

**BHARATHIAR UNIVERSITY:COIMBATORE 46**  
**B.Sc. RADIOLOGICAL IMAGING TECHNOLOGY (3 Years)**  
*Under The CENTRE FOR COLLABORATION OF INDUSTRY AND INSTITUTION*  
**CCII COLLABORATIVE PROGRAMME**

**SCHEME OF EXAMINATION – CBCS PAPPERN**  
**For the students admitted from the academic year 2013 -2014 batch and onwards**

Part	Study Components	Course Title	Hrs Per week	Exam			Credits	
				Dur. hrs	CIA	Marks		Total
<b>SEMESTER – I</b>								
I	Language – I		6	3	25	75	100	4
II	English – I		6	3	25	75	100	4
III	Core Paper – I Anatomy & Physiology- I		4	3	20	55	75	3
	Core Paper – II General Physics – I		4	3	20	55	75	3
	Core Anatomy & Physiology – Practical – I		2	-	-	-	-	-
	Core General Physics – Practical - I		2	-	-	-	-	-
	Allied Paper I – Biology –I		4	3	25	75	100	4
IV	Environmental Studies		2	3	-	50	50	2
<b>SEMESTER – II</b>								
I	Language – II		6	3	25	75	100	4
II	English –II		6	3	25	75	100	4
III	Core paper –III Anatomy & Physiology II		4	3	20	55	75	3
	Core paper IV – General Physics II		4	3	20	55	75	3
	Core Anatomy and Physiology – Practical I		2	3	40	60	100	4
	Core General Physics – Practical I		2	3	40	60	100	4
	Allied paper II – Biology II		4	3	25	75	100	4
IV	Value Education – Human Rights		2	3	-	50	50	2
<b>SEMESTER III</b>								
III	Core Paper V – Dark room Technique I		4	3	20	55	75	3
	Core Paper VI- General Radiology I		4	3	20	55	75	3
	Core Paper VII –Radiation Physics I		4	3	20	55	75	3
	Core Dark Room Technique Practical – I		2	-	-	-	-	-
	Core General Radiology Practical – I		2	-	-	-	-	-
	Core Radiation Physics Practical - I		2	-	-	-	-	-
	Allied paper III – Computer Application I		4	3	25	75	100	4
IV	Skill based subject I – Personality Development –I		3	3	20	55	75	3
IV	Tamil @/Advanced Tamil #/ (or) Non-major elective – I (Yoga for Human Excellence)# / Women’s Rights#		2	3	-	50	50	2

<b>SEMESTER – IV</b>							
III	Core Paper VIII – Dark Room Technique II	4	3	20	55	75	3
	Core Paper IX – General Radiology II	4	3	20	55	75	3
	Core Paper X – Radiation Physics II	4	3	20	55	75	3
	Core Dark Room Technique Practical – I	2	3	40	60	100	4
	Core General Radiology Practical – I	2	3	40	60	100	4
	Core Radiation Physics Practical – I	2	3	40	60	100	4
	Allied paper IV Computer Application –II	4	3	25	75	100	4
IV	Skill based Subject II – Personality Development II	3	3	20	55	75	3
IV	Tamil @/ Advanced Tamil # (or) Non-manor elective – II (General awareness #)	2	3	-	50	50	2
<b>SEMESTER V</b>							
III	Core Paper XI – General Radiology – III	4	3	20	55	75	3
	Core Paper XII – Radiation Physics - III	4	3	20	55	75	3
	Core Paper XIII- Radiotherapy – I	4	3	20	55	75	3
	Core General Radiology Practical – II	2	-	-	-	-	-
	Core Radiation Physics Practical –II	2	-	-	-	-	-
	Core Radiotherapy Practical – I	2	-	-	-	-	-
	Elective – I Psychology I	4	3	20	55	75	3
IV	Skill based subject III – Health Education I	3	3	20	55	75	3
<b>SEMESTER VI</b>							
III	Core Paper XIV – General Radiology IV	4	3	20	55	75	3
	Core Paper XV – Radiation Physics IV	4	3	20	55	75	3
	Core Paper XVI – Radiotherapy – II	4	6	20	55	75	3
	Core General Radiology Practical – II	2	3	30	45	75	3
	Core Radiation Physics Practical – II	2	3	30	45	75	3
	Core Radiotherapy Practical - I	2	3	30	45	75	3
	Elective II – Psychology II	4	3	20	55	75	3
	Elective III – Psychology III	4	3	20	55	75	3
IV	Skill Based Subject IV– Health Education II	6	6	20	55	75	3
V	Extension Activities	-	-	50	-	50	2
	<b>Total</b>					<b>3500</b>	<b>140</b>

**SEMESTER I**  
**CORE PAPER I : ANATOMY AND PHYSIOLOGY - I**

**Unit - I**

Introduction of Anatomy and Physiology: Terms used in Anatomy-The systems of the body-Cell structure-Cell division-The elementary tissues of the body and their functions

**Unit - II**

Respiratory System :Nasal cavity, Pharynx, Trachea, Bronchial tree, Lungs and Pleura

**Unit -III**

Digestive System: Oral cavity, Teeth, Salivary gland, Tongue, Oesophagus, stomach, Small intestine and large intestine-Liver , Gall bladder, pancreas and spleen

**Unit - IV**

Cardiovascular System: Heart – location, covering, chambers and blood supply-Aorta and its branches

**Unit - V**

Musculo Skeletal System: Different types of muscle – skeletal muscle , smooth muscle and cardiac muscle-In the skeletal system gross anatomy of whole bones including long bones .flat bones, irregular bones and sesamoid bones-Detailed study of the vertebral column -Classification of joints

**References:**

Human Anatomy	–	B.D.Chaurasia
Text Book of Anatomy and Physiology	–	Ross and Wilson

**CORE PAPER II : GENERAL PHYSICS –I**

**Unit - I**

**INTRODUCTION ON PHYSICS**-Units and measurements, discovery of cathode rays, nature and properties-e/m Thomson's method-Millikan's experiment

**Unit -II**

Structure of atom-Thomson's atom model-Rutherford nuclear atom model -Bohr's theory of hydrogen atom – limitations of Bohr's theory.

**Unit - III**

Quantum Physics-Photoelectric effect-Laws of photoelectric emission- Einstein's theory-De Broglie's Theory & uncertainty principle

**Unit -IV**

Radio activity-Introduction-Natural & artificial radioactivity-Laws of radioactive disintegration-Half life and mean life-**Units of radio activity**

**Unit - V**

Oscillation-Doppler effect – general expression for apparent frequency -Ultrasonic – production, piezo electric methods, properties and uses

**Reference Book:**

1. Modern Physics : R. Murugesan, Kiruthiga Sivaprasanth – S.Chand & Company
2. Atomic Physics : J.B.Rajam – S.Chand & Company
3. Quantum Mechanics: Satya Prakash, C.K. Singh – Kedar nath Ramnath & Co.

**ALLIED PAPER – 1                      BIOLOGY – I**

**Unit - I**

Introduction -Branches of biology -Scientific methods in biology-Characteristics of living organisms

**Unit - II**

Origin and evolution of life-Concepts of species-Speciation –Isolation-Origin of species

**Unit - III**

Diversity of life-Variety of living organisms-Biosystematics-Two kingdom and five kingdom systems-Botanical gardens and herbaria-Zoological parks and museums

**Unit - IV**

Human Cell and cell divisions- Basic units of life-Tools and technique-Ultra structure of prokaryotic and eukaryotic cell - Membrane transport

**Unit - V**

Cellular movement-Cell organelles and their functions-Molecules of cells-Enzymes-Vitamins, Hormones and steroids

**Reference Book:**

Foundation Course in Biology – S.K.Aggarwal

**SEMESTER – II**

**CORE PAPER III - ANATOMY AND PHYSIOLOGY II**

**Unit - I**

Urinary system-Kidney, ureters, urinary bladder and urethra

**Unit - II**

Reproductive system-Testis, seminal vesicles, spermatic cord, prostate and penis-Vagina , uterus, cervix , fallopian tube and ovary

**Unit - III**

Lymphatic system-Lymph and structure of lymph nodes, its drainage areas, lymphatic vessels and thoracic duct

**Unit - IV**

Endocrine system-Gross anatomy of endocrine gland , pituitary gland ,thyroid gland, parathyroid gland, pancreas, adrenal and pineal gland

**Unit - V**

Nervous system and Special senses-Brain and its covering , cerebrum , cerebellum, midbrain, pons, medulla oblongata and ventricles of brain-Spinal cord and its position -Structure of eye and ear

**Reference Book :**

Human Anatomy - B.D.Chaurasia  
Text Book of Anatomy and Physiology - Ross And Willson

**CORE PAPER IV - GENERAL PHYSICS – II****Unit - I**

Optics : Interference – principle of super position , expression for band width -Diffraction – fresnel and fraunhofer diffraction -Polarisation – by reflection and refraction , Brewster’s law  
Scattering – Rayleigh scattering

**Unit - II**

Electricity: Semi conductors – energy band, intrinsic and extrinsic semi conductors, N-type and - P –type semi conductors, majority and minority carriers-Properties of charges, conductors and insulators -Inverse law and Ohm’s law

**Unit - III**

Semi conductor diodes: P-N junction diodes forward and reverse biasing, zener diode, rectification –full wave and half wave

**Unit - IV**

Magnetism: Magnetic susceptibility , BH curve , magnetic hysteresis , dia, para and ferro magnetism-Electromagnets – electromagnetic induction , Faraday’s law of electromagnetic induction , self induction and mutual induction

**Unit - V**

Varying current : Growth and decay of current in LR circuit , peak and r.m.s value, current containing LR , CR and LCR -Transformer- principle , construction , types of transformer – step up , step down , auto transformer and high tension transformer

**Reference Books:**

Modern Physics – R. Murugesan, Kiruthiga Sivaprasath – S. Chand & Company.  
A Text Book of Optics – N. Subrahmanyam, Brijlal, M.N. Avadhanulu – S.Chank & Company  
Basic Electronics solid state – B.L. Theraja – S. Chand & Company  
Sound – S.R. Govindarajan, T. Murugaiyan, T. Jayaraman

## **ALLIED PAPER II - BIOLOGY – II**

### **Unit - I**

Genetics-Introduction -Continuity of life – hereditary and variation -Chromosomes

### **Unit -II**

DNA as genetic materials-DNA structure -Replication of DNA-Gene expression-Ontogenesis - Basics of recombinant DNA technology

### **Unit - III**

Morphology of plants-Introduction-Structure and modification of roots, stems and leaves- Inflorescences- Description of various plant families

### **Unit - IV**

Morphology of animals-Salient features of earthworm -Salient features of cockroaches

### **Unit - V**

Tissue systems-Structure and functions of epithelial tissue, connective tissue, muscular tissue and nervous tissue

### **Reference Book:**

Foundation Course in Biology – S.K.Aggarwal

## **SEMESTER – III**

### **CORE PAPER –V DARK ROOM TECHNIQUE – I**

### **Unit - I**

Photographic Process-Image produced by radiation -Light sensitive material-Differential attenuation-Primary radiological image and latent image formation-Film materials

### **Unit - II**

Films-Structure and types of film, resolving power -Orthochromatic and panchromatic film- Sensitivity of film-X-ray film storage – structure of unexposed film , protection of exposed film and screen

### **Unit - III**

Intensifying screen-Construction-Intensification factor, sharpness and speed -Care of intensifying screen and rare earth screen-Cassette – structure, types and care of cassette

### **Unit - IV**

Density of film-Optical density -H & D curve-Gamma, latitude & film speed-Grid and types of grid , evaluation of grid performance

### **Unit - V**

Radiographic image-Sharpness -Contrast -Magnification, penumbra and distortion

**Reference Book:**

Text Book of Radiology for Residents and Technician – Sathish .K.Bhargava  
Hand book of Medical radiography - C.Rama Mohan

**CORE PAPER VI - GENERAL RADIOLOGY – I**

**Unit - I**

Upper extremity-Basic alternative and additional projections for special conditions of bones and joints of upper extremity-Shoulder girdle – basic and alternative technique for the shoulder joint and scapula , clavicle , ACJ and SCJ

**Unit - II**

Lower extremity-Basic and alternative projections of lower extremity, toes, foot, fingers, calcaneus, subtalar joint, ankle joint, leg, knee, patella and femur

**Unit - III**

Pelvic girdle & hip region-Basic and alternative technique for the whole pelvis and upper femora , pelvis and hip joint -Femoral neck, acetabulum , anterior pelvic bones , ilium, special technique for congenital dislocation of the hip

**Unit - IV**

Vertebral column-Basic and alternative technique for occipito – cervical articulation , atlas and axis, odontoid process , cervical vertebrae , cervico – thoracic region , thoracic vertebrae , lumbar – lumbo sacral vertebrae , lumbo sacral junction and sacro iliac joint and coccyx

**Unit - V**

Bony thorax , thoracic viscera & joint of neck-Techniques for sternum, sterno clavicular joint , ribs – upper and lower -Trachea , pulmonary apex, chest ( lungs and heart ) -Pharynx and larynx

**Reference Books:**

Clark's positioning in radiography  
Text Book of Radiology for Residents and Technicians – Sathish.K.Bhargava

**CORE PAPER VII - RADIATION PHYSICS – I****UNIT - I**

Spectrum-Emission spectrum-Continuous spectrum-Line and Bad spectrum

**UNIT - II**

X-rays-Production and properties -X-ray tube – stationary and rotating anode tube -Inter locking circuit-Relays and timers -Radiation unit-Quality and quantity of x-rays

**UNIT -III**

Interaction of radiation with matter-Attenuation, attenuation coefficient, half value layer - Coherent scattering , photoelectric effect, pair production and Compton effect

**UNIT – IV**

Measurement of ionizing radiation-Exposure, roentgen, absorbed doss, rad, grey and kerma

**UNIT - V**

Filters and grid -Physical principles of filters -Filtration – inherent and added filter -Effect of filtration on low and high energy beam-Grid characteristics, types of grid and evaluation of grid performance

**Reference Books:**

Physics of Diagnostic radiology - Christiansen  
 Physics and Photography Principles of Medical Radiography – Seeman and Herman  
 Basic Radiological Physics - K.Thayalan  
 Radiographic Imaging - Derrick

**ALLIED PAPER III – COMPUTER APPLICATION I****UNIT – I**

Introduction ; Block diagram of a computer -Working of a computer -Parts of a computer - Classification of computer -Identification of various parts of PC

**UNIT –II****INPUT AND OUTPUT DEVICES**

INPUT DEVICES-Keybaord – types of keybaord-Mouse -Touch scrren ;Touch pads,light pen , track ball,joystic-Scanning devices ; types-Optical bar code reader -Digitizer ; Electronic card reader -Voice recognition devices-Vision input devices ,web camera

**OUTPUT DEVICES**

Monitors ; - Types of monitors -Other types of displays –Speakers-Secondary Storage devices-Printer type of printers-Plotters

**UNIT – III**

Generation of Computers-Programming languages-Network -Advantages of networking -Types of computer network-Modem – Type-Processors – Types of processors



**UNIT – IV**

**INTRODUCTION TO OPERATING SYSTEM**

Components of OS-Functions of OS-OS services-UNIX-LINUX-Mac OS-IBM OS/2-Other types

DOS-Installation of MS – DOS-DOS Commands-Limitations of MS – DOS-DOS Structure

**UNIT V**

**SYSTEM FILES**

Batch file Program-Windows users-Configuration files-Boating the system -Re-formatting & Repairing Hard Disk -Windows XP-features Application & Uses

**References:**

**Fundamentals of Computer Application**

**SKILL BASED SUBJECT I – PERSONALITY DEVELOPMENT –I**

**UNIT –I**

What Makes A Winning Personality- Personality Defined- Determinants of Personality- How Personality is Developed

**UNIT-II**

Corporate Theories on Personality Development-The Development Process-What Makes A Winner

**UNIT-III**

Building Self – Esteem and Self – Confidence-Indicators of a Positive Self – Image-Indicators of a Negative Self – Image-The Development of Self

**UNIT –IV**

Image and Self – Esteem- Self – Esteem and Maladjustment

**UNIT-V**

Behavioral Manifestations of Woundedness-Therapy for Wholeness and Wholesome Self – Esteem

**Reference Book:**

Roldan , Amelia Samson . A Workbook on Personality Development and Character Building. AR SKILLS DEVELOPMENT AND MANAGEMENT

**SEMESTER IV**  
**CORE PAPER –VIII DARK ROOM TECHNIQUE –II**

**UNIT - I**

Darkroom chemistry -Developing –Rinsing-Fixing-Washing and drying-Automatic film processing-Silver recovery method

**UNIT - II**

Dark room design-Location, size, installation of the dark room , building essential ,ventilation ,electric wiring, pass box, entrance, illumination , dry side, wet side and safe light

**UNIT-III**

Exposure of factors -Kvp, mAs and FFD-Factors affecting the quality control of radio graph

**UNIT – IV**

Beam limiting devices- Cones, cylinders, aperture diaphragm- Bedside radiography, high KV radiography, soft tissue radiography- Ten day rule

**UNIT-V**

Film artifacts-Photographic and radiation artifact – fog, stain, scum -Defect in radiographic image, spot and splashes, mark and print -Drying fault and miscellaneous fault

**References:**

Text Book of Radiology for Residents and Technician – Sathish .K.Bhargava  
Hand book of Medical radiography - C.Rama Mohan

**CORE PAPER IX- GENERAL RADIOLOGY –II**

**UNIT- I**

Skull -Technique applicable to the whole skull cranial bone, sellaturcica, orbit -Opticforamen, superior and inferior orbital fissure

**UNIT-II**

Facial bone-Radiographic positioning of face bone, nasal bone, zygomatic bone, maxilla, mandible, mandibular symphysis , TMJ

**UNIT - III**

PNS and temporal bone-Radiography and positioning of PNS, radiography and technique of mastoid process and mastoid and petrous positions, jugular foramina

**UNIT-IV**

Digestive system-Abdomen, gallbladder, spleen and liver

**UNIT-V**

Dental radiography-Intra oral radiography -Extra oral radiography

**Reference Books:**

Clark's Position in Radiography

Text book of radiology for Residents and Technician – Sathish .K.Bhargava

**CORE PAPER X - RADIATION PHYSICS – II**

**UNIT - I**

Radiation detectors -Ionization chamber-Scintillation detector-Geiger muller counter

**UNIT – II**

Personal monitoring devices-Pocket dosimeter -Film badge-TLD

**UNIT-III**

X-ray deem restrictors-Aperture diaphragm, cones, cylinders, collimators -Radiation protection devices

**UNIT- IV**

Effects of x-rays-Fluorescence, phosphorescence and luminescence-Images - Primary radiological images, fluoroscopy -Image intensifier-Magnification, distortion, unshrapness, penumbra, radiographic exposure

**UNIT- V**

Biological effects of radiation

**References Books:**

Christensen's Physics of Diagnostic radiology

Basic Radiological Physics – K.Thayalan

Imaging Atlas of Human Anatomy – Jemie Weir et al (Mosby – Elsevier)

Concepts in Medical Radiographic Imaging – Merianne Jortice

**ALLIED PAPER IV - Computer Application II**

**UNIT – I**

MS Office – Introduction -Versions of MS Office-Components of word window-Preparing documents ;opening document-Editing document ;spell checker-Saving a document ;printing a document

**UNIT – II**

Formatting document-Creating graphics inserting diagrams-Creating and editing tables-Macros-Inserting header and footer -Inserting characters-Page setup-Features and benefits of write pad-Adding bookmark

**UNIT – III**

Introduction to MS-excel-Structure of spread sheet-Creating and editing simple work sheets- Applications of spread sheet-Preparing spared sheets-Building a sample worksheet using MS-Excel-Information ,presentation using excel

**UNIT – IV**

Simple data and numeric operations in spared sheet-Using formula in spread sheet operations - Making tables-Printing reports or worksheets-Formula for calculations-Sorting and quering - Data filters

**UNIT – V**

Computer aided design-Introduction to CAD-Features, benefits and business applications- Conforming to the drafting specifications-Saving and retrieving drawings-Dimensions – Lettering-Plotting drawings-Importing and exporting graphics through CAD.

**References:**

**Fundamentals of Computer Application**

**SKILL BASED SUBJECT II – PERSONALITY DEVELOPMENT II**

**UNIT-I**

Projecting A Positive Social Image - Social Image Defined- Looking great and Attractive- Dressing and Make – up-

**UNIT –II**

Poise and Posture-Eye Contact and body Language-Physical Fitness- Projecting a Professional Image

**UNIT-III**

Developing a Win – Win Attitude- Emotional Programs -Discipline in Problem Solving

**UNIT IV**

Differentiating Assertive from Aggressive and Passive Behavior

**UNIT V**

Ego States and Personality

**Reference :**

Roldan , Amelia Samson . A Workbook on Personality Development and Character Building. AR SKILLS DEVELOPMENT AND MANAGEMENT

**SEMESTER – V**  
**CORE PAPER XI - GENERAL RADIOLOGY – III**

**UNIT - I**

Contrast medium-Procedures involved in various system of the body

**UNIT - II**

Urinary system-Excretion urography ( IVP or IVU )-Micturating cystourethrography ( MCU )  
-Retrograde pyelo urethrography ( RPG)-Ascending urethrography in male

**UNIT - III**

Biliary system-Oral cholecystography-Pre and post cholangiography-PTC and ERCP

**UNIT-IV**

Respiratory system-Bronchography -Nasopharyngography

**UNIT-V**

Reproductive system-HSG-Pelvimetry

**Reference Books:**

A guide of Radiological Procedures - Stephen Chapman  
Hand Book of Medical Radiography - C.Rama Mohan

**CORE PAPER XII - RADIATION PHYSICS – III**

**UNIT -I**

Mammography -Mammographic film, equipments and projections – Principle and image acquisition

**UNIT-II**

Computed tomography-Equipment, reconstructive image and parameters -Various generations of CT-Collimators, detectors, CT numbers and image display -Clinical applications of CT

**UNIT-III**

Magnetic resonance imaging -Larmor equation , Precessional frequency , instrumentation , types of mangment , coils , RF purls , resonance, relaxation time-Fundamentals of MRI -Basic principle of MRI Patient Preparation , advantage and disadvantage of MRI -Clinical Application of MRI -NMR parameters

**UNIT-IV**

Xero radiography / CR (principle, equipment and imaging) / Digital Radiography - Macro radiography / Tomography basics

**UNIT –V**

Recent Advances in Imaging Techniques – Digital Radiography – PACS system – Image Storage Devices

**Referenc Books:**

Christinsens’s Physics of Diagnostic Radiology  
Basic Radiological Physics - K.Thayalan  
Radiographic Imaging - Derrick

**CORE PAPER XIII - RADIOTHERAPY – I**

**UNIT - I**

Principles of radiobiology -Effects on radiation in cells and DNA -4 R principles -Oxygen effect and oxygen enhancement ratio-Therapeutic ratio and therapeutic gain

**UNIT -II**

Aetiology, epidemiology and prevention of cancer-European code, cancers screening and its method

**UNIT-III**

Biological and pathological introduction (general oncology)-Neoplasm- benign and malignant - Carcinogenesis -Causes of cancer -Pre cancerous lesion -Spread of cancer – local invasion and metastasis -Stage based on TNM classification-Classification of neoplasm

**UNIT-IV**

Principles of management and dosage-Radical or palliative treatment -Choice of radical or palliative treatment

**UNIT-V**

Radiation protection -Radiation protective devices -Personal monitoring devices -Biological effects of radiation

**Reference Books:**

Walter & Miller text book of Radiotherapy

**ELECTIVE – I PSYCHOLOGY I**

**UNIT – I**

What is psychology? Field of application and methods of study of psychology

**UNIT -II**

The respective influences of heredity and environment on the individual

**UNIT III**

Development and growth of behaviour in infancy and childhood

**UNIT - IV**

Introduction: Field of application and short history of clinical psychology.

**UNIT- V**

Concept of mind: Conscious and unconscious mind (psychological approach).

**BOOK REFERENCES:**

Clinical Psychology by Kuleman.

**SKILL BASED SUBJECT III – HEALTH EDUCATION I**

**UNIT-I**

**Health-** Concepts -issues - systems for health promotion and management of health problems

**UNIT-II**

**Population dynamics and control**Demography-National population policy- Census, National Family Health Survey

**UNIT-III**

Health care delivery system: Urban, rural, tribal and difficult areas Health organization: National, State, District, CHC, PHC, SubCentre, Village

**UNIT – IV**

Functions- Health agencies: NGO's, Roles and functions-Challenges of health care delivery system

**UNIT-V**

**Epidemiology**

Introduction-Concept- scope-definition-trends

**REFERENCE BOOK:**

Park's **Textbook** of Preventive and Social Medicine

**SEMESTER VI  
CORE PAPER – XIV GENERAL RADIOLOGY – IV**

**PROCEDURES INVOLVED IN VARIOUS SYSTEM OF THE BODY**

**UNIT - I**

CNS-Myelography -Ventriculography -Encephalography -Discography

**UNIT - II**

Digestive system-Barium swallow -Barium meal -Barium meal follow through -Barium enema (single and double contrast) - Small bowel enema – Fistulogram, Enteroclysis, Sinogram

**UNIT -III**

Circulatory system and cardiovascular system-Peripheral angiography –DSA-Cardiographic angiography -Catheterization method and technique – C-Arm, Radiological Interventions

**UNIT -IV**

Sialography and dacryocystography

**UNIT – V**

Arthrography and venography

**References :**

A Guide of Radiological Procedures – Stephen Chapman  
Hand Book of Medical Radiography – C.Rama Mohan

**CORE PAPER : XV RADIATION PHYSICS –IV**

**UNIT - I**

Ultrasonography -Principle of ultrasound , modes of ultra sound -Transducer and its structure - Doppler ultra sound -Color Doppler and duplex scan -Advantage and disadvantage of ultrasound -Clinical application of ultrasound

**UNIT - II**

Nuclear medicine-Radioisotopes , measurements of sample activity -Detection of radio activity in the body -Whole body counting -Gamma camera -Radiopharmaceuticals , radionuclide-Ellusion-Clinical application of nuclear medicine

**UNIT - III**

Positron emission tomography - Single photon emission tomography - Mass miniature radiography

**UNIT – IV**

Radiation Protection in Diagnostic Radiology – Patient Dose in diagnostic Procedures – DAP (Dose area Product) definition and its significance – Personnel and Area Monitoring – Occupational Exposures and Radiation Protection Devices – Annual Dose limits for occupational Workers – AERB guidelines to start new X-ray /C-Arm/CT units – Radiation Safety Officer and Responsibilities – Registration and Licence procedures for CT/Cathlab and X-ray machines



**UNIT - V**

Radiation Safety and Radiobiology: Biological effects – Dose, effects of time, distance & shielding – personal and area monitoring – Planning of X-ray rooms, dark rooms – Inspection of X-ray installations – registration and installation – Certification – Occupational exposure and protection tools / devices – CT dose modulation – AERB safety requirements – Atomic Energy Act – Quality control in Radiology as per NABH

Quality Assurance : Quality Assurance Tests for Radio diagnostic equipments – CT scan, C-Arm (cath Lab) and X-Ray Machines – NABH accreditation requirements

**Reference Books :**

Chrisinsen's Physics of Diagnostic Radiology  
Basic Radiological Physics –K.Thyalan  
Safety aspects in Radiation – K.Thayalan  
Processing and Quality Control – William  
Quality Control in Diagnostic Imaging – JE.Gray  
Diagnostic Imaging Quality Assurance – by MM.Rehani

**CORE PAPER : XVI RADIOTHERAPY – II**

**UNIT - I**

CLINICAL CASES OF TUMORS - All the tumors studies should have - EPIDEMIOLOGY, AETIOLOGY, PATHOLOGY, CLINICAL FEATURES, INVESTIGATION ,STAGING,TREATMENT AND THE RESULT FOR TREATMENT.

**UNIT - II**

Skin tumors – squamous cell carcinoma – Multiple myeloma

**UNIT- III**

Lung cancer-Tongue cancer-Thyroid cancer

**UNIT-IV**

Breast cancer --Cervical cancer-Prostate cancer-

**UNIT- V**

Leukaemia-Hodkin's and non Hodkin's disease

**Reference Book:**

Walter and Miller text book of Radiotherapy

## **ELECTIVE II – PSYCHOLOGY II**

### **UNIT- I**

Motivation: Achievement, affiliation and aggression Maslow's theory. Emotions and emotional development.

### **UNIT-II**

Learning theories, methods of learning (Pavlov, Thorndike, Hull- Tolman)-Learning and maturation  
special reference to conditioning positive and negative reinforcement interest and in learning.

### **UNIT-III**

Sensation, perception- Social psychology, influence of individual or groups on behaviour of others  
leadership and group psychology.

### **UNIT -IV**

Memory, thinking and causes of forgetting.

### **UNIT –V**

Intelligence and intelligence testing, kinds of mental deficiency - Personality: Concept, influencing factors and tests.

**Book References** - Clinical Psychology by Kuleman

## **ELECTIVE III – PSYCHOLOGY III**

### **UNIT – I**

Major psychological disorders: Psychoneurosis – Anxiety – Phobia - Obsessive - compulsive Reaction

### **UNIT-II**

Psychosis –Schizophrenia – Depression - Psychosomatic disorders

### **UNIT – III**

Personality disorders - Frustration and conflict.

### **UNIT- IV**

Stress: Coping mental mechanism with special reference to normal and abnormal conditions.

### **UNIT – V**

Counseling: Process, approaches – Directive , Non-directives , Counseling skills.

**Book References** - Clinical Psychology by Kuleman

## **SKILL BASED SUBJECT 4 – HEALTH EDUCATION II**

### **UNIT-I**

#### **National Health and Family Welfare Programmes**

Objectives, Organisation /manpower/resources, Activities, Goals, inter-sectoral approach-implementation, item/purpose, role and responsibilities of community health worker

### **UNIT II**

National Vector Borne Disease Control Programm (NVBDCP)

National Filariasis Control Programme-National Leprosy Eradication Programme-Revised national TB Control Programme-National Programme for Control of Blindness-National Iodine Deficiency disorders Control Programme- National Mental Health Programme-National AIDS Control Programme-National Cancer Control Programme-RCH I and II

### **UNIT-III**

Non- communicable disease programmes-NRHM-Health Schemes-ESI- CGHS- Health Insurance

### **UNIT-IV**

#### **Occupational health**

Introduction: Trends-issues-Definition- Aims-Objectives, Workplace safety-Occupational hazards for different categories of people

### **UNIT V**

Physical-Chemical-biological-mechanical –Accidents - Occupational diseases and disorders

**REFERENCE-** Park's **Textbook** of Preventive a