

STUDY & EVALUATION SCHEMES
OF
BACHELOR OF SCIENCE IN
RADIOLOGICAL IMAGING TECHNOLOGY
(B. Sc.RIT)
(B. Sc. RIT- I SEMESTER)

[Applicable w.e.f. Academic Session 2020]



INTEGRAL UNIVERSITY, LUCKNOW
DASALI, P.O. BAS-HA KURSI ROAD, LUCKNOW – 226026

Website: www.iul.ac.in

Syllabus approved by Board of Study, Faculty Board, Academic Council, Executive Council of the Integral University, Lucknow

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

STUDY & EVALUATION SCHEME
B.Sc. in RADIOLOGICAL IMAGING TECHNOLOGY (B. Sc.RIT)
(w.e.f. July 2020)

I-Year

I-Semester

S. No.	Code	Name of the Subject	Periods			Credits C	Evaluation Scheme				Subject Total
			L	T	P		Sessional			Exam	
						CT	TA	Total	ESE		
1.	RT101	Human Anatomy- I	3	1	0	4	40	20	60	40	100
2.	RT102	Human Physiology-I	3	1	0	4	40	20	60	40	100
3.	RT103	Basic Physics and Radiation Physics	3	1	0	4	40	20	60	40	100
4.	RT104	Community Healthcare Issues	3	1	0	4	40	20	60	40	100
5.	LN101	Basic Professional Communication	2	1	0	3	40	20	60	40	100
6.	CS103	Introduction to Computers	2	1	0	3	40	20	60	40	100
7.	RT105	Human Anatomy- I Lab	0	0	2	1	40	20	60	40	100
8.	RT106	Human Physiology-I Lab	0	0	2	1	40	20	60	40	100
9.	RT107	Basic Physics and Radiation Physics-Lab	0	0	2	1	40	20	60	40	100
Total			16	06	06	25	360	180	540	360	900

L: Lecture **T:** Tutorials **P:** Practical **C:** Credit **CT:** Class Test

TA: Teacher Assessment **ESE:** End Semester Examination

Sessional Total: Class Test + Teacher Assessment

Subject Total: Sessional Total + End Semester Examination (ESE)

SUBJECT NAME: HUMAN ANATOMY- I
SUBJECT CODE: RT101
(w.e.f. July 2020)

L T P
3 1 0

UNIT-I: GENERAL ANATOMY:

(6 hours)

- a. Introduction and subdivisions of Anatomy
- b. Anatomical nomenclature :
 - a. Terms of Planes, Positions,
 - b. Body parts and movements.
- c. Basic tissues of the body:
 - a. Definition, location and their function

UNIT-II: OSTEOLOGY & ARTHROLOGY (Brief)

(7 hours)

- a. Introduction, axial & appendicular skeleton, classification of bone based on shape and structure, structure of growing and adult long bone, ossification of bone, Types of cartilage, their characteristics features with example.
- b. Introduction to Arthrology: Definition and classifications of joints with example. Details of synovial joint - characteristics features, type with example, close pack and loose pack position.

UNIT-III: SYSTEMIC ANATOMY

(7 hours)

- a. Brief About Myology: Classification of muscles and its characteristics features, Gross features of skeletal muscle, classification of muscle according to shape and fascicular architecture, action of muscles.
- b. Brief About Neurology: Subdivision of nervous system, structural organization of nervous system including types of neurons, ganglion. Introduction to spinal nerves, cranial nerves and autonomic nervous system.
- c. Brief About Cardiovascular System: Components of CVS, types of anastomoses, types of circulation, components of lymphatic systems and its functions.

UNIT-IV: SUPERIOR EXTREMITY

(10 hours)

- a. Surface landmarks and Introduction to superior extremity.
- b. Brief about Muscles and fascia, Pectoral region: Pectoral muscles, Scapular region and Back, Muscles of Arm, Forearm and Hand:
- c. Brief about Joints of superior extremity: Brief of shoulder joint, brief account of elbow joint & wrist joint and radioulnar joint.

UNIT-V- INFERIOR EXTREMITY

(10 hours)

- a. Introduction and surface landmarks of lower extremity.
- b. Brief about Muscles and fascia: Thigh: Brief account of thigh muscles.
- c. Brief about Gluteal region: Muscles of gluteal region,
- d. Compartment of leg, name of the muscles of leg, their action and nerve supply,
- e. Brief about Joints: Details of Hip and Knee joint, subtalar, tibiofibular joints.

RECOMMENDED BOOKS:

- a. Principles of Anatomy & Physiology – Tortora Gerard J
- b. Chaurasia's, A Text Book of Anatomy
- c. Ranganathan, T.S., A Text Book of Human Anatomy.
- d. Fattana, Human Anatomy, (Description and Applied), Saunder's & C P Prism Publishers, Bangalore.
- e. Ester. M. Grishcimer, Physiology & Anatomy with Practical Considerations, J.P. Lippin Cott. Philadelphia.

SUBJECT NAME: HUMAN PHYSIOLOGY-I

SUBJECT CODE: RT102

(w.e.f. July 2020)

L T P

3 1 0

UNIT I-GENERAL AND CELL PHYSIOLOGY

(8Hours)

- a. Cell and cell division- Structure, Function and classification of cell
- b. Cellular Movements: Endocytosis and Exocytosis, Molecules of cell
- c. Transport across the cell membrane, Homeostasis
- d. Diffusion, Osmosis, Bonding, Filtration, Dialysis, Surface Tension, Adsorption, Colloid

UNIT II- BLOOD

(8Hours)

- a. Introduction of blood, Composition and function of blood, Blood cells morphology and development.
- b. Blood cells types and function, Composition and function of blood plasma and Blood clotting factor, Haemoglobin-structure, normal content, function, types. Erythropoiesis.
- c. 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.

UNIT III- RESPIRATION

(8Hours)

- a. Respiratory System Introduction, Structure, Function and Mechanics of Breathing
- b. Respiration measures (Vital capacity, Total Volume, Reserve volume, Total lung capacity), Mechanism of respiration
- c. Regulation of respiration, pulmonary function test, physiological changes in altitude & acclimatization, hypoxia

UNIT IV- CARDIOVASCULAR SYSTEM

(8Hours)

- a. Basic Physiology of Heart, Blood circulation, Arteries and veins, properties and structure of heart muscle.
- b. Cardiac Cycle and heart sounds.
- c. Conductive system of heart, Blood Pressure definition, Regulation factor affecting blood Pressure.

UNIT V- DIGESTIVE SYSTEM

(8Hours)

- a. Digestive system introduction, structure and function
- b. Basic physiology of organs of digestive systems (Salivary glands, Gastric glands, Pancreas, Liver, Gall bladder).
- c. Composition and function of all digestive juices, Digestion and Absorption of carbohydrate, fat and proteins.

RECOMMENDED BOOKS:

- a. Textbook of Physiology: Guyton
- b. Textbook of Physiology: Ganong
- c. Human Physiology: A.K. Jain
- d. Essentials of Medical Physiology: K.Semubulingam, Jaypee Publishers

SUBJECT NAME: BASIC PHYSICS AND RADIATION PHYSICS

SUBJECT CODE: RT103

(w.e.f. July 2020)

L T P
3 1 0

UNIT I – BASIC CONCEPT

(8 Hours)

- a. Units and measurements- Force work power and energy Temperature and heat
- b. SI Units of Force work power and energy Temperature and heat parameter
- c. Atomic structure atom model, nucleus, electronic configuration, periodic table
- d. Isotopes, Ionization, excitation, Binding energy electron volt

UNIT II – ELECTRICITY AND MAGNETISM

(8 Hours)

- a. Electric charges, Coulomb's law, Unit of charge; Electric potential, unit of potential
- b. Electric induction, capacitance and capacitors, series and parallel 2 connection; electric current, unit, resistance, Ohm's law, electric power, Joule's law
- c. Types of Magnets, Magnetic Induction, materials, Faradays Law of Induction,
- d. Magnetic effects of current, voltmeter, Ammeter (AC & DC)

UNIT III - ATOMS AND MOLECULES:

(8 Hours)

- a. Atoms and molecules, their structure, Nucleus of an Atoms and Atomic numbers
- b. Isotopes, Isobars & Isomers
- c. Excitation and Ionization, BE, Elements and compounds
- d. Type of solids (Insulator, Conductors & Semiconductors)

UNIT IV - X-RAYS

(8 Hours)

- a. Discovery of x-rays, properties-production, x-ray spectrum, bremsstrahlung and characteristic x-rays- X-ray tube
- b. Coolidge tube, tube design, line focus principle, space charge effect, tube cooling- Modern x-ray tubes
- c. Stationary anode, rotating anode, grid controlled x-ray tubes
- d. Heel effect, off focus radiation, tube insert and housing-Tube rating Quality and intensity of x-rays, factors influencing them

UNIT V - RADIATION PHYSICS AND QUANTITIES AND UNITS

(8 Hours)

- a. Atomic structure as applied to generation of X-rays
- b. Radioactivity spectrum of diagnostic imaging and therapy X ray
- c. Effects of variation of tube voltage current, filtration, wave form and target material on X-ray production
- d. Interaction of radiation with matter attenuation absorption and scattering phenomena
- e. Radiation intensity-exposure, roentgen, its limitations

BOOK RECOMMENDED

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

SUBJECT NAME: COMMUNITY HEALTHCARE ISSUES
SUBJECT CODE: RT104
(w.e.f. July 2020)

L T P
2 1 0

UNIT I- BASIC CONCEPTS OF COMMUNITY HEALTHCARE (6Hours)

- a. Definition of Health, Determinants of Health, Health Indicators of India, Health Team Concept
- b. National Health Policy, National Health Programmers (Briefly Objectives and Scope)
- c. Population of India and Family welfare programme in India
- d. Health problem in India, Environment and health

UNIT II- FAMILY (6Hours)

- a. Family, meaning and definitions, Functions of types of family, changing family patterns
- b. Influence of family on Individuals Health, family and nutrition
- c. Effects of sickness in the family and psychosomatic disease
- d. Concepts of joint family

UNIT III- COMMUNITY (6Hours)

- a. Rural community, Meaning and features
- b. Health hazards to rural communities
- c. Health hazards to tribal community
- d. Urban community, Meaning and features, Health hazards of urbanities

UNIT IV- CULTURE AND HEALTH DISORDERS (6Hours)

- a. Social Change: Meaning of social changes, Factors of social changes
- b. Human adaptation and social changes, social changes and stress
- c. Social changes and deviance, Social changes and health programme
- d. Role of social planning in the Improvement of health and rehabilitation

UNIT V- OBJECTIVE AND ORGANIZATION OF IMPORTANT AGENCIES (6Hours)

- a. WHO, UNICEF, FAO, ILO
- b. Indian Red cross Society
- c. UNFPA, World Bank
- d. Ford foundation, Rockefeller foundation

RECOMMENDED BOOKS:

1. K. Perks, Sunder Lal, Adarsh Pandey, Textbook of Preventive Social Medicine

SUBJECT NAME: BASIC PROFESSIONAL COMMUNICATION
SUBJECT CODE: LN101
(w.e.f. July 2020)

L T P
2 1 0

UNIT- I- PROFESSIONAL COMMUNICATION (6Hours)

- a. Professional Communication: Meaning & importance
- b. Essentials of Effective Communication
- c. Barriers to Effective Communication

UNIT- II- LANGUAGE THROUGH LITERATURE (6Hours)

- a. Essays:
 - “The Effect of the Scientific Temper on Man” by Bertrand Russell
 - “The Aims of Science and Humanities” by Moody E. Prior
- b. Short Stories:
 - “The Meeting Pool” by Ruskin Bond
 - “The Portrait of a Lady” by Khushwant Singh

UNIT- III- BASIC VOCABULARY (6Hours)

- e. Euphemism, One-word Substitution, Synonyms, Antonyms
- f. Homophones, Idioms and Phrases, Common mistakes
- g. Confusable words and expressions

UNIT- IV- BASIC GRAMMAR (6Hours)

- e. Articles, Prepositions, Tenses
- f. Concord (Subject-Verb agreement), Verbs: kinds & uses
- g. Degrees of Comparison

UNIT- V- BASIC COMPOSITION (6Hours)

- e. Report writing: What is a report? Kinds and objectives of reports, writing reports
- f. Business Letter writing: Introduction to business letters, types of business letters, Layout of business letters, Letter of Enquiry / Complaint

RECOMMENDED 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)

SUBJECT NAME: INTRODUCTION TO COMPUTERS

SUBJECT CODE: CS103

(w.e.f. July 2020)

**L T P
2 1 0**

UNIT-I COMPUTER FUNDAMENTALS: (6 Hours)

What is a computer? Components of a computer system. Classification of computers. Types of computers. Brief history of evolution of computers and generation of computers. Computer hardware and software. Input/ Output devices.

UNIT-II DOS: (7 Hours)

Elementary knowledge of DOS commands DIR, CLS, DATE, TIME, MD, CD, RD, RENAM, DEL, BACKUP, RESTORE, COPY, SCANDISK, CHKDSK.

UNIT-III WINDOWS: (8 Hours)

Difference between windows and DOS. Basic Features - Date, Time, Time Zone, Display, Screen Saver, Fonts, Mouse, and mouse pointers. Using accessories such as calculator, paint brush, CD player, etc. Use of Windows Explorer for moving and copying files. Introduction to MS-Office and its integrated nature.

UNIT-IV MS-WORD: (7 Hours)

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 printing a document. Mail merge: creating main document and data source. Adding and removing fields from data source.

UNIT-V POWER POINT (PRESENTATION SOFTWARE): (7 Hours)

Basic concept of presentation software. Standard, Formatting, and drawing toolbars in power point 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.

RECOMMENDED 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

SUBJECT NAME: HUMAN ANATOMY- I LAB
SUBJECT CODE: RT105
(w.e.f. July 2020)

L T P
0 0 2

1. Identification and description of all Anatomical structures
2. The learning of Anatomy is by demonstration only through dummy dissected parts, slides, models, charts etc.
3. Demonstration of dummy dissected parts (upper extremity, lower extremity, thoracic & abdominal viscera, face and brain)
4. Demonstration of skeleton - articulated and disarticulated
5. Demo of all bones showing its parts, radiographs of normal bones & joints.
Demonstration of all muscles of the body
6. Demonstration of heart and vessels in the body
7. Demonstration of parts of respiratory system, Normal radiographs of chest.
8. Demonstration of all plexuses and nerves in the body.
9. Demonstration of all part of brain

RECOMMENDED 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.

SUBJECT NAME: HUMAN PHYSIOLOGY- I LAB
SUBJECT CODE: RT106
(w.e.f. July 2020)

L T P
0 0 2

1. Measurement of Pulse rate, Heart rate, Blood Pressure.
2. Auscultation for Heart Sounds and Normal Respiratory sounds.
3. Introduction of Microscope, Identification of blood cells by study of peripheral blood smears.
4. D.L.C Differential Leucocytes count.
5. T.L.C Total Leukocytes Count.
6. R.B.C. Count.
7. Estimation of Haemoglobin.
8. Estimation of bleeding time & clotting time.
9. Blood Group, ABO and Rh factor.
10. Haemoglobinometry, various methods of estimation of Hb, errors involved and standardization of instrument for adaptation for Hb estimation.

RECOMMENDED 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

SUBJECT NAME: BASIC PHYSICS AND RADIATION PHYSICS-LAB

SUBJECT CODE: RT107

(w.e.f. July 2020)

L T P
0 0 2

1. Atomic structure, X-ray tubes, X-ray circuits involving students to present and discuss
2. Congruence of Radiation and Optical field and beam
3. Determination of focal spot size of diagnostic X-ray tube
4. K.V. and Exposure time testing and Linearity testing of the Timer
5. Consistency of M.A. loading and Consistency of Radiation Output
6. Evaluation of Total filtration of the tube.
7. Film screen contact testing.
8. Table top Exposure rate measurement in fluoroscopy
9. Radiation protection survey, in and around of diagnostic installations

BOOK RECOMMENDED

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

SUBJECT NAME: INTRODUCTION TO COMPUTERS-LAB

SUBJECT CODE: CS104

(w.e.f. July 2020)

L T P

0 0 2

SESSIONS WILL RELATE TO PRACTICAL TOPIC ASSIGNED IN THE SYLLABUS OF INTRODUCTION TO COMPUTERS.

UNIT-1 DOS commands:

(06 Hours)

DIR, CLS, DATE, TIME, MD, RD, CD, RD, RENAME, DEL, BACKUP, RESTORE, COPY, SCANDISK, CHKDSK, COPY CON, CD\, CD., MOVE, FORMAT, TREE, EXIT.

Exercise-

- Create a directory and make a file in this directory
- Rename the file and folder & move the file in another drive
- Copy a file from one directory to another directory
- Delete file and folder
- Find the detail of any directory
- Format a drive
- Show all the directories using TREE command

UNIT-2 Windows Basic Features:

(06 Hours)

Date, Time, Time Zone, Display, Screen Saver, Fonts, Mouse pointers, calculator, Paint Brush.

Exercise-

- Set date and time of the computer
- Set screensaver on the computer after 2 minutes if not in use
- Change font size of the system from normal to extra large.
- Change the mouse pointers.
- Find the percentage of your marks using system calculator
- Create Indian flag using paint brush.

UNIT-3 MS WORD:

(06 Hours)

New document, Entering & changing text, Aligning, Justifying, Bold, Italics, Underline. Borders & Shading. Table- Creation, Adding rows & columns, splitting & combining cells. Headers & Footers.

Exercise-

- Make a file using Bold, Italic and underline.
- Set alignments (left, right & center)
- Create a file and use format painter.
- Insert a table in a file and apply bullets and numbers in rows and columns.

UNIT-4 Mail merge:

(06 Hours)

Creation of main document & data source, Adding & Removing fields from data source.

Exercise-

- Write a letter for inviting 75 people using mail merge with minimum 4 fields (name, address, phone number, e-mail ID).
- Add one more field of your choice and remove the address field.
- Rename phone number field with contact number.

UNIT-5MS POWERPOINT:

(06 Hours)

Creating presentation, Adding slides. Applying design templates. Master slide. Adding special effects.

Exercise-

- Create a power point presentation of 5 slides using custom animation.
- Insert 2 slides in the existing presentation and change their background color
- Insert a chart and a picture in second slide.
- Show the use of master slide and duplicate slide.
- Prepare a slide showing slide transition.