OPJS UNIVERSITY, CHURU (RAJASTHAN)

Syllabus

For

Diploma in Radiological Imaging & Technology (DRIT)

Duration of Course : 1 year

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<thead>
<tr>
<th>S.No.</th>
<th>Paper code</th>
<th>Name of Papers</th>
<th>M.M.(T-S-P)</th>
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<tr>
<td>1.</td>
<td>DRIT-101</td>
<td>Anatomy and Physiology &amp; Related Pathology &amp; Introductory Biology-I</td>
<td>50+30+20=100</td>
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<td>2.</td>
<td>DRIT-102</td>
<td>Anatomy and Physiology &amp; Related Pathology &amp; Introductory Biology-II</td>
<td>50+30+20=100</td>
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<td>3.</td>
<td>DRIT-103</td>
<td>General and Radiation Physics</td>
<td>50+30+20=100</td>
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<td>4.</td>
<td>DRIT-104</td>
<td>Dark Room Techniques</td>
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<td>5.</td>
<td>DRIT-105</td>
<td>Communication &amp; Soft Skills</td>
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Details of Syllabus

DRIT-101- Anatomy and Physiology & Related Pathology & Introductory Biology-I

INTRODUCTORY BIOLOGY:-

Unit-I-Living World
  Biology & Its Branches; characters of living organisms, (elementary idea of metabolism, homoeostasis, ) Variety of living organisms, status of bacteria and virus;

Unit-II-Cell and Cell Division
  Cell as a basic unit of life - prokaryotic and eukaryotic cell; unicellular and multicellular organisms; Ultrastructure of prokaryotic and eukaryotic cell – cell organelles and their functions – Brief introduction to Molecules of cell; inorganic and organic materials - water, salt, mineral ions, carbohydrates, lipids, amino acids, proteins, nucleotides, nucleic acids (DNA and RNA); Enzymes; vitamins, hormones and steroids.

Unit-III-Genetics
  Continuity of life - heredity, variation;
  Chromosomes – STRUCTURE, variations, sex linked inheritance; mutation and chromosomal aberrations; Brief of Gene expression - transcription and translation, oncogenes.

Unit-IV-Basic Cell pathology
  • Definition, cell growth – cell deformities – cell damage- defence mechanism cell repair. Inflammation Neoplasia:
  • Benign & malignant including its mode of growth and metastasis.

ANATOMY AND PHYSIOLOGY
Musculo-Skeletal System  Muscular System: Skeletal Muscles: Major skeletal muscles of the head, neck, thorax, abdomen and upper and lower limbs, Structure &Types of muscle in human body
General Osteology: General morphology of bones; structural classification of bones; identification and naming of individual bones of the skeleton; Types of bones, Major Important Bones , bones of skull, lower and upper extremities, Pelvic girdle, shoulder girdle, Thoracic cage
Bony joints.
Cardiovascular System Heart, Blood, Arteries, Veins, circulation of blood, pulse, blood pressure, blood volume, Blood groups, Rh. Importance.

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DRIT-102- Anatomy and Physiology & Related Pathology & Introductory Biology-II

UNIT-I- Structure of the Body-tissues.
UNIT-II - Digestive System, : Parts of gastrointestinal tract and associated glands
UNIT-III - Respiratory System - Nose & Larynx, Trachea – Lungs
• Urinary System - Kidney – Uterus – Bladders, Prostate, Urethera.
UNIT-IV - Nervous System: Brain – Meninges – Ventrices – Spinal cord and nerves, physiology of neuromuscular junction
Anatomical introduction to skin & Sense organs : Eye, Ear Nose.
UNIT-V - Reproductive System: Female & Male Reproductive Organs Endocrine System- • Pituitary glands – Pineal gland – Thymus gland – Thyroid and parathyroid glands, Supra-renal glands & their action.

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DRIT-103- General and Radiation Physics

UNIT-1- A.C. D.C. current, RMS value, peak value.
UNIT-3- Transformer- Principal Construction and Losses of Step Down and High Tension Transformers.
UNIT-4- Diode valves and its use as rectifiers, full wave rectifiers half wave rectifiers solid- state rectifiers, its various rectifying circuits using X-ray machines.
UNIT-5- Production of x-rays and its properties, X-ray tube- stationery anode and rotating anode & therapy tubes. X-ray circuit, interlocking circuits, relays
and timers. Various units used for measuring radiation Roentgen, rad and rem.

**UNIT-6** - Interaction of x-rays with matter. (photo electric, compton and pair production)

**UNIT-7** - Quality and quantity of X-rays, HVT, linear absorption, coefficient, Gird cones, filters, L.B.D. F.F>D, focal spot size etc.

**UNIT-8** - Inverse square law, scattered radiations and appliances used to reduce it.

**UNIT-9** - Radiation hazards protection against it, film badge pocket ionization chamber, maximum permissible dose.

**UNIT-10** - Alpha, Beta & Gamma rays, X-ray film, X-ray tube calibration, solarization, sensitometer and densitometer, radiation protection devices- Lead shield, lead chair, lead apron, lead goggles, Thyroid and gonad shield, lead gloves etc.

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**DRIT-104 - Dark Room Techniques**

**UNIT-1** - Photographic Process Light image- image produce by radiation- light sensitive material – Latent image formation.

**UNIT-2** - Film materials The structure of X-ray films resolving power

film- sensitivity of film contrast of films X-ray Films Storage of unexposed films and protection to exposed films.


**UNIT-4** - Cassettes Cassettes designs- care of cassette- mounting of intensifying screen in the cassette. Various types of cassettes, definition, structure of cassettes.

**UNIT-5** - Factors affecting the developer Types of developer and fixer- factors affecting the use of fixer.

**UNIT-6** - Silver recovery methods. Components of PQ & MQ developer and fixers, replenisher etc. Film rising and washing and drying, Intermediate rinse-washing and drying Film processing and equipment Manual and
automatic processing method.

UNIT-7- Dark Room Design
Outlay and material used. Entrance, Safelight Ventilation, Construction of wall dry bench & wet bench etc.

UNIT-8- The Radiographic Image

The sharpness, contrast, details definition, viewing conditions.

UNIT-9- Miscellaneous

Trimming, identification of films legends-records filling- report distribution.

UNIT-10- Film Artifacts
Photographic and radiation artifacts.
Factors affecting the quality control of a radiograph.

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DRIT-105- Communication & Soft Skills

UNIT-I-Essentials of Grammar:
• Parts of Speech • Punctuation • Vocabulary Building • Phonetics

UNIT -II-Office Management:
• Types of Correspondence • Receipt and Dispatch of Mail • Filing Systems
• Classification of Mail. • Role & Function of Correspondence • MIS • Managing Computer

UNIT-III- Group Discussion & Presentation:
• Definition • Process • Guidelines • Helpful Expressions • Evaluation
(Note: Every student shall be given 15 minutes. of presentation time & 45 minutes of discussion on his/ her presentation.)

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**DRIT-106- Practical**

- Introduction of the various parts and structure in human body on charts and models.
- Identification of Bones and skeleton
- Surface making of human body
- Identification of bones & parts on X ray films
- Visit to pathology museum for identification common pathology lesions
- Visit to antomy museum for identification of various parts of the human body.

In Dark room:
- How the dark room light be tested for safety
- Formation of duplicate and negative radiograph
- To prepare the developer and fixer
- Load unload and processing of X-rays film.
- Overdeveloped film reduction.
- Verification of inverse square law
- Calibration of x-rays machines
- To check the lead apron for any crack
- Find out whether the glass in the screen is lead glass or ordinary glass
- To survey the X-ray control for radiation

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