changes, social changes and stress. 3. Social changes and deviance, Social changes and health programme. **4.** Role of social planning in the Improvement of health and rehabilitation.	8	CO4
5	**OBJECTIVE AND ORGANIZATION OF IMPORTANT AGENCIES**	1. WHO, UNICEF, FAO, ILO. 2. Indian Red cross Society. 3. UNFPA, World Bank. 4. Ford foundation, Rockefeller foundation.	8	CO5

Reference Books:

1. K. Perks, Sunder Lal, Adarsh Pandey, Textbook of Preventive Social Medicine.
2. AH Suryakantha, Community Medicine With Recent Advances
3. PVD Shetty , Khape, Short Notes In Community Medicine

e-Learning Source:

1. https://www.youtube.com/watch?v=kpWB5reLrmk
2. https://www.youtube.com/watch?v=c0TquroTHxo
3.

	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.
LT104	COMMUNITY HEALTH CARE ISSUES	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	
		√	√	√	√		√	√	**3,4**

Integral University, Lucknow

Effective from Session: 2017-18							
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 Power point.						

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, paintbrush, 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, adding rows and columns, splitting, and combining 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/S4Zio60b8P8
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- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Attributes & SDGs

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

Integral University, Lucknow

Effective from Session: 2017-18							
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	**BASIC GRAMMAR**	a. Articles, Prepositions, Tenses b. Concord (Subject-Verb agreement), Verbs: kinds & uses c. Degrees of Comparison	6	CO4
5	**BASIC 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 Bertrand Russell & "The Aims of Science and Humanities" by Moody E. Prior)

e-Learning Source:

1. https://www.youtube.com/watch?v=jQx_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

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

Attributes & SDGs

Course Code	**Course Title**	**Attributes**							**SDGs No.**
LN101	BASICS OF PROFESSIONAL COMMUNICATION	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	
				√					**3,4, 11**

Integral University, Lucknow

Effective from Session: 2022-23							
Course Code	**LT105**	**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 neuromusculoskeletal 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 OSTEOLOGY & ARTHROLOGY (Brief) SYSTEMIC ANATOMY SUPERIOR EXTREMITY INFERIOR EXTREMITY**	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 McMinn'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 McDowell

e-Learning Source:

1. https://youtu.be/X5RUFXZZBH4
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.
		Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	
LT105	HUMAN ANATOMY-I LAB	√	√	√	√		√	√	**3,4**

Integral University, Lucknow

Effective from Session: 2022-23							
Course Code	**LT106**	**Title of the Course**	**HUMAN PHYSIOLOGY-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 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 cardiovascular system.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	**GENERAL AND CELL PHYSIOLOGY BLOOD RESPIRATION CARDIO VASCULAR 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/X5RUFXZZBH4
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- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Attributes & SDGs

Course Code	Course Title	Attributes							SDGs No.
LT106	HUMAN PHYSIOLOGY-I LAB	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	
		√	√	√	√		√	√	**3,4**

Integral University, Lucknow

Effective from Session: 2022-23							
Course Code	**LT107**	**Title of the Course**	**BASICS OF BIOCHEMISTRY- I LAB**	**L**	**T**	**P**	**C**
Year	**I**	**Semester**	**I**	**0**	**0**	**2**	**1**
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 & CHEMISTRYOF 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 • Molishs 3. Phenol Sulfuric Acid		
4		2. Quantitative estimation of proteins: • Lowry Method 4. Bradford test		
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 –Chatterje and Shinde
4. Text book of Medical Bio-Chemistry – Dr. M.N. Chettergee, 5th Edition, Jaypee Publication.
5. Fundamental 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.
		Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	
LT107	**BASICS OF BIOCHEMISTRY- I LAB**	√	√	√	√		√	√	**3,4**

INTEGRAL UNIVERSITY, LUCKNOW

INTEGRAL INSTITUTE OF ALLIED HEALTH SCIENCES & RESEARCH

DEPARTMENT OF PARAMEDICAL SCIENCES

BACHELOR OF SCIENCE IN MEDICAL LABORATORY TECHNOLOGY (B.Sc. MLT)

SYLLABUS

YEAR/ SEMESTER: I/II

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

Program: B.Sc. MLT 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	LT108	Human Anatomy-II	Core	2	1	0	40	20	60	40	100	2:1:0	3
2	LT109	Human Physiology-II	Core	2	1	0	40	20	60	40	100	2:1:0	3
3	LT110	Medical Biochemistry-I	Core	3	1	0	40	20	60	40	100	3:1:0	4
4	LT111	Introduction to Pathology, Hematology & Clinical Pathology	Core	3	1	0	40	20	60	40	100	3:1:0	4
5	LT112	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	LT113	Human Anatomy-II - Lab	Core	0	0	2	40	20	60	40	100	0:0:1	1
2	LT114	Human Physiology-II - Lab	Core	0	0	2	40	20	60	40	100	0:0:1	1
3	LT115	Medical Biochemistry-I – Lab	Core	0	0	2	40	20	60	40	100	0:0:1	1
4	LT116	Introduction to Pathology, Hematology & Clinical Pathology- 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	LT108	Human Anatomy-II	Core	√	√	√	√		√	√	3,4
2	LT109	Human Physiology-II	Core	√	√	√	√		√	√	3,4
3	LT110	Medical Biochemistry-I	Core	√	√	√	√		√	√	3,4
4	LT111	Introduction to Pathology, Hematology & Clinical Pathology	Core	√	√	√	√		√	√	3,4
5	LT112	Medical Law & Ethics	Core	√	√	√	√		√	√	3,4, 6
6	LN131	Effective Communication and Media Studies in English	Core			√				√	3,4
PRACTICAL											
1	LT113	Human Anatomy-II - Lab	Core	√	√	√	√		√	√	3,4
2	LT114	Human Physiology-II - Lab	Core	√	√	√	√		√	√	3,4
3	LT115	Medical Biochemistry-I – Lab	Core	√	√	√	√		√	√	3,4
4	LT116	Introduction to Pathology, Hematology & Clinical Pathology- 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: 2022-23							
Course Code	**LT108**	**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. Intercostal 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 tracheobronchial 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 Oesophagus (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-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 B.D. Chaurasia's, Human Anatomy-Volume 1, 2, 3 CBS Publishers & Distributors.
5 Inderbir Singh, Textbook of Anatomy with Colour Atlas-Vol. 1, 2, 3 Jaypee Brothers.
6 Snell-Clinical Anatomy by regions -Lippincott.

e-Learning Source:

1. https://youtu.be/X5RUFXZZBH4
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	1	1	-	3	2	2	1	1	1
CO2	1	3	2	2	-	-	-	1	1	1	-	3	2	2	1	1	1
CO3	1	3	1	2	-	-	-	1	1	1	-	3	2	1	1	1	1
CO4	2	3	1	2	-	-	-	1	1	1	-	3	2	2	1	1	1
CO5	1	3	1	2	-	-	-	1	1	1	-	3	2	1	1	1	1

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

Attributes & SDGs

Course Code	**Course Title**	**Attributes**							**SDGs No.**
LT108	HUMAN ANATOMY-II	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	
		√	√	√	√		√	√	**3,4**

Integral University, Lucknow

Effective from Session: 2022-23							
Course Code	**LT109**	**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 gastro intestinal 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, Gall bladder). 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, Saunder/Elsevier.
2. Sujit Chaudhury, (2011), Concise Medical Physiology, 6th edition, NCBA.
3. Sembulingam 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).

e-Learning Source:

1. https://youtu.be/JuhDx9hQAx8
2. https://youtu.be/Ta_vWUsrjho
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.**
LT109	HUMAN PHYSIOLOGY-II	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	
		√	√	√	√		√	√	**3,4**

Integral University, Lucknow

Effective from Session: 2022-23							
Course Code	**LT110**	**Title of the Course**	**MEDICAL BIOCHEMISTRY- I**	**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 Equipments, 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 & equipments 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 Bio metabolite, 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 Glasswares. 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 Deionizers.	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 Hasselbalch 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 Proteinurea 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/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	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.
		Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	
LT110	MEDICAL BIOCHEMISTRY- I	√	√	√	√		√	√	**3,4**

Integral University, Lucknow

Effective from Session: 2022-23							
Course Code	**LT111**	**Title of the Course**	**INTRODUCTION TO PATHOLOGY, HEMATOLOGY & CLINICAL PATHOLOGY**	**L**	**T**	**P**	**C**
Year	**I**	**Semester**	**II**	**3**	**1**	**0**	**4**
Pre-Requisite	**Nil**	**Co-requisite**	Nil				
Course Objectives	The hematology curriculum aims to prepare students in basic understanding of composition of blood. Students would also be introduced to laboratory waste management protocols, instrumentation, techniques and methods of estimating different parameters of blood. The academic emphasis of this module is that students would learn basic hematological techniques including blood coagulation tests, blood banking and automation.						

Course Outcomes	
CO1	Students are able to learn about laboratory organization, safety measures , waste management.
CO2	Students are able to learn about RBC, WBC, Platelet count.
CO3	Students are able to learn about blood smear, cell counter, etc
CO4	Students are able to learn about body fluid & coagulation profile
CO5	Students are able to learn about Immunohematology & blood banking.

Unit No.	**Title of the Unit**	**Content of Unit**	**Contact Hrs.**	**Mapped CO**
1	**Introduction of Pathology**	Introduction to Pathology; Organization of laboratory and Laboratory safety guidelines; Lab safety measures employed; Accidents in laboratory and their emergency management; Biomedical waste management - segregation, collection, transportation, treatment and disposal (including color coding), Personal protective equipments; Principles of light microscopy; Other types of microscopy and its uses; Light microscope and its parts, care and maintenance of monocular and binocular microscopes; Introduction to Hematology; Hematopoiesis - Mechanism of hemopoiesis, stages of cell development, sites of hemopoiesis; Blood and its composition; Morphology of blood cells.	8	CO1
2	**Blood Collection Method & Preservation**	Anticoagulants, mechanism of action, types and uses, merits and demerits, effect of anticoagulants on blood cells during storage; Techniques of blood collection from different sites in patients (Venous, capillary and arterial blood); Vacutainer - types and uses, sample acceptance and rejection criteria; Important equipments used in haematology lab; Hemoglobin - structure, function and types; Hemoglobin estimation by various methods, advantages and disadvantages; Manual RBC counting; Manual total WBC counting by Neubauer counting chamber - Principle and precautions; Manual Platelet counting by Neubauer counting chamber - Principle and precautions; Absolute eosinophil count; Physiological and pathological changes in values of blood cell count; Stains used in routine staining of blood smears - Different types of stains and their uses.	8	CO2
3	**Blood Investigation**	Preparation of thin and thick smears and its uses; staining of blood smears; Differential leucocytes count by manual and automated method; Physiological and pathological variations in leukocyte values; Theory of erythrocyte sedimentation rate; Measurement of ESR - manual and automated method; Hematocrit and red cell indices - Its use in clinical practice; Principle of automated blood cell counter; Newer parameters available with automated cell counter and their significance; Reticulocyte count - Stains used; normal values; use of reticulocyte count in clinical practice; Collection, transport and preservation of clinical specimens other than blood; Processing of various clinical Specimens; CSF examination in clinical practice.	8	CO3
4	**Body Fluid & Coagulation Profile**	Semen analysis in clinical practice; Sputum examination as relevant to Pathology lab; Stool examination as relevant to Pathology lab; Mechanism of coagulation, coagulation factors; Common disorders of bleeding and coagulation; Approach to a patient with bleeding disorder; Bleeding time, clotting time, Platelet count; Prothrombin time, Prothrombin concentration, INR; Clot retraction test and APTT; Principle of automated blood cell counter; Uses, care, maintenance and calibration of automated blood cell counter; Coagulometer, automatic ESR analyzer, urine analyzer.	8	CO4
5	**Immunohematology logy & Blood Banking**	Point of care testing; Pre and Post analytical variables; Introduction to immuno hematology and blood banking technology; Antigen, antibody, complement system; ABO & Rh blood group system; Genetics of ABO blood group system; Red cell reagents and preparation of red cell suspension; Method of determination of ABO and Rh blood group; Other blood group system; Importance of blood grouping; Donor selection; Blood collection, anticoagulants and additive systems.	8	CO5

Reference Books:

1. Godkar. B. Praful, (2016) Textbook of MLT,3rd edition, Bhalani Publications.
2. Singh Tejinder, (2014), Atlas & Textbook of Haematology, 3rd edition, Avichal Publications.
3. Ochei J & Kolhatkar A (2000), Medical Laboratory Science: Theory & Practice, 3rd edition, Mcgraw Hill Educatio
4. Mukherjee L.K. (2017), Medical Laboratory Technology, Vol.1-3, 3rd edition, Tata Mcgraw Hill.
5. Mukherjee L.K. (2017), Medical Laboratory Technology, Vol.1-3, 3rd edition, Tata Mcgraw Hill.
6. Sood Ramnik, (2015), Text book of Medical Laboratory Technology, 2nd edition, Jaypee Publications.

e-Learning Source:

1. https://www.slideshare.net/peddanasunilkumar/introduction-to-pathology-ppt
2. https://www.ucsfhealth.org/medical-tests/semen-analysis#:~:text=Semen%20analysis%20is%20one%20of,have%20a%20male%20infertility%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	PSO3	PSO4	PSO5
CO1	2	-	-	1	-	3	3	2	2	-	2	2	-	-	-	-	1
CO2	2	-	-	2	-	3	2	2	1	-	2	3	-	-	-	-	2
CO3	2	-	-	1	-	3	3	1	2	-	1	2	-	-	-	-	1
CO4	2	-	-	1	-	3	3	2	1	-	2	3	-	-	-	-	1
CO5	2	-	-	2	-	3	2	2	1	-	2	2	-	-	-	-	1

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

Attributes & SDGs

Course Code	**Course Title**	**Attributes**							**SDGs No.**
LT111	INTRODUCTION TO PATHOLOGY, HEMATOLOGY & CLINICAL PATHOLOGY	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	**3,4**
		√	√	√	√		√	√	

Integral University, Lucknow

Effective from Session: 2015-16							
Course Code	**LT112**	**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 medico legal 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. Medico legal aspects of medical records, Medico legal 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 or sentinel events obtaining an informed consent.	8	CO4
5	**Emergency and Life Care 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. Kennedy I, Grubb A. Medical law. London: Butterworths; 2000.
2. Jackson E. Medical law: text, cases, and materials. Oxford University Press.
3. Recent Trends in Medical Imaging (CT, MRI and USG).
4. Bontrager KL, Lampignano J. Bontrager's Handbook of Radiographic Positioning and Techniques-E-BOOK. Elsevier Health Sciences; 2017 Feb 10

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

	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	-	2	-	-	-	2	-	-	-	-	-
CO2	-	-	-	-	-	2	-	-	-	-	-	2	-	-	-	-	-
CO3	-	-	-	-	-	2	-	1	-	1	-	2	-	-	-	-	-
CO4	-	-	-	-	-	2	2	-	-	-	-	2	-	-	-	-	-
CO5	-	-	-	-	-	2	1	1	-	-	1	2	-	-	-	1	1

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

Attributes & SDGs

Course Code	Course Title	Attributes							SDGs No.
		Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	
LT112	MEDICAL LAW & 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: • 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**	Do's 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**	• 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:

1. Kumar, SanjayandPushpLata.CommunicationSkills.OxfordUniversityPress, Oxford 2011.
2. Raman, Meenakshi, and Sangeeta Sharma. *Technical Communication: Principals and Practice*. Second Edition, OxfordUniversityPress, 2012.
3. Raina, Roshan Lal, Iftikhar Alam, and Faizia Siddiqui. *Professional Communication*. Himalaya PublicationHouse2012.
4. Agarwal, Malti.ProfessionalCommunication.Krishna'sEducationalPublishers.2016.
5. Carnegie, Dale. *How to Win Friends and Influence People in theDigitalAge*.SimonandSchuster.2012.
6. Covey, Stephen R. *The Seven Habits of Highly SuccessfulPeople*.FreePress.1989.
7. Verma, KC.TheArtofCommunication.Kalpaz.2013.
8. Alred, G. J., Brusaw, C. T., & Oliu, W. E. (2011). Handbook of Technical Writing, Tenth Edition (10th ed.). St. Martin's Press
9. Sherman, Barbara.(2014). Skimming and Scanning Techniques. Liberty University Press.
10. Barker, Alan. (2011). Improve Your Communication Skills. Kogan Page Pub. [later edited version to be added if any]

11Seely, John. (1998). The Oxford Guide to Effective Writing and Speaking. Oxford UP.

e-Learning Source:

1. http://www.uptunotes.com/notes-professional-communication-unit-i-nas-104...
2. https://www.docsity.com/en/subjects/professional-communication/
3. https://lecturenotes.in/download/note/22690-note-for-communication-skills-for-profession...
4. https://www.files.ethz.ch/isn/125396/1154_trystnehru.pdf
5. https://kr.usembassy.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- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

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: 2022-23							
Course Code	**LT113**	**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	Student's are able to learn about human Head.
CO5	Student's 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. Lumbar 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:

1. Ross & Wilson,(2014),Anatomy & Physiology in health & illness,11th edition, Elsevier Publications
2. Chaurasia B D, (2016), Human Anatomy, 7th edition, CBS publishers
3. Gerard J. Tortora and Bryan H. Derrickson, (Principles of Anatomy and Physiology,14th edition, Wiley publications.

e-Learning Source:

1. https://youtu.be/X5RUFXZZBH4
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	-	-	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.**
LT113	HUMAN ANATOMY- II LAB	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	
		√	√	√	√		√	√	**3,4**

Integral University, Lucknow

Effective from Session: 2022-23							
Course Code	**LT114**	**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**	1. History taking and general examination.	30	CO1-CO5
2	**CENTRAL NERVOUS SYSTEM**	2. Examination of Pulse.		
3		3. Measurement of Blood Pressure.		
4	**ENDOCRINE GLAND**	4. Auscultation for heart sounds and normal respiratory sounds.		
5	**REPRODUCTIVE SYSTEM**	5. To study about intrauterine contraceptive devices.		
6		6. To measure temperature.		
7	**EXCRETORY SYSTEM**	7. Calculation & evaluation of daily energy & nutrient intake.		

Reference Books:

1. Guyton and Hall, (2011) Textbook of Medical Physiology,12th Edition, Saunder/Elsevier.
2. Sujit Chaudhury, (2011), Concise Medical Physiology, 6th edition, NCBA.
3. Sembulingam k, (2012), Essentials of Medical Physiology, 6thedition, 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_vWUsrjho
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- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Attributes & SDGs

Course Code	Course Title	Attributes							SDGs No.
		Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	
LT114	**HUMAN PHYSIOLOGY- II LAB**	√	√	√	√		√	√	**3,4**

Integral University, Lucknow

Effective from Session: 2022-23							
Course Code	**LT115**	**Title of the Course**	**MEDICAL BIOCHEMISTRY - I 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 Glass wares, 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 Cyclo mixer.		
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, 0.2 N HCl, 0.1 M H_2SO_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 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.
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

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

Attributes & SDGs

Course Code	Course Title	Attributes							SDGs No.
LT115	MEDICAL BIOCHEMISTRY - I LAB	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	
		√	√	√	√		√	√	**3,4**

Integral University, Lucknow

Effective from Session: 2022-23							
Course Code	**LT116**	**Title of the Course**	**INTRODUCTION TO PATHOLOGY, HEMATOLOGY & CLINICAL PATHOLOGY- I LAB**	**L**	**T**	**P**	**C**
Year	**I**	**Semester**	**II**	0	0	2	**1**
Pre-Requisite	**Nil**	**Co-requisite**	**Nil**				
Course Objectives	The curriculum of practical hematology aims to prepare the students to understand composition of blood, waste managemen instrumentation, techniques and methods of estimating different parameters. The unique preposition of this paper is that the students should learn the basic hematological techniques including coagulation profile, blood banking and automation.						

Course Outcomes: After the successful course completion, learners will develop following attributes:	
CO1	Students are able to learn about laboratory safety rules.
CO2	Students are able to learn about anticoagulants, blood collection.
CO3	Students are able to learn about lab organization, smear preparation.
CO4	Students are able to learn about demonstration of various hematological test.
CO5	Students are able to learn about demonstration of various body fluids.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	**Introduction of pathology. Blood collection method & preservation. Blood investigation Body fluid & coagulation profile. Immunohematology & blood banking**.	To learn general laboratory safety rules; Demonstration of common glassware, apparatus and plastic wares used in laboratory; Maintenance and cleaning of glasswares used in hematology lab; To prepare EDTA, Sodium citrate and sodium fluoride anticoagulants vials; Demonstration of different types of vacutainers; Demonstration of blood collection technique from a patient; Separation of serum and plasma from collected blood; Demonstration of light microscope; Determination of hemoglobin by Sahli's Hemoglobin meter; Determination of hemoglobin by cyanmeth Hb method; Determination of total leukocyte count; Preparation of Leishman and Giemsa stain; Preparation of buffer, semen diluting fluid and Turk's solution; Preparation of thick and thin blood smear and Leishman staining technique; Demonstration of different types of leukocytes in PBS; Determination of differential leukocyte count; Determination of total red blood cell count; Determination of total platelet count; Determination of absolute leukocyte counts; To determine erythrocyte sedimentation rate by various methods; To determine packed cell volume of the given specimen; To determine red cell indices; Determination of reticulocyte count; To determine bleeding and clotting time; To determine blood group of the given sample by slide method; To determine blood group of the given sample by tube method; Basics of donor selection in blood bank; Demonstration of automated blood cell counter; Basics of semen analysis; Collection techniques, preparation and physical examination of different body fluids	30	CO1-5

Reference Books:

1. Godkar B' Praful (2016): Textbook of Medical laboratory Technology (3rd edition) Bhalani Publications.
2. Singh Tejinder (2014): Atlas & Textbook of Haematology (3rd edition), Avichal Publications.
3. Sood Ramnik (2015): Medical Laboratory Technology: Methods and Interpretations (vol- 1 & 2).
4. Lewis, Mitchell S: Dacie and Lewis Practical Haematology.
5. Kawthalkar, Shrish M: Essential of Clinical Pathology.

e-Learning Source:

1	https://www.slideshare.net/peddanasunilkumar/introduction-to-pathology-ppt
2	https://www.ucsfhealth.org/medical-tests/semen-analysis#:~:text=Semen%20analysis%20is%20one%20of,have%20a%20male%20.
3	https://www.youtube.com/watch?v=wZCKrseSIOE

	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
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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

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

Attributes & SDGs

Course Code	Course Title	Attributes							SDGs No.
		Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	
LT116	INTRODUCTION TO PATHOLOGY, HEMATOLOGY & CLINICAL PATHOLOGY- I LAB	√	√	√	√		√	√	**3,4**