

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

DETAILED SYLLABUS

FOR

DISTANCE EDUCATION

Under Graduate Degree Program

**BACHELOR OF SCIENCE –
RADIO IMAGING TECHNOLOGY
(BRIT)**

(SEMESTER SYSTEM)

FIRST SEMESTER

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

SECOND SEMESTER

COURSE TITLE	PAPER CODE	MARKS		
		THEORY	PRACTICAL	TOTAL
PHYSICS	BRIT-210	100	00	100
GENERATION AND PROPERTIES OF X- RAY	BRIT- 220	100	00	100
PATHOLOGY	BRIT-230 BRIT-230/P	50	50	100
BASIC COMPUTER	BRIT-240	100	00	100
TOTAL				400

THIRD SEMESTER

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

FOURTH SEMESTER

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

FIFTH SEMESTER

COURSE TITLE	PAPER CODE	MARKS		
		THEORY	PRACTICAL	TOTAL
DOPPLER & ECHO CARDIO GRAPHY	BRIT-510 BRIT-510/P	50	50	100
CT SCAN	BRIT-520 BRIT-520/P	50	50	100
MRI	BRIT-530 BRIT-530/P	50	50	100
COMPUTER SKILL	BRIT-540	100	00	100
TOTAL				400

SIXTH SEMESTER

COURSE TITLE	PAPER CODE	MARKS		
		THEORY	PRACTICAL	TOTAL
NUCLEAR MEDICINE & PET SCAN	BRIT-610	100	00	100
INTERVENTION RADIOLOGY	BRIT-620	100	00	100
ANASTHESIA IN DIAGNOSTIC RADIOLOGY	BRIT-630	100	00	100
PROJECT REPORT	BRIT-640	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 Assessment will be considered for Assessment 60% of Continuous**
- 2) Seminars/Assignment/Quizzes Internal Assessment 30% of Continuous**
- 3) Attendance class participation and behavior Internal Assessment 10% of Continuous**

FIRST SEMESTER

BRIT – 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
- Stomach
- Small intestine
- Large intestine

PRACTICAL :

Labeled Diagrams of different organs and bones
Viva

BRIT – 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 Meiosis, 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
- Reproductive system
- Endocrine system
- Lymphatic system

PRACTICAL :

Diagram of different Vital Organs

Viva

BRIT – 130

PATHOLOGY

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 : 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 summery & prices.

Communication Techniques

Importance of communication

One way and two way communication

Essentials of good communication

Methods of communication, oral, written and non-verbal

Barriers to communication

Techniques of overcoming barriers

Concept of effective communication

SECOND SEMESTER

BRIT – 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

BRIT-220 GENERATION AND PROPERTIES OF X-RAY

Maximum Time : 3hrs
80%
Total marks :100
Minimum Pass Mark – 40%

University Assessment –
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

BRIT – 230 RADIATION HAZARDS & PROTECTION

Maximum Time : 3hrs

University Assessment – 80%

Total marks :100

Internal Assessment – 20%

Minimum Pass Mark – 40%

COURSE CONTENTS :

1. Introduction of various Hazards
 - Ionization chamber, GM and Scintillation Counter
 - Measuring radiation dose
 - Absorption coefficient, grid, cones and filter
 - Inverse square law scattered radiation radio activity, curie, half life, decay factor
2. Doses, film badge, Pocket Ionization chamber

Maximum permissible Dose
3. Principle and Method of Protection

PRATICAL

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

Maximum Time : 3hrs**University Assessment – 80%****Total marks :100****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

BRIT – 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.

BRIT – 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
 - Thormbocytes
3. Mechanism of Blood Clotting
4. Cerebrospinal Fluid :
 - Composition
 - Formation
 - Function
5. Specials Senses
 - Hearing
 - Taste
 - Smell
 - Touch
 - Sight

PRACTICAL :

Diagram of Corpuscles
Viva

Maximum Time : 3hrs**University Assessment – 80%****Total marks :100****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) Barium Swallow
 - b) Barium Meal Series
 - c) Barium Meal Follow Through
 - d) Barium Enema
 - Hystero Salpingography
 - Angiography
 - Tomography
2. Guideline for design and location of X-ray equipments
3. Dark Room designing
 - Outline structure of Dark Room
 - Material used
 - Miscellaneous

PRACTICAL :

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

Maximum Time : 3hrs
Total marks :100
Minimum Pass Mark – 40%

University Assessment – 80%
Internal Assessment – 20%

COURSE CONTENTS:**A) Instructions for paper-setter**

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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 summery & prices.

Communication Techniques

Importance of communication

One way and two way communication

Essentials of good communication

Methods of communication, oral, written and non-verbal

Barriers to communication

Techniques of overcoming barriers

Concept of effective communication

FOURTH SEMESTER

BRIT – 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 Hospitals and Diagnostics C

BRIT – 420

CT SCAN

Maximum Time : 3hrs
Total marks :100
Minimum Pass Mark – 40%

University Assessment – 80%
Internal Assessment – 20%

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

BRIT – 430

MRI

Maximum Time : 3hrs
Total marks :100
Minimum Pass Mark – 40%

University Assessment – 80%
Internal Assessment – 20%

COURSE CONTENTS :

- MRI**
- Basic Principle
 - Equipment's description

PRACTICAL

Applications of various procedures in well equipped Hospitals and Diagnostics Centers

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

Internet - Evolution, Protocols, Interface Concepts, Internet Vs Intranet, Growth of Internet, ISP.

Connectivity- Dial-up, Leased line, VSAT etc., URLs, Domain names, Portals.

E-MAIL - Concepts, POP and WEB Based E-mail ,merits, address, Basics of Sending & Receiving, E-mail Protocols, Mailing List, Free Email services.

SECTION B

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

SECTION C

Electronic Payment Systems: Introduction, Types of Electronic Payment Systems, Digital Token-Based, Electronic Payment Systems, Smart Cards and Electronic Payment Systems, Credit Card-Based Electronic Payment Systems, Risk and Electronic Payment Systems.

Internet Protocols- Data Transmission Protocols, Client/Server Architecture & its Characteristics, FTP & its usages. Telnet Concept, Remote Logging, Protocols, Terminal Emulation, Message Board.

Reference:

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

FIFTH SEMESTER

BRIT – 510 DOPPLER & ECHO CARDIO GRAPHY

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

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

Minimum Pass Mark – 40%

COURSE CONTENTS :

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

PRACTICAL

Application of various procedures in well equipped Hospitals and Diagnositic Centers

BRIT – 520 CT SCAN

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

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

Minimum Pass Mark – 40%

COURSE CONTENTS :

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

PRACTICAL

Application of various procedures in well equipped Hospitals and Diagnostic Centers

Maximum Time : 3hrs

Total marks :100

Minimum Pass Mark – 40%

University Assessment – 80%

Internal Assessment – 20%

COURSE CONTENTS :

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

PRACTICAL

Application of various procedures in well equipped Hospitals and Diagnostic Centers

BRIT – 540 COMPUTER SKILL - B

**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

Input and Output units: Their functional characteristics, main memory, cache memory read only memory, overview of storage devices – floppy disk, hard disk, compact disk, tape.

Computer Networks and Communication: Network types, Network topologies, Network communication devices, Physical communication media, TCP/IP.

Internet and its Applications: E-mail, Telnet, FTP, WWW, Internet chatting

SECTION B

Word Wide Web (www) - History, Working, Web Browsers, Its functions, Concept of Search Engines, Searching the Web, HTTP, URLs, Web Servers, Web Protocols.

Web Publishing - Concepts, Domain name Registration, Space on Host Server for Web site, HTML, Design tools, HTML editors, and Image editors, Issues in Web site creations & Maintenance

SECTION C

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

Reference:-

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

SIXTH SEMESTER

BRIT – 610 NUCLEAR MEDICINE & PET SCAN

Maximum Time : 3hrs

Total marks :100

Minimum Pass Mark – 40%

University Assessment – 80%

Internal Assessment – 20%

COURSE CONTENTS :

1. Nuclear Medicines, PET scan and Mammography
 - A. Definition
 - B. Characteristic of Radio Nuclide
 - C. Commonly used Radio Nuceids
 - D. Description of Equipments

BRIT – 620 INTERVENTIONAL RADIOLOGY

Maximum Time : 3hrs

Total marks :100

Minimum Pass Mark – 40%

University Assessment – 80%

Internal Assessment – 20%

COURSE CONTENTS :

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

BRIT – 630 ANAESTHESIA IN DIAGNOSTIC RADIOLOGY

Maximum Time : 3hrs

Total marks :100

Minimum Pass Mark – 40%

University Assessment – 80%

Internal Assessment – 20%

COURSE CONTENTS:

1. Facilities regarding general Anaesthesiar in the X-ray Deptt.
2. Anaesthetic Problems associated with specific technique –
 - A. Vasclar Studies
 - B. Carotid Angiography
 - C. Venography
 - D. T and NMR

BRIT – 640 PROJECT REPORT

Maximum Time : 3hrs

Total marks :100

Minimum Pass Mark – 40%

University Assessment – 80%

Internal Assessment – 20%

COURSE CONTENTS: