



INTEGRAL UNIVERSITY, LUCKNOW

INTEGRAL INSTITUTE OF ALLIED HEALTH SCIENCES & RESEARCH

DEPARTMENT OF PARAMEDICAL SCIENCES

**BACHELOR OF SCIENCE IN RADIOLOGICAL
IMAGING TECHNOLOGY
(B.Sc. RIT)**

SYLLABUS

YEAR/ SEMESTER: I/I



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

Program: B.Sc. RIT

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 | RT101 | Human Anatomy- I | Core | 3 | 1 | 0 | 40 | 20 | 60 | 40 | 100 | 3:1:0 | 4 |
| 2 | RT102 | Human Physiology-I | Core | 3 | 1 | 0 | 40 | 20 | 60 | 40 | 100 | 3:1:0 | 4 |
| 3 | RT103 | Basic and Radiation Physics | Core | 3 | 1 | 0 | 40 | 20 | 60 | 40 | 100 | 3:1:0 | 4 |
| 4 | RT104 | 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 | RT105 | Human Anatomy-I Lab | Core | 0 | 0 | 2 | 40 | 20 | 60 | 40 | 100 | 0:0:1 | 1 |
| 2 | RT106 | Human Physiology-I Lab | Core | 0 | 0 | 2 | 40 | 20 | 60 | 40 | 100 | 0:0:1 | 1 |
| 3 | RT107 | 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 | RT101 | Human Anatomy- I | Core | √ | √ | √ | √ | | √ | √ | 3,4 |
| 2 | RT102 | Human Physiology-I | Core | √ | √ | √ | √ | | √ | √ | 3,4 |
| 3 | RT103 | Basic and Radiation Physics | Core | √ | √ | √ | √ | | √ | √ | 3,4 |
| 4 | RT104 | 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 | RT105 | Human Anatomy-I Lab | Core | √ | √ | √ | √ | | √ | √ | 3,4 |
| 2 | RT106 | Human Physiology-I Lab | Core | √ | √ | √ | √ | | √ | √ | 3,4 |
| 3 | RT107 | 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 | RT101 | 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. Chaurasia'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>

| | 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. |
|-------------|------------------|---------------|------------------|----------------------|--------------------|---------------------------------|----------------|------------------------|-------------|
| RT101 | HUMAN ANATOMY- I | Employability | Entrepreneurship | Skill Development | Gender Equality | Environment & Sustainability | Human Value | Professional Ethics | 3,4 |
| | | √ | √ | √ | | | √ | √ | |



Integral University, Lucknow

Effective from Session: 2023-24

| Effective from Session: 2023-24 | | | | | | | |
|---------------------------------|---|---------------------|--------------------|---|---|---|---|
| Course Code | RT102 | 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. Sembulingam, 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_\(physiology\)](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. |
|-------------|--------------------|---------------|------------------|-------------------|-----------------|------------------------------|-------------|---------------------|----------|
| RT102 | HUMAN PHYSIOLOGY-I | Employability | Entrepreneurship | Skill Development | Gender Equality | Environment & Sustainability | Human Value | Professional Ethics | 3,4 |
| | | f | f | f | f | | f | f | |



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|---------------------------------|--|---------------------|-----------------------------|---|---|---|---|
| Effective from Session: 2023-24 | | | | | | | |
| Course Code | RT103 | 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 David Sutton.
3. Christensen's Physics of diagnostic radiology.
4. The Essentials 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>

| PO-PSO CO | Course Articulation Matrix: (Mapping of Cos with Pos and PSOs) | | | | | | | | | | | | | | | |
|-----------|--|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|
| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | PSO4 |
| 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. |
|-------------|-----------------------------|---------------|------------------|-------------------|-----------------|------------------------------|-------------|---------------------|----------|
| RT103 | 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 | RT104 | 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. |
|-------------|------------------------------|---------------|------------------|-------------------|-----------------|------------------------------|-------------|---------------------|----------|
| RT104 | COMMUNITY HEALTH CARE ISSUES | Employability | Entrepreneurship | Skill Development | Gender Equality | Environment & Sustainability | Human Value | Professional Ethics | 3,4 |
| | | <i>f</i> | <i>f</i> | <i>f</i> | <i>f</i> | | <i>f</i> | <i>f</i> | |



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. 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 | 1. Elementary knowledge of DOS commands DIR, CLS, DATE, TIME, MD, CD, RD, 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 source. Adding and removing fields from the data source. 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. |
|-------------|---------------------------|---------------|------------------|-------------------|-----------------|------------------------------|-------------|---------------------|----------|
| CS103 | INTRODUCTION TO COMPUTERS | Employability | Entrepreneurship | Skill Development | Gender Equality | Environment & Sustainability | Human Value | Professional Ethics | 3,4, 11 |



Integral University, Lucknow

Effective from Session: 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 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://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 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: 2023-24 | | | | | | | |
| Course Code | RT105 | 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. |
|-------------|----------------------|---------------|------------------|-------------------|-----------------|------------------------------|-------------|---------------------|----------|
| RT105 | HUMAN ANATOMY- I LAB | Employability | Entrepreneurship | Skill Development | Gender Equality | Environment & Sustainability | Human Value | Professional Ethics | 3,4 |
| | | f | f | f | f | | f | f | |



Integral University, Lucknow

| Effective from Session: 2023-24 | | | | | | | |
|---------------------------------|--|---------------------|-------------------------|---|---|---|---|
| Course Code | RT106 | 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. | Mappe d 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.jpup.com/9781284035179/9781284030341_CH01_Secure.pdf
2. <https://en.wikipedia.org/wiki/Blood>
3. [https://en.wikipedia.org/wiki/Respiration_\(physiology\)](https://en.wikipedia.org/wiki/Respiration_(physiology))

| PO-PSO CO | Course Articulation Matrix: (Mapping of COs with POs and PSOs) | | | | | | | | | | | | | | | |
|--------------|--|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|
| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | PSO4 |
| 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. |
|-------------|-------------------------|---------------|------------------|-------------------|-----------------|------------------------------|-------------|---------------------|----------|
| RT106 | HUMAN PHYSIOLOGY- I LAB | Employability | Entrepreneurship | Skill Development | Gender Equality | Environment & Sustainability | Human Value | Professional Ethics | 3,4 |
| | | f | f | f | f | | f | f | |



Integral University, Lucknow

| | | | | | | | |
|---------------------------------|---|---------------------|---------------------------------|---|---|---|---|
| Effective from Session: 2023-24 | | | | | | | |
| Course Code | RT107 | 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>

| PO-PSO CO | Course Articulation Matrix: (Mapping of COs with POs and PSOs) | | | | | | | | | | | | | | | |
|------------|--|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|
| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | PSO4 |
| 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. |
|-------------|---|---------------|------------------|-------------------|-----------------|------------------------------|-------------|---------------------|----------|
| RT107 | BASIC PHYSICS AND RADIATION PHYSICS-LAB | Employability | Entrepreneurship | Skill Development | Gender Equality | Environment & Sustainability | Human Value | Professional Ethics | 3,4 |



INTEGRAL UNIVERSITY, LUCKNOW
INTEGRAL INSTITUTE OF ALLIED HEALTH SCIENCES & RESEARCH

DEPARTMENT OF PARAMEDICAL SCIENCES

**BACHELOR OF SCIENCE IN RADIOLOGICALIMAGING
TECHNOLOGY
(B.Sc. RIT)**

SYLLABUS

YEAR/ SEMESTER: I/II



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

Program: B.Sc. RIT

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 | RT108 | Human Anatomy-II | Core | 2 | 1 | 0 | 40 | 20 | 60 | 40 | 100 | 2:1:0 | 3 |
| 2 | RT109 | Human Physiology-II | Core | 2 | 1 | 0 | 40 | 20 | 60 | 40 | 100 | 2:1:0 | 3 |
| 3 | RT110 | Radiation Hazard, Control & Radiotherapy | Core | 3 | 1 | 0 | 40 | 20 | 60 | 40 | 100 | 3:1:0 | 4 |
| 4 | RT111 | Radiographic Positioning-I | Core | 3 | 1 | 0 | 40 | 20 | 60 | 40 | 100 | 3:1:0 | 4 |
| 5 | RT112 | 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 | RT113 | Human Anatomy-II Lab | Core | 0 | 0 | 2 | 40 | 20 | 60 | 40 | 100 | 0:0:1 | 1 |
| 2 | RT114 | Human Physiology-II Lab | Core | 0 | 0 | 2 | 40 | 20 | 60 | 40 | 100 | 0:0:1 | 1 |
| 3 | RT115 | Radiation Hazard, Control & Radiotherapy - Lab | Core | 0 | 0 | 2 | 40 | 20 | 60 | 40 | 100 | 0:0:1 | 1 |
| 4 | RT116 | Radiographic Positioning -I 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 | RT108 | Human Anatomy-II | Core | √ | √ | √ | √ | | √ | √ | 3,4 |
| 2 | RT109 | Human Physiology-II | Core | √ | √ | √ | √ | | √ | √ | 3,4 |
| 3 | RT110 | Radiation Hazard, Control & Radiotherapy | Core | √ | √ | √ | √ | | √ | √ | 3,4 |
| 4 | RT111 | Radiographic Positioning -I | Core | √ | √ | √ | √ | | √ | √ | 3,4 |
| 5 | RT112 | Medical Law & Ethics | Core | √ | √ | √ | √ | | √ | √ | 3,4, 11 |
| 6 | LN131 | Effective Communication and Media Studies in English | Core | | | √ | | | | | 3,4, 11, 16 |
| PRACTICAL | | | | | | | | | | | |
| 1 | RT113 | Human Anatomy-II Lab | Core | √ | √ | √ | √ | | √ | √ | 3,4 |
| 2 | RT114 | Human Physiology-II Lab | Core | √ | √ | √ | √ | | √ | √ | 3,4 |
| 3 | RT115 | Radiation Hazard, Control & Radiotherapy -Lab | Core | √ | √ | √ | √ | | √ | √ | 3,4 |
| 4 | RT116 | Radiographic Positioning -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 | RT108 | 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:

- Ross & Wilson, (2014), Anatomy & Physiology in health & illness, 11th edition, Elsevier Publications.
- Chaurasia B D, (2016), Human Anatomy, 7th edition, CBS publishers
- Ross & Wilson, (2014), Anatomy & Physiology in health & illness, 11th edition, Elsevier Publications.

e-Learning Source:

- <https://my.clevelandclinic.org/health/articles/21205-respiratory-system>
- <https://my.clevelandclinic.org/health/body/7041-digestive-system>
- 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 |



Integral University, Lucknow

| | | | | | | | | | | | | | | | | |
|-----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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. |
|-------------|-------------------|---------------|------------------|-------------------|-----------------|------------------------------|-------------|---------------------|----------|
| RT108 | HUMAN ANATOMY- II | Employability | Entrepreneurship | Skill Development | Gender Equality | Environment & Sustainability | Human Value | Professional Ethics | |
| | | f | f | f | f | | f | f | 3,4 |



Integral University, Lucknow

Effective from Session: 2023-24

| Course Code | RT109 | 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, Saunderson/Elsevier.
2. Sembulingam k, (2012), Essentials of Medical physiology, 6th edition, Jaypee Publication.
3. Sembulingam k, (2012), Essentials of Medical Physiology, 6th edition, 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, 14th edition, Wiley publications)

e-Learning Source:

1. https://samples.jpub.com/9781284035179/9781284030341_CH01_Secure.pdf
2. <https://en.wikipedia.org/wiki/Blood>
3. [https://en.wikipedia.org/wiki/Respiration_\(physiology\)](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. |
|-------------|---------------------|---------------|------------------|-------------------|-----------------|------------------------------|-------------|---------------------|----------|
| RT109 | HUMAN PHYSIOLOGY-II | Employability | Entrepreneurship | Skill Development | Gender Equality | Environment & Sustainability | Human Value | Professional Ethics | 3,4 |
| | | r | r | r | r | | r | r | |



Integral University, Lucknow

Effective from Session: 2023-24

| Course Code | RT110 | 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 & its 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 | RADIATION 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 design calculations. 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 flattening 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.safopedia.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. |
|-------------|---|---------------|------------------|-------------------|-----------------|------------------------------|-------------|---------------------|----------|
| RT110 | 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

| Effective from Session: 2023-24 | | | | | | | |
|---------------------------------|---|---------------------|----------------------------|---|---|---|---|
| Course Code | RT111 | Title of the Course | RADIOGRAPHIC POSITIONING-I | 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 basic and special projections for the better and delineation diagnosis of the disease conditions of different anatomical structure. | | | | | | |

Course Outcomes

| CO1 | Student will be able to know about the Anatomical Landmarks used for Radiography. |
|-----|---|
| CO2 | Student will be able to perform Radiographic projection of Skull. |
| CO3 | Student will be able to perform Radiographic projection of Neck. |
| CO4 | Student will be able to perform Radiographic projection of Thoracic region. |
| CO5 | Student will be able to perform Radiographic projection of Abdomen. |

| Unit No. | Title of the Unit | Content of Unit | Contact Hrs. | Mapped CO |
|----------|------------------------|--|--------------|-----------|
| 1 | ANATOMICAL TERMINOLOGY | 1. Anatomical land marks, postural variations, erect and horizontal technique, respiratory movement and diaphragm level, region densities, preparations and immobilization of patient, positioning terminology identification system. | 8 | CO1 |
| 2 | SKULL PROJECTIONS | 1. Cranial bones and facial bones Related radiological anatomy 2. Basic & special projections 3. Cranium, Skull, Sella turcica, Mastoids, Optic foramina and Orbits, Nasal bone, TM joint, Facial bone, Zygomatic arches, Mandible, Para nasal sinuses | 8 | CO2 |
| 3 | NECK PROJECTIONS | 1. Related radiological anatomy 2. Positioning- AP, Lateral, Soft Tissue Neck (STN) | 8 | CO3 |
| 4 | THORAX PROJECTIONS | 1. Related radiological anatomy 2. Chest X-ray –AP, PA, Lateral, B/L Oblique, Decubitus, Apicogram, Lordotic projection. 3. Ribs AP & Oblique 4. Sternum PA, Oblique & B/L Sternoclavicular joint projections | 8 | CO4 |
| 5 | ABDOMEN PROJECTIONS | 1. Abdomen related Radiological Anatomy. 2. Basic & special projection 3. Basic: AP supine (KUB) 4. Special: PA prone, lateral Decubitus, Erect AP, Dorsal Decubitus, Lateral 5. Acute abdomen: three-way series | 8 | CO5 |

Reference Books:

1. Whitley AS, Jefferson G, Holmes K, Sloane C, Anderson C, Hoadley G. Clark's.
2. Positioning in Radiography 13E. CRC Press; 2015 Jul 28
3. Bontrager KL, Lampugnano J. Textbook of Radiographic Positioning and Related.
4. Anatomy-E-Book. Elsevier Health Sciences; 2013 Aug 7.
5. Bontrager KL, Lampugnano J. Bontrager's Handbook of Radiographic Positioning.
6. Techniques-E-BOOK. Elsevier Health Sciences; 2017 Feb 10.

e-Learning Source:

1. <https://radiopaedia.org/articles/skull-radiography>
2. <https://radiopaedia.org/cases/normal-soft-tissue-neck-lateral-radiograph>
3. <https://radiopaedia.org/articles/abdomen-ap-supine-view-1>

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. |
|-------------|----------------------------|---------------|------------------|-------------------|-----------------|------------------------------|-------------|---------------------|----------|
| RT111 | RADIOGRAPHIC POSITIONING-I | Employability | Entrepreneurship | Skill Development | Gender Equality | Environment & Sustainability | Human Value | Professional Ethics | 3,4 |
| | | r | r | r | r | | r | r | |



Integral University, Lucknow

Effective from Session: 2017-18

| Effective from Session: 2017-18 | | | | | | | |
|---------------------------------|---|---------------------|----------------------|---|---|---|---|
| Course Code | RT112 | 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_\(BLS\)](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

| Course Code | Course Title | Attributes | | | | | | | SDGs No. |
|-------------|----------------------|---------------|------------------|-------------------|-----------------|------------------------------|-------------|---------------------|----------|
| | | Employability | Entrepreneurship | Skill Development | Gender Equality | Environment & Sustainability | Human Value | Professional Ethics | |
| RT112 | MEDICAL LAW & 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 IN PRACTICE | 1. Do's and Don'ts of Formal and Informal Communication 2. Tips on Career Management- Setting Clear Goals, Skill Development, Network Building and Professional Relationship Etiquette, Knowing Aptitude and Values. 3. Classroom Practice- 4. JAM (Just A Minute) 5. Extempore, Rebuttal, Forum, Role Play. | 7 | CO1 |
| 2 | MASS COMMUNICATION AND 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, Media Writing. | 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 and Spelling: 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 Publication House 2012.
4. Agarwal, Malti. *Professional Communication*. Krishna's Educational Publishers. 2016.
5. Carnegie, Dale. *How to Win Friends and Influence People in the Digital Age*. Simon and Schuster. 2012.
6. Covey, Stephen R. *The Seven Habits of Highly Successful People*. Free Press. 1989.
7. Verma, KC. *The Art of Communication*. 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]
11. Seely, 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_trystnehr.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 | | | | | | | |
| | | | <i>f</i> | <i>f</i> | | <i>f</i> | | | | | <i>f</i> | | | | | | | 3,4, 6 |



Integral University, Lucknow

| Effective from Session: 2023-24 | | | | | | | |
|---------------------------------|---|---------------------|-----------------------|---|---|---|---|
| Course Code | RT113 | 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

| PO-PSO CO | Course Articulation Matrix: (Mapping of COs with POs and PSOs) | | | | | | | | | | | | | | | |
|--------------|--|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|
| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | PSO4 |
| 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. |
| RT113 | HUMAN ANATOMY- II LAB | Employability | Entrepreneurship | Skill Development | Gender Equality | Environment & Sustainability | Human Value | Professional Ethics | 3,4 |
| | | r | r | r | r | | r | r | |



Integral University, Lucknow

Effective from Session: 2023-24

| Course Code | RT114 | 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, 6th edition, 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_\(physiology\)](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. |
|-------------|--------------------------|---------------|------------------|-------------------|-----------------|------------------------------|-------------|---------------------|----------|
| RT114 | HUMAN PHYSIOLOGY- II LAB | Employability | Entrepreneurship | Skill Development | Gender Equality | Environment & Sustainability | Human Value | Professional Ethics | 3,4 |
| | | r | r | r | r | | r | r | |



Integral University, Lucknow

| | | | | | | | |
|---------------------------------|--|---------------------|--|---|---|---|---|
| Effective from Session: 2023-24 | | | | | | | |
| Course Code | RT115 | 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.safepedia.com/definition/446/personal-monitoring>

| PO-PSO CO | Course Articulation Matrix: (Mapping of COs with POs and PSOs) | | | | | | | | | | | | | | | |
|-----------|--|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|
| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | PSO4 |
| 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. |
|-------------|---|---------------|------------------|-------------------|-----------------|------------------------------|-------------|---------------------|----------|
| RT115 | RADIATION HAZARD, CONTROL AND RADIOTHERAPY-LAB | Employability | Entrepreneurship | Skill Development | Gender Equality | Environment & Sustainability | Human Value | Professional Ethics | 3,4 |
| | | <i>f</i> | <i>f</i> | <i>f</i> | <i>f</i> | | <i>f</i> | <i>f</i> | |



Integral University, Lucknow

Effective from Session: 2023-24

| Course Code | RT116 | Title of the Course | RADIOGRAPHIC POSITIONING- I LAB | L | T | P | C |
|-------------------|---|---------------------|---------------------------------|---|---|---|---|
| Year | I | Semester | II | 0 | 0 | 2 | 1 |
| Pre-Requisite | Nil | Co-requisite | Nil | | | | |
| Course Objectives | Demonstration of various positioning of Skull, Neck, Thorax and abdomen | | | | | | |

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

| CO1 | Student will be able to perform Radiography of Skull. |
|-----|--|
| CO2 | Student will be able to perform Radiography of Skull with special projections. |
| CO3 | Student will be able to perform Radiography of PNS and Facial bones. |
| CO4 | Student will be able to perform Radiography of STN & Chest. |
| CO5 | Student will be able to perform Radiography of Chest special views. |

| Unit No. | Title of the Unit | Content of Unit | Contact Hrs. | Mapped CO |
|----------|------------------------------|--|--------------|-----------|
| 1 | SKULL PROJECTION- I | 1. Demonstration of Skull AP view. 2. Demonstration of Skull PA view. | 4 | CO1 |
| 2 | SKULL PROJECTION- II | 3. Demonstration of Skull Town's view. 4. Demonstration of Skull Lateral & Sella Turcica view. 5. Demonstration of Skull SMV Projection. | 4 | CO2 |
| 3 | SKULL PROJECTION- III | 6. Demonstration of PNS Open and Close mouth views. 7. Demonstration of Facial Projections. 8. Demonstration of TMJ projection. | 4 | CO3 |
| 4 | CHEST PROJECTION- I | 9. Demonstration of STN projection. 10. Demonstration of Chest PA view. 11. Demonstration of Chest AP view. | 4 | CO4 |
| 5 | CHEST PROJECTION- II | 12. Demonstration of Chest Lateral view. 13. Demonstration of Chest Oblique view. 14. Demonstration of Lordotic view. | 4 | CO5 |

Reference Books:

- Whitley AS, Jefferson G, Holmes K, Sloane C, Anderson C, Hoadley G. Clark's Positioning in Radiography 13E. CRC Press; 2015 Jul 28.
- Bontrager KL, Lampignano J. Textbook of Radiographic Positioning and Related Anatomy-E-Book. Elsevier Health Sciences; 2013 Aug 7.
- Bontrager KL, Lampignano J. Bontrager's Handbook of Radiographic Positioning and Techniques-E-BOOK. Elsevier Health Sciences; 2017 Feb 10.
- 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:

- <https://radiopaedia.org/articles/skull-radiography>
- <https://radiopaedia.org/cases/normal-soft-tissue-neck-lateral-radiograph>
- <https://radiopaedia.org/articles/abdomen-ap-supine-view-1>

| 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 | 2 | 3 | 2 | 3 | 2 | 2 | 3 | 3 |
| CO3 | 2 | 3 | 2 | 2 | 3 | 2 | 3 | 2 | 1 | 1 | 2 | 3 | 2 | 1 | 3 | 2 |
| CO4 | 1 | 3 | 2 | 1 | 3 | 3 | 2 | 3 | 3 | 2 | 2 | 1 | 2 | 2 | 3 | 3 |
| CO5 | 2 | 3 | 2 | 1 | 3 | 2 | 3 | 2 | 1 | 2 | 3 | 2 | 2 | 1 | 3 | 3 |

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

Attributes & SDGs

| Course Code | Course Title | Attributes | | | | | | | SDGs No. |
|-------------|---------------------------------|---------------|------------------|-------------------|-----------------|------------------------------|-------------|---------------------|----------|
| RT116 | RADIOGRAPHIC POSITIONING- I LAB | Employability | Entrepreneurship | Skill Development | Gender Equality | Environment & Sustainability | Human Value | Professional Ethics | 3,4 |
| | | <i>f</i> | <i>f</i> | <i>f</i> | <i>f</i> | | <i>f</i> | <i>f</i> | |