INTEGRAL UNIVERSITY, LUCKNOW

INTEGRAL INSTITUTE OF ALLIED HEALTH SCIENCES & RESEARCH

DEPARTMENT OF PARAMEDICAL SCIENCES

BACHELOR OF MEDICAL RADIOLOGICAL IMAGING SCIENCES (BMRIS)

SYLLABUS

YEAR/ SEMESTER: I/I

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

Program: BMRIS 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	RS101	Human Anatomy- I	Core	3	1	0	40	20	60	40	100	3:1:0	4
2	RS102	Human Physiology-I	Core	3	1	0	40	20	60	40	100	3:1:0	4
3	RS103	Basic and Radiation Physics	Core	3	1	0	40	20	60	40	100	3:1:0	4
4	RS104	Basic Preventive Medicine & Community Health Care	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	RS105	Human Anatomy-I Lab	Core	0	0	2	40	20	60	40	100	0:0:1	1
2	RS106	Human Physiology-I Lab	Core	0	0	2	40	20	60	40	100	0:0:1	1
3	RS107	Basic and Radiation Physics-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	RS101	Human Anatomy- I	Core	√	√	√	√		√	√	3,4
2	RS102	Human Physiology-I	Core	√	√	√	√		√	√	3,4
3	RS103	Basic and Radiation Physics	Core	√	√	√	√		√	√	3,4
4	RS104	Basic Preventive Medicine & Community Health Care	Core	√	√	√	√		√	√	3,4
5	LN101	Basic Professional Communication	Core			√					3,4, 11
6	CS103	Introduction to Computers	Core			√					3,4, 11
PRACTICAL											
1	RS105	Human Anatomy-I Lab	Core	√	√	√	√		√	√	3,4
2	RS106	Human Physiology-I Lab	Core	√	√	√	√		√	√	3,4
3	RS107	Basic and Radiation Physics-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	**RS101**	**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	To ensure complete and comprehensive knowledge of all Anatomical Structures of body.						

Course Outcomes	
CO1	To learn about Anatomy, its branches, Cell, Tissue & Anatomical terminology.
CO2	To study about classification of bone, Ossification of bone, type of cartilage, classifications of joints.
CO3	To learn about classification & function about Muscles, their types and features.
CO4	To learn about Nervous & cardiovascular system.
CO5	To learn about Integumentary & Reproductive system.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	**GENERAL ANATOMY**	1. Introduction to Anatomy and its Division. 2. Cell: Definition, Parts, and Types. 3. Tissues: Definition, types and location. 4. Introduction to organ systems and their types. 5. Anatomical nomenclature, Body Planes, Positions, Body Membranes, Body cavities and movements.	**6**	CO1
2	**SKELETAL SYSTEM & ARTHROLOGY**	1. Introduction to the skeletal system and its parts. 2. Bone, ossification of bone, classification of bone based on structure, size, shape, and location. 3. Cartilage: Types of cartilage, their characteristics, features, and location in the body. 4. Introduction to axial & appendicle skeleton with bone features. 5. Introduction to Arthrology: Definition and classifications of joints with examples in detail. 6. Brief about Joints of superior extremity like shoulder joint, elbow joint, wrist joint and radioulnar joint. 7. Brief about Joints: Hip and Knee joint, subtalar, tibiofibular joints.	**10**	CO2
3	**MUSCULAR SYSTEM**	1. Introduction to Muscular system and Muscles, Classification of muscles and their characteristics, features and action of muscles. 2. Introduction to surface landmarks of superior extremity. Brief about Muscles and fascia of Pectoral region: Pectoral muscles, Scapular region and Back, Muscles of Arm, Forearm, and Hand, their action and nerve supply. 3. Introduction to surface landmarks of the lower extremity. Brief about Muscles and fascia of Thigh region, Gluteal region, Compartment of the leg, name of the muscles of leg, their action and nerve supply.	**10**	CO3
4	**NERVOUS & CARDIOVASCULAR SYSTEM**	1. **Nervous System:** Introduction and subdivision of nervous system. 2. CNS: Structure and Characteristic features of Neurons, Brain, and Spinal cord. 3. PNS: Introduction to PNS, Classification of PNS and spinal nerves& cranial nerves. 4. **Cardiovascular System:** Introduction to CVS, structure of Blood vessels, Arteries &Veins with their major and minor branches in detail, Structure of heart along with blood and nerve supply, types of circulation.	**8**	CO4
5	**INTEGUMENTARY & REPRODUCTIVE SYSTEM**	1. **Integumentary system-** Skin (Introduction, Structure, Function), hair, nails, exocrine glands. 2. **Reproductive System:** Introduction and classification. 3. **Male reproductive System-** Testes, Scrotum, penis, and glands. 4. **Female reproductive System-**External genitalia, & internal organs – Vagina, Cervix, Uterus, Fallopian tubes and Ovaries. 5. Breast structure with blood and nerve supply.	**6**	CO5

Reference Books:

1. Principles of Anatomy & Physiology – Tortora Gerard J.
2. Chaursia's, A Text Book of Anatomy.
3. Ranganathan, T.S., A Text Book of Human Anatomy
4. Fattana, Human Anatomy, (Description and Applied), Saunder's& C P Prism Publishers, Bangalore
5. Ester. M. Grishcimer, Physiology & Anatomy with Practical Considerations, J.P.Lippin Cott. Philadelphia
6. Principles of Anatomy & Physiology – Tortora Gerard J.
7. Ross and Wilson- Anatomy and Physiology in health and illness

e-Learning Source:

1. https://www.kenhub.com/en/library/education/the-human-anatomy

2. https://www.imaios.com/en/e-anatomy/lower-limb/lower-extremity

	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
CO1	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3
CO2	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3
CO3	3	2	3	3	3	2	3	2	2	3	2	3	2	3	2	2
CO4	3	3	3	3	3	3	3	3	3	3	3	3	2	2	2	3
CO5	3	3	3	3	3	3	3	2	3	3	3	3	3	3	3	2

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	
RS101	HUMAN ANATOMY- I	√	√	√			√	√	**3,4**

Integral University, Lucknow

Effective from Session: 2023-24							
Course Code	**RS102**	**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	To obtain the knowledge of Body systems and blood, cell physiology.						

Course Outcomes	
CO1	To learn about General & Cell Physiology.
CO2	To study about composition of blood, morphology of cells, Hemoglobin, ESR, MCV, MCH, MCHC, PT, APTT, BT, CT, ABO, Cross matching, etc.
CO3	To learn about basic physiology of Nervous system & Special Senses.
CO4	To learn about basic physiology of heart, blood circulation, Cardiac Cycle, etc.
CO5	To learn about introduction and physiology of reproductive system.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	**GENERAL AND CELL PHYSIOLOGY**	1. Cell Functions, Cellular Movements: Endocytosis and Exocytosis, Molecules of cell. 2. Transport across the cell membrane, Homeostasis. 3. Diffusion, Osmosis, Bonding, Filtration, Dialysis, Surface Tension, Absorption, Colloid.	8	CO1
2	**BLOOD**	1. Introduction of blood, Composition, and function of blood, Blood cell morphology and development. 2. Blood cell types and function, Composition, and function of blood plasma and Blood clotting factor, Haemoglobin-structure, normal content, function, types. Erythropoiesis. 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.	10	CO2
3	**NERVOUS SYSTEM & SPECIAL SENSES**	1. Nervous System: 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.	8	CO3
4	**CARDIO VASCULAR SYSTEM**	1. Basic Physiology of Heart, Blood circulation. 2. Cardiac Cycle and heart sound. 3. Conductive system of heart, Blood Pressure definition, Regulation factor affecting blood Pressure.	6	CO4
5	**REPRODUCTIVE SYSTEM**	1. Introduction of Reproductive Systems in human. 2. Spermatogenesis and Oogenesis. 3. Physiological functions of Reproductive Hormones. 4. Menstrual Cycle. 5. Placental Hormone (Physiological Function).	8	CO5

Reference Books:

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

e-Learning Source:

1. https://samples.jbpub.com/9781284035179/9781284030341_CH01_Secure.pdf
2. https://en.wikipedia.org/wiki/Blood
3. https://en.wikipedia.org/wiki/Respiration_(physiology)

	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
CO1	1	3	1	2	3	2	3	1	2	3	2	2	2	1	3	1
CO2	1	3	1	3	2	3	2	1	3	2	3	3	3	2	2	2
CO4	1	3	1	2	2	3	2	1	3	2	3	3	2	1	2	1
CO5	1	3	1	2	3	2	3	1	2	3	2	2	2	1	3	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	
RS102	HUMAN PHYSIOLOGY-I	✓	✓	✓	✓		✓	✓	3,4

Integral University, Lucknow

Effective from Session: 2023-24							
Course Code	**RS103**	**Title of the Course**	**BASIC AND RADIATION PHYSICS**	**L**	**T**	**P**	**C**
Year	**I**	**Semester**	**I**	**3**	**1**	**0**	**4**
Pre-Requisite	**Nil**	**Co-requisite**	**Nil**				
Course Objectives	To ensure the knowledge of basic concept of Physics and radiation Physics.						

Course Outcomes: After the successful course completion, learners will develop following attributes:	
CO1	To study about Basic Physics & Units of measurements.
CO2	To study about Electricity & Magnetism.
CO3	To study about Atoms and molecules.
CO4	To study about Discovery of x-rays, properties-production, x-ray spectrum, bremsstrahlung and characteristic x-rays- X-ray tube.
CO5	To study about X ray Circuits, beam limiting devices and factors affecting the quality & Quantity of X-Rays.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	**BASIC PHYSICS**	1. **Introduction to Basic Physics:** Matter, energy, Force work power and energy Temperature and heat, Methods of heat transfer. 2. SI Units of Force, work, power, energy, Temperature and heat parameter.	6	CO1
2	**ELECTRICITY & MAGNETISM**	1. **Electricity:** Electric charges, Coulomb's law, Unit of charge, Electric potential, unit of potential. 2. Electric induction, capacitance and capacitors, series and parallel 2 connection; electric current, unit, resistance, Ohm's law, electric power, Joule's law. 3. **Magnetism:** Types of Magnets, Magnetic Induction, materials with their magnetic properties, Faradays Law of Induction, Generator, Transformers, Laws of Transformers, and Types of Transformers. 4. Magnetic effects of current, voltmeter, and Ammeter (AC &DC).	8	CO2
3	**ATOMS & SOLIDS**	1. Atoms and molecules, their structure, the Nucleus of an Atoms, and atomic numbers. 2. Isotopes, Isobars &Isomers. 3. Excitation and Ionization, BE, Elements, and compounds. 4. Type of solids (Insulator, Conductors &Semiconductors).	8	CO3
4	**X-RAYS**	1. X-Rays discovery, production, properties, types and spectrum. 2. X-ray tube, Crook's tube, Coolidge tube, tube design, line focus principle, space charge effect, tube cooling, Modern x-ray tubes. 3. Stationary anode, rotating anode, grid-controlled x-ray tubes. 4. Heel effect, off-focus radiation, tube insert and housing, Tube rating, Quality and intensity of x-rays.	10	CO4
5	**X-RAY CIRCUITS & RADIATION UNITS**	**1. X-ray circuits Components**- Filament Circuit, High voltage circuit, Switched, Fuses, Circuit Breakers **2. Beam limiting Devices**- Cones, Cylinders, collimator, Grids, Filters. 3. Effects of tube voltage, current variation, filtration, and waveform and target material on X-ray production. 4. Interaction of radiation with matter, attenuation, absorption and scattering phenomena. 5. Radiation Units-Becquerel, Exposure, KERMA, Absorbed dose, Effective dose, Equivalent dose, maximum permissible doses with their uses and limitations.	8	CO5

Reference Books:

1. Diagnostics X-Ray Imaging Quality Assurance by M.A. Period and P. Chaloner.
2. Textbook of Radiology and imaging- by DavidSutton.
3. Christensen's Physics of diagnostic radiology.
4. The Essentaila of Physics of Medical Imaging by Bushberg.
5. Radiologic Science for Technologist by Stewart C Bushong.

e-Learning Source:

1. https://byjus.com/physics/electricity-and-magnetism/
2. https://byjus.com/chemistry/atoms-and-molecules/
3. https://en.wikipedia.org/wiki/X-ray

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
CO1	2	2	2	2	2	3	2	2	3	3	3	2	3	2	3	3
CO2	3	3	2	3	3	2	3	3	2	2	2	3	3	2	3	3
CO3	2	2	2	2	2	3	2	2	3	3	3	2	2	3	3	3
CO4	3	3	3	3	3	2	3	2	2	2	2	3	3	2	2	3
CO5	2	2	2	2	2	3	2	2	3	3	3	2	2	3	3	3

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

Attributes & SDGs

Course Code	Course Title	Attributes							SDGs No.
RS103	**BASIC AND RADIATION PHYSICS**	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	
		√	√	√	√		√	√	**3,4**

Integral University, Lucknow

Effective from Session: 2023-24							
Course Code	**RS104**	**Title of the Course**	**BASIC PREVENTIVE MEDICINE AND COMMUNITY HEALTH CARE**	**L**	**T**	**P**	**C**
Year	**I**	**Semester**	**I**	**3**	**1**	**0**	**4**
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. 3. 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 **4.** Population, problems of population growth, birth rates, death rates, fertility rates & MMR.	8	CO2
3	**COMMUNICABLE DISEASES**	1. Epidemiology, etiology, pathogenesis and control of communicable diseases like malaria, cholera, tuberculosis, leprosy, diarrhoea, 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. 2. Nutrition and major nutritional problems, etiology, manifestations and prevention, components of RCH care.	8	CO4
5	**HEALTH GOVERNING BODIES**	1. 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
CO1	2	2	3	2	3	3	3	2	3	3	3	3	2	3	3	2
CO2	3	2	2	3	2	2	2	3	2	3	2	3	2	3	3	2
CO3	2	3	3	2	3	3	3	2	3	2	3	3	2	3	3	3
CO4	3	2	2	3	2	2	2	3	2	3	2	2	3	2	3	2
CO5	2	2	2	2	3	3	3	2	3	2	3	3	2	3	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	
RS104	COMMUNITY HEALTH CARE ISSUES	✓	✓	✓	✓		✓	✓	**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	**FUNDAMENTALS OF COMPUTER**	1. What is a computer? Components of a computer system. Classification of computers. Typesof computers. A brief history of the evolution of computers and generation of computers. Computer hardware and software. Input/ Output devices.	6	CO1
2	**DOS**	1. Elementary knowledge of DOS commands DIR, CLS, DATE, TIME, MD, CD, RD, 2. RENAME, DEL, BACKUP, RESTORE, COPY, SCANDISK, CHKDSK.	6	CO2
3	**WINDOWS**	1. 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. 2. Introduction to MS Office and its integrated nature.	6	CO3
4	**MS-WORD**	1. 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 2. source. Adding and removing fields from the data source.	6	CO4
5	**POWERPOINT (PRESENTATION SOFTWARE)**	1. 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://testbook.com/learn/computer-fundamentals/
2. https://en.wikipedia.org/wiki/Microsoft_Word

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
CO1	2	2	3	2	3	3	3	2	3	3	3	3	2	3	3	2
CO2	3	2	3	3	2	3	2	3	2	3	2	3	2	3	3	2
CO3	2	3	2	2	3	3	3	2	3	2	3	3	2	2	3	3
CO4	3	2	2	3	2	3	2	3	2	3	2	3	3	2	3	2
CO5	2	2	2	2	3	2	3	2	3	3	3	3	2	3	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	
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**	1. Professional Communication: Meaning & importance 2. Essentials of Effective Communication 3. Barriers to Effective Communication	6	CO1
2	**LANGUAGE THROUGH LITERATURE**	**1.** Essays: "The Effect of the Scientific Temper on Man" by Bertrand Russell"The Aims of Science and Humanities" by Moody E. Prior **2.** Short Stories: "The Meeting Pool" by Ruskin Bond "The Portrait of a Lady" by Khushwant Singh	6	CO2
3	**BASIC VOCABULARY**	1. Euphemism, One-word Substitution, Synonyms, Antonyms 2. Homophones, Idioms and Phrases, Common mistakes 3. Confusable words and expressions	6	CO3
4	**BASIC GRAMMAR**	1. Articles, Prepositions, Tenses 2. Concord (Subject-Verb agreement), Verbs: kinds & uses 3. Degrees of Comparison	6	CO4
5	**BASIC COMPOSITION**	1. Report writing: What is a report? Kinds and objectives of reports, writing reports 2. Business Letter Writing: Introduction to business letters, types of business letters, Layout ofbusiness 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://en.wikipedia.org/wiki/Professional_communication
2. https://www.wallstreetenglish.com/blog/english-vocabulary-for-beginners
3. https://grammar.yourdictionary.com/grammar-rules-and-tips/basic-english-grammar-rules.html

	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
CO1	3	2	3	3	3	2	3	2	3	3	1	3	2	3	3	2
CO2	3	2	3	3	2	3	2	3	2	3	2	3	2	3	3	2
CO3	2	3	2	2	3	3	2	2	3	3	3	3	2	3	3	3
CO4	2	2	2	3	2	3	2	3	2	3	2	3	3	2	3	2
CO5	3	3	3	2	3	2	3	2	3	3	2	3	2	3	2	3

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

Attributes & SDGs

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

Integral University, Lucknow

Effective from Session: 2023-24							
Course Code	**RS105**	**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	Demonstration of all systems and upper extremity, lower extremity bones.						

Course Outcomes	
CO1	To learn about identification & description of all anatomical structures and cell.
CO2	To study about Skull, Vertebrae & Thoracic bones.
CO3	To learn about Upper Extremity and joints of them.
CO4	To learn about Wrist, Hand, Phalanges, Pelvis & Lower extremity along with joints.
CO5	To learn about Cardiovascular system, Nervous System & reproductive system.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	**GENERALANATOMY**	1. Identification and description of all Anatomical structures. 2. Demonstration of Cells and tissues.	4	CO1
2	**SKELETAL SYSTEM**	3. Demonstration of Skull. 4. Demonstration of Vertebrae. 5. Demonstration of Thoracic bones.	4	CO2
3	**ARTHROLOGY-I**	6. Demonstration of the Shoulder joint, Scapula, clavicle and Humerus. 7. Demonstration of Elbow joint, radius and Ulna.	4	CO3
4	**ARTHROLOGY-I**	8. Demonstration of Wrist joint, Carpals, Metacarpals Phalanges and joints of hand. 9. Demonstration of Pelvis and lower extremity with joints.	4	CO4
5	**SYSTEMIC ANATOMY**	10. Demonstration of the cardiovascular system. 11. Demonstration of Nervous system. 12. Demonstration of the Reproductive system.	4	CO5

Reference Books:

1 Principles of Anatomy & Physiology – Tortora Gerard J.
2 Chaursia's, A Text Book of Anatomy.
3 Ranganathan, T.S., A Text Book of Human Anatomy.
4 Fattana, Human Anatomy, (Description and Applied), Saunder's & C P Prism Publishers, Bangalore.
5 Ester. M. Grishcimer, Physiology & Anatomy with Practical Considerations, J.P. Lippin Cott. Philadelphia.

e-Learning Source:

1. https://www.kenhub.com/en/library/anatomy/human-anatomy-terminology
2. http://ecoursesonline.iasri.res.in/mod/page/view.php?id=54210
3. https://byjus.com/question-answer/what-is-meant-by-systemic-anatomy/

	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
CO1	3	2	3	3	3	2	3	2	3	3	1	3	2	3	3	2
CO2	3	2	3	3	2	3	2	3	2	3	2	3	2	3	3	2
CO3	2	3	2	2	3	3	2	2	3	3	3	3	2	3	3	3
CO4	2	2	2	3	2	3	2	3	2	3	2	3	3	2	3	2
CO5	3	3	3	2	3	2	3	2	3	3	2	3	2	3	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	
RS105	HUMAN ANATOMY- I LAB	✓	✓	✓	✓		✓	✓	**3,4**

Integral University, Lucknow

Effective from Session: 2023-24							
Course Code	**RS106**	**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	Measurements of Pulse rate, Heart rate and blood pressure including blood parameters, D.L.C, T.L.C, and R.B.C count.						

Course Outcomes	
CO1	To learn about Pulse Rate and Heart Rate and how to measure them.
CO2	To study about Blood Pressure and Body temperature and how to measure them.
CO3	To study about Microscope, Blood collection methods & Hemoglobin techniques.
CO4	To learn how to prepare blood smear, counting of TLC & DLC.
CO5	To learn how to count RBCs, Platelets & finding of Blood Group.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	**VITAL SIGNS-I**	1. Demonstration of Pulse Rate. 2. Demonstration of Heart Rate.	4	CO1
2	**VITAL SIGNS-II**	1. Demonstration of Blood Pressure. 2. Demonstration of Body Temperature measurement.	4	CO2
3	**BLOOD TEST-I**	1. Demonstration of Microscope. 2. Blood collection through various methods. 3. Estimation of Haemoglobin through Sahli Method and Tube method.	4	CO3
4	**BLOOD TEST-II**	1. Identification of Blood cells by study of Peripheral blood smears. 2. Demonstration of TLC. 3. Demonstration of DLC.	4	CO4
5	**BLOOD TEST-III**	1. Demonstration of RBCs. 2. Demonstration of Platelet counts. 3. Demonstration of Blood group.	4	CO5

Reference Books:

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

e-Learning Source:

1. https://samples.jbpub.com/9781284035179/9781284030341_CH01_Secure.pdf
2. https://en.wikipedia.org/wiki/Blood
3. https://en.wikipedia.org/wiki/Respiration_(physiology)

	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
CO1	3	2	3	3	3	2	3	2	3	3	1	3	2	3	3	2
CO2	3	2	3	3	2	3	2	3	2	3	2	3	2	3	3	2
CO3	2	3	2	2	3	3	2	2	3	3	3	3	2	3	3	3
CO4	2	2	2	3	2	3	2	3	2	3	2	3	3	2	3	2
CO5	3	3	3	2	3	2	3	2	3	3	2	3	2	3	2	3

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

Attributes & SDGs

Course Code	Course Title	Attributes							SDGs No.
RS106	HUMAN PHYSIOLOGY-I 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	**RS107**	**Title of the Course**	**BASIC AND RADIATION PHYSICS-LAB**	**L**	**T**	**P**	**C**
Year	**I**	**Semester**	**I**	**0**	**0**	**2**	**1**
Pre-Requisite	**Nil**	**Co-requisite**	**Nil**				
Course Objectives	Learn about basic Physics, Electricity, Magnetism, Atoms, X-Rays, X-Ray tube and devices used in Radiography.						

Course Outcomes	
CO1	To study about basic Physics & Electricity.
CO2	To study about Magnetism & Atomic structure.
CO3	To study about X-Rays & X-Ray Tube.
CO4	To study about types of Anode & Filters used in Radiography.
CO5	To study about Grid & Beam restriction devices used in Radiography.

Unit No.	**Title of the Unit**	**Content of Unit**	**Contact Hrs.**	**Mapped CO**
1	**BASIC PHYSICS & ELECTRICITY**	1. To study basic physics 2. To study Electricity	4	CO1
2	**MAGNETISM & ATOMIC STRUCTURE**	3. To study Magnetism and electromagnetic fields. 4. To study atomic structure.	4	CO2
3	**X-RAYS**	5. To study X-Ray Production and Properties. 6. To study the design of the X-Ray tube and its types.	4	CO3
4	**ANODE & FILTERS**	7. To study the structure of different types of Anodes. 8. To study the Filters and Filtration technique of radiography.	4	CO4
5	**GRID & BEAM RESTRICTION DEVICES**	9. To study the structure and working of Grid used in radiology. 10. To study the beam restriction devices.	4	CO5

Reference Books:

1. Diagnostics X-Ray Imaging Quality Assurance by M.A. Periard and P. Chaloner.
2. Textbook of Radiology and imaging- by David Sutton.

e-Learning Source:

1. https://byjus.com/physics/electricity-and-magnetism/
2. https://byjus.com/chemistry/atoms-and-molecules/
3. https://en.wikipedia.org/wiki/X-ray

	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
CO1	3	2	3	3	3	2	3	2	3	3	1	3	2	3	3	2
CO2	3	2	3	3	2	3	2	3	2	3	2	3	2	3	3	2
CO3	2	3	2	2	3	3	2	2	3	3	3	3	2	3	3	3
CO4	2	2	2	3	2	3	2	3	2	3	2	3	3	2	3	2
CO5	3	3	3	2	3	2	3	2	3	3	2	3	2	3	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	
RS107	BASIC PHYSICS AND RADIATION PHYSICS-LAB	✓	✓	✓	✓		✓	✓	**3,4**

INTEGRAL UNIVERSITY, LUCKNOW

INTEGRAL INSTITUTE OF ALLIED HEALTH SCIENCES & RESEARCH

DEPARTMENT OF PARAMEDICAL SCIENCES

BACHELOR OF MEDICAL RADIOLOGICALIMAGING SCIENCES (BMRIS)

SYLLABUS

YEAR/ SEMESTER: I/II

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

Program: BMRIS 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	RS108	Human Anatomy-II	Core	2	1	0	40	20	60	40	100	2:1:0	3
2	RS109	Human Physiology-II	Core	2	1	0	40	20	60	40	100	2:1:0	3
3	RS110	Radiation Hazard, Control & Radiotherapy	Core	3	1	0	40	20	60	40	100	3:1:0	4
4	RS111	Conventional Radiographic Techniques-I	Core	2	1	0	40	20	60	40	100	2:1:0	3
5	RS112	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	RS113	Human Anatomy-II Lab	Core	0	0	2	40	20	60	40	100	0:0:1	1
2	RS114	Human Physiology-II Lab	Core	0	0	2	40	20	60	40	100	0:0:1	1
3	RS115	Radiation Hazard, Control & Radiotherapy - Lab	Core	0	0	2	40	20	60	40	100	0:0:1	1
4	RS116	Conventional Radiographic Techniques-I Lab	Core	0	0	4	40	20	60	40	100	0:0:2	2
Total				**14**	**06**	**10**	**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	RS108	Human Anatomy-II	Core	√	√	√	√		√	√	3,4
2	RS109	Human Physiology-II	Core	√	√	√	√		√	√	3,4
3	RS110	Radiation Hazard, Control & Radiotherapy	Core	√	√	√	√		√	√	3,4
4	RS111	Conventional Radiographic Techniques-I	Core	√	√	√	√		√	√	3,4
5	RS112	Medical Law & Ethics	Core	√	√	√	√		√	√	3,4, 11
6	LN131	Effective Communication and Media Studies in English	Core			√					3,4, 11, 16
PRACTICAL											
1	RS113	Human Anatomy-II Lab	Core	√	√	√	√		√	√	3,4
2	RS114	Human Physiology-II Lab	Core	√	√	√	√		√	√	3,4
3	RS115	Radiation Hazard, Control & Radiotherapy -Lab	Core	√	√	√	√		√	√	3,4
4	RS116	Conventional Radiographic Techniques-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	**RS108**	**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	To ensure complete and comprehensive knowledge of all Anatomical Structures of body.						

Course Outcomes	
CO1	To study about Structures of Respiratory system and their blood & Nerve supply.
CO2	To study about Structures of Digestive system and their blood & Nerve supply.
CO3	To study about Structures of Urinary system and their blood & Nerve supply.
CO4	To study about Structures of Endocrine system and their blood & Nerve supply.
CO5	To study about Structures of Lymphatic system and their blood & Nerve supply.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	**RESPIRATORY SYSTEM**	1. Introduction to the system and organs, Orientation of Thoracic cage- boundaries, inlet, outlet & walls. 2. Nose, pharynx, Larynx extent, walls with associated cartilages & muscles with blood and nerve supply. 3. Trachea- extent & brief structure, Bronchi, Bronchioles and alveoli along with blood and nerve supply. 4. Lungs- Surfaces, borders, lobes, fissures, pleural cavity and fluid. 5. Intercostal muscles - origin, insertion, nerve supply 6. Diaphragm - origin, insertion, nerve supply. 7. Joints of Thorax.	6	CO1
2	**DIGESTIVE SYSTEM**	1. Introduction and parts of the system, Blood vessel and layers of GIT. 2. Oral cavities (boundaries), teeth, tongue, enumerate muscles & papillae, and salivary glands. 3. Pharynx (extent, parts & boundaries) and Oesophagus (parts, extent, constrictions, sphincters). 4. Stomach - location, parts, surfaces, curvatures, nerve supply. 5. Small Intestine parts, the difference between duodenum, jejunum & ileum, nerve supply. 6. Large intestine - parts & their features with blood and nerve supply. 7. Liver- location, surfaces, border, lobes, Gall bladder-location, parts & function, Pancreas -location, parts, surfaces, borders & its ducts.	6	CO2
3	**URINARY SYSTEM**	1. Introduction and Parts of Urinary system. 2. Kidney- Structure (surfaces, poles, borders, hilum) & function. 3. Structure of nephron, Ureter (length, parts, constrictions), Urinary bladder (location, capacity, surfaces, borders, parts, openings) and Urethra (parts).	6	CO3
4	**ENDOCRINE SYSTEM**	1. Introduction of Gland and their types. 2. Pituitary gland locations, parts, enumerate types of cells & hormones secreted. 3. Thyroid gland- location, parts, features & blood supply. 4. Parathyroid S - 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, Lymph, lymphatic capillaries and vessels. 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. Ross & Wilson, (2014), Anatomy & Physiology in health & illness,11th edition, Elsevier Publications.
2. Chaurasia B D, (2016), Human Anatomy, 7th edition, CBS publishers
3. Ross & Wilson, (2014), Anatomy & Physiology in health & illness,11th edition, Elsevier Publications.

e-Learning Source:

1 https://my.clevelandclinic.org/health/articles/21205-respiratory-system
2 https://my.clevelandclinic.org/health/body/7041-digestive-system
3 **https://en.wikipedia.org/wiki/Urinary_system**

	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
CO1	3	2	1	3	1	3	1	2	3	1	2	3	3	2	3	3
CO2	2	1	2	2	3	2	3	1	2	2	3	2	3	2	3	3
CO3	3	2	1	3	2	3	2	2	3	3	2	3	2	3	2	2

CO4	2	1	2	2	3	2	3	1	2	2	3	2	2	2	2	3
CO5	3	2	3	1	2	3	2	2	3	3	1	3	3	3	3	2

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	
RS108	HUMAN ANATOMY- II	✓	✓	✓	✓		✓	✓	**3,4**

Integral University, Lucknow

Effective from Session: 2023-24							
Course Code	**RS109**	**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 functions of included organs and organ systems in normal human body.						

Course Outcomes	
CO1	To learn about Physiological functions of Digestive system, organs of the system and content of it.
CO2	To learn about Physiological functions of Respiratory system, organs of the system and content of it.
CO3	To learn about Physiological functions of Endocrine system, organs of the system and content of it.
CO4	To learn about Physiological functions of Urinary system, organs of the system and content of it.
CO5	To learn about Physiological functions of Lymphatic & Muscular system and organs of the system.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	**DIGESTIVE SYSTEM**	1. Digestive system: Basic physiology of organs of the digestive system (Salivary glands, Gastric glands, Pancreas, Liver, Gallbladder). 2. Digestive fluids composition and functions- Saliva, gastric juice, Succus Intericus, Pancreatic Juice, and Bile Juice. 3. Physiological functions of Liver and Pancreas. 4. Digestion and Absorption of carbohydrate, fat and proteins.	6	CO1
2	**RESPIRATORY SYSTEM**	**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.	6	CO2
3	**ENDOCRINE GLAND**	1. **Endocrine system:** Introduction of Endocrine system. 2. Physiological Functions of Pituitary hormones, Thyroid hormones, Parathyroid hormones, Adrenal hormones, Pineal hormones, Ovarian hormones, Testes hormones, Thymus hormones, Other hormones. 3. Vitamins and Nutrients.	6	CO3
4	**URINARY SYSTEM**	**1.** Functions of Kidneys, Urine formation, (Glomerular filtration and tubular Reabsorption), Electrolytes: their balances and imbalances Introduction of acidosis and alkalosis.	6	CO4
5	**LYMPHATIC & MUSCULAR SYSTEM**	**1. Lymphatic System:** Introduction to Physiology of Lymphatic System, Lymph, lymphatic capillaries and vessels, Lymph nodes, Spleen, Thymus and Tonsil. **2. Muscular System:** Muscle nerve physiology, types of muscles, their gross structural and functional difference with reference to properties.	6	CO5

Reference Books:

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

e-Learning Source:

1. https://samples.jbpub.com/9781284035179/9781284030341_CH01_Secure.pdf
2. https://en.wikipedia.org/wiki/Blood
3. https://en.wikipedia.org/wiki/Respiration_(physiology)

	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
CO1	3	2	1	3	1	3	1	2	3	1	2	3	3	2	3	3
CO2	2	1	2	2	3	2	3	1	2	2	3	2	3	2	3	3
CO3	3	2	1	3	2	3	2	2	3	3	2	3	2	3	2	2
CO4	2	1	2	2	3	2	3	1	2	2	3	2	2	2	2	3
CO5	3	2	3	1	2	3	2	2	3	3	1	3	3	3	3	2

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

Attributes & SDGs

Course Code	Course Title	Attributes							SDGs No.
RS109	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	**RS110**	**Title of the Course**	**RADIATION HAZARDS, CONTROL AND RADIOTHERAPY**	**L**	**T**	**P**	**C**
Year	**I**	**Semester**	**II**	**3**	**1**	**0**	**4**
Pre-Requisite	**Nil**	**Co-requisite**	**Nil**				
Course Objectives	The objective is to learn aim, objective, philosophy and principle of radiation, radiation protection to protect oneself from biological effect of radiation and monitoring of radiation exposure, Radiotherapy & planning of Radiotherapy.						

Course Outcomes	
CO1	Student will be able to know about Radiation Protection and Governing bodies of Radiology department.
CO2	Student will be able to know about Radiation detection devices used in radiography and radiotherapy.
CO3	Student will be able to know about Planning or Radiology department installation.
CO4	Student will be able to know about Radiotherapy & it's type.
CO5	Student will be able to understand the Radiotherapy planning & devices used for it.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	**RADIATION PROTECTION & GOVERNING BODIES**	1. Radiation protection: Definition of radiation hazards. 2. Principle, history & development - National & international agencies; AERB, BARC, ICRP, WHO,IAEA and their role. 3. Sources of radiation-natural-man made & internal exposures. 4. Permissible dose levels on and around sealed source housing and installation principles of radiation protection.	**8**	CO1
2	**RADIATIN DETECTION**	1. **Radiation Detection-** Principle of radiation detection-Basic principles of ionization chambers, proportional counters, G.M counters and scintillation detectors. 2. Area monitoring and radiation survey, practical use of survey meter, zone monitors and phantoms. 3. Survey in teletherapy, brachytherapy and simulator units.	**8**	CO2
3	**PLANNING OF RADIATION INSTALLATION**	1. Protection from primary, leakage and scattered 4 radiations. 2. Concepts of work load use factor, occupancy factor & distance. 3. Barrier design- barrier materials-concrete, brick& lead, Primary & secondary barrier designcalculations. 4. Design of doors. Control of radiation-effects of time, distance and shielding.	**6**	CO3
4	**RADIOTHERAPY**	**1. Radiotherapy:** Introduction and Types of Radiotherapy. **2. Teletherapy:** Introduction, types and Common Modalities - Telecobalt Unit, Linear Accelerator Unit, Orthovoltage unit, Betatron, Cyclotron. **3. Brachytherapy:** Introduction, types, radioactive elements used in brachytherapy, Applicators, After loading and Remote after loading system. **4. Radiosurgery:** Introduction, X-Ray and Gamma Knife.	**10**	CO4
5	**RADIOTHERAPY PLANNING**	1. Radiotherapy planning 2. Wedge filters, wedge angle, hinge angle, Compensator beams flattering filters, scattering foils. 3. Physical properties of phantom materials, bolus and substitutes. 4. Factor used for treatment dose calculations, Daily treatment time and monitor units' calculation.	**8**	CO5

Reference Books:

1. Sherer MA, Visconti PJ, Ritenour ER, Haynes K. Radiation Protection in Medical Radiography-E-Book. Elsevier Health Sciences; 2014 Mar 12
2. Brandon AN, Hill DR. Selected list of books and journals in allied health. Bulletin of the Medical Library Association. 1996.
3. Long BW, Frank ED, Ehrlich RA. Radiography Essentials for Limited Practice-E- Book. Elsevier Health Sciences; 2016 Sep 6.
4. Durrani SA, Ilic R, editors. Radon measurements by etched track detectors: applications in radiation protection, earth sciences and the environment. world scientific.
5. Turner JE. Atoms, radiation, and radiation protection. John Wiley & Sons; 2008 Jan 8.
6. www.AERB.com (Guidelines and Details of Quality Control in Radiology).

e-Learning Source:

1. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6037814/
2. https://www.safeopedia.com/definition/446/personal-monitoring

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
CO1	3	2	1	3	3	3	3	2	3	3	3	3	3	2	3	3
CO2	3	2	1	3	3	3	3	2	3	3	3	3	3	2	3	3
CO3	3	2	1	3	3	3	3	2	3	3	3	3	2	3	2	2
CO4	3	2	1	3	3	3	3	2	3	3	3	3	2	2	2	3
CO5	3	2	1	3	3	3	3	2	3	3	3	3	3	3	3	2

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

Attributes & SDGs

Course Code	Course Title	Attributes							SDGs No.
RS110	RADIATION HAZARDS, CONTROL AND RADIOTHERAPY	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	
		✓	✓	✓	✓		✓	✓	**3,4**

Integral University, Lucknow

Effective from Session: 2023-24							
Course Code	**RS111**	**Title of the Course**	**CONVENTIONAL RADIOGRAPHIC TECHNIQUES- I**	**L**	**T**	**P**	**C**
Year	**II**	**Semester**	**III**	**2**	**1**	**0**	**3**
Pre-Requisite	**Nil**	**Co-requisite**	**Nil**				
Course Objectives	The main objective is to aware the student about conventional technique of radio imaging technique like (manual image processing & fluoroscopy / dynamic imaging) along with image formation, developing and reading.						

Course Outcomes	
CO1	Students will be able to learn about Radiation, Sources of radiation, Radioactivity, Half-life, Ionizing & Non-ionizing Radiation, and History of x-ray production.
CO2	Students will be able to learn about Characteristic Radiation, Bremsstrahlung Radiation, X-ray Emission Spectrum, and the Properties of X-ray.
CO3	Students will be able to learn about Image recording systems.
CO4	Students will be able to learn about film processing techniques.
CO5	Students will be able to understand the Fluoroscopy technique.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	**RADIATION, RADIOACTIVITY & X-RAYS**	1. Radiation, Types of radiation, Sources of radiation, Radioactivity, its types Half-life, History of x-ray production, Principle of Xray production, Development of modern Radiology X-Ray Tube- External components- X-ray tube support, Protective housing, Glass or metal Enclosure, Internal components- cathode, anode, focusing cup, focal spot, Line focus principle, Heel effect, X-ray tube failure, Rating charts.	6	CO1
2	**TYPES OF X-RAYS & AFFETING FACTORS**	1. Characteristic Radiation, Bremsstrahlung Radiation, X-ray Emission Spectrum, Properties of X-ray, X-ray quality, X-ray quantity, Half value layer. Interaction of x-ray with matter- Coherent scattering, Compton effect, Photoelectric effect, Pair Production, Photodisintegration, Differential absorption.	6	CO2
3	**THE RECORDING SYSTEM**	1. Introduction of X-ray film, its construction, and Types of film. Formation of the latent image, Film storage rules and guidelines, film handling and care 2. Introduction of an Intensifying screen, its construction, Types and properties. Luminescence, screen characteristics. 3. Introduction of Cassette, its construction and types, silver recovery, Film artifact and its types	6	CO3
4	**FILM PROCESSING**	1. Introduction of Film processing, its types (Manual Processing, Automatic processing), Processing sequence, wetting, developing, fixing, washing, Drying, Darkroom, its purpose and location, layout of dark room. Characteristic curve, Optical density, Geometry of Radiographic image- magnification, distortion, focal spot blur, Subject factors.	6	CO4
5	**FLUOROSCOPY**	1. Introduction to fluoroscopy, Techniques of fluoroscopy, Its construction, image intensifier - Construction and working, Flux gain, Brightness gain, Minification gain, Multifield image intensifier, Cathode ray tube.	6	CO5

Reference Books:

1. Brant WE, Helms CA, editors. Fundamentals of diagnostic radiology. Lippincott Williams & Wilkins; 2012 Mar20.
2. Curry TS, Dowdey JE, Murray RC. Introduction to the physics of diagnostic radiology.
3. AdamA, DixonAK, Gillard JH, Schaefer-Prokop C, Grainger RG, Allison DJ. Grainger &Allison's Diagnostic Radiology E-Book. Elsevier Health Sciences.
4. D N and M O Chesney- X ray equipments for student radiographers- Third edition.
5. Burgener FA, Kormano M. Differential diagnosis in conventional radiology.
6. The physics of radiology and imaging by K Thayalan.

e-Learning Source:

1. https://youtu.be/SHvAl5yIyS0
2. https://www.slideshare.net/anurajgowda/dark-room-procedures-72201093
3. https://en.wikipedia.org/wiki/Fluoroscopy

	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
CO1	1	3	1	2	2	1	3	1	2	2	2	2	2	3	2	3
CO2	1	3	1	3	2	2	2	1	3	3	3	3	3	2	2	1
CO3	1	3	1	2	3	2	3	1	2	1	2	2	3	3	3	2
CO4	1	3	1	2	2	3	2	1	3	2	1	3	2	3	3	3
CO5	1	3	1	2	2	2	2	1	2	2	2	2	2	3	2	3

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

Attributes & SDGs

Course Code	Course Title	Attributes							SDGs No.
RS111	CONVENTIONAL RADIOGRAPHIC TECHNIQUES- I	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	
		√	√	√	√		√	√	3,4

Integral University, Lucknow

Effective from Session: 2017-18							
Course Code	**RS112**	**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	Students will abide by the rule and regulation of the medicine and have abundant knowledge on professional attitude and communication among the colleague and patients.
CO2	Students will be able to know the Rights of Patients during Radiographic examination.
CO3	Students will able to know medico legal aspects in Radiology department.
CO4	Students will able to know about professional Indemnity Insurance Policies.
CO5	Students will able to know about Emergency care and Life support.

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 PATIENT**	1. Autonomy and informed consent. 2. Right of patients Care of the terminally ill. 3. Euthanasia Organ transplantation, ethics and law	8	CO2
3	**MEDICO LEGAL ASPECTS**	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	**PROFESSIONAL INDEMNITY INSURANCE POLICY**	1. Professional Indemnity insurance policy. 2. Development of standardized protocol to avoid near miss or sentinel events obtaining aninformed consent	8	CO4
5	**EMERGENCY CARE AND LIFE 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 anemergency 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.
5. Frank ED, Long BW, Smith BJ. Merrill's Atlas of Radiographic Positioning and Procedures-E-Book. Elsevier Health Sciences; 2013 Aug 13.

e-Learning Source:

1. https://www.karger.com/Article/FullText/509119
2. https://www.gov.uk/government/publications/nhs-screening-programmes-duty-of-candour/medico-legal-aspects
3. https://www.physio-pedia.com/Basic_Life_Support_(BLS)

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
CO1	3	2	1	3	3	3	3	2	3	3	3	3	3	2	3	3
CO2	3	2	1	3	3	3	3	2	3	3	3	3	3	2	3	3
CO3	3	2	1	3	3	3	3	2	3	3	3	3	2	3	2	2
CO4	3	2	1	3	3	3	3	2	3	3	3	3	2	2	2	3
CO5	3	2	1	3	3	3	3	2	3	3	3	3	3	3	3	2

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

Attributes & SDGs

Course Code	Course Title	Attributes							SDGs No.
RS112	MEDICAL LAW & ETHICS	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	
		√	√	√	√		√	√	**3,4, 11**

Integral University, Lucknow

Effective from Session: 2017-18							
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 along with knowledge of Professional and Media Skill Development, Career enhancement tips and goal oriented learning.						

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 INPRACTICE**	1. Do's and Don'ts of Formal and Informal Communication 2. Tips on Career Management- Setting Clear Goals, Skill Development, Network Building andProfessional Relationship Etiquette, Knowing Aptitude and Values. 3. Classroom Practice- 4. JAM (Just A Minute) 5. Extempore, Rebuttal, Forum, Role Play.	**7**	CO1
2	**MASS COMMUNICATIONAND JOURNALISM**	1. Introduction to Mass Communication. 2. Types of Mass Communication/ Mass Media 3. Impact of Globalization on Mass Media 4. Socio Political Impact of Digital Media 5. Advertisement- Ethical and Unethical Advertisement, Jingles,Tag Lines, Punch Lines, MediaWriting.	**7**	CO2
3	**FUNDAMENTALS OF ACADEMIC WRITING**	1. The four main types of academic writing- Descriptive, Analytical, Persuasive and Critical. 2. Writing Book Review, 3. Introduction to Descriptive Writing 4. Techniques and Features of Descriptive Writing - Character, Place and Travel Description,Event, Movie and Food description.	**7**	CO3
4	**CONVERSATION SKILLS**	1. Phonetics- Learning Speech Mechanism (Voice and Accent) A. Introduction- Self and Other-Guest Speaker / Colleague B. Polite Conversational Etiquette 1. Varieties of English Language; their difference in terms of Pronunciation, Vocabulary andSpelling: A. British B. American	**7**	CO4
5	**ACADEMIC PROJECT**	1. Creating News Bytes 2. Writing News Report 3. Creating Jingles and Tag Lines for Famous Brands. 4. Writing Editorial on a Topical Subject 5. Writing Film Reviews 6. Travelogue	**4**	CO5

Reference Books:

1. Kumar, Sanjay and PushpLata. Communication Skills. Oxford University Press, Oxford 2011.
2. Raman, Meenakshi, and Sangeeta Sharma. *Technical Communication: Principals and Practice*. Second Edition, Oxford University Press, 2012.
3. Raina, Roshan Lal, Iftikhar Alam, and Faizia Siddiqui. *Professional Communication*. Himalaya PublicationHouse2012.
4. Agarwal, Malti.Professional Communication. 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: 2023-24							
Course Code	**RS113**	**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	Demonstration of Respiratory, digestive, Urinary, Endocrine & Lymphatic System.						

Course Outcomes	
CO1	To study about Structures of Respiratory system.
CO2	To study about Structures of Digestive system.
CO3	To study about Structures of Urinary system.
CO4	To study about Structures of Endocrine system.
CO5	To study about Structures of Lymphatic system.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	**RESPIRATORY SYSTEM**	1. Demonstration of Respiratory System. 2. Demonstration of Lungs.	4	CO1
2	**DIGESTIVE SYSTEM**	3. Demonstration of Digestive System. 4. Demonstration of Stomach, Small Intestine & Large Intestine. 5. Demonstration of Liver. 6. Demonstration of Pancreas.	4	CO2
3	**URINARY SYSTEM**	7. Demonstration of Urinary System. 8. Demonstration of Kidney and Nephron.	4	CO3
4	**ENDOCRINE SYSTEM**	9. Demonstration of Endocrine Glands. 10. Demonstration of Thyroid Gland.	4	CO4
5	**LYMPHATIC SYSTEM**	11. Demonstration of Lymphatic System. 12. Demonstration of Spleen.	4	CO5

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://my.clevelandclinic.org/health/articles/21205-respiratory-system
2. https://my.clevelandclinic.org/health/body/7041-digestive-system
3. https://en.wikipedia.org/wiki/Urinary_system

	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
CO1	2	3	3	2	1	2	3	2	1	1	3	1	2	3	3	2
CO2	1	3	2	2	2	3	2	3	1	3	2	1	2	2	3	2
CO3	2	3	2	2	3	2	3	2	1	1	2	1	2	2	3	2
CO4	1	3	2	1	3	3	2	3	1	2	2	1	2	2	3	2
CO5	2	3	2	1	3	2	3	2	1	2	3	1	2	3	3	2

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	
RS113	HUMAN ANATOMY- II LAB	✓	✓	✓	✓		✓	✓	**3,4**

Integral University, Lucknow

Effective from Session: 2023-24							
Course Code	**RS114**	**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	**Learn how to taking History , general examination andVital Parameters of Patients**						

Course Outcomes: After the successful course completion, learners will develop following attributes:	
CO1	To learn about Heart Sound, Bleeding time and how to measure them.
CO2	To study about Clotting Time, CSF examination and how to perform them.
CO3	To study about Contraceptive devices & Microscopic structure of bones through slides.
CO4	To learn about microscopic structure of muscles and Reflexes.
CO5	To learn how Cerebrum, Cerebellum and Sensory organs work through demonstration.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	**HEART SOUND & BLEEDING TIME**	1. Demonstration of Auscultation of Heart Sound. 2. To perform bleeding time.	**4**	CO1
2	**CLOTTING TIME & CSF EXAMINATION**	3. To perform clotting time. 4. To study about CSF examination.	**4**	CO2
3	**IUCD & MICROSCOPIC BONE STUDY**	5. To study about intrauterine contraceptive devices. 6. To demonstrate microscopic structure of bones with permanent slides.	**4**	CO3
4	**MICROSCOPIC MUSCLES STUDY & REFLEXES**	7. To demonstrate microscopic structure of muscles with permanent slides. 8. Demonstration of Reflexes.	**4**	CO4
5	**PARTS OF BRAIN & SENSORY ORGAN FUNCTIONS**	9. Demonstration of functioning of Cerebrum and Cerebellum. 10. Demonstration of functioning of Sensory organs.	**4**	CO5

Reference Books:

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

e-Learning Source:

1. https://samples.jbpub.com/9781284035179/9781284030341_CH01_Secure.pdf
2. https://en.wikipedia.org/wiki/Blood
3. https://en.wikipedia.org/wiki/Respiration_(physiology)

	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
CO1	2	3	3	2	1	2	3	2	1	1	3	2	2	3	3	2
CO2	1	3	2	2	2	3	2	3	3	3	2	1	2	2	3	2
CO3	2	3	2	2	3	2	3	2	1	1	2	3	2	3	3	2
CO4	1	3	2	1	3	3	2	3	2	2	2	3	2	2	3	2
CO5	2	3	2	1	3	2	3	2	2	2	3	1	2	3	3	2

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

Attributes & SDGs

Course Code	**Course Title**	**Attributes**							**SDGs No.**
RS114	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	**RS115**	**Title of the Course**	**RADIATION HAZARD, CONTROL AND RADIOTHERAPY-LAB**	**L**	**T**	**P**	**C**
Year	**I**	**Semester**	**II**	0	0	2	1
Pre-Requisite	**Nil**	**Co-requisite**	**Nil**				
Course Objectives	Demonstration of the method of radiation hazards, protection, personnel monitoring systems and radiation installation.						

Course Outcomes: After the successful course completion, learners will develop following attributes:	
CO1	Student will be able to know about Radiation and type of it, Radiation detection devices used in radiography and radiotherapy.
CO2	Student will be able to know about Planning or Radiology department installation.
CO3	Student will be able to know about Radiotherapy & Teletherapy.
CO4	Student will be able to know about Orthovoltage, Betatron & Brachytherapy.
CO5	Student will be able to understand the Radiosurgery & filters used in Radiotherapy.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	**RADIATION & DETECTION OF RADIATION**	1. To study Radiation and its types. 2. To study Radiation detector GM Counter & Scintillation detector. 3. To study Area monitoring devices.	4	CO1
2	**PLANNING OF RADIATION INSTALLATION**	4. To study Primary, Leakage and Scattered Radiation and protection from them. 5. To study the Survey Meters. 6. To study the Installation of a Radiology department.	4	CO2
3	**RADIOTHERAPY & TELETHERAPY**	7. To study Radiotherapy and Teletherapy. 8. To study LINAC structure.	4	CO3
4	**BRACHYTHERAPY**	9. To study Orthovoltage and Betatron units. 10. To study Brachytherapy and equipments of it.	4	CO4
5	**RADIOSURGERY & FILTERS USED IN RADIOTHERAPY**	11. To study the Radiosurgery. 12. To study the Filters used in Radiotherapy.	4	CO5

Reference Books:

1. Sherer MA, Visconti PJ, Ritenour ER, Haynes K. Radiation Protection in Medical Radiography-E-Book. Elsevier Health Sciences; 2014 Mar 12.
2. Brandon AN, Hill DR. Selected list of books and journals in allied health. Bulletin of the Medical Library Association. 1996.
3. Long BW, Frank ED, Ehrlich RA. Radiography Essentials for Limited Practice-E- Book. Elsevier Health Sciences; 2016 Sep 6.
4. Durrani SA, Ilic R, editors. Radon measurements by etched track detectors: applications in radiation protection, earth sciences and the environment. world scientific.
5. Turner JE. Atoms, radiation, and radiation protection. John Wiley & Sons; 2008 Jan 8.
6. www.AERB.com (Guidelines and Details of Quality Control in Radiology).

e-Learning Source:

1. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6037814/
2. https://www.safeopedia.com/definition/446/personal-monitoring

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
CO1	2	3	3	2	1	2	3	2	1	1	3	1	2	3	3	2
CO2	1	3	2	2	2	3	2	3	2	3	2	2	2	2	3	2
CO3	2	3	2	2	3	2	3	2	3	1	2	3	2	3	3	2
CO4	1	3	2	1	3	3	2	3	1	2	2	3	2	2	3	2
CO5	2	3	2	1	3	2	3	2	3	2	3	3	2	3	3	2

2- 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	
RS115	**RADIATION HAZARD, CONTROL AND RADIOTHERAPY-LAB**	✓	✓	✓	✓		✓	✓	**3,4**

Integral University, Lucknow

Effective from Session: 2023-24							
Course Code	**RS116**	**Title of the Course**	**CONVENTIONAL RADIOGRAPHIC TECHNIQUES-I LAB**	**L**	**T**	**P**	**C**
Year	**II**	**Semester**	**III**	**0**	**0**	**4**	**2**
Pre-Requisite	**Nil**	**Co-requisite**	**Nil**				
Course Objectives	The main objective is to aware the student about conventional technique of radio imaging technique like (manual image processing & fluoroscopy / dynamic imaging) along with image formation, developing and reading. Students must know about its practical aspects and handling procedures.						

Course Outcomes	
CO1	Students will be able to learn about Radiological imaging techniques.
CO2	Students will be able to learn about X-Ray production.
CO3	Students will be able to learn about X-ray Recording system.
CO4	Students will be able to learn about understanding the Processing of Radiograph.
CO5	Students will be able to understand the Fluoroscopy in detail.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	**INTRODUCTION TO RADIOLOGIC IMAGING**	1. Introduction to Radiologic Imaging.	8	CO1
2	**X-RAY PRODUCTION**	2. X-Ray Production.	8	CO2
3	**RECORDING SYSTEM**	3. The Recording System.	8	CO3
4	**PROCESSING OF LATENTIMAGE**	4. Processing of Latent Image techniques.	8	CO4
5	**FLUOROSCOPY**	5. Handling of Fluoroscopy.	8	CO5

Reference Books:

1. Brant WE, Helms CA, editors. Fundamentals of diagnostic radiology. Lippincott Williams & Wilkins; 2012 Mar 20.
2. Curry TS, Dowdey JE, Murray RC. Introduction to the physics of diagnosticradiology.
3. Adam A, Dixon AK, Gillard JH, Schaefer-Prokop C, Grainger RG, Allison DJ. Grainger & Allison's Diagnostic Radiology E-Book. Elsevier Health Sciences.
4. D N and M O Chesney- X ray equipments for student radiographers- Thirdedition.
5. Burgener FA, Kormano M. Differential diagnosis in conventional radiology.

e-Learning Source:

1. https://youtu.be/SHvAl5yIyS0
2. https://www.slideshare.net/anurajgowda/dark-room-procedures-72201093
3. https://en.wikipedia.org/wiki/Fluoroscopy

PO-PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	3	1	2	3	2	1	1	2	3	1	2	2	3	2	**3**
CO2	1	3	1	3	3	3	3	1	3	3	3	3	3	3	3	2
CO3	1	3	1	2	1	2	1	1	2	2	1	2	3	1	2	**3**
CO4	1	3	1	2	2	2	2	1	3	3	2	3	2	2	2	1
CO5	1	3	1	2	1	2	2	1	2	2	2	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	
RS116	CONVENTIONAL RADIOGRAPHIC TECHNIQUES-ILAB	√	√	√	√		√	√	**3,4**