

INSTITUTE OF ADVANCED STUDIES IN
EDUCATION (DEEMED UNIVERSITY)
GANDHI VIDYA MANDIR
SARDARSHAHAR

DETAILED SYLLABUS

FOR

DISTANCE EDUCATION

Under Graduate Diploma Program

**DIPLOMA IN
RADIO IMAGING TECHNOLOGY
(DRIT)**

(SEMESTER SYSTEM)

FIRST SEMESTER

COURSE TITLE	PAPER CODE	MARKS		
		THEORY	PRACTICAL	TOTAL
ANATOMY	DRIT-110 DRIT-110/P	50	50	100
PHYSIOLOGY	DRIT-120 DRIT-120/P	50	50	100
PATHOLOGY	DRIT-130	100	00	100
COMPUTER SKILL	DRIT-140	100	00	100
TOTAL				400

SECOND SEMESTER

COURSE TITLE	PAPER CODE	MARKS		
		THEORY	PRACTICAL	TOTAL
PHYSICS	DRIT-210	100	00	100
GENERATION AND PROPERTIES OF X-RAY	DRIT-220	100	00	100
RADIATION HAZARD & PROTECTION	DRIT-230 DRIT-230/P	50	50	100
GENERAL RADIOGRAPHY	DRIT-240	100	00	100
TOTAL				400

THIRD SEMESTER

COURSE TITLE	PAPER CODE	MARKS		
		THEORY	PRACTICAL	TOTAL
ANATOMY	DRIT-310 DRIT-310/P	50	50	100
PHYSIOLOGY	DRIT-320 DRIT-320/P	50	50	100
GENERAL RADIOGRAPHY	DRIT-330 DRIT-330/P	50	50	100
COMMUNICATION SKILL	DRIT-340	100	00	100
TOTAL				400

FOURTH SEMESTER

COURSE TITLE	PAPER CODE	MARKS		
		THEORY	PRACTICAL	TOTAL
ULTRASOUND	DRIT-410 DRIT-410/P	50	50	100
CT SCAN	DRIT-420 DRIT-420/P	50	50	100
MRI	DRIT-430 DRIT-430/P	50	50	100
COMPUTER SKILL	DRIT-440	100	00	100
TOTAL				400

NOTE:

Theory Paper :30% Continuous Internal Assessment and 70% University examination.
Practical Paper : 30% Continuous Internal Assessment and 70% University examination

Continuous Internal assessment:

1) Two or three tests out of which two Internal 60% of Continuous

Assessment will be considered for Assessment

2) Seminars/Assignment/Quizzes Internal Assessment 30% of Continuous

**3) Attendance class participation and behavior Internal 10% of Continuous
Assessment**

FIRST SEMESTER

DRIT – 110

ANATOMY

Maximum Time: 3hrs
Total marks: 100

University Assessment – 80%
Internal Assessment – 20%

Minimum Pass Mark – 40%

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
- Stocmach
- Small intestine
- Large intestine

PRACTICAL:

Labeled Diagrams of different organs and bones
Viva

DRIT – 120

PHYSIOLOGY

Maximum Time: 3hrs
Total marks: 100

University Assessment – 80%
Internal Assessment – 20%

Minimum Pass Mark – 40%

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
- 2) Fundamentals of different Organ Systems
 - Cardiovascular System
 - Respiratory system
 - Digestive system
 - Excretory system
 - Reporductive system
 - Endocrine system
 - Lymphatic system

PRACTICAL:

Diagram of different Vital Organs
Viva

Maximum Time: 3hrs
Total marks: 100

University Assessment – 80%
Internal Assessment – 20%

Minimum Pass Mark – 40%

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 haemodynamic derangement :*
 - Derangement of body fluids and electrolytes
 - Haemodynamic disorders due to deranged blood volume
 - Haemodynamic disorders of obstructive nature
 - Ischaemia and infarction

5. *Growth disorders and Neoplasia*
 - Neoplasia
 - Tumours
 - Histopathology of diseases

6. *Pathology of Biliary tract and excretory system*

Maximum Time : 3 Hrs.**University Examination : 70 Marks****Total Marks : 100****Continuous Internal Assessment: 30 Marks****Minimum Pass Marks: 40%****A) Instructions for paper-setter**

The question paper will consist of five sections A, B, C and D. Sections A, B and C will have two questions from the respective sections of the syllabus and will carry 15% marks each. Section D will have 10-20 short answer type questions which will cover the entire syllabus uniformly and will carry 40% marks in all.

B) Instructions for candidates

1. Candidates are required to attempt one question each from sections A, B and C of the question paper and the entire section D.
2. Use of non-programmable scientific calculator is allowed.

SECTION A

Definition of Information Technology, Use of IT, Definition of information system, need of information system, definition of knowledge, Range of application : Scientific, business, educational, whether forecasting, and remote sensing, planning, e-commerce, web publishing, Management Information System, Decision Support System, inventory control, medical, industrial control, banks, railways, etc.

SECTION B

Computer Fundamentals: Block structure of computer, Characteristics of computers, Problem solving with computers, Generation of computers, Classification of computers.

SECTION C

Number System: Bit, Byte, Binary, Decimal, Hexadecimal, and Octal system, Conversion from one system to the other, Error detecting codes, Representation of characters, Integers and fractions.

Binary Arithmetic: Addition, Subtraction and Multiplication.

Reference:-

1. D.H.Sanders, "Computers Today", McGraw Hill, 1988.
2. T.N. Trainer, "Computers" (4th Edition) McGraw Hill, 1994.
3. Kenneth C.Laudon, Jane P. Laudon "Management Information System"(7th Edition),
4. V. Rajaraman, "Fundamentals of Computers" (2nd Edition), Prentice Hall of India, New Delhi, 1996.
5. B. Ram, "Computer Fundamentals", Wiley, 1997.

SECOND SEMESTER

DRIT – 210

PHYSICS

Maximum Time: 3hrs
Total marks: 100

University Assessment – 80%
Internal Assessment – 20%

Minimum Pass Mark – 40%

COURSE CONTENTS:

1. *Physics*
 - Introduction
 - Measurements
 - Basic Units
 - Derived Units
 - Structure of atom
2. *Electromagnetic Induction (Self & mutual)*
 - AC and DC generator
 - Rectification
 - Transformers
 - Capacitance/capacitance
3. *Properties of X-Ray*
 - Thermionic / photoelectric emissions
 - Conductor and conductance
 - Light intensity
 - HT Cable
 - Radio activity

DRIT – 220

GENERATION AND PROPERTIES OF X-RAY

Maximum Time: 3hrs

Total marks: 100

Minimum Pass Mark – 40%

University Assessment – 80%

Internal Assessment – 20%

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 and tube current
- Exposure switches and timers and its radiographic application
- X-Ray tubes fixed and rotating anodes and faults in X-Ray tubes
- Image intensifier/fluoroscopic equipment, dental radiographic 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

DRIT – 230 RADIATION HAZARDS & PROTECTION

Maximum Time: 3hrs

Total marks: 100

Minimum Pass Mark: 40%

University Assessment – 80%

Internal Assessment – 20%

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

**Maximum Time : 3hrs
Total marks :100**

**University Assessment – 80%
Internal Assessment – 20%**

Minimum Pass Mark – 40%

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-clavicular 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

DRIT – 310

ANATOMY

**Maximum Time : 3hrs
Total marks :100**

**University Assessment – 80%
Internal Assessment – 20%**

Minimum Pass Mark – 40%

COURSE CONTENTS:

1. Reproductive Organ:

- Male and female cCongds: Testes, Epidymis, 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.

DRIT – 320

PHYSIOLOGY

**Maximum Time : 3hrs
Total marks :100**

**University Assessment – 80%
Internal Assessment – 20%**

Minimum Pass Mark – 40%

COURSE CONTENTS :

1. Blood

- Introduction
- Composition
- Function

2. Formation of different type fo Blood Cells

- Eythrocytes
- Leucocytes
- Thornbocytes

3. Mechanism of Blood Clotting

4. Cerebrospinal Fluid :

- Composition
 - Formation
 - Function
5. Specials Senses
- Hearing
 - Taste
 - Smell
 - Touch
 - Sight

PRACTICAL :

Diagram of Corpuscles
Viva

DRIT – 330

GENERAL RADIOGRAPHY

Maximum Time : 3hrs
Total marks :100

University Assessment – 80%
Internal Assessment – 20%

Minimum Pass Mark – 40%

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) Braium 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

BRIT– 340

COMMUNICATION SKILL-I

Maximum Time : 3hrs

Total marks :100

Minimum Pass Mark – 40%

University Assessment – 80%

Internal Assessment – 20%

COURSE CONTENTS:

A) Instructions for paper-setter

1. The question paper will consist five sections namely A, B, C, D and E.
2. Each of the sections A, B, C and D will contain two questions and candidates have to attempt at least one question compulsorily from each section. Each section carry 15% of the total marks
3. Section E will comprise of 10-15 short answers type questions, which will cover the entire syllabus and will carry 40% of the total marks.

B) Instructions for candidates

1. Candidates are required to attempt one question each from sections A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed

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

DRIT – 410 ULTRASOUND

Maximum Time : 3hrs

Total marks :100

Minimum Pass Mark – 40%

University Assessment – 80%

Internal Assessment – 20%

COURSE CONTENTS :

1. Ultra Sounde

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

PRACTICAL

Applications of various procedures in well equipped Hospi9tals and Diagnostics C

DRIT – 420

CT SCAN

Maximum Time : 3hrs

Total marks :100

University Assessment – 80%

Internal Assessment – 20%

Minimum Pass Mark – 40%

COURSE CONTENTS :

2. C. T. Scan

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

PRACTICAL

Applications of various procedures in well equipped Hospitals and Diagnostics Centers

DRIT – 430

MRI

Maximum Time : 3hrs
Total marks :100

University Assessment – 80%
Internal Assessment – 20%

Minimum Pass Mark – 40%

COURSE CONTENTS :

MRI

- Basic Principle
- Equipment's description

PRACTICAL

Applications of various procedures in well equipped Hospitals and Diagnostics Centers

DRIT-440

COMMUNICATION SKILLS-II

Maximum Time : 3 Hrs.

University Examination : 35 Marks

Total Marks : 50

Continuous Internal Assessment : 15 Marks

Minimum Pass Marks :40%

A) Instructions for paper-setter

1. The question paper will consist five sections namely A, B, C, D and E.
2. Each of the sections A, B, C and D will contain two questions and candidates have to attempt at least one question compulsorily from each section. Each section carry 15% of the total marks
3. Section E will comprise of 10-15 short answers type questions, which will cover the entire syllabus and will carry 40% of the total marks.

B) Instructions for candidates

1. Candidates are required to attempt one question each from sections A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed

SECTION A

1. 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 B

2. 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 C

3. Essay

Preferably on scientific topic from the given outlines. The paper setter may be instructed to give a choice of attempting one out of three topics. The question paper may provide the outlines. The essay will be of 250 to 300 words. The examiner may select three topics one from each of the following.

- (i) Science
- (ii) Technology
- (iii) General.

SECTION D

Written Communication

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