

CMJ UNIVERSITY
SHILLONG, MEGHALAYA.
Recognized by UGC

DETAILED SYLLABUS

Under Graduate Diploma Program
DR(OPT)
(Diploma in Refraction Optometry)

(YEARLY SYSTEM)

DIPLOMA IN REFRACTION OPTOMETRY

COURSE TITLE : DIPLOMA IN REFRACTION OPTOMETRY

DURATION : 2 YEARS

TOTAL DIPLOMA MARKS : 2500

FIRST SEMESTER

<i>COURSE TITLE</i>	<i>Paper Code</i>	<i>MARKS</i>		
		THEORY	PRACTICAL	TOTAL
BASICS OF HUMAN ANATOMY	OPTO-110	100	100	200
BASICS OF MEDICAL PHYSIOLOGY	OPTO-120	100	100	200
PATHOLOGY	OPTO-130	100	100	200
COMPUTER SKILLS	OPTO-140	100	00	100
COMMUNICATION SKILLS	OPTO-210	100	00	100
OPHTHALMIC OPTICS & OPTHALMIC DISPENSING & WORKSHOP PRACTICE	OPTO-220	100	100	200
BIOLOGICAL FOUNDATIONS OF CLINICAL OPTOMETRY	OPTO-230	100	00	100
BIOCHEMISTRY	OPTO-240	100	100	200

SECOND YEAR

<i>COURSE TITLE</i>	<i>Paper Code</i>	<i>MARKS</i>		
		THEORY	PRACTICAL	TOTAL
OCULAR ANATOMY	OPTO-310	100	100	200
PHOTOMETRY & VISUAL PERCEPTION	OPTO-320	100	00	100
OPHTHALMIC OPTICS & OPTHALMIC DISPENSING & WORKSHOP PRACTICE-II	OPTO-330	100	100	200
INSTRUMENTATION & METHODS	OPTO-340	100	00	100
OPTOMETRIC PROCEDURES/ CLINICAL REFRACTION	OPTO-410	100	100	200
ORTHOPTICS	OPTO-420	100	100	200
LAW, ETHICS & PSYCHOLOGY	OPTO-430	100	00	100
PROJECT	OPTO-440	100	00	100

6 months internship in any Hospital or Nursing Home

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 Internal Assessment | 30% of Continuous |
| 3) Attendance, class participation and behavior Internal Assessment | 10% of Continuous |

FIRST YEAR

OPTO-110

Maximum Time : 3 Hrs.
Total Marks : 100
Minimum Pass Marks : 40%

BASICS OF HUMAN ANATOMY

University Examination : 70 %
Continuous Internal Assessment : 30 %

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

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

OPTO-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. OPTO 110.

OPTO -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

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, reticulate endothelial 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 O₂ and CO₂ by the blood and their exchange at the tissue level, applied and environment physiology. lung defense mechanism. changes with age.

OPTO -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. OPTO 120.

OPTO-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

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 Tumours.

OPTO-130 P

PATHOLOGY

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

OPTO-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

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

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

OPTO-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

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)

OPTO-220

**OPHTHALMIC OPTICS, OPHTHALMIC
DISPENSING AND WORKSHOP PRACTICE**

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

Geometrical optics and ophthalmic lenses, Spectacle lenses; lens materials, lens design Spectacle frames; terminology, measuring systems, materials, frame fitting and adjustments. Optical principles and practical use of the focimeter; measuring, decentering and marking of lenses. Practical use of tools and equipment for hand edging and automatic edging. Practical use of tools and equipment for soldering metal frames. Repairs of frames made of cellulose acetate using acetone

OPTO-220 P

**OPHTHALMIC OPTICS, OPHTHALMIC
DISPENSING AND WORKSHOP PRACTICE**

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

**OPTO-230
CLINICAL**

**BIOLOGICAL FOUNDATIONS OF
OPTOMETRY**

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

The applications of modern biomedical science to understanding ocular disorders and diseases. anatomy and embryology with an emphasis on clinically important structures, especially the blood supply to the brain, the cranial nerves relevant to ophthalmic practice, embryology relevant to common congenital conditions. Genetics of eye disease. Biochemistry and metabolism: review of the key biochemical pathways; changes to ocular tissues in disease, metabolic demands of the retina; glucose and oxygen deprivation. Pharmacology: review of basic pharmacological concepts and the action of common drugs in ophthalmic practice. General principles of immunology with particular reference to the eye. General principles of inflammation and wound healing. Microbiology of the eye.

OPTO-240**BIOCHEMISTRY**

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

Water, PH and Buffers, the atom and chemical bonds, bio Molecules-Carbohydrates, Proteins, Lipids, Enzymes, Proteins and Vitamins.

OPTO-240 P**BIOCHEMISTRY**

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

SECOND YEAR

OPTO-310

OCULAR 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

The orbit, the uvea, the retina, intraocular structures, the visual pathway, lacrimal structures, external structures, the oculomotor system, blood supply to the eye embryology.

OPTO-310 P

OCULAR ANATOMY

The laboratory course will comprise of exercises on what is learnt in the theory classes of the same course i.e. OPTO 310.

OPTO-320**PHOTOMETRY AND VISUAL PERCEPTION**

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

Light / energy radiation, generation of light, spectral radiation, photometric units, color, light emitters, standards of illumination, illumination for daily life.

Retinal function, adaptation. Colour/ colorimetry. CIE diagrams. Colour systems like DIN, BS etc . Colour vision deficiencies. Clinical tests of colour vision. Perception of colour: Helmholtz-Kohlrausch, Bezold Brücke effects Fechner colours, Benhans top etc. Colour constancy. Contrast and CSF. Induction and glare. Psychophysics and perception. Thresholds. Webers law, Fechners law. Flicker and Ferry-Porters law.

Introduction to electrophysiology

OPTO-330**OPHTHALMIC DISPENSING AND WORKSHOP
PRACTICE II**

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

Spectacle lenses; lens materials (high index materials), lens design (asphericals, prog., bifocals etc.), lens selections, safety lenses / regulations, tinted lenses. Spectacle frames; terminology, measuring systems, materials, frame fitting and adjustments. Practical use of tools and equipment for hand edging and automatic edging. Automatic edging machines, semiautomatics and computerized machines. Low vision aid, mounting of binocular / monocular magnification systems.

OPTO-330 P**OPHTHALMIC DISPENSING AND WORKSHOP
PRACTICE II**

The laboratory course will comprise of exercises on what is learnt in the theory classes of the same course i.e. OPTO 330.

OPTO-340**INSTRUMENTATION AND METHODS**

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

Basic optometric instrumentation and methods.

The objective and subjective methods of refraction and methods to measure and evaluate binocular problems.

The other basic optometric instrumentation and methods.

OPTO-410**OPTOMETRIC PROCEDURES / CLINICAL REFRACTION**

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

Clinical Refraction, Vision screening, Investigation and follow-up of Low Vision Patients, Service and reception routines. Use of all types of tests, instruments and methods for examination of the eye and vision.

OPTO-410 P OPTOMETRIC PROCEDURES / CLINICAL REFRACTION

The laboratory course will comprise of exercises on what is learnt in the theory classes of the same course i.e. OPTO 410.

OPTO-420 ORTHOPTICS

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 compromise 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

Normal Binocular Vision, Heterophorias, Convergence Insufficiency, Accommodation, Extraocular Muscles, Incomitancy, Tropias, The Synoptophore, Suppression, Amblyopia, Eccentric Fixation, ARC, Microtropias, Nystagmus, Syndromes.

OPTO-420 P

ORTHOPTICS

The laboratory course will comprise of exercises on what is learnt in the theory classes of the same course i.e. OPTO 420.

OPTO-430

LAW, ETHICS AND PSYCHOLOGY

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

Ethics: norms and values, ethical models, ethics within health care, declaration of Helsinki, code of ethics and guidelines for professional conduct. Law: principles and nature of law, contracts, consumer rights, public relations, computer technology - legal aspects, the professional secrecy, the data protection registrar and patient protection. Psychology: Empiri and theory, -paradigms, psycho-analysis, Darwinism, learning, theory, motivation, conflict, stress, Maslow's theories, social psychology / behavioral psychology

OPTO -440

PROJECT

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