

***DETAILED SYLLABUS***

***FOR***

***DISTANCE EDUCATION***

**Under Graduate Degree program**

**BACHELOR OF SCIENCE-RADIO IMAGING  
TECHNOLOGY**

**(BSCRIT)**

**(SEMESTER SYSTEM)**

**COURSE TITLE : BACHELOR OF SCIENCE-RADIO IMAGING TECHNOLOGY**  
**DURATION : THREE YEARS**  
**MODE : SEMESTER SYSTEM**  
**TOTAL MARKS : 3600**

### **FIRST SEMESTER**

Course Title	Paper Code	Marks				
		Theory		Practical		Total
		Internal	External	Internal	External	
PRINCIPAL OF ANATOMY	BSCRIT/S-110	40	60	40	60	200
FUNDAMENTALS OF PHYSIOLOGY	BSCRIT/S-120	40	60	40	60	200
INTRODUCTION TO PATHAOLGY	BSCRIT/S-130	40	60	NA	NA	100
FUNDAMENTALS OF COMPUTERS	BSCRIT/S-140	40	60	NA	NA	100

### **SECOND SEMESTER**

Course Title	Paper Code	Marks				
		Theory		Practical		Total
		Internal	External	Internal	External	
PHYSICS	BSCRIT/S-210	40	60	NA	NA	100
GENERATION & PROPERTIES OF X-RAY	BSCRIT/S-220	40	60	NA	NA	100
PATHOLOGY	BSCRIT/S-230	40	60	40	60	200
BASIC COMPUTER	BSCRIT/S-240	40	60	NA	NA	100

### **THIRD SEMESTER**

Course Title	Paper Code	Marks				
		Theory		Practical		Total
		Internal	External	Internal	External	
STUDY OF ANATOMY	BSCRIT/S-310	40	60	40	60	200
PHYSIOLOGY	BSCRIT/S-230	40	60	40	60	200
GENERAL RADIOGRAPHY	BSCRIT/S-230	40	60	40	60	200
EFFECTIVE COMPUTER SKILL	BSCRIT/S-230	40	60	NA	NA	100

## **FOURTH SEMESTER**

Course Title	Paper Code	Marks				
		Theory		Practical		Total
		Internal	External	Internal	External	
INTRODUCTION TO ULTRASOUND	BSCRIT/S-410	40	60	40	60	200
BASICS OF CT SCAN	BSCRIT/S-420	40	60	40	60	200
BASICS OF MRI	BSCRIT/S-430	40	60	40	60	200
ADVANCE COMPUTER SKILL	BSCRIT/S-440	40	60	NA	NA	100

## **FIFTH SEMESTER**

Course Title	Paper Code	Marks				
		Theory		Practical		Total
		Internal	External	Internal	External	
DOPPLER & ECHO CARDIO GRAPHY	BSCRIT/S-510	40	60	40	60	200
CT SCAN	BSCRIT/S-520	40	60	40	60	200
MRI	BSCRIT/S-530	40	60	40	60	200
COMPUTER SKILL	BSCRIT/S-540	40	60	NA	NA	100

## **SIXTH SEMESTER**

Course Title	Paper Code	Marks				
		Theory		Practical		Total
		Internal	External	Internal	External	
NUCLEAR MEDICINE & PET SCAN	BSCRIT/S-610	40	60	NA	NA	100
STUDY OF INTERVENTION RADIOLOGY	BSCRIT/S-620	40	60	NA	NA	100
BASICS OF ANASTHESIA IN DIAGNOSTIC RADIOLOGY	BSCRIT/S-630	40	60	NA	NA	100
PROJECT REPORT	BSCRIT/S-640	40	60	NA	NA	100

**NOTE:**

Theory Paper : 40% Continuous Internal Assessment and 60% University examination.

Practical Paper : 40% Continuous Internal Assessment and 60% University examination

## **FIRST SEMESTER**

i) **PRINCIPAL OF ANATOMY**

Paper Code: **BSCRIT/S-110**

### **COURSE CONTENTS :**

#### **1) Introduction of Bones of the Human Body of :**

Upper Limb , clavicle, scapula, humerus, radius, ulna, carpus, metacarpus and phalanges Lower Limb: hipbone, femur, tibia, fibula, tarsus, metatarsus and phalanges Skull : name the bones of skull and sutures between them Thorax : ribs and their articulations Vertebral Column : cervical, thoracic, lumbar, sacral and coccygeal vertebrae

#### **2) Surface Land Marks of the Human Body**

- Anterior land marks
- Posterior land marks
- Regions of Abdomen
- Quadrants of Hip

#### **3) Introduction of different Vital Organs :**

##### **A) Respiratory Organs**

- Nasopharynx
- Oropharynx
- Larynx
- Trachea
- Bronchi
- Lungs and their lobular segments
- Thoracic cavity
- Pleurae

##### **B) Circulatory Organs**

- Anatomical position of the Heart
- Pericardium
- Chambers of the heart
- Valves of the heart
- Great vessels of the heart

##### **C) Digestive Organs :**

- Tongue
- Teeth
- Oral cavity
- Pharynx
- Oesophagus
- Stomach
- Small intestine
- Large intestine

### **PRACTICAL :**

Labeled Diagrams of different organs and bones  
Viva

## ii) FUNDAMENTALS OF PHYSIOLOGY

Paper Code: BSCRIT/S-120

### COURSE CONTENTS :

#### 1) Cell

- Definition
- Structure and functions the Cytoplasmic Organelles
- Reproduction Meosis, Mitosis

#### 2) The important physico-chemical laws applied to physiology

- Diffusion
- Osmosis
- Bonding
- Filtration
- Dialysis
- Surface Tension
- Adsorption
- Colloid

#### 3) Fundamentals of different Organ Systems

- Cardiovascular System
- Respiratory system
- Digestive system
- Excretory system
- Reproductive system
- Endocrine system
- Lymphatic system

#### PRACTICAL :

Diagram of different Vital Organs  
Viva

## iii) INTRODUCTION TO PATHAOLGY

Paper Code: BSCRIT/S-130

### COURSE CONTENTS :

#### 1. Pathology –

- Introduction
- State of Cell
- Inflammation
- Metabolism of cell and disorders
- Cause of disease
- Diseased state
- Degeneration

#### 2. Immunity & Hypersensitivity

- Introduction
- Infection
- Healing
- Electrolyte movements
- Pathogenesis of disease

#### 3. Blood supply to organs and disease due to non supply of blood

#### 4. Fluid and homodynamic derangement :

- Derangement of body fluids and electrolytes
- Homodynamic disorders due to deranged blood volume
- Homodynamic disorders of obstructive nature

- Ischemia and infraction

#### **5. Growth disorders and Heoplasia**

- Neoplasia
- Tumouts
- Histopathology of diseases

#### **6.Pathology of Biliary tract and excretory system**

### **iv) FUNDAMENTALS OF COMPUTERS**

**Paper Code: BSCRIT/S-140**

#### **COURSE CONTENTS:**

#### **SECTION A**

##### **1. Grammar**

A brief review of easy form of tenses. Conversion of direct narration into indirect form of narration and vice versa (only simple sentences). Punctuation.

#### **SECTION B**

##### **2. Corresponding : (Official, Business And Personal)**

One Letter from each category (Official, Business and Personal) may be set in the examination paper and the students be asked towrite one of them.

#### **SECTION C**

##### **Written Communication**

report, notices, agenda notes, business correspondence preparation of summery & prices.

##### **Communication Techniques**

Importance of communication one way and two way communication Essentials of good communication Methods of communication, oral, written and non-verbal Barriers to communication Techniques of overcoming barriers Concept of effective communication

## **SECOND SEMESTER**

### **i) PHYSICS**

**Paper Code: BSCRIT/S-210**

#### **COURSE CONTENTS :**

##### **1. Physics**

- Introduction
- Measurements
- Basic Units
- Derived Units
- Structure of atom

## 2. Electromagnetic Induction (Self & mutual)

- AC and DC generator
- Rectification
- Transformers
- Capacity/.capacitance

## 3. Properties of X-Ray

- Thermoionic / photoelectric emissions
- Conductor and conductance
- Light intensity
- HT Cable
- Radio activity

## ii) GENERATION AND PROPERTIES OF X-RAY

Paper Code: BSCRIT/S-220

### COURSE CONTENTS:

#### INTRODUCTION:

- Properties and Production of X-Ray
- Electric system, Components and Control in X-Ray circuit
- Basic X-Ray circuits transformers laws and types used in X-ray machine. The rectification of high tension, control of kilo voltage, filament circuit ad tube current
- Exposure switches and timers and its radiographic application
- X-Ray tubes fixed and rotating anodes and faults in X-Ray tubes
- Imageintensifier/fluoroscopic equipment, dentalradiographic equipments

#### Clinical Lab:

- X-ray tubes general features and mobile equipments.
- Care and maintenance of X-ray equipment and image intensifier
- To study effects of KV and MAS

## iii) PATHOLOGY

Paper Code: BSCRIT/S-230

### COURSE CONTENTS :

#### 1. Introduction of various Hazards

- Ionization chamber GM and Scintillation Counter
- Measuring radiation dose
- Absorption co-efficient, grid, cones and filter
- Inverse square law scattered radiation radio activity, curie, half life, decay factor

#### 2. Doses, film Bodge, Pocket Ionization chamber

Maximum permissible Dose

#### 3. Principle and Method of Protection

#### PRATICAL

- Dark Room Procedure
- Equipments
- Developing Technique
- Fixing Technique

**iv) General Radiography**

**Paper Code: BRIT/S-240**

**COURSE CONTENTS :**

**1. Patents and role of General Radiographer**

**2. Regional Radiography :**

**a) Upper Limb – (30 Hours)**

- I) Fingers
- II) Hand, Carpal Tunnel
- III) Wrist Joint
- IV) Fore arm
- V) Elbow Joint
- VI) Head of Radius and Ulna
- VII) Humerus
- VIII) Shoulder Joint
- IX) Acromio-calvicular joint
- X) Scapula
- XI) Sterno-clavicular joint

**b) Lower Limb – (20 Hours)**

- I) Toes
- II) Foot
- III) Calcaneum
- IV) Intercondylar Notch
- V) Ankle Joint
- VI) Tibia and Fibula
- VII) Patella
- VIII) Knee Joint
- IX) Femur

**c) Hip and Pelvis (20 Hours)**

- I) Theatre procedure for Hip Pinning and Reduction
- II) Pelvis
- III) Sacro iliac Joint
- IV) Pelvis Bone
- V) Acetabulum

## **THIRD SEMESTER**

**i) STUDY OF ANATOMY**

**Paper Code: BSCRIT/S-310**

**COURSE CONTENTS:**

**1. Reproductive Organ:**

- Male and female cCongds: Testes, Epidiymis, Ovary, Fallopian Tubes, Uterus, Vagina etc.
- Introduction of male Genital Organs
- Introduction of female Genital Organs

**2. Liver and Spleen:**

- Introduction
- Anatomical Position
- Gall Bladder

**3. Excretory Organs**

- Introduction of Kidney



- Ureter
- Urinary ladder
- Urethra (male and female)

#### **4. Muscles**

- Introduction
- Origin and insertion of muscles
- Functuion

#### **PRACTICAL:**

Labeled diagram of different organs and bones Viva.

### **ii) DIFFERENT ASPECTS OF PHYSIOLOGY**

**Paper Code: BSCRIT/S-320**

#### **COURSE CONTENTS :**

##### **1. Blood**

- Introduction
- Composition
- Function

##### **2. Formation of different type of Blood Cells**

- Erythrocytes
- Leucocytes
- Thormbocytes

##### **3. Mechanism of Blood Clotting**

##### **4. Cerebrospinal Fluid :**

- Composition
- Formation
- Function

##### **5. Specials Senses**

- Hearing
- Taste
- Smell
- Touch
- Sight

#### **PRACTICAL :**

Diagram of Corpuscles Viva

### **iii) RADIOGRAPHY**

**Paper Code: BSCRIT/S-330**

#### **COURSE CONTENTS :**

##### **1. Special procedure and related Contrast Media**

- Contrast Media
- Emergency in Radiology Department
- Excretory System

**a) IVP**

**b) RGU**

**c) MCUG**

- Oral Cholecystography
- Percutaneous Transepatic Cholangiography
- G. I. Tract

**a) Barium Swallow**

**b) Barium Meal Series**

**c) Barium Meal Follow Through**

**d) Barium Enema**

- Hystero Salpingography
- Angiography
- Tomography

**2. Guideline for design and location of X-ray equipments**

**3. Dark Room designing**

- Outline structure of Dark Room
- Material used
- Miscellaneous

**PRACTICAL :**

1. Radiography in various positions for all the special radiological procedures, using contrast media as per syllabus.
2. Positioning and treatment of various cancer patients by using a) Prescribed filters and wedges  
b) Protecting various organs

**iv) EFFECTIVE COMMUNICATION SKILL-I**

**Paper Code: BSCRIT/S-340**

**COURSE CONTENTS:**

**SECTION A**

**1. Grammar**

A brief review of easy form of tenses. Conversion of direct narration into indirect form of narration and vice versa (only simple sentences). Punctuation.

**SECTION B**

**2. Corresponding : (Official, Business And Personal)**

One Letter from each category (Official, Business and Personal) may be set in the examination paper and the students be asked to write one of them.

**SECTION C**

**Written Communication**

report, notices, agenda notes, business correspondence preparation of summary & prices.

**Communication Techniques**

Importance of communication

One way and two way communication

Essentials of good communication

Methods of communication, oral, written and non-verbal

Barriers to communication

Techniques of overcoming barriers

Concept of effective communication

## **FOURTH SEMESTER**

### **i) INTRODUCTION TO ULTRASOUND**

**Paper Code: BSCRIT/S-410**

#### **COURSE CONTENTS :**

##### **1. Ultra Sound**

- Principle of Ultra Sound
- Types of Ultra Sound
- Equipments description
- Indication and Clinical Application

##### **PRACTICAL**

Applications of various procedures in well equipped Hospitals and Diagnostics C

### **ii) BASIC OF CT SCAN**

**Paper Code: BSCRIT/S-420**

#### **COURSE CONTENTS :**

##### **2. C. T. Scan**

Basic principle of CT scan  
Equipment 's description  
Conventional CT  
Indications and Contra Indications

##### **PRACTICAL**

Applications of various procedures in well equipped Hospitals and Diagnostics Centers

**iii) BASIC OF MRI Paper Code: BSCRIT/S-430**

**COURSE CONTENTS :**

**MRI**

- Basic Principle
- Equipment's description

**PRACTICAL**

Applications of various procedures in well equipped Hospitals and Diagnostics Centers

**iv) ADVANCE COMPUTER SKILL – A**

**Paper Code: BSCRIT/S-440**

**SECTION A**

Internet - Evolution, Protocols, Interface Concepts, Internet Vs Intranet, Growth of Internet, ISP. Connectivity- Dial-up, Leased line, VSAT etc., URLs, Domain names, Portals. E-MAIL - Concepts, POP and WEB Based E-mail ,merits, address, Basics of Sending & Receiving, E-mail Protocols, Mailing List, Free Email services.

**SECTION B**

E-Commerce- An introductions, Concepts, Advantages and disadvantages, Technology in E-Commerce, Internet & E-business, Applications, Feasibility & various constraints. E-transition, challenges for Indian corporate.

**SECTION C**

Electronic Payment Systems: Introduction, Types of Electronic Payment Systems, Digital Token-Based, Electronic Payment Systems, Smart Cards and Electronic Payment Systems, Credit Card-Based Electronic Payment Systems, Risk and Electronic Payment Systems. Internet Protocols- Data Transmission Protocols, Client/Server Architecture & its Characteristics, FTP & its usages. Telnet Concept, Remote Logging, Protocols, Terminal Emulation, Massage Board.

**Reference:**

1. A. Manor, "Internet and Web Design Made Easier", Pray Publications.
2. V.K.Jain, "level Module - M 1.2 - Internet & web page designing" BPB Publications.
3. P.T. Joseph, S.J., "E-Commerce An Indian Perspective (Second Edition)", Prentice Hall of India
4. Alexis Leon and Mathews Leon, "Internet for Everyone", Vikas Publishing House Pvt. Ltd., New Delhi.
5. "Internet for Dummies", Pustak Mahal, New Delhi.

## **FIFTHSEMESTER**

### **i) DOPPLER & ECHO CARDIO GRAPHY**

**Paper Code: BSCRIT/S-510**

#### **COURSE CONTENTS :**

1. Equipments and description
2. Colour Doppler Flow Imaging
3. Indication
4. Preparation and Technique
5. Clinical Application

#### **PRACTICAL**

Application of various procedures in well equipped Hospitals and Diagnostic Centers

### **ii) CT SCAN**

**Paper Code: BSCRIT/S-520**

#### **COURSE CONTENTS :**

1. Advancement in CT
2. Spiral CT
3. Preparation of Patient
4. Contrast Media
5. Indication and Contraindication
6. Technical Aspects of various procedures in CT

#### **PRACTICAL**

Application of various procedures in well equipped Hospitals and Diagnostic Centers

### iii) MRI

Paper Code: BSCRIT/S-530

#### **COURSE CONTENTS :**

1. Preparation of Patients
2. Contrast Media
3. Indication and Contraindication
4. Clinical Application
5. procedure
6. MR Angiography

#### **PRACTICAL**

Application of various procedures in well equipped Hospitals and Diagnostic Centers

### iv) COMPUTER SKILL – B

Paper Code: BSCRIT/S-540

#### **SECTION A**

Input and Output units: Their functional characteristics, main memory, cache memory read only memory, overview of storage devices – floppy disk, hard disk, compact disk, tape. Computer Networks and Communication: Network types, Network topologies, Network communication devices, Physical communication media, TCP/IP. Internet and its Applications: E-mail, Telnet, FTP, WWW, Internet chatting

#### **SECTION B**

Word Wide Web (www) - History, Working, Web Browsers, Its functions, Concept of Search Engines, Searching the Web, HTTP, URLs, Web Servers, Web Protocols. Web Publishing - Concepts, Domain name Registration, Space on Host Server for Web site, HTML, Design tools, HTML editors, and Image editors, Issues in Web site creations & Maintenance

#### **SECTION C**

Html - Concepts of Hypertext, Versions of HTML, Elements of HTML syntax, Head & Body Sections, Building HTML documents, Inserting texts, Images , Hyperlinks, Backgrounds and Color controls, Different HTML tags, Table layout and presentation, Use of font size & Attributes, List types and its tags, Use of Frames and Forms in web pages. Overview of MS FrontPage, Macromedia Dream weaver, and other popular HTML editors, designing web sites using MS FrontPage (using at least FrontPage 2000)

#### **Reference:-**

1. D.H.Sanders, "Computers Today", McGraw Hill, 1988.
2. T.N. Trainer, "Computers" (4 Edition) McGraw Hill, 1994.
3. P.T. Joseph, S.J., "E-Commerce An Indian Perspective (Second Edition)", Prentice Hall of India

## **SIXTH SEMESTER**

### **i) NUCLEAR MEDICINE & PET SCAN**

**Paper Code: BSCRIT/S-610**

#### **COURSE CONTENTS :**

##### **1. Nuclear Medicines, PET scan and Mammography**

- A. Definition
- B. Characteristic of Radio Nuclide
- C. Commonly used Radio Nuclides
- D. Description of Equipments

### **ii) STUDY OF INTERVENTIONAL RADIOLOGY**

**Paper Code: BSCRIT/S-620**

#### **COURSE CONTENTS :**

##### **1. Interventional Radiology**

- A. Definition
- B. Indication
- C. Clinical Application
- D. Name of different type of Procedures

### **iii) BASIC OF ANAESTHESIA IN DIAGNOSTIC RADIOLOGY**

**Paper Code: BRIT/S-630**

#### **COURSE CONTENTS:**

- 1. Facilities regarding general Anaesthesia in the X-ray Deptt.
- 2. Anaesthetic Problems associated with specific technique –
  - A. Vascular Studies

B. Carotid Angiography  
C. Venography  
D. T and NMR

**iv)PROJECT REPORT**

**Paper Code: BSCRIT/S-640**