

CMJ UNIVERSITY
SHILLONG, MEGHALAYA.
Recognized by UGC

DETAILED SYLLABUS

Certificate Program
Radio Imaging Technology

(YEARLY SYSTEM)

**COURSE TITLE : CERTIFICATE IN
(RADIO IMAGING TECHNOLOGY)**

DURATION : 1 YEAR

TOTAL DEGREE MARKS : 1200

<i>COURSE TITLE</i>	<i>Paper Code</i>	<i>MARKS</i>		
		THEORY	PRACTICAL	TOTAL
BASICS OF HUMAN ANATOMY	CRIT-110 CRIT-110/P	100	100	200
BASICS OF MEDICAL PHYSIOLOGY	CRIT-120 CRIT-120/P	100	100	200
PATHOLOGY	CRIT-130 CRIT-130/P	100	100	200
COMPUTER SKILLS	CRIT-140	100	00	100
COMMUNICATION SKILLS	CRIT-210	100	00	100
BASIC PHYSICS	CRIT-220 CRIT-220P	100	100	200
MS-OFFICE	CRIT-230 CRIT-230P	50	50	100
GENERATION AND PROPERTIES OF X-RAYS	CRIT-240	100	00	100

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 minimum two Internal Assessment will be considered for Assessment | 60% of Continuous |
| 2) Seminars/Assignments/Quizzes Assessment | 30% of Continuous Internal |
| 3) Attendance, class participation and behavior Assessment | 10% of Continuous Internal |

CRIT-110

BASICS OF HUMAN ANATOMY

Maximum Time : 3 Hrs.

University Examination : 70 %

Total Marks : 100

Continuous Internal Assessment : 30 %

Minimum Pass Marks : 40%

A) Instructions for paper-setter

1. The question paper will be divided into two parts. Part-I will contain subjective questions. This part will carry 60% of the total marks.
2. Part-II will comprise of 10-15 short questions, which will cover the entire syllabus and will carry 40% of the total marks.

B) Instructions for the candidates

1. Candidates are required to attempt Part-I as defined in the question paper and the entire part-II.
2. Use of non-programmable scientific calculator is allowed

COURSE CONTENTS

Skeleton Structures of Bone, Vertebral Column, Upper Extremity, Lower Extremity, superior extremity, inferior extremity, ossification centers, bone of upper limb, radius and uina, surface marker of thorax abdomen, head and neck.

CRIT-110 P

BASICS OF HUMAN ANATOMY

The laboratory course will comprise of exercises on what is learnt in the theory classes of the same course i.e. CRIT 110.

CRIT -120

BASICS OF MEDICAL PHYSIOLOGY

Maximum Time : 3 Hrs.

University Examination : 70 %

Total Marks : 100

Continuous Internal Assessment : 30 %

Minimum Pass Marks : 40%

A) Instructions for paper-setter

1. The question paper will be divided into two parts. Part-I will contain subjective questions. This part will carry 60% of the total marks.
2. Part-II will comprise of 10-15 short questions, which will cover the entire syllabus and will carry 40% of the total marks.

B) Instructions for the candidates

1. Candidates are required to attempt Part-I as defined in the question paper and the entire part-II.
2. Use of non-programmable scientific calculator is allowed

COURSE CONTENTS

General information: - The cell, membrane potential, some common terms used in physiology.

Blood:- Red blood corpuscles, hemoglobin, the leucocytes, immunity, origin and function of lymphocytes, reticuloendothelial system, the platelets, homeostasis, coagulation of blood, the plasma proteins, blood groups.

Digestive system:- introduction to digestive system. Elementary functional anatomical considerations, the salivary glands, the stomach and its secretion, pancreas, the bile, the small intestine, movement of the alimentary tract, gastrointestinal hormones, apud cells.

Respiratory system:- functional anatomy, ventilation, control of ventilation, exchange of gases between the alveoli and pulmonary capillary blood, carriage of O_2 and CO_2 by the blood and their exchange at the tissue level, applied and environmental physiology, lung defense mechanism. Changes with age.

CRIT –120 P

BASICS OF MEDICAL PHYSIOLOGY

The laboratory course will comprise of exercises on what is learnt in the theory classes of the same course i.e. CRIT 120.

CRIT-130

PATHOLOGY

Maximum Time : 3 Hrs.

University Examination : 70 %

Total Marks : 100

Continuous Internal Assessment : 30 %

Minimum Pass Marks : 40%

A) Instructions for paper-setter

1. The question paper will be divided into two parts. Part-I will contain subjective questions. This part will carry 60% of the total marks.
2. Part-II will comprise of 10-15 short questions, which will cover the entire syllabus and will carry 40% of the total marks.

B) Instructions for the candidates

1. Candidates are required to attempt Part-I as defined in the question paper and the entire part-II.
2. Use of non-programmable scientific calculator is allowed

COURSE CONTENTS

The Cell in Health and Disease:- Introduction to Pathology, Cellular Structure and Metabolism, Etiology and Pathogenesis of Disease, Intracellular Accumulations and Disorders of Metabolism, Amyloidosis, Degenerations and Cell Death.

Inflammation and Healing, Immunity and Hypersensitivity, Infection and infestation:-

Inflammation-Acute and Chronic, Granulomatous Inflammation, Healing, immunity and Hypersensitivity, Infection and Infestation.

Fluid and Haemodynamic Derangements:- Derangements of Body Fluids and Electrolytes, Haemodynamic Disorders due to Deranged Blood Volume, Haemodynamic Disorders of Obstructive Nature, Ischaemia and Infarction.

Growth Disorders and Neoplasia: - Adaptive Disorders of Growth, General Aspects of Neoplasia, Etiology and pathogenesis of Neoplasia, Clinical Aspects of Neoplasia, Common Specific Tumors.

CRIT-130 P

PATHOLOGY

The laboratory course will comprise of exercises on what is learnt in the theory classes of the same course i.e. CRIT 130.

CRIT-140

COMPUTER SKILLS

Maximum Time : 3 Hrs. University Examination : 70 %
Total Marks : 100 Continuous Internal Assessment : 30 %
Minimum Pass Marks : 40%

A) Instructions for paper-setter

1. The question paper will be divided into two parts. Part-I will contain subjective questions. This part will carry 60% of the total marks.
2. Part-II will comprise of 10-15 short questions, which will cover the entire syllabus and will carry 40% of the total marks.

B) Instructions for the candidates

1. Candidates are required to attempt Part-I as defined in the question paper and the entire part-II.
2. Use of non-programmable scientific calculator is allowed

COURSE CONTENTS

Hardware & Software: CPU, RAM, SSD, Operating Systems, System Software's, Application Software. Inside Computers. Computer Systems.

Input-Output devices: Monitor, Keyboard, Mouse, System Unit, Printer, and Scanner.

Storage devices: Floppy disk, Hard disk, Cartridge tape, CD-ROM

Printers: Dot Matrix, Inkjet, LaserJet, Colour printer, High-speed printer, Label printer, Plotters.

PROGRAMMING LANGUAGE:-Compiler, Assembly Language, Machine Language.

Graphical user interface: Windows 3x, Program manager, Main & accessories program groups, Multitasking.

CRIT-210

COMMUNICATION SKILLS

Maximum Time : 3 Hrs. University Examination : 70 %
Total Marks : 100 Continuous Internal Assessment : 30 %
Minimum Pass Marks : 40%

A) Instructions for paper-setter

1. The question paper will be divided into two parts. Part-I will contain subjective questions. This part will carry 60% of the total marks.
2. Part-II will comprise of 10-15 short questions, which will cover the entire syllabus and will carry 40% of the total marks.

B) Instructions for the candidates

1. Candidates are required to attempt Part-I as defined in the question paper and the entire part-II.
2. Use of non-programmable scientific calculator is allowed

COURSE CONTENTS

Basic Skills: - Listening, Speaking, Reading and Writing.

Comprehension: - Reading Comprehension, Passages, Poems.

Listening Comprehension: - Talks, Reports, Poems

Writing Skills: - Paragraph Writing, Composition Writing, Report Writing, Application & Letter Writing

Grammar: - Simple, Compound and complex sentences, Co-ordinate clause (with, but or either-or, Neither-Nor otherwise or else), Subordinate clauses-noun clauses-as subjects object and complement: Relative Clauses (restrictive and non-restrictive clauses). Adverb clauses (open and hypothetical, Comparative Clauses

Simple present, progressive and present perfect, simple past, progressive and past perfect, indication of futurity, the passive (Sample present and past, present and past perfect and 'to' infinitive structure), Reported Speech: - (I) Declarative sentences, (ii) Imperatives (iii) Interrogatives –question, Yes/No Questions, Exclamation sentences, Modals (will, shall, should, would, ought to, have to/have got to, can, could, may-might and need), Verb structures (infinitives and gerundial)

CRIT-220

BASIC PHYSICS

Maximum Time : 3 Hrs. University Examination : 70 %
Total Marks : 100 Continuous Internal Assessment : 30 %
Minimum Pass Marks : 40%

A) Instructions for paper-setter

1. The question paper will be divided into two parts. Part-I will contain subjective questions. This part will carry 60% of the total marks.
2. Part-II will comprise of 10-15 short questions, which will cover the entire syllabus and will carry 40% of the total marks.

B) Instructions for the candidates

1. Candidates are required to attempt Part-I as defined in the question paper and the entire part-II.
2. Use of non-programmable scientific calculator is allowed

COURSE CONTENTS

Measurement, Basic Units, Derived Units, Electromagnetic Unit of current, Electrical charges, structure of Atom, etc
Magnetic Density, Magnetic line of force, Electromagnetic induction, Mutual and self Induction, AC Generator, DC Generator, Transformer, Electrical Insulation, Rectification Characteristics of X-ray Beam, capacitor and capacitance
Transformer, Types of Transformer, Rectifier
Distribution of Electrical supply (single Phase, Three phase) Electric Insulation Earthing , High Tension cable.
Characteristics of X-ray beams, capacitor, Capacitance
Thermionic Emission, Photoelectric Emission, Diode value
Light Intensity, Quality Invisible spectrum, Electromagnetic Radiation, Theory of waves and quanta, properties of Electromagnetic radiation, radioactivity.

CRIT-220 P

BASIC PHYSICS

Maximum Time : 3 Hrs. University Examination : 70 %
Total Marks : 100 Continuous Internal Assessment : 30 %
Minimum Pass Marks : 40%

The laboratory course will comprise of exercises on what is learnt in the theory classes of the same course i.e. CRIT 220.

CRIT-230

MS OFFICE

Maximum Time : 3 Hrs. University Examination :35%
Total Marks : 50 Continuous Internal Assessment:15%
Minimum Pass Marks : 40%

A) Instructions for paper-setter

1. The question paper will be divided into two parts. Part-I will contain subjective questions. This part will carry 60% of the total marks.
2. Part-II will comprise of 10-15 short questions, which will cover the entire syllabus and will carry 40% of the total marks.

B) Instructions for the candidates

1. Candidates are required to attempt Part-I as defined in the question paper and the entire part-II.
2. Use of non-programmable scientific calculator is allowed

COURSE CONTENTS

MS Word: Creating documents, Formatting, Auto text, Auto correct, Tables, Page setup, Printing, Object linking & embedding, Spell check, Thesaurus, Mail merge, Word art, Clip art. Setup.

MS Excel: Creating workbooks & worksheets, Formulas & functions, Linking workbooks & worksheets, Cell references, Formatting, Creating charts, Data lists, Page setup, Printing.

MS Power Point: Creating slides with different layouts and templates, Inserting charts, Tables, Organization charts, Pictures, Running a screen show, Presentation

CRIT-230 P**MS OFFICE**

Maximum Time : 3 Hrs. University Examination :35%
Total Marks : 50 Continuous Internal Assessment:15%
Minimum Pass Marks : 40%

The laboratory course will comprise of exercises on what is learnt in the theory classes of the same course i.e. CRIT 230.

CRIT- 240

GENERATION AND PROPERTIES OF X-RAYS

Maximum Time : 3 Hrs. University Examination : 70 %
Total Marks : 100 Continuous Internal Assessment : 30 %
Minimum Pass Marks : 40%

A) Instructions for paper-setter

1. The question paper will be divided into two parts. Part-I will contain subjective questions. This part will carry 60% of the total marks.
2. Part-II will comprise of 10-15 short questions, which will cover the entire syllabus and will carry 40% of the total marks.

B) Instructions for the candidates

1. Candidates are required to attempt Part-I as defined in the question paper and the entire part-II.
2. Use of non-programmable scientific calculator is allowed

COURSE CONTENTS

Introduction, Properties of X-rays, Productions of X-rays, Characteristics and Bremsstrahlung Radiation X-ray Spectrum, Effect of mA, kVp on shape of spectrum
X-ray Tube: cathode, anode, glass envelope, stator and rotor, tube housing
Method of heat dissipation, Tube Rating charts, cooling chart, angiography rating Chart, cine radiographic rating charts,
Basic x-ray circuit transformers, transformer laws, autotransformer, high tension Transformer and types used in X-Ray machine, rectification, self rectified circuit, half Wave rectifier, full wave rectifier, limitations of single phase generator.
Three phase generator, three phase six plus six rectifier, three phase twelve plus twelve Rectifier, medium frequency generator