SUMANDEEP VIDYAPEETH

(Declared as Deemed to be University under Section 3 of the UGC Act 1956)
Accredited by NAAC with a CGPA of 3.53 out of four-point scale at 'A' Grade
Category – I deemed to be university under UGC Act - 2018
At & Post Piparia, Tal: Waghodia 391760 (Gujarat) India.
Ph: 02668-245262/64/66, Telefax: 02668-245126,
Website: www.sumandeepvidyapeethdu.edu.in

CURRICULUM
Bachelor of Science
(B.Sc)
RADIO IMAGING TECHNOLOGY

Attested CTC

15/2/2021

Vice-Chancellor
Sumandeep Vidyapeeth
An Institution Deemed to be University
Vill. Piparia, Taluka: Waghodia.
Dist. Vadodara-391 760. (Gujarat)

Dean
Smt. B. K. Shah Med. Insti. & Resc. Centre

AMENDED UP TO DECEMBER -2020

INTRODUCTION:

Learning Objectives:

The Aim of B.Sc. in Medical Radiology and Imaging Technology program is to provide highest and Atomic Energy Regulatory Board (AERB) accredited educational process through formal didactic and state-of-the-art clinical experiences that will render qualified, patient focused, compassionate, critical thinkers Medical Radiology and Imaging Technologist for the community who are engaged in lifelong learning. The graduates of the program are prepared to apply for the Level I Radiation Safety Officer (RSO) as per AERB norms.

Learning goals and objectives for paramedical healthcare professionals

1. Provide the profession and community with trained qualified technologist
2. Provide education a comprehensive program that promotes problem solving, critical thinking and communication skills in the clinical environment
3. Students will demonstrate quality patient care skills including professionalism and ethical behaviors as specified in the code of ethics
4. Graduate students with specific skills necessary to be competent entry level

Program outcomes

1. Should be able to undertake Mammography, CT scan and MRI procedures independently.
2. Assist in specialized radiological procedures.
3. Able to do the image processing.
4. Should be able to handle all radiological and imaging equipment independently.
5. Should ensure radiation protection and quality assurance.
6. Undertake care and maintenance of all radiological and imaging equipment.
7. Able to evaluate images for technical quality.
8. Able to identify and manage emergency situations.
9. Able to receive and document verbal, written and electronic orders in the patient's medical record.
10. Should have computer skills.
11. Should be able to provide empathetic professional patient care.
12. Able to demonstrate professional growth, sense of professionalism and desire to learn.
13. Able to demonstrate the core values of caring, integrity and discovery.
14. To exhibit keen interest, initiative & drive in the overall development of the Department and 'Leadership Qualities' for others to follow.
15. He / She is expected to be confident and to perform all the duties diligently with utmost sincerity and honesty.
16. Any other duty/task/work assigned by any higher authority like Director, Dean, Medical Superintendent, Head of the Department from time to time; either in "Public Interest" or in the interest of upkeep / development of the Department / Institutions.

Ethics and accountability

Students will understand core concepts of clinical ethics and law so that they may apply these to their practice as healthcare service providers. Program objectives should enable the students to:

- Describe and apply the basic concepts of clinical ethics to actual cases and situations
- Recognize the need to make health care resources available to patients fairly, equitably and without bias, discrimination or undue influence

- Demonstrate an understanding and application of basic legal concepts to the practice
- Employ professional accountability for the initiation, maintenance and termination of patient-provider relationships
- Demonstrate respect for each patient's individual rights of autonomy, privacy, and confidentiality

Commitment to professional excellence

The student will execute professionalism to reflect in his/her thought and action a range of attributes and characteristics that include technical competence, appearance, image, confidence level, empathy, compassion, understanding, patience, manners, verbal and non-verbal communication, an anti-discriminatory and non-judgmental attitude, and appropriate physical contact to ensure safe, effective and expected delivery of healthcare.

Eligibility for admission:

1. He/she has passed the Higher Secondary (10+2) Science or a duly constituted Board with pass marks in Physics, Chemistry, Biology
2. Diploma in Radiology Imaging Technology with minimum aggregate of 50% marks.

Provision of Lateral Entry:
Lateral entry to second year for allied and healthcare science courses for candidates who have passed diploma program from the Government Boards and recognized by State/Central University, fulfilling the conditions specified and these students are eligible to take admission on lateral entry system only if the same subject have been studied at diploma level.

Duration of the course:
Duration of the course is 4 years including 1 year internship.

Attendance:
A candidate has to secure minimum 80% attendance in overall with at least-
1. 75% attendance in theoretical
2. 80% in Skills training (practical) for qualifying to appear for the final examination.

No relaxation, whatsoever, will be permissible to this rule under any ground including indisposition etc.

Medium of instruction:
English shall be the medium of instruction for all the subjects of study and for examination of the course.

Assessment: Assessments should be completed by the academic staff, based on the compilation of the student's theoretical & clinical performance throughout the training programme. To achieve this, all assessment forms and feedback should be included and evaluated. Student must attain at least 50% marks in each Theory, Internal assessment and Practical independently / separately for each individual subject.

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COURSE OF INSTRUCTION

Course Name	Course code	Theory (In hrs.) (Class and lab)	Practical (In hrs.) (Clinical)
First Year – total hours-606			
Anatomy	BRIT101	60	40
Physiology	BRIT102	60	40
Pathology & Microbiology	BRIT103	60	40
Biochemistry	BRIT104	40	40
Radiation physics	BRIT105	60	--
Radiographic positioning	BRIT106	70	140
Total		**340**	**266**
Second Year –total hours-260			
Radiological Special Procedures	BRIT201	120	**100**
General Medicine	BRIT202	40	-
General Pharmacology	BRIT203	40	-
Total		**160**	**100**
Third Year – total hours 800			
New Imaging Modalities and Recent advance	BRIT301	160	240
Radiation Physics and Darkroom Technique	BRIT302	120	80
Radiological special Procedures and Radiographic Positioning	BRIT302	120	80
Total		**400**	**400**
Fourth Year			
Internship			
Internship	**Total hours**		
	2184		

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SCHEME OF EXAMINATION

Course	Course Code	Assessment			
		Hours	Internal	External	Total
First Year					
Anatomy	BRIT101	3	20	80	100
Physiology	BRIT102	3	20	80	100
Pathology & Microbiology	BRIT103	3	20	80	100
Biochemistry	BRIT104	3	20	80	100
Radiation physics	BRIT105	3	20	80	100
Radiographic positioning	BRIT106	3	20	80	100
Total			**120**	**480**	**600**
Second Year -					
Radiological Special Procedures	BRIT201	3	20	80	100
General Medicine	BRIT202	**3**	20	80	100
General Pharmacology	BRIT203	3	20	80	100
Total			**60**	**240**	**300**
Third Year -					
New Imaging Modalities and Recent advance	BRIT301	3	20	80	100
Radiation Physics and Darkroom Technique	BRIT302	3	20	80	100
Radiological special Procedures and Radiographic Positioning	BRIT302	3	20	80	100
Total			**60**	**240**	**300**

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FIRST YEAR B.SC RADIO IMAGING -TECHNOLOGY

BRIT101-ANATOMY **60 HOURS**

THEORY

UNIT – I (ORGANISATION)

- Terms, terminology, planes
- Tissues of the body (General) Epithelial tissue
- Glands, mucous membrane

UNIT – II (SKELETAL SYSTEM)

- Cartilage
- Bones
- Ossification, blood supply
- Joints
- Synovial joint

UNIT – III (MUSCULAR TISSUE)

- Muscle classification – I
- Muscle – II,
- UNIT – IV (Nervous system)
- Neuron, Neuroglia
- Spinal cord & Spinal nerves
- Parts of brain & major functions
- Cranial nerves
- Autonomic nervous system

UNIT – V (SENSORY ORGANS)

- Nose & Olfaction
- Tongue

UNIT – VI (CIRCULATION & LYMPHATIC)

- Systemic, Pulmonary, Portal
- Heart, chambers, valves
- Coronary circulation, venous drainage, applied
- Major branches of aorta, major veins, pulse
- Femoral and Auxiliary artery
- Diaphragm
- Lymphoid tissue classification, structure I
- Lymphoid tissue classification, structure II
- Lymphatic drainage, lymphatic trunks

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PRACTICAL: 40 HOURS

1.	Human skeleton
2.	Organ systems
3.	Organs – 1
4.	Organs – 2
5.	Organs – 3
6.	Organs – 4
7.	Organs – 5
8.	Types of Cartilages
9.	Bones -1
10.	Bones -2
11.	Bones -3
12.	Histology of compact bones
13.	Muscles of body as functional groups
14.	Histology of types of muscles

BRIT102-PHYSIOLOGY 60 HOURS

UNIT-1GENERAL PHYSIOLOGY

- Introduction to cell physiology,
- Transport across cell membrane
- Homeostasis, Body Fluid compartment & measurement

UNIT-2 BLOOD

- Introduction - composition and function of blood
- Plasma proteins
- Red blood cells.
- Hemoglobin
- WBC
- Platelets
- Homeostasis
- Blood Group

UNIT-3 NERVE – MUSCLE PHYSIOLOGY

- Resting membrane potential &Action potential
- Types of muscle& Mechanism of Muscle Contraction
- Neuromuscular Junction
- Neuron and neuroglia
- Properties of nerve fibre
- Secretion & Composition & function of CSF

UNIT-4 GIT

- Movement of GIT
- Deglutition & Mechanism of Vomiting
- Digestive juices in upper digestive tract
- Digestive juices in lower digestive tract

UNIT-5 EXCRETORY SYSTEM

- Kidneys-structure, function
- Glomerular filtration rate
- Counter current mechanism of concentration of urine,
- micturition, Diuretics
- Artificial kidney, renal function tests
- Skin
- Regulation of body Temperature

UNIT-6 RESPIRATORY SYSTEM

- Mechanism of Breathing
- Hypoxia
- O2 and CO2 transport
- Pulmonary volume & Capacities

UNIT -7 CARDIO VASCULAR SYSTEM

- Introduction to CVS & general principles of circulation
- Properties of Cardiac muscle
- Cardiac cycle, heart sounds, Pulse
- Cardiac output, Heart rate ,BP ,ECG
- Coronary circulation, Cutaneous circulation-Triple response ,Shock
- Effects of exercise on CVS and Respiratory system

UNIT-8 LYMPHATIC SYSTEM

UNIT- 9 ENDOCRINE SYSTEMS

- Hormones of pituitary, Thyroid
- Parathyroid Gland
- Hormones of Adrenal Gland & Pancreas

UNIT 10REPRODUCTIVE SYSTEM

- Introduction to reproductive system, Puberty
- Male reproductive system,
- Female reproductive system,
- Physiological changes during pregnancy, pregnancy tests, parturition & lactation
- Male & Female contraceptive methods
- Special senses
- Vision
- Audition
- Olfaction
- Gustation

PRACTICAL: 40 HOURS

- Introduction and Laboratory guidelines
- Demonstration of estimation of Hemoglobin
- Practical of estimation of Hemoglobin
- Practical of BT & CT
- Practical of Blood Grouping

- ESR & PCV
- Blood Pressure
- Pulse
- Revision
- Heart rate & heart sound
- Breathing rate & breathing sound
- Identification of blood cells by peripheral smear. RBC, WBC, Platelets.
- Revisions

BRIT103-PATHOLOGY 30 HOURS

UNIT I-CELL INJURY AND ADAPTATION:

- Necrosis:
- Definition.
- Types of necrosis.
- Short notes: Coagulative necrosis.
- Liquefactive necrosis
- Caseous necrosis
- Fat necrosis
- Gangrene

UNIT II- INFLAMMATION AND REPAIR:

Inflammation: Definition

- Types of inflammation
- Vascular changes, Hemodynamic changes
- Changes in vascular permeability
- Cellular events: Margination, Adhesion, Emigration, Chemotaxis, Phagocytosis.
- Shortnotes: Phagocytosis,Chemotaxis and Granulomas

Healing and repair:

- Process of healing by primary intention.
- Process of healing by secondary intention.
- Shortnotes: factors influencing wound healing.

UNIT III-FLUID AND HEMODYNAMIC DERANGEMENTS:

Edema:

- Definition
- Types of edema
- Pathogenesis of renal and cardiac edema
- Lymph edema

Shock:

- Definition
- Types of shock
- Pathogenesis of septic and hypovolemic shock

Thrombosis:

- Definition
- Factors influencing thrombosis
- Fate of thrombosis

UNIT IV-NEOPLASIA

- Introduction: nomenclature, metaplasia, dysplasia, anaplasia, hyperplasia, hypertrophy
- Definition
- Differences between benign and malignant tumors
- Spread of tumors
- Shortnotes: Gross features and clinical features of:
- Squamous papilloma
- Squamous cell carcinoma
- Lipoma
- Fibrosarcoma.

UNIT V-INFECTIOUS DISEASES:

- Tuberculosis: Etiology and clinical features.
- Geon complex
- Secondary tuberculosis
- Leprosy: Etiology, classification and morphology of Lepromatous and Tuberculoid
- leprosy
- Etiology, mode of infection, clinical features and gross pathology of HIV infection

UNIT VI-DISEASES OF RED CELLS AND BLEEDING DISORDERS

- Anaemia: definition and classification
- Clinical features of:
- Iron deficiency anaemia
- Vit B 12 deficiency anaemia
- Sickle cell anemia
- Coagulation disorders: classification, capillary fragility and platelet disorders.
- Haemophilia(SN) thrombocytopeniaincluding ITP(SN)

UNIT VII-DISEASES OF WHITECELL AND LYMPH NODES

- Leukaemia: definition, classification and clinical features
- Lymphoma: definition, types and clinical features

UNIT VIII-NUTRITIONAL DISEASES

- Vit A, B, C, D deficiency including a brief account of rickets

PRACTICAL: 20 HOURS

- Receiving of Specimen in the laboratory
- Grossing Techniques
- Mounting Techniques – various Mutants
- Maintenance of records and filing of the slides
- Tissue processing for routine paraffin sections
- Section Cutting
- Staining of tissues - H& E Staining
- Collection, Transport, Preservation, and Processing of various clinical Specimens
- Urine Examination – Collection and Preservation of urine. Physical, Chemical, Microscopic Examination
- Urine Examination –Chemical and Microscopic Examination
- Collection of Blood samples
- Various Anticoagulants used in Haematology

BRIT103-MICROBIOLOGY 30 HOURS

UNIT I: GENERAL MICROBIOLOGY

- History: Louis Pasteur, Robert Koch
- Microscope: Parts, function and its types
- Morphology of bacteria: classification of microorganisms, bacteria cell, staining of bacteria-Gram and ZN stain.
- Physiology of bacteria: Growth and nutrition of bacteria, Growth curve
- Sterilization and disinfection: Dry heat, moist heat sterilization, filtration, Radiation,disinfectants use in hospital
- Culture media: simple and complex media, preparation and its use
- Culture methods: aerobic and anaerobic
- Identification of bacteria: catalase test, coagulase test, oxidase test, Urease test, IMViCTESTS

UNIT II: IMMUNOLOGY

- Infection
- Immunity
- Antigen
- Antibody

UNIT III: COLLECTION, TRANSPORT AND PROCESSING OF CLINICAL SPECIMENS:

- Throat swab
- Sputum
- Urine
- Pus
- Blood
- CSF

UNIT IV: SYSTEMIC BACTERIOLOGY

- Staphylococcus aureus
- Streptococcus pyogenes
- Pneumococcus
- E.coli, Klebsiella and Pseudomonas

UNIT V: HEALTH CARE ASSOCIATED INFECTIONS:

- Sources, Method of transmission and Prevention

UNIT VI: Principle and Practices of Biomedical waste management

PRACTICAL: 20 HOURS

- Microscope: parts function, focus, care and handling
- Hanging drop preparation
- Performance of Gram's stain
- Performance of ZN stain
- Culture media preparation: Nutrient agar, Blood agar, Chocolate agar, NA slant,
- Mac conkeys agar.

- Functioning of Autoclave and Hot air oven
- Visit to hospital for the demonstration of Biomedical Waste Management
- Aseptic practices in laboratory and safety precautions

BRIT104-BIOCHEMISTRY 60 HOURS

UNIT I-BASIC CONCEPTS OF ENZYMES

- Clinical enzymology
- Carbohydrates proteins and lipids (structure and function)
- Primary metabolic pathways involving proteins, lipids and carbohydrates
- Biosynthesis of Proteins, Membrane, Lipids and Glucose – Basic Steps

UNIT II

- Haemoglobin (Haem Synthesis), Blood Clotting Factors

UNIT III

- Brief Note on Vitamins

UNIT IV

- Plasma Proteins and their Clinical Importance

UNIT V-CLINICAL BIOCHEMISTRY AND INTERPRETATION

- Test for liver function/gastric function
- Test for renal function
- Lipid profile
- Glucose –gtt, rbs, fbs
- Electrolytes
- Blood collection/anticoagulants

PRACTICALS: 40 HOURS

- To demonstrate glassware's, apparatus and plastic wares used in laboratory.
- Preparation of different percentage solutions
- Preparation of normal and molar solutions. (0.1 N NaOH, 0.2N HCl, 0.1 M H2SO4).
- Reactions of Carbohydrate
- Reactions of Protein: - Precipitation and Color reaction.
- Analysis of Normal Urine:- Physical, Chemical and Microscopic
- Analysis of abnormal Urine:- Physical, Chemical and Microscopic
- Qualitative analysis of Saliva.
- Qualitative analysis of Milk
- Qualitative analysis of Bile.
- Qualitative analysis of CSF.
- Qualitative analysis of Gastric juice.

BRIT105-RADIATION PHYSICS 60 HOURS

UNIT I-REVIEW OF IDEAS ON ATOMIC AND NUCLEAR PHYSICS

- Alpha decay, beta decay gamma emission
- Internal conversion and nuclear isomerism
- Nuclides and its classification
- Radio activity
- Half life

UNIT II-ELECTROMAGNETIC RADIATION

- Electromagnetic spectrum
- Common properties of electromagnetic radiation
- Relationship between energy, frequency, wavelength and velocity eg, x- ray and
- gamma rays

UNIT III-REVIEW OF X-RAYS

- Properties of x-rays
- Production of x-rays
- Interaction of x-rays with the target
- Spectra of x-rays
- Quality and intensity of x-rays
- The factors influencing quality and intensity

UNIT IV-INTERACTIONS OF X-RAYS, GAMMA RAYS AND BETA RAYS WITH MATTER

- Transmission through matter
- Law of exponential attenuation
- Half value layer
- Linear attenuation coefficient
- Interaction of radiation with matter
- Classical scattering
- Compton scatter
- Photo electric absorption
- Pair production
- Practical aspects of radiation absorption and transmission through body tissue

UNIT V-METHODS OF MEASUREMENT OF X AND GAMMA RAY

- Principles of radiation detection and measurement
- Ionization chamber
- G M counter
- Scintillation detector
- Photo film method
- Pocket dosimeter
- TLD
- Solid state detectors
- Chemical dosimeters
- Exposure meters and rate meters
- Measurement of half value layer
- Unit of quantity of radiation exposure, Definition and application of roentgen and relationship with RAD, unit of Dose equivalent(REM)

UNIT VI-Radiation protection

- Introduction
- Maximum permissible Dose, the code of practice
- Protective materials for X and _ radiation
- Radiation monitoring
- Evaluation of workload, occupancy & use factors in diagnostic x-ray departments
- Department planning,
- Protection regulation fluoroscopy & radiography.

UNIT VII-MAIN POWER SUPPLY

- Generators and transformers
- AC and DC power supply with examples
- Single phase and poly phase power supply
- Switches, fuses, circuit breakers, earthing etc
- Main voltage drop: causes and remedy
- Cables: low and high tensions

UNIT VIII-RECTIFICATION

- Vacuum diode- variation of anode current with anode voltage and filament temperature
- Gas filled diode and triode
- Principles of rectification
- Wave form of half wave and full wave current/voltace wave form
- Rectifiers: valves, metal rectifiers, semiconductor rectifiers and relative merits and demerits
- Silicon, germanium diodes

UNIT IX: X-RAY CIRCUITS

- Principle of transformers, design efficiency of transformer, source of power loss
- H.T generators for x-ray machines
- High frequency circuits
- Self-rectifier half wave rectifier, bridge rectifier and three phase rectifier circuits
- Capacitance filter control and stabilizing equipment
- Main voltage compensators and main resistance compensators
- Compensation for frequency variation
- Control of tube voltage, including kv compensator
- High tension selector switch
- Filament circuit
- Control of tube current, space charge compensation

UNITX: X-RAY TUBE

- Gas filled x-ray tube: construction, working and limitations; thermionic emission
- Stationary anode x-ray tube : construction, working, methods of cooling anode; rating chart and cooling chart
- Rotating anode x-ray tube: construction, working rating chart, speed of anode rotation, angle of anode inclination
- Dual focus with particular consideration in choice of focus
- Anode heel effect
- Grid controlled x-ray tube
- Effect of variation of anode voltage and filament temperature
- Continuous and characteristic spectrum of x-rays

- Inherent filter and added filter; their effect on quality of the spectrum

UNIT XI MODERN X-RAY TUBES

- Types in detail

UNIT XII-FILTERS

- Definition of filtration
- Types of filtration
- Effect of filtration on patient as well as exposure factor
- Types of filters

UNIT XIII:X-RAY BEAM RESTRICTORS

- Definition
- Functions of restrictors
- Patient protection

UNIT XIV-GRIDS

- Definition and types
- Evaluation of grid performance
- Grid cut-off
- Air gap technique

UNIT XV: FLUOROSCOPY

- Image intensifier
- Direct fluoroscopy
- Principles of image intensification
- Image quality : unsharpness, noise, resolution, distortion
- Spectral emission ; gas spots
- Multifield image intensifiers
- Lens system and image distribution
- Viewing and recording of fluoroscopic image

UNIT XVI: FACTORS EFFECTING IMAGE QUALITY

- Radiographic image.
- Geometry of the radiographic image

BRIT106-RADIOGRAPHIC POSITIONING **70 HOURS**

UNIT 1-SKULL AND CRANIAL BONES AND FACIAL BONES

- Related radiological anatomy
- **Basic & special projections**
- Cranium
- Base of skull
- Sella turcica
- Mastoids
- Optic foramina and Orbits
- Nasal bone
- TM joint
- Facial bone

- Zygomatic arches
- Mandible
- Para nasal sinuses

UNIT2-NECK

- Related radiological anatomy
- Positioning- AP, LAT

UNIT3-CHEST

- Related radiological anatomy

- **Basic & special projections**
- AP,LAT
- AP supine & semierect
- Lateral decubitus
- AP lordotic
- Anterior oblique
- Posterior oblique
- Upper airway: AP, LAT

UNIT4-ABDOMEN

- Related radiological anatomy
- Basic & special projection

Basic:

- AP supine (KUB)

Special:

- PA prone
- Lateral decubitus
- Erect AP
- Dorsal decubitus
- Lateral
- Acute abdomen: three-way series

UNIT5-KUB

- Related radiological anatomy
- Positioning- AP

UNIT6-PELVIC GIRDLE AND PROXIMAL FEMUR

- Related radiological anatomy
- Basic & special projections
- Pelvic girdle
- AP pelvis
- Frog lateral(modified cleaves method)
- AP axial for pelvic outlet(tailor method)
- AP axial for pelvic inlet(modified linenfold method)
- Posterior oblique- acetabulum(judge method)

UNIT6-HIP AND PROXIMAL FEMUR

- AP unilateral hip
- Axiolateral, inferosuperior (danelius miller method)

- Unilateral frog leg(modified cleaves method)
- Modified axiolateral(clements- nakayama method)
- Sacrioiliac joints: AP, posterior obliques

UNIT7-SHOULDER GIRDLE

- Related radiological anatomy
- Basic and special projections

Shoulder non trauma routine:

- AP(external rotation)
- AP(internal rotation)
- Inferiosuperior axial(Lawrence method)
- Inferiosuperior shoulder projection(west point method)
- Posterior oblique – glenoid cavity(grashey method)
- Intertubercular groov(kisk method)

Shoulder (trauma routine):

- AP neutral rotation
- Transthoracic lateral (Lawrence method)

Scapula Y view

- Tangential projection- supraspinatus outlet(neer method)
- Apical oblique projections (garth method)

Clavicle

- AP and AP axial

Acromioclavicular joints:

- AP bilateral with and without weight

Sternoclavicular joints

Scapula

- AP
- Lateral erect
- Lateral recumbent

UNIT8-HUMOURS

- Related radiological anatomy
- AP
- LAT
- Horizontal beam LAT
- Proximal humerus views

UNIT9-ELBOW

- Related radiological anatomy
- AP- fully extended, partially flexed
- AP oblique- external and internal rotation
- Lateral
- Acute flexion(jones method)
- Trauma axial lateral(coyle method)
- Radial head lateral

UNIT10- FOREARM

- Related radiological anatomy
- AP
- LAT

UNIT11-WRIST

- Related radiological anatomy
- PA, AP
- PA oblique
- Lateral
- Radial deviation
- Carpal canal- inferiosuperior (gaynor-hart method)
- Carpel bridge

UNIT12- HAND

- Related radiological anatomy
- PA
- PA oblique
- Lateral
- Lateral- flexion and extension
- AP bilateral oblique(nirgaard method)

UNIT13- FINGERS

- Related radiological anatomy
- PA
- Oblique
- LAT

UNIT14-THUMB

- Related radiological anatomy
- AP
- PA oblique
- Lateral
- AP (Roberts method)
- Skiers thumb (folio method)

UNIT15-FEMUR

- Related radiological anatomy
- Mid and distal femur
- AP
- Lateral
- Mid and proximal femur
- AP
- Lateral

UNIT16-KNEE

- Related radiological anatomy
- Knee
- AP

- Oblique- medial and lateral rotations
- Lateral
- AP(weight bearing)
- Knee- intercondylar fossa
- PA axial(camp coventry and holmblad method)
- AP axial

UNIT17-LEG

- Related radiological anatomy
- AP
- LAT

Ankle

- Related radiological anatomy
- AP
- AP mortise (15° oblique)
- Lateral
- AP stress

Foot

- Related radiological anatomy
- AP
- Oblique
- Lateral
- AP and lateral weight bearing

Calcaneus

- Related radiological anatomy
- Plantodorsal(axial)
- Lateral

UNIT18-CERVICAL SPINE

- Related radiological anatomy
- Basic views
- AP open mouth (C1 and C2)
- AP axial
- Oblique
- Lateral
- Erect
- Trauma lateral(horizontal beam)
- Cervicothoracic junction (swimmers view)

Special views

- Lateral hyperflexion and hyperextension
- AP (fuchs method) or PA (judd method)
- AP wagging jaw (ottonello method)
- AP axial (pillars)

UNIT19-THORACIC SPINE

- Related radiographic anatomy and projections
- AP
- Lateral
- Oblique

UNIT20-LUMBAR SPINE, SACRUM AND COCCYX

- Related radiographic anatomy
- AP
- Oblique
- Lateral
- Lateral (L5 – S1)
- AP axial (L5 – S1)

Scoliosis series

- AP or PA
- Erect lateral
- AP(ferguson method)
- AP – R and L bending

Spinal fusion series

- AP or PA – R and L bending
- Lateral – hyperextension and hyperflexion

UNIT21-SACRUM AND COCCYX

- AP axial sacrum
- AP axial coccyx
- Lateral sacrum
- Lateral coccyx

UNIT22-PAEDIATRIC RADIOGRAPHY

- Positioning, care and radiation protection while handling babies

Each student shall undergo training in Skill Simulation Laboratory for learning certain basic clinical skills like IV/IM injection, setting IV-line, Cardio-pulmonary resuscitation (CPR), and Life support skills in the beginning of second year, for duration of continuous four days. (Board of Studies letter No.:FPMS/SV/BOS-MIN/0006/2016-17, dated 19/04/2017, and vide notification of Board of Management resolution Ref.:No. SVDU/R/2017-18/5056, dated 09/01/2018).

SECOND YEAR B.SC RADIO-IMAGING TECHNOLOGY

BRIT201-RADIOLOGICAL SPECIAL PROCEDURES 120 HOURS

UNIT1-INTRODUCTION TO THE SUBJECT

- All radiographic procedures including:
- IVU
- MCU

- Retrograde pyelourethrogram
- Myelogram
- Ba studies
- HSG/ FTR
- Sialography
- T- tube cholangiography
- Percutaneous transhepatic cholangiography
- Direct portal venography
- Bronchography
- Angiography
- Phlebography
- Dacrocystography

UNIT2 -CONTRAST MEDIA

- Definition
- Classification
- Chemistry
- Physiology
- Toxicity
- Treatment- emergency drugs
- C M used in USG

UNIT3-I V U

- Anatomy of urinary system
- Indication & contra indication
- Risk factors
- Contrast media
- Patient preparation
- Procedure and filming techniques
- Nephrotomogram
- Modification of urogram
- Complication and aftercare

UNIT4-M C U

- Anatomy of lower urinary tract
- Indication & contra indication
- Procedure & filming
- Complications
- Other techniques

UNIT5-MYELOGRAM

- Anatomy of spinal coard
- Definition, indication & contraindication
- Preparations, requirements & contrast media
- Lumbar, cisternal & lateral cervical puncture
- C T myelogram
- M R myelogram

UNIT6-CONTRAST MEDIA IN GIT

- Introduction
- Properties of an ideal barium preparation
- Advantages of barium sulphate preparation
- Manufacture
- Characteristics influencing coating
- Adverse effects
- Other contrast media used
- Contrast media used for CT in GIT
- Contrast media for MRI in GIT

UNIT7-BARIUM SWALLOW

- Anatomy of upper GI tract
- Indications & contraindications
- Contrast
- Procedure and techniques
- Specific conditions
- Complications

UNIT8-BARIUM MEAL

- Anatomy of stomach
- Indications & contraindications
- Preparation
- Contrast media
- Standard views
- Conventional single contrast study
- Double contrast barium study
- Biphasic study of upper GIT
- Hypotonic duodenography
- After care & complications

UNIT9-BMFT

- Anatomy of GI tract
- Indications & contraindication
- Contrast medium
- Patient preparation
- Small bowel follows through
- Dedicated small bowel follow through
- Peroral pneumocolon
- Retrograde small bowel examination
- Advantages, disadvantages & complications

UNIT10-ENTEROCLYSIS

- Anatomy of small bowel
- Indication contraindication
- Equipment, contrast medium
- Preparation
- Techniques
- Single contrast study
- Double contrast study

- Air D C enteroclysis
- Comparison
- Advantages, disadvantages & after care

UNIT11-BARIUM ENEMA

- Anatomy of large bowel
- Definition, indication, contraindication
- Contrast
- Preparation and positioning
- DCBE, SCBE
- Special barium enema studies
- Aftercare & complications

UNIT12-HSG

- Anatomy of female reproductive system
- Definition, indication and contraindication
- Equipments, procedures & techniques
- After care & complications
- Sonosalpingiography

UNIT13-FTR

- Definition, indication and contraindication
- Instrumentation
- Timing of the study, patient preparation
- Technique and filming
- Other methods
- Post procedure follow up and complications

UNIT14-SIALOGRAPHY

- Anatomy of salivary glands
- Definition, indication & contraindication
- Equipments
- Preparation of the patient
- Procedure & filming

UNIT15-CATHETERS

- Classification
- Catheters used for different studies
- Sterilization of catheters
- Balloon angioplasty catheters

UNIT16-ANGIOGRAPHY (CEREBRAL, VISCERAL, PERIPHERAL)

- Anatomy of blood vessels
- Definition, indication & contraindication
- Patient preparation and precautions
- Local anaesthesia
- Direct needle puncture
- Catheter angiography

- Percutaneous transluminal angioplasty

UNIT17-DACROCYSTOGRAPHY

- Anatomy of nasolacrimal duct
- Definition, indication & contraindication
- Materials & technique
- Complications
- Other techniques

UNIT18-PATIENT CARE &PROFESSIONAL ETHICS

- Development of communication skills with patient- general comfort and reassurance to the patient-patient education and explaining about the study-drugs used in the preparation of the patient. Handling of an unconscious patient-shifting of patients -hazards of lifting and manoeuvring patients -rules for correct lifting- transfer from chair/wheel chair or trolley to couch and vice-versa -safety of patient and worker while lifting & shifting of patients-handling of geriatric, paediatric and trauma patients -handling female patients-pregnant women. Communicable diseases - hygiene in the department-cross infection and prevention-handling of infectious patients in the department -application of asepsis. Ethics of medical practice- Radiography professionalism-essential qualities of the radiographer-improving professional and personal qualities- Radiographer as a part of Hospital /Organization-responsibilities. Medico-legal considerations - radiographers clinical and ethical responsibilities- misconduct and malpractice.

BRIT202-GENERAL MEDICINE **40 HOURS**

UNIT1-INTRODUCTION

- Modes of transfer of communicable diseases & general preventive measures.

UNIT2. BACTERIAL DISEASES:

- Tuberculosis, Leprosy, Rhematic fever, Tetanus, Typhoid fever, Diphtheria, Pneumonia, Bacillary Dysentry and Measles.

UNIT3. VIRAL DISEASES:

- Simplex and zoster, Varicella, Measles Mumps, Hepatitis B &C,AIDS & Influenza.

UNIT4. METABOLIC AND DEFICIENCY DISEASES:

- Diabetes, Anemia, Vitamin & Nutritional,
- Deficiency diseases, diseases of the endocrine glands.
- Diseases of Respiratory System
- Diseases of Circulatory System:
- Diseases of Digestive System
- Diseases of Liver
- Diseases of kidney.
- Diseases of Skin.

BRIT203-GENERAL PHARMACOLOGY 40 HOURS

UNIT I: Describe pharmaco-dynamics, pharmacokinetics, classification and the Principles of drug administration.

UNIT II:
Introduction to pharmacology

Definitions
Sources
Terminology used

UNIT III:
Types : Classification
Pharmaco-dynamics: Actions, therapeutic,
Adverse, toxic

UNIT IV:
Pharmacokinetics: absorption, distribution, metabolism, interaction,
Excretion

UNIT V:
Review : Routes and principles of
Administration of drugs

UNIT VI:
Indian pharmacopoeia: Legal issues

UNITVII:
Rational use of drugs

VIII:
Principles of therapeutics

THIRD YEAR B.SC RADIO IMAGING TECHNOLOGY

BRIT301-NEW IMAGING MODALITIES AND RECENT ADVANCES 160 HOURS

UNIT1-COMPUTED RADIOGRAPHY

- **Introduction**
- Components
- Cassettes and Imaging plates
- Digitizer
- Image formation
- Advantages and disadvantages

UNIT2-DIGITAL RADIOGRAPHY

- **Introduction**
- Work flow
- System components

- Image formation
- Advantages and disadvantages

UNIT3-PACS

- **Introduction**
- Work flow
- Components
- Types
- Storage
- Advantages and disadvantages

UNIT4-DSA

- **Introduction**
- Room layout and design
- Equipment
- Image recording system
- Automatic injection devices
- Contrast media
- Catheters and accessories
- Subtraction techniques

UNIT5: MACRO RADIOGRAPHY

- Definition
- Principle
- Unsharpness
- Scattered radiation
- Cassette support
- Examples of macro radiography

UNIT6: DENTAL RADIOGRAPHY

- Introduction
- Terminology
- Dental formula
- Intra – oral radiography
- Bite wing
- Periapical radiography
- Occlusal radiography
- Extra oral oblique lateral
- Cephalometry
- Orthopantomography

UNIT7-NUCLEAR MEDICINE

- History
- Isotopes and radionuclides
- Production of radionuclides
- Radioactivity
- Radioactive transformations
- Specific activity
- Introduction to radiopharmaceuticals
- Precautions while handling radiopharmaceuticals

- Instrumentation- gamma camera, computer and monitor
- PET
- SPECT

UNIT8-MAMMOGRAPHY

- Introduction
- Physics involved in it
- Patient preparation
- Different techniques

UNIT9-COMPUTED TOMOGRAPHY

- Introduction to CT
- History
- Advantage of CT
- Comparisons with other imaging modalities
- CT principle
- Basic principle
- CT number
- CT generations
- Slip ring technology
- Electron beam CT
- Multy slice technology
- CT detector

UNIT10- IMAGE RECONSTRUCTION

- Basic principle
- Image reconstruction from projections
- Reconstruction algorithms

UNIT11- INSTRUMENTATION

- CT scanner
- Imaging system
- CT computer and image processing
- Image display, storage, recording and communications
- CT control console
- Options and accessories for CT systems

UNIT12-DATA ACQUISITION

- Basic scheme for data acquisition
- CT detector technology
- Detector electronics
- Data acquisition and sampling

UNIT13-IMAGE DISPLAY

- Image formation and representation
- Image processing
- Pixel and voxel
- CT number
- Window level and window width

UNIT14-CT ARTIFACTS

- Classification
- Types
- Causes
- Remedies

UNIT15- IMAGE QUALITY

- Qualities
- Resolution
- Contrast
- Sharpness
- Noise properties in CT

UNIT16-BASIC DIAGNOSTIC ASPECTS

- Role of the CT technologist
- Patient management
- Indication
- Patient preparation
- Patient positioning and scanning protocols

UNIT17-CT CONTRAST MEDIA

- Types
- Use and administration
- Suspected contraindications

UNIT18-CT GUIDED PROCEDURES

- Types
- Protocols
- Both invasive and non invasive

UNIT19-SAFETY CONSIDERATION

- Staff safety
- Patient safety
- Universal precautions
- Knowledge of communicable and non communicable diseases

UNIT20-DOCUMENTATION

- Role of CT Technologist
- Documentation of information about patient care, the procedure and the final
- outcome

UNIT21. CROSS SECTIONAL ANATOMY

- Head
- Neck
- Thorax
- Abdomen
- Pelvis
- Extremities

UNIT22-ULTRASOUND IMAGING

- Introduction
- Ultrasound imaging
- Doppler imaging
- Basic principle
- Advantages and disadvantages

MAGNETIC RESONANCE IMAGING AND ITS PHYSICS

UNIT1- INTRODUCTION

- Basic principle
- Introduction
- Atomic structure
- Motion within the atom
- The hydrogen nucleus, alignment
- Precession
- Larmor equation
- Resonance
- MR signal
- Free induction decay signal
- Relaxation
- T1 recovery
- T2 decay
- Pulse timing parameters

UNIT2-ENCODING AND IMAGE FORMATION

- Encoding
- Introduction
- Gradients
- Slice selection
- Frequency encoding
- Phase encoding
- Sampling
- Data collection and image formation
- Introduction
- K space
- Fast fourier transformation
- Matrix
- Scan timing
- K space filling
- Partial or fractional echo imaging & averaging
- Pre- scan
- Types of acquisition

UNIT3-PARAMETERS AND TRADE- OFFS

- Introduction
- Signal To Noise Ratio(SNR) & How to increase SNR
- Contrast to Noise Ratio (CNR)

- Spatial resolution & how to increase the spatial resolution
- Scan time & how to reduce time
- Trade-offs
- Decision making
- Volume imaging

UNIT4-PULSE SEQUENCES

- Introduction
- Spin echo sequences
- Conventional spin echo
- Fast spin echo
- Inversion recovery
- STIR
- FLAIR
- Gradient echo pulse sequences
- Conventional gradient echo
- Coherent residual transverse magnetization
- Incoherent residual transverse magnetization
- SSFP
- Ultra- fast sequences
- EPI

UNIT5-FLOW PHENOMENA

- Introduction
- The mechanisms of flow
- Time of flight phenomenon
- Entry slice phenomenon
- Intra- voxel dephasing
- Flow phenomena compensation
- Gradient moment rephrasing
- Pre saturation
- Even echo rephrasing

UNIT6-ARTIFACTS AND THEIR COMPENSATION

- Introduction
- Phase mismapping
- Aliasing or wrap around
- Chemical shift artifact
- Chemical misregistration
- Truncation artifact
- Magnetic susceptibility artifact
- Zipper artifact
- Shading artifact
- Motion of the patient
- Cross excitation and cross talk

UNIT7- INSTRUMENTATION AND EQUIPMENTS

- Introduction
- Magnetism
- Permanent magnets

- Electromagnets
- Super conducting magnets
- Fringe fields
- Shim coils
- Gradient coils
- Radio-frequency coils
- The pulse control units
- Patient transportation system
- Operator interface

UNIT8-Vascular and cardiac imaging

- Introduction
- Conventional vascular imaging techniques
- MRA
- Perfusion and diffusion imaging
- Cardiac imaging
- Peripheral gating
- Pseudo-gating
- Multy-phase cardiac imaging
- Cine
- SPAMM

UNIT 9-MR SAFETY

- Introduction
- The main magnetic field
- Projectiles
- Medical emergencies
- Implants and prostheses
- Pacemakers
- Gradient magnetic field
- Radio-frequency fields
- Claustrophobia
- Quenching
- Safety education
- Patient monitoring
- Monitors and devices in MRI
- Safety tips
- Site planning

UNIT10- CONTRAST AGENTS IN MRI

- Introduction
- Uses and methodology
- Review of weighting
- Mechanism of action
- Dipole-dipole interactions
- Magnetic susceptibility
- Relaxivity
- Gadolimium safety
- Feridex safety
- Current applications of contrast agents

UNIT11-ADVANCED IMAGING TECHNIQUES

- Introduction
- High speed gradient system
- Developments in fast spin echo
- Developments in gradient echo
- Applications of echo planar imaging
- Diffusion imaging
- Perfusion imaging
- Functional imaging
- Interventional MRI

UNIT12-MRI CROSSES SECTIONAL ANATOMY

- Brain
- Neck
- Thorax
- Abdomen
- Pelvis
- Extremities
- Spine

PRACTICAL **130 HOURS**

MRI

Specific Procedural Requirements

- The 5 categories include:
- Head and Neck
- Spine
- Thorax
- Abdomen and Pelvis
- Musculoskeletal

General Guidelines

When performing the MRI procedures, the candidate must demonstrate

- Evaluation of requisition and/or medical record
- Identification of patient
- Documentation of patient history including allergies
- Safety screening and patient education
- Patient care and assessment
- Preparation of examination room
- select optimal imaging coil
- Patient positioning
- Protocol selection
- Parameter selection
- Image display, filming, and archiving
- Documentation of procedure and patient data in appropriate records
- Patient discharge with post-procedure instructions
- Universal precautions

- MRI safety procedures and precautions and evaluate the resulting images for image quality
- Optimal demonstration of anatomic region
- Proper identification on images and patient data
- Exam completeness

A. Head and Neck

- Routine brain
- Internal auditory canal
- Orbit
- Pituitary
- Vascular head
- Cranial nerves
- Posterior fossa
- Head trauma
- Sinuses
- Soft tissue neck
- Vascular neck

B. Spine

- Thoracic
- Lumbar
- Cervical
- Sacrum / coccyx
- Spinal trauma
- Bony pelvis

C. Thorax

- Brachial plexus
- Mediastinum
- Cardiovascular
- Breast
- Aorta
- Heart and great vessels

D. Abdomen and Pelvis

- Liver / spleen / pancreas*
- Kidneys
- Adrenals
- MRCP
- Vascular
- Male pelvis
- Female pelvis

PRACTICAL CT

Specific Procedural Requirements

The 8 categories include:

- Head
- Neck
- Spine and Musculoskeletal

- Chest
- Abdomen
- Pelvis
- Special Procedures
- Image Display and Post Processing

PROTOCOLS

A. Head

- Routine head
- Sinuses
- Facial / orbit
- Temporal bones
- Trauma head
- Vascular head (CTA)

B. Neck

- Soft tissue neck
- Larynx and vocal cords
- Vascular neck (CTA)

C. Spine and Musculoskeletal

- Lumbar
- Cervical
- Thoracic
- Spinal trauma
- Upper extremity
- Lower extremity
- Pelvic girdle; hips
- Musculoskeletal trauma

D. Chest

- Routine chest
- HRCT
- Vascular chest (e.g., PE)
- Chest trauma
- Airway (trachea, bronchus)
- Heart (e.g., cardiac scoring, Angiography)

E. Abdomen

- Routine abdomen
- Liver (multi-phase)
- Kidneys (with contrast)
- Pancreas
- Adrenals
- GI tract
- Renal stone
- Abdominal trauma
- Vascular abdomen (CTA)

Pelvis

- Routine pelvis
- Bladder
- Pelvic trauma
- Vascular pelvis (CTA)
- Colorectal studies

G. Special Procedures

- Biopsies
- Drainage / aspirations
- Radiation therapy planning

H. Image Display and Post Processing

- Geometric measurements
- (e.g., stent graft, distance)
- Retrospective reconstruction

PRACTICAL **130 HOURS**

COMPUTED TOMOGRAPHY

General Guidelines

- When performing the CT imaging procedures, the candidate must demonstrate appropriate:
- Evaluation of requisition and/or medical record
- Preparation of examination room
- Patient assessment and education concerning the procedure
- Documentation of patient history including allergies
- Patient positioning
- Protocol selection
- Parameter selection
- Image display, filming, and archiving

PROTOCOLS

A. Head

- Routine head
- Sinuses
- Facial / orbit
- Temporal bones
- Trauma head
- Vascular head (CTA)

B. Neck

- Soft tissue neck
- Larynx and vocal cords
- Vascular neck (CTA)

C. Spine and Musculoskeletal

- Lumbar
- Cervical
- Thoracic
- Spinal trauma
- Upper extremity
- Lower extremity
- Pelvic girdle; hips
- Musculoskeletal trauma
-

D. Chest

- Routine chest
- HRCT
- Vascular chest (e.g., PE)
- Chest trauma
- Airway (trachea, bronchus)
- Heart (e.g., cardiac scoring, Angiography)

E. Abdomen

- Routine abdomen
- Liver (multi-phase)
- Kidneys (with contrast)
- Pancreas
- Adrenals
- GI tract
- Renal stone
- Abdominal trauma
- Vascular abdomen (CTA)

F. Pelvis

- Routine pelvis
- Bladder
- Pelvic trauma
- Vascular pelvis (CTA)
- Colorectal studies

G. Special Procedures

- Biopsies
- Drainage / aspirations
- Radiation therapy planning

H. Image Display and Post Processing

- Geometric measurements
- (e.g., stent graft, distance)
- Retrospective reconstruction

CT CROSS SECTIONAL ANATOMY OF HEAD

- Eyeball-lens
- Optic nerve.
- Bony margins of orbit, Extra ocular muscles,
- Maxillary,ethmoid,sphenoid and frontal sinuses.
- Nasal septum.
- Mastoid air cells.
- Petrous bone, Internal auditarymeatus.
- Styloid process.
- Foramen magnum.
- Cerebellar hemispheres.
- Pons,4th ventricle.
- Basilar artery.
- CP angle cistern.
- Temporal lobes,temporalhorns,hippocampus.
- Dorsum sellae,clivus.
- Pituitary fossa.
- Circle of willis-aca,mca,pca.

- Mid brain.
- Third ventricle,pineal gland.
- Frontal horns,frontal lobes,occipital horns,occipital lobes.
- Sylvian fissures.
- Lateral Ventricles
- Falx cerebri.
- Superior sagittal sinus.
- Cerebral hemispheres (parietal lobes),gray and white matter.

BRIT302 DARK ROOM TECHNIQUES 120 HOURS

UNIT1-INTRODUCTION TO THE SUBJECT

UNIT2-IMAGE CHARACTERISTICS

- Definition
- Reflected, transmitted and emitted light image
- Noise(fog, quantum noise), SNR, contrast, optimum contrast, sharpness
- Resolution

UNIT3-THE INVISIBLE X-RAY IMAGE

- Latent image
- Subject contrast
- Differential attenuation
- Effects of scatter and its control
- Geometric & motion Unsharpness

UNIT4-RADIOGRAPHY (PHOTOGRAPHIC PRINCIPLE)

- Photographic effect
- Photosensitive chemicals: latent image formation
- Manufacture of emulsion: light and x-ray sensitive emulsion
- Describing photographic performance: density, log relative exposure
- The characteristic curve
  Sensitometry

UNIT5-THE RECORDING SYSTEM: FILM MATERIAL

- Film construction
- Film base, subbing layer, emulsion, super coat, backing layers
- Crossover effect; irradiation
- Types of films
- Film storage

UNIT6-THE RECORDING SYSTEM: INTENSIFYING SCREENS

- Luminescence
- Screen unsharpness
- Screen construction
- Phosphors
- Quantum detection & conversion efficiency
- Types of screen
- Intensifying factor ; quantum mottle
- Factors affecting speed and unsharpness

- Care of screens

UNIT7-THE RECORDING SYSTEM: FILM CASSETTES

- Cassette construction and ideal features
- Types of cassettes
- Care of cassettes; loading and unloading cassettes
- Special cassettes

UNIT8-THE PROCESSING AREA

- Siting and function of the processing area
- Darkroom design and construction
- Darkroom illuminations
- Darkroom equipments : manual & automatic processors
- Health and safety
- COSHH regulations

UNIT9-PHOTOGRAPHIC PROCESSING: PRINCIPLES-1

- Acidity, alkalinity and pH
- Development: (manual)
- Developer solution & activity
- Fixing: fixing solution and activity
- Washing & Drying

UNIT10-PHOTOGRAPHIC PROCESSING: PRINCIPLES- 2 (AUTO PROCESSORS)

- Film transport, cycle time, capacity
- Feed section
- Developer section
- Fixer section
- Washing section
- Drying section
- Replenishment; auto mixers
- Auto processors for special films
- Care & maintenance of the auto processors

UNIT11-SILVER RECOVERY

- Justification for silver recovery
- Amounts of silver in fixer
- Electrolytic recovery; high current systems
- Recovering silver deposit; recycling fixer
- Monitoring efficiency; comparison of methods
- Silver recovery from scrap films

UNIT12-FILM ARTIFACTS

- Definition
- Types
- Causes and remedies

BRIT303-RADIOLOGICAL SPECIAL PROCEDURES AND PATIENT CARE 120 HOURS

- All radiographic procedures including:
- IVU
- MCU
- Retrograde pyelourethrogram
- Myelogram
- Ba studies
- HSG/ FTR
- Sialography

- T- tube cholangiography
- Percutaneous transhepatic cholangiography
- Direct portal venography
- Bronchography
- Angiography
- Phlebography
- Dacrocystography
- Patient care and Radiation protection in Radiology Department

SPECIAL RADIOLOGICAL EQUIPMENT

- Portable and mobile x-ray units
- Dental x-ray machine
- High tension Generators
- X-ray tubes-their types and advancements
- Digital radiography equipment
- Digital subtraction techniques Tomography: Body section radiography, basic principle and equipment, multi section tomography, various types of tomographic movements, Tomosynthesis, Stich radiography, Dual energy x-ray absorptionometry (DEXA) scan.

INTERNSHIP (INTEGRATED PRACTICE) - TOTAL HOURS 1440

- The internship will span1 Year. This will include 6 hours of practice a day, totaling to 1440 hours during internship year. As a part of this, the students will maintain a work logbook which will be duly endorsed by the supervisor or trainer. At the end of internship, the candidate shall submit the work log book along with certificate from the training institute.

- The internship time period provides the students the opportunity to continue to develop confidence and increased skill in clinical delivery of services. Students will demonstrate competence in beginning and intermediate procedures. Students will observe the advanced and specialized procedures. The student will complete the clinical training by practicing all the skills learned in classroom and clinical instruction. The students are expected to work for minimum 6 hours per day and this may be more depending on the need and the healthcare setting.

Seminars, Journal Clubs and Group Discussions

Each student will be assigned topics for presentations as seminars, will explore recent innovations in radio-imaging technology for presenting topics during journal clubs and shall be holding group discussions along with in the presence of radio-imaging faculty.

Allied and Healthcare Professions

Allied and healthcare professionals includes individuals involved with the delivery of health or healthcare related services, with qualification and competence in therapeutic, diagnostic, curative, preventive and/or rehabilitative interventions. They work in multidisciplinary health teams in varied healthcare settings including doctors (physicians and specialist), nurses and public health officials to promote, protect, treat and/or manage a person('s) physical, mental, social, emotional, environmental health and holistic well-being.

Attested CTC

15/2/2021

Vice-Chancellor
Sumandeep Vidyapeeth
An Institution Deemed to be University
Vill. Piparia, Taluka: Waghodia.
Dist. Vadodara-391 760. (Gujarat)

Sumandeep Vidyapeeth • Deemed to be University •