# NATIONAL BOARD FOR TECHNICAL EDUCATION

# CURRICULUM AND COURSE SPECIFICATION
# FOR
# NATIONAL DIPLOMA IN DISPENSING OPTICIANRY PROGRAMME

## DEVELOPED IN COLLABORATION WITH

## OPTOMETRISTS & DISPENSING OPTICIANS REGISTRATION BOARD OF NIGERIA (ODORBN), ABUJA.

## MARCH, 2021.

# GENERAL INFORMATION

## 1.0 TITLE OF THE PROGRAMME

The programme is National Diploma in **Dispensing Opticianry**

## 2.0 PROGRAMME GOAL

The goal of the National Diploma (ND) in **Dispensing Opticianry** programme is to produce Dispensing Opticians who are grounded with reasonable technical skills who could efficiently utilize various types of equipment and machines in a modern ophthalmic laboratory.

## 3.0 PROGRAMME OBJECTIVES

On completion of the programme, the Diplomates should:

1. Have acquire skills in the art of ophthalmic dispensing (i.e. mounting of spectacle lenses on frames; marketing of eye wares, etc).
2. Be equipped with such training that collaborate with other ophthalmic practitioners in providing eye-care services.
3. Be prepared to qualify for registration with the Board (Optometrists and Dispensing Opticians Board of Nigeria).
4. Be Dispensing Opticians who could satisfy internationally recognized standards in Dispensing Optics.
5. Be grounded in the basics of ophthalmic dispensing and fully prepared for higher training (HNDDO) in the production of Lenses, Frames and Ocular prostheses.

## 4.0 ENTRY REQUIREMENTS INTO THE PROGRAMME

**NATIONAL DIPLOMA (ND)**

The academic requirements for admission into the ND **Dispensing Opticianry** programme are:

To possess a minimum of five (5) credits in WASC or SSCE at not more than two sittings in the following subjects: English Language, Mathematics, Physics and any other two (2) science subjects from; Chemistry, Biology/Health Science, Agriculture and Technical Drawing.

## 5.0 PROGRAMME DURATION:

The ND programme runs for two academic sessions of two semesters each (four semesters) and one year of Supervised Ophthalmic Laboratory Experience scheme (SOLE).

## 6.0 CURRICULUM

6.1 The curriculum is structured into four semesters of classroom, studio and other field activities. Each semester of institutional based activities shall be for a duration of 17 weeks distributed as follows:

(i.) 15 contact weeks of teaching, i.e. theory, practical exercises, quizzes, tests, etc.; and

(ii.) 2 weeks for examination and registration

6.2 The curriculum of the programme consists of four main components viz:

i) General Studies Courses

ii) Foundation Courses

iii) Professional Courses

iv) Intensive Practical Sessions

The General Studies component includes courses in General Sciences, English Language/Communication, Entrepreneurship Development and Computer Studies.

The General Education Courses shall account for not more than 10-15% of the total contact hours for the programme.

Foundation Courses: Research Methods, Law courses etc. The number of hours for the foundation courses shall be between 10-15% of the total contact hours for the programme.

Professional Courses are specialized core courses, which give the student the theory and practical skills he/she needs to practice in his/her field of specialisation at the technical level.

Those specialized core courses account for between 60-70% of the total contact hours of the programme.

## 7.0 PROJECT

Every ND student is required to successfully complete a project in the field of **Dispensing Opticianry** during his/her final year on the programme. Adequate project supervision/assessment should be done by qualified lecturers.

## 8.0 EVALUATION

For the purpose of awarding the National Diploma (ND) Certificate in **Dispensing Opticianry**, evaluation of the student's work shall include: examinations, project and course work (tests, quizzes, practical etc.). The weighting of each of the components of the evaluation system shall be prescribed by the National Board for Technical Education and the institutions running the programme.

The final examination leading to the award of the Diploma Certificate will be conducted by the regulatory body (ODORBN) after all qualified candidates have paid the prescribed enrolment fee. To qualify to sit for the professional Board examination the student must pass all core courses and a minimum of 80% of all mandatory courses as well as successfully complete the Supervised Ophthalmic Laboratory Experience (SOLE) scheme.

A student that has not completed the laboratory training or project work shall not be eligible to participate in the final qualifying Board examination.

## 9.0 CONDITIONS FOR THE AWARD OF THE NATIONAL DIPLOMA

9.1 The National Board for Technical Education (NBTE) and ODORBN shall accredit the ND programme in **Dispensing Opticianry** before the award of the diploma certificate. Details about the process of accrediting programmes for the award of National Diploma shall be in line with guidelines from the Executive Secretary, (NBTE), Plot B, Bida Road, P.M.B 2239, Kaduna Nigeria or www.nbte.gov.ng. as well as those from the Optometrists and Dispensing Opticians Registration board of Nigeria (ODORBN).

9.2 The institution will award the National Diploma to candidates who successfully complete the programme after passing the prescribed coursework, examination, and diploma project. Such candidates should have completed between 72-80 semester credit units as prescribed in the programme.

9.3 The National Diploma (ND) **Dispensing Opticianry** shall be awarded to only persons who have satisfied all conditions for the award of the certificate as laid down by the National Board for Technical Education (NBTE) and the institution in which the programme is offered.

## 10.0 GRADING SYSTEM/CLASSIFICATION OF DIPLOMAS:

To obtain a passing grade in each examination, the student must score a minimum of 50%. This will be made up as follows: Continuous assessment (30%) and Semester examination (70%).

Lecturers are to keep a record of continuous assessment test and a register of class attendance (75%) for each student (for eligibility to sit for examinations).

National Diploma (ND) shall be based on a total scale of 4 points classified into the following categories:

Distinction - CGPA of 3.50 and above
Upper Credit - CGPA of 3.00 – 3.49
Lower Credit - CGPA of 2.50 – 2.99
Pass - CGPA of 2.00 – 2.49

| MARKED RANGE | LETTER GRADE | WEIGHTING |
|---|---|---|
| 75% and Above | A | 4.00 |
| 70% - 74% | AB | 3.50 |
| 65% - 69% | B | 3.25 |
| 60% - 64% | BC | 3.00 |
| 55% - 59% | C | 2.75 |
| 50% - 54% | CD | 2.50 |

| | | |
|---|---|---|
| 45% - 49% | D | 2.25 |
| 40% - 44% | E | 2.00 |
| Below 40% | F | 0.00 |

## 11.0 ACCREDITATION OF PROGRAMMES

This programme shall be accredited by the National Board for Technical Education (NBTE) and Optometrists and Dispensing Opticians Registration Board of Nigeria (ODORBN).

## 12.0 GUIDANCE NOTES FOR TEACHERS OF THE PROGRAMME

12.1 The curriculum is drawn in course units. This is in keeping with the provision of the National Policy on Education, which stresses the need to introduce semester credit unit to enable a student who wishes to transfer the units already completed in an institution of similar standard from which he is transferring.

12.2 In designing the units, the principles of the modular system by product has been adopted, thus making each of the professional modules, when completed, provide the student with technical operative skills, which can be used for employment purposes.

12.3 As the success of the credit unit system depends on the articulation of programmes in the institutions and industry, the curriculum content has been written in behavioural objectives, so that it is clear to all, the expected performance of the student who successfully completes the programme.

12.4 The teaching of the theory and practical work should, as much as possible, be integrated. Practical exercises especially those in professional courses and laboratory work should, as much as possible, be integrated to a ratio of 70:30.

## CURRICULUM TABLE
## NATIONAL DIPLOMA IN DISPENSING OPTICIANRY

**LEVEL: ND I** **1ST SEMESTER**

| COURSE CODE | COURSE TITLE | L | P | CU | CH | PRE-REQUISITE COURSES |
|---|---|---|---|---|---|---|
| DDO 111 | Basic principles of Optics I | 2 | 1 | 3 | 45 | |
| DDS 111 | Introduction to Microbiology | 2 | 1 | 3 | 45 | |
| DDS 112 | Basic Mathematics | 2 | 0 | 2 | 30 | |
| DDS 113 | Introduction to Chemistry | 2 | 1 | 3 | 45 | |
| EHT 112 | Introduction to Concept of Health and Diseases | 2 | 0 | 2 | 30 | |
| GNS 111 | Citizenship Education I | 2 | 0 | 2 | 30 | |
| GNS 102 | Communication in English I | 2 | 0 | 2 | 30 | |
| GNS 411 | Introduction to Psychology | 3 | 0 | 3 | 45 | |
| COM 101 | Introduction to Computing | 2 | 2 | 4 | 60 | |
| BAM 114 | Principles of Economics I | 2 | 1 | 3 | 45 | |
| | TOTAL | 21 | 6 | 27 | 405 | |

**LEVEL: ND I** **2nd SEMESTER**

| COURSE CODE | COURSE TITLE | L | P | CU | CH | PRE-REQUISITE COURSES |
|---|---|---|---|---|---|---|
| DDO 121 | Physical Optics I | 2 | 0 | 2 | 30 | |
| DDO 122 | Introduction to Ocular Anatomy and Physiology | 2 | 1 | 3 | 45 | |
| DDO 123 | Basic Principles of Optics II | 2 | 1 | 3 | 45 | |
| DDO 124 | Clinical Optical Dispensing I | 2 | 1 | 3 | 45 | |
| DDO 125 | Ophthalmic Instrumentation | 1 | 2 | 3 | 45 | |
| DDS 121 | Nigerian People and Culture | 2 | 0 | 2 | 30 | |
| DDS 122 | Basic Accounting Techniques I | 2 | 1 | 3 | 45 | |
| GNS 121 | Citizenship Education II | 2 | 0 | 2 | 30 | |
| GNS 202 | Communication in English II | 2 | 0 | 2 | 30 | |
| COM 123 | Computer Application Packages I | 2 | 0 | 2 | 30 | |
| EED 126 | Introduction to Entrepreneurship | 1 | 2 | 3 | 45 | |
| | TOTAL | 20 | 8 | 28 | 420 | |

**LEVEL: ND II** **1st SEMESTER**

| COURSE CODE | COURSE TITLE | L | P | CU | CH | PRE-REQUISITE COURSES |
|---|---|---|---|---|---|---|
| DDO 211 | Clinical Optical Dispensing II | 2 | 1 | 3 | 45 | |
| DDO 212 | Physical Optics II | 2 | 1 | 3 | 45 | |
| DDO 213 | Synopsis of Ophthalmic Lenses | 2 | 1 | 3 | 45 | |
| DDO 214 | Safety and First Aid | 2 | 1 | 3 | 45 | |
| DDO 215 | Optical Laboratory I | 0 | 4 | 4 | 60 | |
| CHO 111 | Primary Health Care Management I | 1 | 0 | 1 | 15 | |
| ACC 121 | Principle of Accounts II | 1 | 3 | 4 | 60 | |
| EED 216 | Practice of Entrepreneurship | 1 | 2 | 3 | 45 | |
| GNS 228 | Research Methods | 2 | 0 | 2 | 30 | |
| | TOTAL | 13 | 13 | 26 | 390 | |

**LEVEL: ND II** **2nd SEMESTER**

| COURSE CODE | COURSE TITLE | L | P | CU | CH | PRE-REQUISITE COURSES |
|---|---|---|---|---|---|---|
| DDO 221 | Optical Laboratory II | 0 | 6 | 6 | 90 | |
| DDO 222 | Professional Ethics | 2 | 0 | 2 | 30 | |
| DDO 223 | Introduction to Ocular prosthetics | 1 | 2 | 3 | 45 | |
| DDO 224 | Dispensing Opticianry Practice Management | 1 | 1 | 2 | 30 | |
| DDO 225 | Seminar in Dispensing Optics | 2 | 0 | 2 | 30 | |
| DDO 227 | Project | 0 | 6 | 6 | 90 | |
| | TOTAL | 6 | 15 | 21 | 315 | |

# YEAR ONE

# SEMESTER ONE

| | | | |
|---|---|---|---|
| **PROGRAMME: NATIONAL DIPLOMA IN DISPENSING OPTICIANRY** | | | |
| **COURSE TITLE: BASIC PRINCIPLES OF OPTICS I** | | | |
| **COURSE CODE: DDO 111** | | | |
| **DURATION:** | **Lecture: - 2 Hours** | **Practical: - 1 Hour** | **Total: 3Hrs (45hrs/semester)** |
| **CREDIT UNITS: 3 CU** | | | |
| **GOAL: The course is designed to enable the students understand the basic principles of optics.** | | | |
| **GENERAL OBJECTIVES: On completion of the course, the student should be able to:** | | | |
| 1.0 Understand geometric behaviour of light.<br><br>2.0 Understand reflection in plane and curved mirrors<br><br>3.0 Understand refraction in lenses.<br><br>4.0 Understand prisms and their properties | | | |

| PROGRAMME: NATIONAL DIPLOMA IN DISPENSING OPTICIANRY | | | | | | |
|---|---|---|---|---|---|---|
| **COURSE TITLE: BASIC PRINCIPLES OF OPTICS I** | **Course Code: DDO 111** | | **Contact Hours: 3Hrs (45Hrs/semester)** | | | |
| **COURSE SPECIFICATION: Theoretical content: - 2 hours** | | **Practical Content: 1 hour** | | | | |
| **General Objective: 1.0 Understand geometric behaviour of light.** | | | | | | |
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |
| 1.1 Explain geometric optics<br><br>1.2 Explain the nature of light:<br>- As a stream of particle<br>- As wave motion.<br><br>1.3 Explain the concept of rectilinear propagation of light:<br>- Pin hole camera<br>- Shadows and Eclipses | Explain 1.1 – 1.3 | Text Books<br>Laptop and Projector<br>Journals<br>White Board and Marker | 1.1 Demonstrate light travelling in a straight line | Demonstrate and supervise | Light box, Screen, Optical pins, Etc. | Assignments<br><br>Quiz<br><br>Examination |

| General Objective: 2.0 Understand reflection in plane and curved mirrors | | | | | | |
|---|---|---|---|---|---|---|
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |
| 2.1 Define reflection<br><br>2.2 Explain the terms:<br>- Incident ray<br>- Reflected ray<br>- Normal ray<br>- Angle of incidence<br>- Angle of reflection<br><br>2.3 State the Laws of reflection.<br>2.4 Explain ray tracing<br><br>2.5 Explain the terms:<br>- Centre of curvature<br>- Radius of curvature<br>- Image distance<br>- Object distance<br>- Principal focus<br>- Focal length<br>- Real image<br>- Virtual image<br>- Magnification | Explain the content in 2.1 – 2.7 | Text Books<br>Laptop and Projector<br>Journals<br>White Board and Marker | 2.1 Demonstrate how images are formed by plane mirrors using ray diagrams<br><br>2.2 Demonstrate how images are formed by curved mirrors using ray diagram | Demonstrate and supervise | Plane mirrors, Curved mirrors, Optical pins, Screen etc. | Test<br>Quiz<br>Examination |

| | | | | | | |
|---|---|---|---|---|---|---|
| 2.6 Outline properties of images formed by plane mirrors<br><br>2.7 List properties of images formed by curved mirrors | | | | | | |
| **General Objective: 3.0 Understand refraction in lenses** | | | | | | |
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |
| 3.1 Define refraction<br><br>3.2 Explain incident ray, refracted ray and emergent ray<br><br>3.3 Explain angle of incidence<br><br>3.4 Explain angle of refraction<br><br>3.5 State the laws of refraction<br><br>3.6 Explain index of refraction | Explain the content in 3.1 – 3.10 | Text Books<br>Laptop and Projector<br>Journals<br>White Board and Marker | 3.1 Demonstrate refraction through a rectangular glass<br><br>3.2 Draw ray diagrams depicting formation of images by a concave lens<br><br>3.3 Draw ray diagrams depicting formation of images by a convex lens | Demonstrate and supervise | Optical pin<br>Rectangular glass block<br>Screen<br>concave lenses<br>convex lenses | Test<br>Quiz<br>Examination |

| | | | | | | |
|---|---|---|---|---|---|---|
| 3.7 Explain the concept of total internal reflection<br><br>3.8 State applications of the phenomenon of total internal reflection<br><br>3.9 List types of lenses<br><br>3.10 Explain the terms:<br>- Radius of curvature<br>- Principal focus<br>- Focal Length<br>- Centre of curvature | | | | | | |
| **General Objective: 4.0 Understand prisms and their properties** | | | | | | |
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |
| 4.1 Explain prisms<br><br>4.2 List types of prisms<br><br>4.3 Outline properties of prisms<br><br>4.4 List uses of prisms | Explain the contents in 4.1 – 4.4 | Text Books<br>Laptop and Projector<br>Journals<br>White Board and Marker | 4.1 Demonstrate the bending of rays towards the base of a triangular prism | Supervise | Optical pin<br>Prism<br><br>Screen | Test<br>Quiz<br>Examination |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | | |

# YEAR ONE

# SEMESTER TWO

| | | | | |
|---|---|---|---|---|
| **PROGRAMME: NATIONAL DIPLOMA IN DISPENSING OPTICIANRY** | | | | |
| **COURSE TITLE: PHYSICAL OPTICS 1** | | | | |
| **COURSE CODE: DDO 121** | | | | |
| **DURATION** | **Lecture: -2 Hours** | | **Practical: - 0** | **Total: - 2Hrs/Week (30Hrs/Sem)** |
| **CREDIT UNITS: 2 CU** | | | | |
| **GOAL:** This course is designed to enable the student acquire knowledge in wave behavior of light and some optical phenomena. | | | | |
| **GENERAL OBJECTIVES:** On completion of the course, the student should be able to: | | | | |
| 1.0 Understand the concept of light waves<br>2.0 Understand wave motion and its intensity.<br>3.0 Understand the nature of electromagnetic radiation.<br>4.0 Understand the absorption and transmission of light.<br>5.0 Understand the phenomena of light. | | | | |

| PROGRAMME: NATIONAL DIPLOMA IN DISPENSING OPTICIANRY | | | | | | |
|---|---|---|---|---|---|---|
| **COURSE TITLE: PHYSICAL OPTICS 1** | **Course Code: DDO121** | | **Contact Hours: 2Hrs/wk. (30Hrs/Sem)** | | | |
| **COURSE SPECIFICATION: Theoretical content: 2** | | | **Practical Content:0** | | | |
| **General Objective: 1.0: Understand the concept of light waves** | | | | | | |
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |
| 1.1.Define the following terms:<br>- light waves<br>- amplitude<br>- trough<br>- wavelength<br>- frequency<br>- velocity<br>- etc<br>1.2. List types of light waves i.e. transverse and longitudinal waves<br>1.3.Describe each type listed in 1.2 above | Explain the concepts in 1.1 – 1.3 | Text Books<br>Laptop and Projector<br>Journals<br>White Board and Marker | | | | Assignments, Test, Quizzes, Examination |

| General Objective: 2.0: Understand wave motion and its intensity | | | | | | |
|---|---|---|---|---|---|---|
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |
| 2.1 Define wave motion and intensity<br>2.2 Explain simple harmonic motion<br>2.3 Explain the concept of off-phase and phase angle<br>2.4 Explain the concept of velocity of the wave<br>2.5: Explain harmonic waves<br>2.6: Explain the concept off-phase and phase angle | Define harmonic wave<br>Explain phase and phase angle<br>Explain the contents in 2.4 – 2.6 | Text Books<br>Laptop and Projector<br>Journals<br>White Board and Marker | 2.1 Identify wave generation in liquids.<br>2.2 Demonstrate periodic oscillation in spring and pendulum<br>2.3 Determine velocity of wave | Demonstrate and supervise | | Assignments<br>Quiz<br>Examination |
| **General Objective: 3.0 Understand the nature of electromagnetic radiation** | | | | | | |
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |

| | | | | | | |
|---|---|---|---|---|---|---|
| 3.1 Explain the concept of the electromagnetic wave<br><br>3.2 Explain the Properties of electromagnetic waves<br><br>3.3 Explain the concept of the electromagnetic spectrum<br><br>3.4 Describe the different sources of the electromagnetic radiation<br><br>3.5: Discuss the harmful effects of the infrared and ultraviolet rays to the eye<br><br>3.6: Explain the concept of the monochromatic light<br><br>3.7: Explain the concept of Color vision<br><br>3.8: Describe the colors of visible light and the corresponding wavelength in vacuum | Define electromagnetic wave<br><br>Explain the contents in 3.1 to 3.3, 3.6 and 3.7<br><br>Describe the contents in 3.4 and 3.8<br><br>Discuss the contents in 3.5 | White Board and Marker<br><br>Text Books<br><br>Laptop and Projector<br><br>Journals | | | | Assignments<br><br>Quiz<br><br>Examination |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | | |
| **General Objective 4.0: Understand the absorption and transmission of light** | | | | | | |
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |
| 4.1: Explain the concept of absorption of light<br>4.2: Explain the concept of<br>- transparent medium<br>- translucent medium<br>- opaque medium<br>4.3: Explain the relationship of absorption with wavelength<br>4.4: Explain the relationship of absorption with thickness<br>4.5: Explain the exponential law of absorption (Bouguer – Lambert law)<br>4.6: Explain the concept of transmissivity and transmission coefficient | Explain the contents in 4.1 to 4.6<br>Define the contents in 4.2<br>Derivation of the exponential law of absorption | White Board and Marker<br>Text Books<br>Laptop and Projector<br>Journals | | | | Quiz<br>Assignment<br>Examination |
| **General Objective 5.0 Understand the phenomena of light** | | | | | | |

| Specific Learning Objectives: | Teachers Activities | Learning Resources | Specific Learning Objectives: | Teachers Activities | Learning Resources | Evaluation |
|---|---|---|---|---|---|---|
| 5.1: Explain the concept of reflection of light<br>5.2: Explain the concept of specular reflection and diffuse reflection<br>5.3: State the laws of reflection<br>5.4: Explain the concept and magnitude of the speed of light<br>5.5: Explain the concept of index of refraction<br>5.6: Explain the speed of light in a medium<br>5.7: Explain the concept of refraction of light<br>5.8: Explain the wave basis of the laws of refraction | Define<br>Explain the contents in 5.1 to 5.21<br>Derivation of the laws of reflection and laws of refraction | White Board and Marker<br>Text Books<br>Laptop and Projector<br>Journals | | | | Quiz<br>Assignment<br>Examination |

| | | | | | | |
|---|---|---|---|---|---|---|
| 5.9: Solve problems involving Snell's law<br><br>5.10: Explain the relationship of wavelength in vacuum with wavelength in a medium<br><br>5.11: Explain the frequency invariance and wavelength changes when the light moves from one medium to the next<br><br>5.12: Explain the concept of optical path length<br><br>5.13: Discuss the concept of total internal reflection<br><br>5.14: Explain the concept of critical angle of refraction<br><br>5.15: Explain the importance of internal reflection. | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 5.16: Explain the applications of optical fiber<br><br>5.17: Explain the concept of intensity of a wave<br><br>5.18: Explain the relationship of intensity of a harmonic wave with wave's amplitude<br><br>5.19: Explain the concept of homogeneous and inhomogeneous medium<br><br>5.20: Explain the Rayleigh theory of the light scattering<br><br>5.21: Understand the concept of light scattering and color of the sky | | | | | | |

| | | | | |
|---|---|---|---|---|
| **PROGRAMME: NATIONAL DIPLOMA IN DISPENSING OPTICIANRY** | | | | |
| **COURSE TITLE: Introduction to Ocular Anatomy and Physiology** | | | | |
| **COURSE CODE: DDO 122** | | | | |
| **DURATION** | **Lecture: -2 Hours** | | **Practical: -1 Hour** | **Total: - 3Hrs/Wk. (45Hrs/Sem)** |
| **CREDIT UNITS: 3 CU** | | | | |
| **GOAL:** This course is designed to enable students understand the structures and functions of the eye. | | | | |
| **GENERAL OBJECTIVES:** On completion of the course, the student should be able to: | | | | |
| 1.0 Understand the structure and functions of the eyelids.<br>2.0 Understand the structure and functions of the lacrimal system and tear film.<br>3.0 Understand the structure and functions of the cornea.<br>4.0 Understand the structure and functions of the extra ocular muscles.<br>5.0 Understand the functions of the ocular circulation.<br>6.0 Understand the structure and functions of the ciliary epithelia and Aqueous Humor and Intraocular pressure.<br>7.0 Understand the structure and functions of the vitreous.<br>8.0 Understand the structure and functions of the lens. | | | | |

| PROGRAMME: NATIONAL DIPLOMA IN DISPENSING OPTICIANRY | | | | | | |
|---|---|---|---|---|---|---|
| **COURSE TITLE: Introduction to Ocular Anatomy and Physiology** | | **Course Code: DDO 122** | | **Contact Hours: 3Hrs/Wk. (45Hrs/Sem)** | | |
| **COURSE SPECIFICATION: Theoretical content: 2** | | | **Practical Content: 1** | | | |
| **General Objective 1.0: Understand the structure and functions of the eyelids** | | | | | | |
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |
| 1.1Describe the anatomy of the eyelid<br><br>1.2 State the functions of the eyelid:<br><br>- normal closure of eye lids and<br><br>- blinking<br><br>- production, distribution and drainage of tears. | Explain the content in 1.1 - 1.2 | Text Books<br>Laptop and Projector<br>Journals<br>White Board and Marker | 1.1 Draw and label the human eyelid | | | Assignments<br><br>Quiz<br><br>Examination |

| **General Objective2.0:** Understand the structure and functions of the lacrimal system and tear film | | | | | | |
|---|---|---|---|---|---|---|
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |
| 2.1 Describe the structure of the lacrimal system<br><br>2.2 Enumerate the functions of the lacrimal system (gland and duct).<br><br>2.3 Explain the functions of the tear film.<br><br>2.4 Describe the layers of the tear film.<br><br>2.5 Knowledge of the thickness, source and function of each layer of the tear-film.<br><br>2.6 Distinguish between basal and reflex secretion.<br><br>2.~~6~~7 Explain the composition, osmolality and pH of tear film. | Explain the content in 2.1 – 2.7 | Text Books<br>Laptop and Projector<br>Journals<br>White Board and Marker | 2.1 Draw and label the structure of the lacrimal system<br><br>2.2 Draw and label the layers of the tear film | Demonstrate, supervise, assess | Human subjects, Schirmer strip and other tear strips | Assignments<br><br>Quiz<br><br>Examination |

| General Objective:3.0: Understand the structure and functions of the cornea | | | | | | |
|---|---|---|---|---|---|---|
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |
| 3.1 Explain the physical characteristics of the cornea<br><br>3.2 Explain the Permeability of different layers<br><br>3.3 Explain the metabolic activity of each layer<br><br>3.4 Explain the physiology of corneal transparency<br><br>3.5 Discuss causes of corneal deturgescence and oedema.<br><br>3.6 Explain epithelial wound-healing<br><br>3.7 Explain corneal nerve function | Explain the contents in 3.1 to 3.8 | Text Books<br>Laptop and Projector<br>Journals<br>White Board and Marker | 3.1 Observe Purkinje – Sanson image<br><br>3.2 Relate stromal hydration with loss of transparency<br><br>3.3 Test for corneal sensation | Demonstrate, supervise, assess | Light source, magnifier, Ox eyes, scalpel and scissors, glass vials, saline solutions of different osmolality; micrograms analytical balance, Packet of cotton wool | Assignments<br><br>Quiz<br><br>Examination |

| | | | | | | |
|---|---|---|---|---|---|---|
| 3.8 Explain the refractive power of cornea | | | | | | |
| **General Objectives 4.0: Understand the structure and functions of the extra ocular muscles** | | | | | | |
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |
| 4.1 Explain the action of the extra ocular muscles.<br><br>4.2 Explain primary, secondary and tertiary action<br><br>4.3 Explain Sherington's law, Hering's law.<br><br>4.4 Explain duction, version and vergence<br><br>4.5 Explain the physiology of saccades: Ballistic innervation, main saccade and corrective eye-movements<br><br>4.6 Explain the physiology of the pursuit movement: foveal | Explain the contents in 4.1 to 4.9 | Text Books<br>Laptop and Projector<br>Journals<br>White Board and Marker | 4.1 Ability to test for ocular motility<br><br>4.2 Ability to test for Bell's phenomenon<br><br>4.3 Ability to carry out a motility test, assessing saccades and pursuits. | Demonstrate, supervise, assess | | Assignments<br><br>Quiz<br><br>Examination |

| | | | | | | |
|---|---|---|---|---|---|---|
| control, maximum velocity; supranuclear pathways | | | 4.4 Ability to assess and measure saccades<br><br>4.5 Ability to assess pursuit eye-movements | | | |
| **General Objective 5: Understand the functions of ocular circulation** | | | | | | |
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |
| 5.1 Explain the nature and functional importance of the blood ocular barrier, the blood-aqueous barrier and the blood-retinal barrier.<br><br>5.2: Explain the concept of auto-regulation of blood flow: Auto-regulation in the eye.<br><br>5. 3: Enumerate the factors affecting the velocity and | Explain the contents in 5.1 to 5.4 | Text Books<br>Laptop and Projector<br>Journals<br>White Board and Marker | 5.1 Ability to observer the vascular pulse at the optic disc, and the effect of elevating IOP using mild digital pressure | Demonstrate and supervise | | Assignments<br><br>Quiz<br><br>Examination |

| | | | | | | |
|---|---|---|---|---|---|---|
| volume of blood flow in the eye<br><br>5.4: Discuss the ocular pulse and the importance of pulsation in the CRV and CRA | | | | | | |
| **General Objective 6: Understand the structure and functions of the ciliary epithelia and Aqueous Humor and Intraocular pressure.** | | | | | | |
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |
| 6.1 Explain the ciliary epithelia functions<br><br>6.2 Explain the mechanism of formation, composition, and rate of production of aqueous humor<br><br>6.3 Enumerate factors affecting the rate of drainage of aqueous: the conventional and unconventional outflow:<br><br>6.4 Explain the facility and pseudofacility of outflow of aqueous. | Explain the contents in 6.1 to 6.6 | Text Books<br>Laptop and Projector<br>Journals<br>White Board and Marker | | | | Assignments<br><br>Quiz<br><br>Examination |

| | | | | | | |
|---|---|---|---|---|---|---|
| 6.5 Explain neural, pharmacological and pathological factors affecting IOP and its measurement<br><br>6.6 Explain the concept of ocular rigidity, and its importance in determining the tonographic facility of outflow. | | | | | | |
| **General Objective 7.0: Understand the structure and functions of the vitreous** | | | | | | |
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |
| 7.1 Explain the function of vitreous<br><br>7.2 Explain Vitreous composition<br><br>7.3 Explain Vitreous metabolism<br><br>7.4 Enumerate the Physical characteristics and Ageing changes | Explain the contents in 7.1 to 7.4 | Text Books<br>Laptop and Projector<br>Journals<br>White Board and Marker | | | | Assignments<br><br>Quiz<br><br>Examination |

| General Objectives 8.0: Understand the structure and functions of the lens. | | | | | | |
|---|---|---|---|---|---|---|
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |
| 8.1 Explain the elastic properties of the lens capsule and the changes with age<br><br>8.2 Explain the chemical composition of lens<br><br>8.3 Enumerate the physical properties of the lens.<br><br>8.4 Explain the metabolism of lens | Explain the contents in 8.1 to 8.4 | Text Books<br>Laptop and Projector<br>Journals<br>White Board and Marker | | | | Assignments<br><br>Quiz<br><br>Examination |

| | | | | |
|---|---|---|---|---|
| **PROGRAMME: NATIONAL DIPLOMA IN DISPENSING OPTICIANRY** | | | | |
| **COURSE TITLE: BASIC PRINCIPLES OF OPTICS II** | | | | |
| **COURSE CODE: DDO 123** | | | | |
| **DURATION** | **Lecture: - 2 HOURS** | **Tutorial: -** | **Practical: - 1 HOUR** | **Total: - 3hrs/Wk. (45Hrs/Sem)** |
| **CREDIT UNITS: 3 CU** | | | | |
| **GOAL:** This course is designed to enable the students understand the raw materials from which lenses are produced as well as their compositions | | | | |
| **GENERAL OBJECTIVES:** On completion of the course, the student should be able to: | | | | |
| 1.0 Know the historical development of lenses (glass and plastic)<br>2.0 Understand the chemical composition of lenses<br>3.0 Understand the relationship between the structure and optical properties of lenses<br>4.0 Understand the properties of lenses (converging, diverging and cylindrical lenses)<br>5.0 Understand refraction of light through lenses<br>6.0 Understand dispersion of light through lenses | | | | |

| PROGRAMME: NATIONAL DIPLOMA IN DISPENSING OPTICIANRY | | | | | | |
|---|---|---|---|---|---|---|
| **COURSE TITLE: BASIC PRINCIPLES OF OPTICS II** | **Course Code: DDO 123** | | **Contact Hours: 3hrs/Wk. (45Hrs/Sem)** | | | |
| **COURSE SPECIFICATION: Theoretical content: 2 Hours** | | **Practical Content: 1 Hour** | | | | |
| **General Objective: 1.0: Historical Development of Lenses (glass and plastic)** | | | | | | |
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |
| 1.1 Explain the historical development and progress of glass lenses<br>1.2 Explain the history of plastic lenses<br>1.3 Differentiate between the types of lenses | Explain<br>Differentiate | Textbooks<br>Journals<br>Internet<br>Glass lenses<br>Plastic Lenses | | | | Quiz<br>Test<br>Examination |
| **General Objective: 2.0 The Chemical Composition of Lenses** | | | | | | |
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |
| 2.1 Explain the chemical composition of crown glass<br>2.2 Explain the chemical composition of flint glass<br>2.3 Explain the chemical composition of plastic lens (CR-39) | Explain the contents in 2.1 to 2.4<br>Describe | Textbooks,<br>Journals,<br>Internet,<br>Lenses | 2.1 Identify the properties of different lens materials | Demonstrate and supervise | Crown glass,<br>Flint glass,<br>CR-39 and Polycarbonate lenses | Assignments<br>Quiz<br>Examination |

| | | | | | | |
|---|---|---|---|---|---|---|
| 2.4 Explain the chemical composition of polycarbonate lenses<br>2.5 Describe the relationship between the lens compositions | | | | | | |

| **General Objective: 3.0 The Relationship between the Structure and Optical Properties of Lenses** | | | | | | |
|---|---|---|---|---|---|---|
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |
| 3.1 Explain the optical properties of plastic lenses<br>3.2 Explain the following properties<br>a. ABBE number<br>b. UV transmittance<br>c. Impact resistance<br>d. Axis<br>e. Tensile strength, etc<br>3.3 Describe the classifications of lenses (Concave & Convex lenses)<br>3.4 Describe the types of lenses (Single vision, bifocal and varifocal) | Explain the contents in 3.1 to 3.4 | Textbooks, Internet, Lenses | 3.1 Identify the physical properties of the different types of lenses | Demonstrate and supervise | Concave lenses<br>Convex lenses<br>Single vision lenses<br>Bifocal lenses<br>Varifocal lenses | Assignments<br><br>Quiz<br><br>Examination |

| | | | | | | |
|---|---|---|---|---|---|---|
| **General Objective: 4.0: Understand the Properties of Lenses (converging, diverging and cylindrical lenses)** | | | | | | |
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |
| 4.1 Describe the properties of converging lens<br>4.2 Describe the properties of diverging lens<br>4.3 Describe the properties of cylindrical lenses<br>4.4 Differentiate between the properties of lenses (Converging & Diverging) | Explain the contents in 4.1 to 4.3<br><br>Differentiate between converging and diverging lenses | Textbooks, Internet, Lenses | 4.1 Demonstrate movement of objects viewed through the different types of lenses | Demonstrate | Converging lenses, Diverging lenses, Cylindrical lenses, Optical cross | Assignments<br><br>Quiz<br><br>Examination |
| **General Objective: 5.0: Understand Refraction of Light through Lenses** | | | | | | |
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |
| 5.1 Describe the meaning of refraction<br>5.2 Explain the Laws of refraction<br>5.3 Explain the refraction of light through converging lenses<br>5.4 Explain the refraction of light through diverging lenses | Explain the contents in 5.1 to 5.7 | Textbooks, Internet, | 5.1 Ray tracing<br>-Converging lenses<br>-Diverging lenses | Illustrate | Lenses of different powers | Assignments<br><br>Quiz<br><br>Examination |

| | | | | | | |
|---|---|---|---|---|---|---|
| 5.5 Describe the following;<br>a. Image properties and formations<br>b. Magnification<br>c. Power of lens<br>d. Sign conventions<br>e. Lens formula etc<br>5.6 Describe refractive index and critical angle<br>5.7 Describe Total Internal Reflection | | | | | | |
| **General Objective: 6.0: Understand the Dispersion of Light through Lenses** | | | | | | |
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |
| 6.1 Define dispersion<br>6.2 Explain material dispersion in lenses<br>6.3 Explain spatial dispersion in lenses<br>6.4 Describe the following;<br>a. Chromatic aberration<br>b. Prism<br>c. Spectrometers etc<br>6.5 Give examples of dispersion | Define<br><br>Explain the contents in 6.1 to 6.4 | Textbooks, Internet, | | | | Assignments<br><br>Quiz<br><br>Examination |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | | |

| | | | | |
|---|---|---|---|---|
| **PROGRAMME: NATIONAL DIPLOMA IN DISPENSING OPTICIANRY** | | | | |
| **COURSE TITLE: Clinical Optical Dispensing I** | | | | |
| **COURSE CODE: DDO 124** | | | | |
| **DURATION** | **Lecture: -2 Hours** | | **Practical: -1 Hour** | **Total: -3Hrs/Wk. (45Hrs/Sem)** |
| **CREDIT UNITS: 3 CU** | | | | |
| **GOAL:** This course is designed to enable the students acquire knowledge and skills in the use of some ophthalmic frames and lenses | | | | |
| **GENERAL OBJECTIVES:** On completion of the course, the student should be able to: | | | | |
| 1.0 Know types of ophthalmic devices<br>2.0 Know the indications for selection of spectacle frames<br>3.0 Understand clinical issues relating to single vision lenses<br>4.0 Understand clinical issues relating to multifocal lenses.<br>5.0 Understand clinical issues relating to special purpose spectacles. | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **PROGRAMME: NATIONAL DIPLOMA IN DISPENSING OPTICIANRY** | | | | | | |
| **COURSE TITLE: Clinical Optical Dispensing I** | | **Course Code: DDO 124** | | **Contact Hours: 45 HRS** | | |
| **COURSE SPECIFICATION: Theoretical content: 2 Hours** | | | **Practical Content: 1 Hour** | | | |
| **General Objective: 1.0** Know types of ophthalmic devices | | | | | | |
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |
| 1.1 Define Ophthalmic Devices<br>1.2 List types of Ophthalmic Devices<br>1.3 Explain each type listed in 1.2 above<br>1.4 State their uses | Explain the contents in 1.1 to 1.4 | Text Books<br>Laptop and Projector<br>Journals<br>White Board and Marker | | | | Quiz<br>Test<br>Examination |
| **General Objective: 2.0** Know the indications for selection of spectacle frames | | | | | | |
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |

| | | | | | | |
|---|---|---|---|---|---|---|
| 2.1: Explain the characteristics of an ideal spectacle frame<br><br>2.2: Explain the classification of, and different types of spectacle frames<br><br>2.3: Explain the clinical issues relating to frame materials.<br><br>2.4: Explain the causes of skin irritation by spectacle frames | Explain the contents in 2.1 to 2.4 | Text Books<br><br>Laptop and Projector<br><br>Journals<br><br>White Board and Marker | 2.1: Identify the different types of spectacle frames.<br><br>2.2 Identify the different parts of spectacle frames.<br><br>2.3 Determine the dimensions of a frame.<br><br>2.4 Select the optimum spectacle frame shape and material<br><br>2.5 Select frames based on:<br>- Age<br>- Gender<br>- Facial Features<br>- Occupation etc | Demonstrate and Supervise | Eye examination room + samples of different frames and lenses | Quiz<br><br>Test<br><br>Examination |
| **General Objective 3.0: Understand clinical issues relating to Single Vision Lenses** | | | | | | |

| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |
|---|---|---|---|---|---|---|
| 3.1; Explain the uses of Single vision lenses<br><br>3.2: Explain the clinical uses of different lens materials for single vision lenses<br><br>3.3: Explain the reasons why different lens forms are manufactured and the impact of lens form on clinical performance.<br><br>3.4: Explain the specification of single vision lenses in optical prescriptions<br><br>3.5: Explain the transposition of lens specifications<br><br>3.6 Explain the clinical factors affecting BVP<br><br>3.8 Explain the effect of the spectacle position on the | Define, differentiate between AVFL, PVFL and $F_1$ , $F_2$ and $F_1, F_2$<br><br>Compare between image size, movement, BVP with convex lens, concave lens at different positions at $F_1$, outside $F_1$ and inside $F_1$ | Chart<br><br>lens frame<br><br>Ruler<br><br>Wessely<br><br>keratometer<br><br>Frame,<br><br>Different lens powers<br><br>Text Books<br><br>Laptop and Projector<br><br>Journals<br><br>White Board and Marker | 3.1 Interpret appropriate prescriptions for spectacle lenses<br><br>3.2 Perform transpositions between positive and negative cylindrical forms, toric and cross cylinder forms.<br><br>3.3 Calculate Back vertex power (BVP)<br><br>3.4 Identify clinical factors affecting BVP<br><br>3.5 Determine the geometrical | Supervision of students<br><br>Illustrate by the use of convex concave lenses | - Samples of different types of lenses and frames,<br>- Edging machine,<br>- Focimeter, etc<br>- Trial lens box<br>- Volunteers<br>- Eye examination room | Laboratory Work<br><br>Quiz<br><br>Test<br><br>Examination |

| | | | | | | |
|---|---|---|---|---|---|---|
| B.V.P and on the size, movement of retinal image.<br><br>3.9 Explain Back Vertex Distance (BVD), measurement methods and clinical applications<br><br>3.10 Explain Spectacle magnification, and its clinical applications<br><br>3.11 Explain the factors important for centering of the lenses<br><br>3.12 Explain the difference between the geometrical and optical centres<br><br>3.13 Explain the use of decentration to achieve a prismatic effect<br><br>3.14 Explain orthoscopic lenses and their applications | | | and optical centres of a spectacle lens<br><br>3.6 Determine the decentration required on any ophthalmic lens to produce a required prismatic effect | | | |
| **General Objective 4.0: Understand clinical issues relating to multifocal lenses.** | | | | | | |

| Specific Learning Objectives: | Teachers Activities | Learning Resources | Specific Learning Objectives: | Teachers Activities | Learning Resources | Evaluation |
|---|---|---|---|---|---|---|
| 4.1 Discuss the clinical indicators for prescribing multifocal lenses<br>4.2 Explain the major factors influencing the selection of a bifocal or progressive addition lens type<br>4.3 Explain the optical characteristics and aberrations of different types of multifocal lenses<br>4.4 Explain the adverse effects of different types of multifocal lenses in a variety of real-world situations<br>4.5 Explain the side-effects and contra-indications for multifocal lenses<br>4.6 Discuss how to advise patients on strategies to be used with multifocal lenses | Explain the contents in 4.1 to 4.7 | Text Books<br>Laptop and Projector<br>Journals<br>White Board and Marker | | | | Quiz<br>Test<br>Examination |

| | | | | | | |
|---|---|---|---|---|---|---|
| 4.7 Explain the prismatic effects at near of different types of multifocal lenses, and how these may be used to alleviate hyperphorias. | | | | | | |
| **General Objective 5.0: Understand clinical issues relating to special purposes spectacles.** | | | | | | |
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |
| 5.1 Explain special purpose spectacles<br><br>5.2 Explain the clinical indicators for special purpose spectacles<br><br>5.3 Explain the optical properties of:<br>- Recumbent spectacles<br>- Hemianopic spectacles<br>- Shielded spectacles<br>- Diver's spectacles<br>- Crutch spectacles<br><br>5.4 Explain the clinical indications for: | Explain the contents in 5.1 to 5.8 | Text Books<br><br>Laptop and Projector<br><br>Journals<br><br>White Board and Marker | 5.1 Ability to correctly identify the use for which a pair of special spectacles is intended<br><br>5.2 Ability to determine whether ptosis crutch spectacles would be appropriate<br><br>5.3 Identify an appropriate material or tint to achieve protection against different regions of the clinically important EM spectrum | Illustrate by compels or photographs or illustrating films.<br><br>Illustrate different samples these glasses or show photographs | Eye examination room<br><br>Case scenarios | Quiz<br><br>Test<br><br>Examination |

| | | | | | | |
|---|---|---|---|---|---|---|
| - Recumbent spectacles<br>- Hemianopic spectacles<br>- Shielded spectacles<br>- Diver's spectacles<br>- Crutch spectacles<br><br>5.5 Explain the optical properties of toughened lenses<br><br>5.6 Explain the environmental indications for toughened lenses<br><br>5.7 Explain the properties of polycarbonate materials, and the work situations in which they are the protective lens of choice<br><br>5.8 Explain the situations where ocular protection against electromagnetic radiation is indicated | | | | | | |

| | | | | |
|---|---|---|---|---|
| **PROGRAMME: NATIONAL DIPLOMA IN DISPENSING OPTICIANRY** | | | | |
| **COURSE TITLE: Ophthalmic Instrumentation** | | | | |
| **COURSE CODE: DDO 125** | | | | |
| **DURATION** | **Lecture: - 1Hr** | **Tutorial: -** | **Practical: - 2Hrs** | **Total: -3Hrs/Wk. (45Hrs/Sem)** |
| **CREDIT UNITS: 3 CU** | | | | |
| **GOAL:** The course is designed to introduce the students to various types of Ophthalmic instruments and their applications. | | | | |
| **GENERAL OBJECTIVES:** On completion of the course, the student should be able to: | | | | |
| 1. Know various types of instruments and machines used in ophthalmic laboratory<br>2. Understand the functional parts of these machines<br>3. Know the front shop bench tools. | | | | |

| PROGRAMME: NATIONAL DIPLOMA IN DISPENSING OPTICIANRY | | | | | | |
|---|---|---|---|---|---|---|
| **COURSE TITLE: Ophthalmic Instrumentation** | | **Course Code: DDO 125** | | **Contact Hours: 3Hrs/Wk. (45Hrs/Sem)** | | |
| **COURSE SPECIFICATION: Theoretical content** | | | **Practical Content:** | | | |
| **General Objective: 1.0 Know various types of instruments and machines used in the ophthalmic laboratory.** | | | | | | |
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |
| 1.1 Outline the various types of instruments and machines used in the ophthalmic laboratory:<br>- Lensometer<br>- Edging machine<br>- Grooving machine<br>- Drilling machine<br>- Polishing machine<br>- Tinting machine<br>- Soldering Machine<br>- Frame warmer<br>- Ultrasonic lens cleaner<br>- UV testers, etc<br><br>1.2 State the uses of the instruments and machines in 1.1 | Explain the contents in 1.1 – 1.2 | Text Books<br><br>Laptop and Projector<br><br>Journals<br><br>White Board and Marker | 1.1 Identify the various types of instruments and machines | Illustration of the various types of instruments and machines<br><br>Supervise | Lensometer, Edging machine, Grooving machine, Drilling machine, Polishing machine, Tinting machine, Soldering Machine, Frame warmer, Ultrasonic lens cleaner, UV testers. | Assignments<br><br>Quiz<br><br>Examination |

| General Objective: 2.0 Understand the functional parts of these machines | | | | | | |
|---|---|---|---|---|---|---|
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |
| 2.1 Outline the functional parts of the instruments and machines in 1.1. | Explain the content in 2.1 | Text Books<br>Laptop and Projector<br>Journals<br>White Board and Marker | 2.1 Draw and Label the parts of the instruments and machines in 1.1. | Check and supervise | Lensometer,<br>Edging machine,<br>Grooving machine,<br>Drilling machine,<br>Polishing machine,<br>Tinting machine,<br>Soldering Machine,<br>Frame warmer,<br>Ultrasonic lens cleaner,<br>UV testers | Assignments<br>Quiz<br>Examination |

| General Objective: 3.0 Know the front shop bench tools. | | | | | | |
|---|---|---|---|---|---|---|
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |
| 3.1 Outline the different types of front shop bench tools:<br>- Pliers<br>- Screw drivers<br>- Lens clock<br>- Protractor<br>- Caliper<br>- Lens file<br>- PD rule, etc<br>3.2 List the uses of the tools in 3.1 above | Explain the content 3.1 – 3.2 | Text Books<br>Laptop and Projector<br>Journals<br>White Board and Marker | 3.1 Identify different types of front shop bench tools | Check and supervise | Pliers,<br>Screw drivers,<br>Lens clock,<br>Protractor,<br>Caliper,<br>Lens file,<br>PD rule, etc | Assignments<br>Quiz<br>Examination |

# YEAR TWO

# SEMESTER ONE

| | | | | |
|---|---|---|---|---|
| **PROGRAMME: NATIONAL DIPLOMA IN DISPENSING OPTICIANRY** | | | | |
| **COURSE TITLE: Clinical Optical Dispensing II** | | | | |
| **COURSE CODE: DDO 211** | | | | |
| **DURATION** | **Lecture: - 2Hrs** | **Tutorial: -** | **Practical: -1 Hr** | **Total: - 3Hrs/Wk. (45Hrs/Sem)** |
| **CREDIT UNITS: 3 CU** | | | | |
| **GOAL:** This course is designed to enable the student build up the skills needed for clinical practice. | | | | |
| **GENERAL OBJECTIVES:** On completion of the course, the student should be able to: | | | | |
| 1.0 Understand the basic elements of professional consultation<br>2.0 Relate client's need to frame and lens selection<br>3.0 Use the various measurement devices available to assess the PD and facial dimensions<br>4.0 Fit and deliver completed spectacles<br>5.0 Work with children and clients with special needs to achieve a satisfactory outcome. | | | | |

| PROGRAMME: NATIONAL DIPLOMA IN DISPENSING OPTICIANRY. | | | | | | |
|---|---|---|---|---|---|---|
| **COURSE TITLE: Clinical Optical Dispensing II** | | **Course Code: DDO 211** | | **Contact Hours: 3Hrs/Wk (45Hrs/Sem)** | | |
| **COURSE SPECIFICATION: Theoretical Content** | | **Practical Content:** | | | | |
| **General Objective: 1.0 Understand the basic elements of professional consultation** | | | | | | |
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |
| 1.1: Explain professional dress code and personal grooming<br>1.2 Identify the expectations of a client<br>1.3 Explain the impact of first impressions, and how to create an appropriate professional image.<br>1.4. Explain the importance of a personal greeting.<br>1.5. Discuss the range of issues which may determine the visual requirements of a client<br>1.6. Discuss the role of non-verbal communication in Professional consultation<br>1.7. Discuss strategies for dealing with client negative behavior. | Explain the contents in 1.1 – 1.7 | Video Camera.<br>Videotaped Scenarios<br>Text Books<br>Laptop and Projector<br>Journals<br>White Board and Marker | 1.1: Carry out an accurate and comprehensive professional investigation into the visual needs of a client<br><br>1.2 Assess body language in role-play situations. | Role-play | Written scenarios for use in role-play situation | Assignments<br>Quiz<br>Examination |

| General Objective: 2.0 Relate client's need to frame and lens selection | | | | | | |
|---|---|---|---|---|---|---|
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |
| 2.1 Explain the vision needs for various occupations and hobbies<br><br>2.2 Discuss the critical factors for selection of frames, lenses and tints. | Explain the contents in 2.1 – 2.2 | Text Books<br>Laptop and Projector<br>Journals<br>White Board and Marker | | | | Assignments<br>Quiz<br>Examination |

| General Objective 3.0: Use the various measurement devices available to assess the PD and facial dimensions | | | | | | |
|---|---|---|---|---|---|---|
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |
| 3.1. Define PD<br><br>3.2 List types of PD<br><br>3.3 Explain the methods of PD measurement:<br>- PD Rule<br>- PD Guage<br><br>3.4 Explain the impact of PD determination on the selection of an appropriate frame size. | Explain contents in 3.1 to 3.12 | Text Books<br>Laptop and Projector<br>Journals<br>White Board and Marker | 3.1 Determine distance and near PD measurements.<br><br>3.2 Use PD rule and PD gauge to determine the various facial measurements required to specify different types of bridges.<br><br>3.3 Integrate the PD and other facial factors to an | Supervise, check, correct | Provide a number of participants with different facial characteristics, PD rule, Spectacles of different dimensions, Lensometer, Protractor, Lenses, frames, Bifocal lenses, | Assignments<br>Quiz<br>Examination |

| | | | | | | |
|---|---|---|---|---|---|---|
| 3.5 Explain the use of the methods in 3.3 to determine the various facial measurements required to specify different types of bridges.<br><br>3.6 Explain the use of a PD rule and head calipers to determine the angular dimensions of a frame<br><br>3.7 Explain frame adjustment using the appropriate linear and/or angular dimensions.<br><br>3.8 Discuss the impact of multifocal lens type on the occupational needs in frame selection<br><br>3.9 Define Prismatic Effect<br><br>3.10 Explain Decentration<br><br>3.11 Discuss the impact of high<br>Decentration or prismatic effect on frame selection | | | appropriate frame size for a client.<br><br>3.4 Use a facial rule and head calipers to determine the angular dimensions of a frame<br><br>3.5 Demonstrate pantoscopic and retroscopic tilts.<br><br>3.6 Select appropriate frame type for different multifocal lens types and occupational needs<br><br>3.7 Demonstrate prismatic effects induced or abolished by decentration.<br><br>3.8 Determine the segment height for bifocals or multifocal lenses | | Multifocal Lenses | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 3.12 Explain the segment height for bifocals or multifocal lenses | | | | | | |
| **General Objective: 4.0 Fit and deliver completed spectacles.** | | | | | | |
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |
| 4.1 Explain the steps in fitting a single vision lens<br><br>4.2 Explain the steps in fitting a bifocal lens<br><br>4.3 Explain the steps in fitting a multifocal lens<br><br>4.4 Explain steps in verifying completed spectacles in terms of accuracy and quality<br><br>4.5 Explain spectacle adjustment and alignment | Explain contents in 4.1 to 4.5 | Text Books Laptop and Projector Journals White Board and Marker | 4.1. Fit a single vision lens<br><br>4.2. Fit a bifocal lens<br><br>4.3. Fit a multifocal lens<br><br>4.4. Determine the quality and accuracy of completed spectacles<br><br>4.5 Adjust and align completed spectacles | Provide either real cases or scenarios for student to work with. | Single vision lenses, bifocal lenses, multifocal lenses, Edging machine, Focimeter, Pliers, etc | Assignments Quiz Examination |

| **General Objective: 5.0 Work with children and clients with special needs to achieve a satisfactory outcome.** | | | | | | |
|---|---|---|---|---|---|---|
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |

| | | | | | | |
|---|---|---|---|---|---|---|
| 5.1 Explain the special requirements of children's spectacles<br><br>5.2: Explain qualities required in attending to clients with special needs:<br>- Empathy<br>- Courtesy<br>- Patience, etc | Explain contents in 5.1 to 5.2 | Use the students for this demonstration. Text Books<br><br>Laptop and Projector<br><br>Journals<br><br>White Board and Marker | 5.1 Select and fit a child's frame. | Supervise, check, correct | Lenses, Frames | Assignments<br><br>Quiz<br><br>Examination |

| | | | | |
|---|---|---|---|---|
| **PROGRAMME: NATIONAL DIPLOMA IN DISPENSING OPTICIANRY** | | | | |
| **COURSE TITLE: Physical Optics II** | | | | |
| **COURSE CODE: DDO 212** | | | | |
| **DURATION** | **Lecture: - 2 Hrs** | **Tutorial: -** | **Practical: - 1 Hr** | **Total: - 3hrs/Wk. (45Hrs/Sem)** |
| **CREDIT UNITS: 3 CU** | | | | |
| **GOAL:** The course is designed to enable the students understand the wave properties of light | | | | |
| **GENERAL OBJECTIVES:** On completion of the course, the student should be able to: | | | | |
| 1.0 Understand the superimposition principle.<br>2.0 Understand the phenomenon of interference of light waves.<br>3.0 Understand the phenomenon of diffraction of light waves.<br>4.0 Understand the phenomenon of polarization of light waves. | | | | |

| PROGRAMME: NATIONAL DIPLOMA IN DISPENSING OPTICIANRY | | | | | | |
|---|---|---|---|---|---|---|
| **COURSE TITLE: Physical Optics II** | **Course Code: DDO 212** | | **Contact Hours: 3hrs/Wk. (45Hrs/Sem)** | | | |
| **COURSE SPECIFICATION: Theoretical content: 2 Hours** | | **Practical Content: 1 Hour** | | | | |
| **General Objective 1.0: Understand the superimposition principle** | | | | | | |
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |
| 1.1 Explain the concept of superimposition of waves<br>1.2 Explain the superimposition of two harmonic waves<br>1.3 Discuss constructive interference, destructive and complete destructive interference of waves<br>1.4 Define standing waves<br>1.5 Explain the concept of coherence and coherent waves<br>1.6 Differentiate between coherent and non-coherent sources of light | Explain the contents in 1.1 to 1.6 | Textbooks<br>Journals<br>Internet<br>White board<br>Markers<br>Glass lenses<br>Plastic Lenses | 1.1 Identify superimposition of waves.<br>1.2 Identify the standing waves<br>1.3 Identify coherent and non-coherent sources of light | Cause two pulses in the spring wire<br><br>Cause two circular waves and design the interference waves:<br>a) When changing the frequency.<br>b) When changing the distance between the two sources.<br><br>Generation of standing wave | Spring wire<br>The ripple tank two oscillator separated by 5cm.<br>String-electric oscillator<br>weight – two supports<br>Helium-neon laser source of natural light | Assignments<br>Quiz<br>Examination |

| General Objective 2.0: Understand the phenomenon of interference of light waves. | | | | | | |
|---|---|---|---|---|---|---|
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |
| 2.1 Explain the concept of interference<br>2.2 Discuss the general conditions for interference<br>2.3 Explain the production of interference fringes by Fresnel's Bi-prism<br>2.4 Explain the interference formed as a result of multiple reflection processes<br>2.5 Explain the Phase changes at reflection<br>2.6 Explain the concept of interference by thin films.<br>2.7 Explain the mechanism of action of interference filters<br>2.8 Explain the concept of anti-reflection coatings | Explain the contents in 2.1 to 2.8 | Textbooks<br>Journals<br>Internet<br>White board<br>Markers<br>Glass lenses<br>Plastic Lenses | 2.1: Determine the wavelength of sodium light<br>2.2 Calculate the wavelength of sodium light by Newton's rings<br>2.3 Identify interference filters<br>2.4 Use interference filters<br>2.5 Identify properties of antireflection coatings | Illustration for the interference phenomenon and determination of the wavelength of sodium light<br>Illustration for the thin film interference and determination of the wavelength of sodium light by Newton's rings | Source of sodium light, narrow slit bi-prism, convex lens- optical bench,<br>Plano convex lens, convex lens with focal length about 20 cm,<br>sodium source,<br>Interference filter,<br>Antireflection thin film | Assignments<br>Quiz<br>Examination |

| | | | | | | |
|---|---|---|---|---|---|---|
| **General Objective 3.0: Understand the phenomenon of diffraction of light waves** | | | | | | |
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |
| 3.1 Define diffraction of light<br>3.2 Explain types of diffraction<br>3.3 Explain Huygens principle<br>3.4 Describe Fraunhofer diffraction at a single slit<br>3.5 Explain the minimums in a single slit diffraction pattern.<br>3.6 Derive the equation for the minimums in a single slit diffraction pattern, and solve problems.<br>3.7 Describe diffraction by a circular aperture<br>3.8 Define the diameter of Airy's disk. | Explain the contents in 3.1-3.8 | Textbooks<br>Journals<br>Internet<br>White board<br>Markers<br>Glass lenses<br>Plastic Lenses | 3.1 Identify types of diffraction of light<br>3.2 Draw plain waves incident on a single slit<br>3.3 Calculate the wavelength of used source.<br>3.4 Calculate the diameter of lycopodium | Put the barrier in front of the source and put the screen for receiving the produced shadow.<br>Illustrate the intensity curve of the diffraction pattern of a small circular aperture and measurement of diameter of lycopodium | Light source – straight edge - screen<br>Narrow slit - photocell – He-Ne laser-ammeter<br>Sodium light source, metal sheet pierced with number of holes, glass plate, lycopodium powder | Assignments<br>Quiz<br>Examination |

| | | | | | | |
|---|---|---|---|---|---|---|
| **General Objective 4.0: Understand the phenomenon of polarization of light waves** | | | | | | |
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |
| 4.1 Define electromagnetic wave<br>4.2 Explain the difference between polarized and unpolarized light<br>4.3 Outline the types of polarized light | Explain the contents in 4.1-4.3 | Textbooks<br>Journals<br>Internet<br>White board<br>Markers<br>Glass lenses<br>Plastic Lenses | 4.1 Illustrate the three types of polarized light<br>4.2 Illustrate the polarization for transverse waves | Supervise | String – two barrier with a frictionless vertical slot | Assignments<br>Quiz<br>Examination |

| | | | | |
|---|---|---|---|---|
| **PROGRAMME: NATIONAL DIPLOMA IN DISPENSING OPTICIANRY** | | | | |
| **COURSE TITLE: Synopsis of Ophthalmic Lenses** | | | | |
| **COURSE CODE: DDO 213** | | | | |
| **DURATION** | **Lecture: - 2Hrs** | **Tutorial: -** | **Practical: - 1Hr** | **Total: - 3hrs/Wk. (45Hrs/Sem)** |
| **CREDIT UNITS: 3CU** | | | | |
| **GOAL:** This course is designed to enable the student know the properties of the different materials used in lens production and their modifications. | | | | |
| **GENERAL OBJECTIVES:** On completion of the course, the student should be able to: | | | | |
| 1.0 Identify the major factors that determine the properties of lens materials.<br>2.0 Know the atomic and molecular configuration of lens materials.<br>3.0 Understand the principles of the microstructure of lens materials<br>4.0 Understand the properties of polymeric materials.<br>5.0 Understand the properties of ceramic materials<br>6.0 Understand the types and basic characteristics of glass<br>7.0 Understand the different stages of glass production. | | | | |

| PROGRAMME: NATIONAL DIPLOMA IN DISPENSING OPTICIANRY | | | | | | |
|---|---|---|---|---|---|---|
| **COURSE TITLE: Synopsis of Ophthalmic Lenses** | **Course Code: DDO 213** | | **Contact Hours: 3hrs/Wk (45Hrs/Sem)** | | | |
| **COURSE SPECIFICATION: Theoretical content: 2 Hours** | | **Practical Content: 1 Hour** | | | | |
| **General Objective 1.0: Identify the major factors that determine the properties of lens materials.** | | | | | | |
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |
| 1.1 Explain Lens materials<br>1.2 List types of lens materials<br>1.3 State the properties of Lens materials:<br>- Mechanical,<br>- Thermal,<br>- Electrical,<br>- Chemical,<br>- Optical, etc<br>1.4 Explain the behavior of materials in 1.3 | Explain the contents in 1.1 – 1.4 | Textbooks<br>Journals<br>Internet<br>White board<br>Markers<br>Charts<br>Pictures<br>Diagrams | 1.4 Draw stress strain diagram and extract various properties from it | Illustrate, Supervise | Drawing paper, drawing tools | Assignments<br>Quiz<br>Examination |
| **General Objective 2.0: Know the atomic and molecular configuration of lens materials.** | | | | | | |
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |
| 2.1 Explain atomic and ionic configuration of lens materials | Explain the contents in 2.1 – 2.6 | Textbooks<br>Journals<br>Internet<br>White board | | | | Assignments<br>Quiz<br>Examination |

| | | | | | | |
|---|---|---|---|---|---|---|
| 2.2 Explain the concept of primary bonds<br>2.3 Explain the concept of secondary bonds<br>2.4 Define molecules<br>2.5 Explain the concept of inter-atomic distances<br>2.6 Explain the concept of coordination number | | Markers<br>Charts<br>Pictures<br>Diagrams | | | | |
| **General Objective 3.0: Understand the principles of the microstructure of lens materials.** | | | | | | |
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |
| 3.1 Explain atomic order for solids<br>3.2 Describe crystallization<br>3.3 Explain crystal defects<br>3.4 Explain solid solution in crystals<br>3.5 Describe the concept of Allotropic forms<br>3.6 Explain the role of impurities in solids<br>3.7 Define alloys<br>3.8 State the types of alloys:<br>- Single phase<br>- Multi phase | Explain the contents in 3.1 – 3.9 | Textbooks<br>Journals<br>Internet<br>White board<br>Markers<br>Charts<br>Pictures<br>Diagrams | 3.1 Perform simple calculations of phase | Demonstrate procedures | | Assignments<br>Quiz<br>Examination |

| | | | | | | |
|---|---|---|---|---|---|---|
| 3.9 Explain properties and processing of alloys. | | | | | | |
| **General Objective 4.0: Understand the properties of polymeric materials.** | | | | | | |
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |
| 4.1 Explain the concept of the macromolecule<br>4.2 Explain the origin and nature of defects in molecular structure<br>4.3 Describe the structure of three-dimensional polymers<br>4.4 Explain the electrical behavior of polymers<br>4.5 State the requirements for polymer stability<br>4.6 Explain deformation of polymers | Explain the contents in 4.1 – 4.6 | Textbooks<br>Journals<br>Internet<br>White board<br>Markers<br>Charts<br>Pictures<br>Diagrams | | | | Assignments<br>Quiz<br>Examination |
| **General Objective 5.0: Understand the properties of ceramic materials.** | | | | | | |
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |

| | | | | | | |
|---|---|---|---|---|---|---|
| 5.1 Explain the different ceramic phases<br><br>5.2 Explain the formation of ceramic crystals<br><br>5.3 Discuss the forms of silicates<br><br>5.4 Highlight the mechanical properties of ceramics<br><br>5.5 Explain the optical properties of ceramics | Explain the contents in 5.1 – 5.5 | Textbooks<br>Journals<br>Internet<br><br>White board<br><br>Markers<br>Charts<br>Pictures<br>Diagrams | | | | Assignments<br><br>Quiz<br><br>Examination |
| **General Objective 6.0: Understand the types and basic characteristics of glass.** | | | | | | |
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |
| 6.1 List the various types of glass<br><br>6.2 State the importance of the composition of glass<br><br>6.3 List the properties of the raw materials used in the grinding processes | Explain the contents in 6.1 – 6.3 | Textbooks<br>Journals<br>Internet<br><br>White board<br><br>Markers<br>Charts<br>Pictures<br>Diagrams | 6.1 Identify the various types of glass | Demonstrate | Samples of different types of glass | Assignments<br><br>Quiz<br><br>Examination |

| General Objective 7.0: Understand the different stages of glass production. | | | | | | |
|---|---|---|---|---|---|---|
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |
| 7.1 Explain the stages in the formation of glass<br><br>7.2 Explain the methods of producing glass sheets<br><br>7.3 Explain the methods used for glass extrusion<br><br>7.4 Discuss the applications of glass melting: chemical composition and melt refining | Explain the contents in 7.1 – 7.4 | Textbooks<br>Journals<br>Internet<br><br>White board<br><br>Markers<br>Charts<br>Pictures<br>Diagrams | | | | Assignments<br><br>Quiz<br><br>Examination |

| | | | | |
|---|---|---|---|---|
| **PROGRAMME: NATIONAL DIPLOMA IN DISPENSING OPTICIANRY** | | | | |
| **COURSE TITLE: SAFETY AND FIRST AID** | | | | |
| **COURSE CODE: DDO 214** | | | | |
| **DURATION** | **Lecture: - 2 HOURS** | **Tutorial: -** | **Practical: - 1 HOUR** | **Total: - 45 HOURS** |
| **CREDIT UNITS: 3 CU** | | | | |
| **GOAL:** This course is designed to enable the students understand the importance of Safety and First Aid for Dispensing Opticians in the ophthalmic laboratory. | | | | |
| **GENERAL OBJECTIVES:** On completion of the course, the student should be able to know: | | | | |
| 1.0 Understand the meaning of Health and Safety and its management<br>2.0 Understand different health and safety hazards in the laboratory and their control measures<br>3.0 Understand the principles of First Aid<br>4.0 Understand the meaning and management of Emergencies | | | | |

| PROGRAMME: NATIONAL DIPLOMA IN DISPENSING OPTICIANRY | | | | | | |
|---|---|---|---|---|---|---|
| **COURSE TITLE: SAFETY AND FIRST AID** | **Course Code: DDO 214** | **Contact Hours: 45 HRS** | | | | |
| **COURSE SPECIFICATION: Theoretical content: 2 Hours** | **Practical Content: 1 Hour** | | | | | |
| **General Objective: 1.0: Understand the meaning of Health and Safety and its management** | | | | | | |
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |
| 1.1 Understand the meaning of Health and Safety<br>1.2 Understand the management of Health and Safety in a laboratory<br>1.3 Understand occupational Health and Safety management systems<br>1.4 Understand the application of Health and Safety Assistance<br>1.5 Understand the meaning of Personal Protective Equipment (PPE) and its usage<br>1.6 Understand the advantages and disadvantages of 1.5 | Explain the meaning of Health and Safety<br>Explain the management of Health and Safety in the laboratory<br>Explain occupational Health and Safety management systems<br>Explain the different systems of assistance in Health and Safety<br>Explain the meaning and management of PPE | Textbooks<br>Journals<br>Internet | | | | Quiz<br>Test<br>Examination |

| General Objective: 2.0: Understand different Health and Safety Hazards in the Laboratory and their Control Measures | | | | | | |
|---|---|---|---|---|---|---|
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |
| 2.1 Understand the meaning of Health and Safety Hazards in a laboratory<br>2.2 Understand the different Health and Safety Hazards in a laboratory;<br>a. Health hazards<br>b. Physical hazards<br>c. Occupational hazards<br>2.3 Understand the risk assessment and management of hazards in a laboratory<br>2.4 Understand the control measures for risks and hazards in a laboratory | Explain the meaning of Health and Safety hazards<br><br>Explain the different hazards in a laboratory<br><br>Explain the risk assessment and management of hazards in a laboratory<br><br>Explain the control measures for risks and hazards in a laboratory | Textbooks, Journals, Internet | 2.5 Describe the different Health and Safety Hazards in a laboratory;<br>a. Health hazards<br>b. Physical hazards<br>c. Occupational hazards<br>2.6 Describe the risk assessment and management of hazards in a laboratory | Demonstrate occupational Health and Safety hazards in the laboratory<br><br>Demonstrate the risk assessment and management of hazards in the laboratory | White Board, Projector | Assignments<br><br>Quiz<br><br>Examination |

| General Objective: 3.0: Understand the principles of First Aid | | | | | | |
|---|---|---|---|---|---|---|
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |
| 3.1 Understand the meaning of First Aid<br>3.2 Understand the aims, objectives and application of First Aid | Explain the meaning of First Aid<br><br>Explain the aims, objectives and | Textbooks, Internet, First Aid Box | Describe the application of First Aid | Demonstrate | First Aid Box | Assignments,<br><br>Tests/Quizzes,<br><br>Examination |

| | | | | | | |
|---|---|---|---|---|---|---|
| 3.3 Understand the First Aid box and its contents | application of First Aid<br><br>Explain the First Aid box, its contents and application<br><br>Explain the application of First Aid to wounds and/or injuries | | | | | |

| **General Objective: 4.0: Understand the Meaning and Management of Emergencies** | | | | | | |
|---|---|---|---|---|---|---|
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |
| 4.1 Understand the meaning of Emergency and Emergency Cases<br>4.2 Understand the categories of emergency cases and their management;<br>a. Life threatening cases<br>b. CPR<br>c. Wounds<br>d. Bleeding<br>e. Injuries etc<br>4.3 Understand the application of First Aid 4.2 above | Explain the meaning of Emergency and Emergency Cases<br><br>Explain the categories of emergency cases and their management<br><br>Explain the application of First Aid to 4.2 | Textbooks, Internet, First Aid Box | 4.5 Understand the categories of emergency cases and their management;<br>a. Life threatening cases<br>b. CPR<br>c. Wounds<br>d. Bleeding<br>e. Injuries etc | Demonstrate the application of First Aid to emergency cases e.g. CPR | Human Dummy, First Aid Box | Assignments,<br><br>Tests/Quizzes,<br><br>Examination |

| | | | | | | |
|---|---|---|---|---|---|---|
| 4.4 Understand the control measures to prevent 4.2 above | Explain the control measures to prevent 4.2 | | | | | |

| | | | | |
|---|---|---|---|---|
| **PROGRAMME: NATIONAL DIPLOMA IN DISPENSING OPTICIANRY** | | | | |
| **COURSE TITLE: Optical Laboratory I** | | | | |
| **COURSE CODE: DDO 215** | | | | |
| **DURATION** | **Lecture: -** | **Tutorial: -** | **Practical: - 4 Hrs** | **Total: - 4Hrs/Wk. (60Hrs/Sem)** |
| **CREDIT UNITS: 4 CU** | | | | |
| **GOAL:** This course is designed to introduce the students to the use of Optical Instruments to fit Spectacles**.** | | | | |
| **GENERAL OBJECTIVES:** On completion of the course, the student should be able to: | | | | |
| 1. Understand how to determine the power of lenses<br>2. Know how to cut lenses<br>3. Understand how to glaze lenses<br>4. Know how to fit prismatic lenses | | | | |

| PROGRAMME: NATIONAL DIPLOMA IN DISPENSING OPTICIANRY | | | | | | |
|---|---|---|---|---|---|---|
| **COURSE TITLE: Optical Laboratory I** | **Course Code: DDO 215** | | **Contact Hours: 4Hrs/Wk. (60Hrs/Sem)** | | | |
| **COURSE SPECIFICATION: Theoretical content: - 0 Hr** | | | **Practical Content: 4 Hours** | | | |
| **General Objective: 1.0 Understand how to determine the power of lenses.** | | | | | | |
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |
| 1.1 Define Neutralization.<br>1.2 Explain types of neutralization:<br>- Hand neutralization<br>- Lensometry | Explain the contents in 1.1 – 1.2 | Text Books<br>Laptop and Projector<br>Journals<br>White Board and Marker | 1.1 Determine the power of a given lens by:<br>- Hand neutralization<br>- Lensometry | Demonstrate and explain | Lenses, Lensometer | Assignments<br>Quiz<br>Examination |
| **General Objective: 2.0 Know how to cut lenses.** | | | | | | |
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |
| 2.1 Explain lens cutting<br><br>2.2 Explain cutting tools:<br>- Cutting pliers<br>- Scissors<br>- Diamond cutter | Explain the contents in 2.1 – 2.2 | Text Books<br>Laptop and Projector<br>Journals<br>White Board and Marker | 2.1 Identify cutting tools<br><br>2.2 Cut lenses using former and cutting tools | Demonstrate and supervise | Cutting pliers, Scissors, Diamond cutter, Former | Assignments<br>Quiz<br>Examination |

| General Objective 3.0: Understand how to glaze lenses. | | | | | | |
|---|---|---|---|---|---|---|
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |
| 3.1 Explain glazing<br>3.2 State the types of glazing:<br>- Manual<br>- Automated | Explain the contents in 3.1 – 3.2 | Text Books<br>Laptop and Projector<br>Journals<br>White Board and Marker<br>Lenses | 3.1 Glaze lenses using manual edging machine<br>3.2 Glaze lenses using automatic edging machine | Demonstrate and supervise | Lenses,<br>Manual edger,<br>Automatic edger | Assignments<br>Quiz<br>Examination |
| **General Objective: 4.0 Know how to fit prismatic lenses.** | | | | | | |
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |
| 4.1 Explain Prisms<br>4.2 Explain prismatic lenses | Explain the contents in 4.1 – 4.2 | Text Books<br>Laptop and Projector<br>Journals<br>White Board and Marker<br>Prisms<br>Prismatic lenses | 4.1 Fit prismatic lenses | Demonstrate and supervise | Prismatic lenses,<br>Manual edger,<br>Automatic edger | Assignments<br>Quiz<br>Examination |

# YEAR TWO

# SEMESTER TWO

| | | | | |
|---|---|---|---|---|
| **PROGRAMME: NATIONAL DIPLOMA IN DISPENSING OPTICIANRY** | | | | |
| **COURSE TITLE: Optical Laboratory II** | | | | |
| **COURSE CODE: DDO 221** | | | | |
| **DURATION** | **Lecture: -** | **Tutorial: -** | **Practical:- 6 Hrs** | **Total: - 6Hrs/Wk. (45Hrs/Sem)** |
| **CREDIT UNITS: 3 CU** | | | | |
| **GOAL:** This course is designed to introduce the students to the use of Optical Instruments to fit Spectacles**.** | | | | |
| **GENERAL OBJECTIVES:** On completion of the course, the student should be able to: | | | | |
| 1. Understand how to determine the power of lenses<br>2. Know how to cut lenses<br>3. Understand how to glaze lenses<br>4. Know how to fit prismatic lenses | | | | |

| PROGRAMME: NATIONAL DIPLOMA IN DISPENSING OPTICIANRY | | | | | | |
|---|---|---|---|---|---|---|
| **COURSE TITLE: Optical Laboratory II** | **Course Code: DDO 221** | | **Contact Hours: 6Hrs/Wk. (45Hrs/Sem)** | | | |
| **COURSE SPECIFICATION: Theoretical content: -** | | | **Practical Content: - 6Hrs** | | | |
| **General Objective 1.0: Understand how to determine the power of lenses.** | | | | | | |
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |
| 1.1 Define Neutralization.<br>1.2 Explain types of neutralization:<br>- Hand neutralization<br>- Lensometry | Explain the contents in 1.1 – 1.2 | Text Books<br>Laptop and Projector<br>Journals<br>White Board and Marker | 1.2 Determine the power of a given lens by:<br>- Hand neutralization<br>- Lensometry | Demonstrate and explain | Lenses, Lensometer | Assignments<br>Quiz<br>Examination |
| **General Objective 2.0: Know how to cut lenses.** | | | | | | |
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |
| 2.1 Explain lens cutting<br>2.2 Explain cutting tools:<br>- Cutting pliers<br>- Scissors<br>- Diamond cutter | Explain the contents in 2.1 – 2.2 | Text Books<br>Laptop and Projector<br>Journals<br>White Board and Marker | 2.1 Identify cutting tools<br>2.2 Cut lenses using former and cutting tools | Demonstrate the exercise | Cutting pliers, Scissors, Diamond cutter, Former | Assignments<br>Quiz<br>Examination |

| General Objective 3.0: Understand how to glaze lenses. | | | | | | |
|---|---|---|---|---|---|---|
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |
| 3.1 Explain glazing<br>3.2 State the types of glazing:<br>- Manual<br>- Automated | Explain the contents in 3.1 – 3.2 | Text Books<br>Laptop and Projector<br>Journals<br>White Board and Marker<br>Lenses | 3.1 Glaze lenses using manual edging machine<br>3.2 Glaze lenses using automatic edging machine | Demonstrate and supervise | Lenses,<br>Manual edger,<br>Automatic edger | Assignments<br>Quiz<br>Examination |
| **General Objective 4.0: Know how to fit prismatic lenses.** | | | | | | |
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |
| 4.1 Explain Prisms<br>4.2 Explain prismatic lenses | Explain the contents in 4.1 – 4.2 | Text Books<br>Laptop and Projector<br>Journals<br>White Board and Marker<br>Prisms<br>Prismatic lenses | 4.1 Fit prismatic lenses | Demonstrate and supervise | Prismatic lenses,<br>Manual edger,<br>Automatic edger | Assignments<br>Quiz<br>Examination |

| | | | | |
|---|---|---|---|---|
| **PROGRAMME: NATIONAL DIPLOMA IN DISPENSING OPTICIANRY** | | | | |
| **COURSE TITLE: Professional Ethics** | | | | |
| **COURSE CODE: DDO 222** | | | | |
| **DURATION** | **Lecture: - 2Hrs** | **Tutorial: -** | **Practical: -** | **Total: - 2Hrs/Wk. (30Hrs/Wk.)** |
| **CREDIT UNITS: 2 CU** | | | | |
| **GOAL:** This course is designed to enable the students know the code of conduct in professional activities | | | | |
| **GENERAL OBJECTIVES:** On completion of the course, the student should be able to: | | | | |
| 1. Know how to relate with one another in professional matters<br>2. Know the difference between good and bad conduct in professional matters<br>3. Know how to maintain cordial working relationship with colleagues and other health practitioners<br>4. Know the provisions of the ODORBN Act with regard to scope of practice | | | | |

| PROGRAMME: NATIONAL DIPLOMA IN DISPENSING OPTICIANRY | | | | | | |
|---|---|---|---|---|---|---|
| **COURSE TITLE: Professional Ethics** | | **Course Code: DDO 222** | | **Contact Hours: 2Hrs/Wk. (30 Hrs/Sem)** | | |
| **COURSE SPECIFICATION: Theoretical content – 2Hrs** | | | **Practical Content: 0Hr** | | | |
| **General Objective 1.0: Know how to relate with one another in professional matters** | | | | | | |
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |
| 1.1 Development of dispensing opticianry as a profession<br><br>1.2 Relationship of dispensing opticianry with other health professions (Optometry, Ophthalmology etc.) | Explain the contents in 1.1 – 1.2 | Textbooks<br>Journals | | | | Assignments<br>Quiz<br>Examination |
| **General Objective 2.0: Know the difference between good and bad conduct** | | | | | | |
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |
| 2.1 Explain Unethical conduct<br><br>2.2 Explain Misconduct<br><br>2.3 Explain Malpractice | Explain the contents in 2.1 – 2.3 | Textbooks<br>Journals | | | | Assignments<br>Quiz<br>Examination |

| General Objective 3.0: Know how to maintain cordial working relationship with colleagues and other health practitioners | | | | | | |
|---|---|---|---|---|---|---|
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |
| 3.1 Explain how to maintain cordial relationship with colleagues<br><br>3.2 Explain how to maintain cordial relationship with other health practitioners | Explain the contents in 3.1 – 3.2 | Textbook | | | | Assignments<br><br>Quiz<br><br>Examination |
| **General Objective 4.0: Know the provisions of the Act with regard to scope of practice** | | | | | | |
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |
| 4.1 Explain Scope of Practice as specified in the Act<br>4.2 Explain Rights and privileges as specified in Code of Conduct<br>4.3 Discuss duties or obligations towards colleagues, other health practitioners and clients | Explain the contents in 4.1 – 4.3 | The Board document<br><br>The Code of Conduct Handbook | | | | Assignments<br><br>Quiz<br><br>Examination |

| | | | | |
|---|---|---|---|---|
| **PROGRAMME: NATIONAL DIPLOMA IN DISPENSING OPTICIANRY** | | | | |
| **COURSE TITLE: Introduction to Ocular Prosthetics** | | | | |
| **COURSE CODE: DDO 223** | | | | |
| **DURATION** | **Lecture: -1hr** | | **Practical: - 2hrs** | **Total: -3Hrs/Wk. (45 Hrs/Sem)** |
| **CREDIT UNITS:** 3 CU | | | | |
| **GOAL:** This course is designed to enable the students have knowledge on indications for the use of an artificial eye. | | | | |
| **GENERAL OBJECTIVES:** On completion of the course, the student should be able to: | | | | |
| 1.0 Understand the indications for ocular prosthesis<br>2.0 Know the maintenance of the artificial eye<br>3.0 Design and fabricate artificial eyes | | | | |

| PROGRAMME: NATIONAL DIPLOMA IN DISPENSING OPTICIANRY | | | | | | |
|---|---|---|---|---|---|---|
| **COURSE TITLE: Introduction to Ocular Prosthetics** | | **Course Code: DDO 223** | | **Contact Hours: 3Hrs/Wk. (45 Hrs/Sem)** | | |
| **COURSE SPECIFICATION: Theoretical content -1 Hour** | | | **Practical Content: 2 Hours** | | | |
| **General Objective 1.0: Understand the indications for ocular prosthesis** | | | | | | |
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |
| 1.1 Define Prosthesis<br>1.2 List types of Prosthesis<br>1.3 List conditions that will require the use of ocular prosthesis.<br>1.4 Differentiate between clean and dirty eye sockets.<br>1.5 State the implications of fitting prostheses in dirty sockets | Explain the contents in 1.1 – 1.5 | Textbooks<br>Journals<br>Internet<br>Whiteboard<br>Marker<br>Projector<br>Laptop<br>Slides | 1.1 Observe cleaning of dirty eye sockets.<br>1.2 Clean a dirty eye socket | Demonstrate | | Assignments<br>Quiz<br>Examination |
| **General Objective 2.0: Understand the maintenance of the artificial eye** | | | | | | |
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |
| 2.1 Describe the features of the iris<br>2.2 Describe how to clean an artificial eye | Explain the contents in 2.1 – 2.2 | Textbooks<br>Journals<br>Internet<br>Whiteboard<br>Marker<br>Projector<br>Laptop | **2.1** Represent the iris<br><br>**2.2** Clean an artificial eye | Demonstrate, supervise, assess | Set of artificial eyes<br>Storage kits, artificial eyes in various states of maintenance. | Assignments<br>Quiz<br>Examination |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | Slides | **2.3** Disinfect an artificial eye | | Cleaning and disinfecting chemical regimen; soiled artificial eyes | |
| **General Objective 3.0: Design and fabricate an artificial eye** | | | | | | |
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |
| 3.1 List materials used in the fabrication of artificial eye<br>- Alginates<br>- Plastic etc<br>3.2 List tools used in fabrication of artificial eye<br>- Mixing bowls<br>- spatulas<br>- Measuring cups<br>- Disposable syringes etc<br>3.3 Describe the use of each tool listed in 3.2 | Explain the contents in 3.1 – 3.3 | Textbooks<br>Journals<br>Internet<br>Whiteboard<br>Marker<br>Projector<br>Laptop<br>Slides | 3.1 Identify tools used in fabrication of artificial eyes.<br><br>3.2 Reshape the mould to the appropriate dimension of the socket.<br><br>3.3 Make alginates<br><br>3.4 Observe the effect of temperature and water ratio on setting of the alginates | Assemble materials<br>Demonstrate,<br>Supervise,<br>Assess | Alginates for ocular moulding, mixing bowls and spatulas, measuring cups or spoons (or mg weighing scales), Disposable syringes, Plastic moulding shells,<br>Set of artificial eyes<br><br>Small casting chambers, Plaster of Paris or other casting materials, Methyl methacrylate for producing shells. | Assignments<br><br>Quiz<br><br>Examination |

| | | | | |
|---|---|---|---|---|
| **PROGRAMME: NATIONAL DIPLOMA IN DISPENSING OPTICIANRY** | | | | |
| **COURSE TITLE: Dispensing Opticianry Practice Management** | | | | |
| **COURSE CODE: DDO 224** | | | | |
| **DURATION** | **Lecture: - 1Hr** | | **Practical: - 1Hr** | **Total: - 2Hrs/Wk. (30 Hrs/Wk)** |
| **CREDIT UNITS: 2 CU** | | | | |
| **GOAL:** This course is designed to enable students assist in the management of small-scale dispensing opticianry business enterprises | | | | |
| **GENERAL OBJECTIVES:** On completion of the course, the student should be able to: | | | | |

1.0 Understand the basic techniques in the establishment of a small-scale business enterprise.

2.0 Know the methods of keeping stock of optical materials.

3.0 Understand the management of staff, clients and resources.

| | | | | | | |
|---|---|---|---|---|---|---|
| **PROGRAMME: NATIONAL DIPLOMA IN DISPENSING OPTICIANRY** | | | | | | |
| **COURSE TITLE: Dispensing Opticianry Practice Management** | | **Course Code: DDO 224** | | **Contact Hours: 2Hrs/Wk. (30 Hrs/Wk)** | | |
| **COURSE SPECIFICATION: Theoretical content – 1 Hour** | | | **Practical Content: 1 Hour** | | | |
| **General Objective: 1.0 Understand the basic techniques in the establishment of a small-scale business enterprise** | | | | | | |
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |
| 1.1 Explain the guidelines for the establishment of an ophthalmic laboratory.<br>1.2 Enumerate the criteria for choice of business location<br>1.3 List the relevant office equipment and machines<br>1.4 Explain the guidelines for the establishment of an ophthalmic laboratory.<br>1.5 Enumerate the criteria for choice of business location<br>1.6 List the relevant office equipment and machines | Explain contents in 1.1 to 1.3 | Text Books<br>Laptop and Projector<br>Journals<br>White Board and Marker | 1.1 Plan office location and space<br>1.2 Identify relevant office equipment and machines<br>1.3 Plan office location and space<br>1.4 Identify relevant office equipment and machines | Check and supervise | Pictures Video clips etc. | Assignments<br>Quiz<br>Examination |
| **General Objective 2.0: Know the methods of keeping stock of optical materials** | | | | | | |
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |

| | | | | | | |
|---|---|---|---|---|---|---|
| 2.1 Explain how to stock lenses, frames and other ophthalmic accessories<br><br>2.2 Enumerate the principles of ophthalmic dispensing<br><br>2.3 Explain marketing strategies<br><br>2.4 Explain how to access credit facilities and loans | Explain the contents in 2.1 to 2.2.<br><br>Explain marketing strategies.<br><br>Explain credit facilities, loans and liabilities. | Text Books<br><br>Laptop and Projector<br><br>Journals<br><br>White Board and Marker | 2.1 make entries in stock cards.<br><br>2.2 Visit an ophthalmic laboratory. | Check and supervise | | Assignments<br><br>Quiz<br><br>Examination |
| **General Objective: 3.0 Understand the management of staff, clients and material resources.** | | | | | | |
| **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Specific Learning Objectives:** | **Teachers Activities** | **Learning Resources** | **Evaluation** |
| 3.1 Explain how to manage resources in an ophthalmic outfit<br>- Human (Personnel)<br>- Material.<br><br>3.2 Enumerate the rights and privileges of clients and employees.<br><br>3.3 Explain how to schedule clients' appointments. | Explain the contents in 3.1 to 3.3 | Text Books<br><br>Laptop and Projector<br><br>Journals<br><br>White Board and Marker | 3.1 Role play management of staff in an ophthalmic outfit<br><br>3.2 Schedule clients' appointments. | Check and supervise | | Assignments<br><br>Quiz<br><br>Examination |

| | | | | |
|---|---|---|---|---|
| **PROGRAMME: NATIONAL DIPLOMA IN DISPENSING OPTICIANRY** | | | | |
| **COURSE TITLE: Optical Laboratory III (Practical Manual)** | | | | |
| **COURSE CODE: DDO 226** | | | | |
| **DURATION** | **Lecture: - 0** Hr | | **Practical: -** 6 Hours | **Total: - 6 Hrs (**90 Hours) |
| **CREDIT UNITS:** 6 | | | | |
| **GOAL:** This course is designed for the Dispensing Opticianry student to develop high level of practical skills by working in the laboratory with supervisors using a practical manual provided | | | | |
| **GENERAL OBJECTIVES:** On completion of the course, the student should be: | | | | |

1. Proficient in the handling laboratory equipment and instruments.
2. Able to carry out basic maintenance of laboratory equipment and instruments.
3. Proficient in the handling and usage of optical supplies such as lenses, frames, etc.

The externship in Optical Dispensing is intended to enable the student to develop high levels of professional skills in a practice setting. The practice must be one where optical prescriptions from optometrists and/or ophthalmologists are routinely dispensed. The practice must also have an optical workshop where finished spectacles are produced from frames and finished (or semi-finished) blanks. A minimum inventory of equipment includes a focimeter (lensometer); Geneva lens measure; marking and setting machine; cutting and edging facilities (preferably both hand-edging and automated edging); drilling machine for rimless mounts and frame repairs; polishing machine for polishing lens edges; heating machine for allowing the springing in of lenses to plastic frames, as well as the adjustment of the fit of plastic frames; a range of screwdrivers and ophthalmic pliers; soldering and welding equipment; PD gauge; lens tinting equipment; etc.

The student must divide his or her time between (1) working with clients in frame and lens selection and ordering, (2) workshop work, and (3) the final fitting and checking with clients. In addition, the student may be required to carry out other works such as reception or accounting duties as appropriate.

For each activity the student will keep a complete record of their work, with a commentary on it.

(1) Working with clients in frame and lens selection and ordering. The student will record:

- A name or identification number for the client so that, if necessary the clients practice record can be located
- The date of the initial consultation
- The main reason for the consultation
- Any secondary factors that were elicited in the consultation process
- The prescription of the lenses to be made up
- The frame selection
- A copy of the job order.
- The student's reflection on any special feature of the case which aided the students learning or skills development, (this may include clinical features of the prescriptions, cosmetic considerations, factors that affected the lens or frame selection such as occupational or lifestyle considerations, or communication factors that the student had to deal with) and how the student solved the problems posed.

(2) Workshop work: The student will keep a log of workshop work including:

- The date of the work
- The nature of the work (e.g. metal side repair by solder)
- Any special feature of the work which aided the student's learning or skills development.

(3) The final fitting and checking with clients. The student will record:

- A name or identification number for the client so that, if necessary the client's practice record can be located
- The date of the final consultation
- Details of any unusual features of the consultation that aided the development of the student's skills.

At the end of the externship the student will produce a portfolio consisting of detailed reports of 10 cases seen during the externship with features which were important in developing the student's skills, setting out the important clinical features of the case, how the student dealt with them, what the outcome was, and how it assisted the student's learning.

| | | | |
|---|---|---|---|
| **PROGRAMME: Higher National Diploma Dispensing Opticianry** | **Code: DDO 304** | **Total Hours: 3** | |
| **Subject/Course:**<br>**Contact lens 1** | **Pre-requisite: none** | **Theoretical:** | **Hours/week- %** |
| **Semester: First** | | **Practical:** | **Hours/week- %** |

| | |
|---|---|
| **GOAL:**<br>**Understand the choice, fitting and management of contact lens** | |
| **GENERAL OBJECTIVES** | |
| **On completion of this module students should be able to** | |
| **1** | Understand the basic principles of contact lens |
| **2** | Understand contact lens types and materials, their benefits, disadvantages and their most appropriate applications |
| **3** | Understand the initial contact lens selection and fitting of RGP and soft contact lens patients |
| **4** | Knowledge of the different methods of contact lens removal, the ability to remove the lens in an emergency if feasible and the ability to discuss the use of care regimes |
| **5** | Understand both the aftercare of patients wearing RGP and soft contact lenses and the management of any complications |
| **6** | Understand the signs and symptoms of serious contact lens complications. |

| **Theoretical Content** | | | | **Practical Content** | | |
|---|---|---|---|---|---|---|
| **Week** | **General Objective 1:** Understand the basic principles of contact lens | | | | | |
| **1** | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** |

| | | | | | | |
|---|---|---|---|---|---|---|
| | 1.1 History of contact lens<br>. | Define Explain, demonstrate | | | | |
| | | Define Explain, demonstrate | | | | |
| | | Define Explain, demonstrate | | | | |

| | |
|---|---|
| **Week**<br>**2** | **General Objective 1: Understand the basic principles of contact lens** |

| | *Specific learning outcomes* | *Teacher's Activities* | *Resources* | *Specific learning outcomes* | *Teacher's Activities* | *Resources* |
|---|---|---|---|---|---|---|
| | . | Define Explain, demonstrate | | | | |
| | 1.2 Knowledge of the manufacturing methods of contact lens | Define Explain, demonstrate | | | | |
| | 1.3 Terminlogies and optics in contact lens | Define Explain, demonstrate | | | | |
| **Week 3** | **General Objective 2:** Understand contact lens types and materials, their benefits, disadvantages and their most appropriate applications | | | | | |
| | *Specific learning outcomes* | *Teacher's Activities* | *Resources* | *Specific learning outcomes* | *Teacher's Activities* | *Resources* |
| | 1.1 Knowledge of contact lens types including benefits and disadvantages<br>. | Define Explain, demonstrate | | | | |
| | 1.2 Knowledge of contact lens materials including benefits and disadvantages | Define Explain, demonstrate | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| WEEK 4 | 1.3 Optical comparisons of spectacles and contact lenses | Define Explain, demonstrate | | | | |
| | 1.4 Knowledge of therapeutic use of contact lenses | | | | | |
| WEEK 5 | 1.5 Knowledge of dispensing contact lenses for the low vision patients | Define Explain, demonstrate | | | | |

| WEEK 6 | **General Objective 3: Understand the initial contact lens selection and fitting of RGP and soft contact lens patients** | | | | | |
|---|---|---|---|---|---|---|
| | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** |
| | 2.1 Understand factors which affect the choice of design and parameters of all types of contact lens | Define Explain, demonstrate | | Lab demonstration on use of radius gauge, ophthalmometer, thickness and diameter gauges, shadow graph and biomicroscope | | |

| **Week 7** | **General Objective 4.: Knowledge of the different methods of contact lens removal, the ability to remove the lens in an emergency if feasible, and the ability to discuss the use of care regimes.** | | | | | |
|---|---|---|---|---|---|---|
| | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** |

| | | | | | | |
|---|---|---|---|---|---|---|
| | 4.1 Knowledge of the methods of contact lens insertion and removal by the patient of all contact lens types. | Define Explain, demonstrate | | | | |
| WEEK 8 | 4.2 Knowledge of methods of removal of all lens types by someone other than the patient. | Define Explain, demonstrate | | | | |
| | 4.3 Understand the use of the products involved in contact lens care regimes. | Define Explain, demonstrate | | | | |
| | 4.4 Awareness of the limitation of knowledge regarding the removal of a contact lens | | | | | |

| Week 9 | **General Objective 5. : Understand both the aftercare of patients wearing RGP and soft contact lenses and the management of any complications** | | | | | |
|---|---|---|---|---|---|---|
| | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** |
| | 5.1 Understand the format and content of an aftercare consultation for all types of contact lenses. | Define Explain, demonstrate | | | | |
| | 5.2 Management of contact lens aftercare issues for all contact lens types. | Define Explain, demonstrate | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Week 10** | **General Objective 5. : Understand both the aftercare of patients wearing RGP and soft contact lenses and the management of any complications** | | | | | |
| | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** |
| | 5.1 Understand the format and content of an aftercare consultation for all types of contact lenses. | Define Explain, demonstrate | | | | |
| WEEK 11 | 5.2 Management of contact lens aftercare issues for all contact lens types. | Define Explain, demonstrate | | | | |

| | |
|---|---|
| | **General Objective 6. Understand the symptoms and signs of serious contact lens complications** |

| Week 12 | *Specific learning outcomes* | *Teacher's Activities* | *Resources* | *Specific learning outcomes* | *Teacher's Activities* | *Resources* |
|---|---|---|---|---|---|---|
| | 6.1 Signs, symptoms and differential diagnosis of serious contact lens complications. | Define Explain, demonstrate | | | | |
| WEEK 13 | 6.2 Overview of treatment of serious contact lens complications. | Define Explain, demonstrate | | | | |
| | | | | | | |

| *ASSESSMENT CRITERIA* | | | |
|---|---|---|---|
| ***Coursework*** | ***Course test*** | ***practical***<br>***40*** | ***Other (Examination)***<br>***%60*** |

| | | | |
|---|---|---|---|
| **PROGRAMME: HND Opticianry** | **Code: DDO** | **Total Hours:** | |
| **Subject/Course:**<br>**Low vision II** | **Pre-requisite: none** | **Theoretical:** | **Hours/week- %** |
| **Semester:** | | **Practical:** | **Hours/week- %** |

| | |
|---|---|
| **GOAL: The Management of Low vision patients** | |
| **GENERAL OBJECTIVES** | |
| **On completion of this module students should be able to** | |
| **1** | **Consider the effectiveness of current refraction of patients with low visual acuity.** |
| **2** | **Understand the assessment of visual function and the effects of illumination contrast and glare.** |
| **3** | **Understand the assessment of the visual field of patients with reduced vision.** |

| | |
|---|---|
| **4** | **Understand binocular vision in relation to low vision appliances.** |
| **5** | **Have Knowledge of the relevance of optical low vision aids and of common types of non-optical low vision aid.** |
| **6** | **To advise low vision patients on illumination, glare and contrast.** |
| **7** | **To advise patients about their impairment and its consequences.** |
| **8** | **Understand the need for multi- and inter-disciplinary approaches to low vision care.** |
| **9** | **To refer low vision patients to other agencies where appropriate.** |
| **10** | **To know the Aftercare management of low vision patients** |

| Theoretical Content | | | | Practical Content | | |
|---|---|---|---|---|---|---|
| **Week 1** | **General Objective 1: Consider the effectiveness of current refraction of patients with low visual acuity.** | | | | | |
| | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** |
| | 1.1 Definition of vision, low vision, visual acuity and visual field. | Define Explain, demonstrate | | | | |
| | 1.2 Methods of refractive verification, relevance of pinhole and least distance of distinct vision(LDDV) | Define Explain, demonstrate | | | | |
| | 1.3 Distance and near test charts | Define Explain, demonstrate | | | | |
| | 1.4 Criteria for referral for new prescription | Define Explain, demonstrate | | | | |
| | 1.5 low vision and contact lenses | Define Explain, demonstrate | | | | |
| | | | | | | |
| | | | | | | |
| WEEK 2 | **General Objective 2: Understand the assessment of visual function and the effects of illumination contrast and glare** | | | | | |

| | *Specific learning outcomes* | *Teacher's Activities* | *Resources* | *Specific learning outcomes* | *Teacher's Activities* | *Resources* |
|---|---|---|---|---|---|---|
| | 2.1 Effects of reduced/increased illumination and low contrast sensitivity on vision and visual acuity | Define Explain, demonstrate | | | | |
| | 2.2 Reasons for reduced near visual acuity(reading acuity) | Define Explain, demonstrate | | | | |

| **Week 3** | **General Objective 3: Understand the assessment of the visual field of patients with reduced vision.** | | | | | |
|---|---|---|---|---|---|---|
| | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** |
| | 3.1 Visual field and visual pathway | Define Explain, demonstrate | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | 3.2 Effects of pathologies on visual field | Define Explain, demonstrate | | | | |
| | 3.3 Instruments for measuring visual field | Define Explain, demonstrate | | | | |

| Week 5 | **General Objective 4: Understand binocular vision in relation to low vision appliances.** | | | | | |
|---|---|---|---|---|---|---|
| | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** |
| | 4.1 Indications for binocular low vision aids | Define Explain, demonstrate | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | 4.2 Use of occlusion | Define Explain, demonstrate | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Week 6** | **General Objective 5: Have Knowledge of the relevance of optical low vision aids and of common types of non-optical low vision aid.** | | | | | |
| | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** |
| Week 7 | 5.1 Relevance of suitability of magnification spectacles prescription and type of optical low vision aids for different visual tasks | Define Explain, demonstrate | | | | |
| | 5.2 Design, availability and suitability of non-optical aids | Define Explain, demonstrate | | | | |
| | 5.3 CCTV and TV reader systems and field expanders | Define Explain, demonstrate | | | | |
| | | | | | | |

| Week 8 | General Objective 6: To advise low vision patients on illumination, glare and contrast. | | | | | |
|---|---|---|---|---|---|---|
| | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** |
| | 6.1 Types of lamps and positioning of light | Define Explain, demonstrate | | | | |
| | 6.2 Discomfort and disability glare | Define Explain, demonstrate | | | | |
| | 6.3 Ways of improving contrast | Define Explain, demonstrate | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Week 9** | **General Objective 7:To advise patients about their impairment and its consequences.** | | | | | |
| | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** |
| | 7.1 Psychology of low vision | Define Explain, demonstrate | | | | |
| | 7.2 Identification of patient's visual needs | Define Explain, demonstrate | | | | |
| | 7.3 Signs and symptoms of ocular and systemic pathologies | Define Explain, demonstrate | | | | |
| | 7.4 Effects of ocular and systemic pathologies on vision, visual acuity and visual field | | | | | |
| | 7.5 Visual acuity/criteria for sight impaired(partial sight)/severely sight | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | impaired(blind) registration and appropriate forms | | | | | |
| | 7.6 Assessment of magnification for distance and near vision (and other distances) | | | | | |
| | 7.7 Selection of aids | | | | | |
| Week11 | 7.8 Training in use of aids | | | | | |
| | 7.9 Statutory/non-statutory benefits of registration | | | | | |
| | 7.9 Support groups | | | | | |

| **Week 12** | **General Objective 8:Understand the need for multi- and inter-disciplinary approaches to low vision care.** | | | | | |
|---|---|---|---|---|---|---|
| | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** |

| | | | | | | |
|---|---|---|---|---|---|---|
| | 8.1 Role of other healthcare professionals in the low vision field | Define Explain, demonstrate | | | | |
| | 8.2 Advantages of multi-disciplinary team care for the low vision patient | Define Explain, demonstrate | | | | |

| **Week 13** | **General Objective9: To refer low vision patients to other agencies where appropriate.** | | | | | |
|---|---|---|---|---|---|---|
| | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** |

| | | | | | | |
|---|---|---|---|---|---|---|
| | 9.1 Social services, support groups, specialist trainers, teachers and (children) | Define Explain, demonstrate | | | | |
| | 9.2 Specialist trainers/rehabilitation officers | Define Explain, demonstrate | | | | |

| **Week** | **General Objective 10: To know the Aftercare management of low vision patients** | | | | | |
|---|---|---|---|---|---|---|
| **14** | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** |

| | | | | | | |
|---|---|---|---|---|---|---|
| | 10.1 Frequency of visits | Define Explain, demonstrate | | | | |
| Week 15 | 10.2 Review of progress and suitability of low vision aids and statutory/voluntary benefits | Define Explain, demonstrate | | | | |
| | 10.3 Communication with referring practitioner/agency | Define Explain, demonstrate | | | | |

| ***ASSESSMENT CRITERIA*** | | | |
|---|---|---|---|
| ***Coursework*** | ***Course test*** | ***practical*** | ***Other (Examination)*** |

| | | | |
|---|---|---|---|
| | | | |

| | | | |
|---|---|---|---|
| **PROGRAMME: HND Opticianry** | **Code: DDO 306** | **Total Hours:** | |
| **Subject/Course:**<br>**Low vision I** | **Pre-requisite: none** | **Theoretical: 2** | **Hours/week-**<br>**%** |

| | | | |
|---|---|---|---|
| **Semester: FIRST** | | **Practical: 3** | **Hours/week-<br>%** |

**GOAL:**
**Introduction to low vision .**

**GENERAL OBJECTIVES**

**On completion of this module students should be able to**

| | |
|---|---|
| **1** | **Consider the effectiveness of current refraction of patients with low visual acuity.** |
| **2** | **Understand the assessment of visual function and the effects of illumination contrast and glare.** |
| **3** | **Understand the assessment of the visual field of patients with reduced vision.** |
| **4** | **Understand binocular vision in relation to low vision appliances.** |
| **5** | **Have Knowledge of the relevance of optical low vision aids and of common types of non-optical low vision aid.** |

| **Theoretical Content** | **Practical Content** |
|---|---|

| Week 1 | **General Objective 1: Consider the effectiveness of current refraction of patients with low visual acuity.** | | | | | |
|---|---|---|---|---|---|---|
| | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** |
| Week 2 | 1.1 Definition of vision, low vision, visual acuity and visual field. | Define Explain, demonstrate | | | | |
| | 1.2 Methods of refractive verification, relevance of pinhole and least distance of distinct vision(LDDV) | Define Explain, demonstrate | | | | |
| | 1.3 Distance and near test charts | Define Explain, demonstrate | | | | |
| | 1.4 Criteria for referral for new prescription | Define Explain, demonstrate | | | | |
| | 1.5 low vision and contact lenses | Define Explain, demonstrate | | | | |
| | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| WEEK 3 | **General Objective 2: Understand the assessment of visual function and the effects of illumination contrast and glare** | | | | | |
| | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** |
| | 2.1 Effects of reduced/increased illumination and low contrast sensitivity on vision and visual acuity | Define Explain, demonstrate | | | | |
| Week 4 | 2.2 Reasons for reduced near visual acuity(reading acuity) | Define Explain, demonstrate | | | | |

| Week 5 | General Objective 3: Understand the assessment of the visual field of patients with reduced vision. | | | | | |
|---|---|---|---|---|---|---|
| | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** |
| Week6 | 3.1 Visual field and visual pathway | Define Explain, demonstrate | | | | |
| | 3.2 Effects of pathologies on visual field | Define Explain, demonstrate | | | | |
| | 3.3 Instruments for measuring visual field | Define Explain, demonstrate | | | | |

| Week 7 | General Objective 4: Understand binocular vision in relation to low vision appliances. | | | | | |
|---|---|---|---|---|---|---|
| | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** |
| | 4.1 Indications for binocular low vision aids | Define Explain, demonstrate | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | 4.2 Use of occlusion | Define Explain, demonstrate | | | | |

| Week 8 | **General Objective 5: Have Knowledge of the relevance of optical low vision aids and of common types of non-optical low vision aid.** | | | | | |
|---|---|---|---|---|---|---|
| | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** |
| | 5.1 Relevance of suitability of magnification spectacles prescription and type of optical low vision aids for different visual tasks | Define Explain, demonstrate | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Week9 | 5.2 Design, availability and suitability of non-optical aids | Define Explain, demonstrate | | | | |
| | 5.3 CCTV and TV reader systems and field expanders | Define Explain, demonstrate | | | | |

| | | | |
|---|---|---|---|
| **PROGRAMME: HND Opticiary** | **Code: DDO** | **Total Hours:** | |
| **Subject/Course:**<br>**Low vision II** | **Pre-requisite: none** | **Theoretical:** | **Hours/week- %** |
| **Semester:** | | **Practical:** | **Hours/week- %** |

| | |
|---|---|
| **GOAL: The Management of Low vision patients** | |
| **GENERAL OBJECTIVES** | |
| **On completion of this module students should be able to** | |
| **1** | **To advise low vision patients on illumination, glare and contrast.** |
| **2** | **To advise patients about their impairment and its consequences.** |
| **3** | **Understand the need for multi- and inter-disciplinary approaches to low vision care.** |
| **4** | **To refer low vision patients to other agencies where appropriate.** |
| **5** | **To know the Aftercare management of low vision patients** |

| Week 1 | General Objective 1: To advise low vision patients on illumination, glare and contrast. | | | | | |
|---|---|---|---|---|---|---|
| | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** |
| | 1.1 Types of lamps and positioning of light | Define Explain, demonstrate | | | | |
| | 1.2 Discomfort and disability glare | Define Explain, demonstrate | | | | |
| Week 2 | 1.3 Ways of improving contrast | Define Explain, demonstrate | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Week 3 and 4** | **General Objective 2:To advise patients about their impairment and its consequences.** | | | | | |
| | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** |
| | 2.1 Psychology of low vision | Define Explain, demonstrate | | | | |
| | 2.2 Identification of patient's visual needs | Define Explain, demonstrate | | | | |
| | 2.3 Signs and symptoms of ocular and systemic pathologies | Define Explain, demonstrate | | | | |
| | 2.4 Effects of ocular and systemic pathologies on vision, visual acuity and visual field | | | | | |
| | 2.5 Visual acuity/criteria for sight impaired(partial sight)/severely sight impaired(blind) registration and appropriate forms | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | 2.6 Assessment of magnification for distance and near vision (and other distances) | | | | | |
| | 2.7 Selection of aids | | | | | |
| | 2.8 Training in use of aids | | | | | |
| Week 5 | 2.9 Statutory/non-statutory benefits of registration | | | | | |
| | | | | | | |

| **Week 6** | **General Objective 3:Understand the need for multi- and inter-disciplinary approaches to low vision care.** | | | | | |
|---|---|---|---|---|---|---|
| | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** |
| | 3.1 Role of other healthcare professionals in the low vision field | Define Explain, demonstrate | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | 3.2 Advantages of multi-disciplinary team care for the low vision patient | Define Explain, demonstrate | | | | |

| **Week 7** | **General Objective 4: To refer low vision patients to other agencies where appropriate.** | | | | | |
|---|---|---|---|---|---|---|
| | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** |
| | 4.1 Social services, support groups, specialist trainers, teachers and (children) | Define Explain, demonstrate | | | | |
| Week 8 | 4.2 Specialist trainers/rehabilitation officers | Define Explain, demonstrate | | | | |

| **Week 9** | **General Objective 5: To know the Aftercare management of low vision patients** | | | | | |
|---|---|---|---|---|---|---|
| | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** |

| | | | | | | |
|---|---|---|---|---|---|---|
| | 5.1 Frequency of visits | Define Explain, demonstrate | | | | |
| Week 10 | 5.2 Review of progress and suitability of low vision aids and statutory/voluntary benefits | Define Explain, demonstrate | | | | |
| | 5.3 Communication with referring practitioner/agency | Define Explain, demonstrate | | | | |

| ***ASSESSMENT CRITERIA*** | | | |
|---|---|---|---|
| ***Coursework*** | ***Course test*** | ***practical*** | ***Other (Examination)*** |

| | | | |
|---|---|---|---|
| **PROGRAMME: Optics** | **Code : DDO 403** | **Total Hours: 5** | |
| **Course: CLINICAL PRACTICE, PUBLIC RELATION AND RECORD KEEPING** | **Pre-requisite: : none** | **Theoretical 3** | **Hours/week- %** |
| **Semester: first** | | **Practical:** | **Hours/week- %** |

**Goal:**

**The ability to seek and communicate relevant information from and to patients in an effective and appropriate manner**

| | |
|---|---|
| **GENERAL OBJECTIVES** | |
| **On completion of this module students should be able to** | |
| 1. | **Understand the importance and significance of family history, signs and symptoms including a recognition of the importance of the patient's health status, medication, work, sports, lifestyle and special skills** |
| 2 | **Develop the key skills of listening to patients, explaining and discussing with them ophthalmic matters, taking into account relevant individual characteristics** |
| 3 | **Understand patients' fears, anxieties and concerns about their visual welfare in the eye examination and its outcome** |
| 4 | **Understand patient's expectations, aspirations and managing situations where these cannot be met** |
| 5 | **Recognize cultural diversity, and communicate with patients who have poor or non-verbal communication skills or those who are confused, reticent or misled** |
| | **Electronic**<br><br>**Electronic Health records** |

| Theoretical Content | | | | Practical Content | | |
|---|---|---|---|---|---|---|
| **Week 1** | **General Objective 1: Understand the importance and significance of family history, signs and symptoms including a recognition of the importance of the patient's health status, medication, work, sports, lifestyle and special skills** | | | | | |
| | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** |
| Week 2 | 1.1- Task analysis<br>1.2- Analysis information<br>1.3- Interpreting verbal and written information<br>1.4- Effective questioning<br>1.5- Decision making | Explain | Chalk+<br>Board | | | |

>

| Week 3 | General Objective 2: Develop the key skills of listening to patients, explaining and discussing with them ophthalmic matters, taking into account relevant individual characteristics | | | | | |
|---|---|---|---|---|---|---|
| | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** |
| | 2.1: Two way communication<br>2.2: Listening skills | Explain | Chalk+<br>Board | | | |

| Week 4 | General Objective 3: Understand patients' fears, anxieties and concerns about their visual welfare in the eye examination and its outcome | | | | | |
|---|---|---|---|---|---|---|
| | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** |
| Week 5 | 3.1: Handling difficult patients<br>3.2: Dealing with people who are upset<br>3.3: Non verbal communication<br>3.4: Developing empathy<br>3.5: Maintain and respect confidentiality | | Chalk+<br>Board | | | |

| Week 6 | General Objective 4: Understand patient's expectations, aspirations and managing situations where these cannot be met | | | | | |
|---|---|---|---|---|---|---|
| | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** |
| | 4.1: Managing of conflict | Explain | | | | |
| | 4.2: Dealing with people who are upset | Explain | CHALK | | | |
| 7 | 4.3: Negotiating skills | Explain | + | | | |
| | 4.4: Overcoming barriers | Explain | BOARD | | | |
| Week 8 | 4.5: Handling complaints | Explain | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | | |
| **Week 9** | **General Objective 5: Recognize cultural diversity, and communicate with patients who have poor or non-verbal communication skills or those who are confused, reticent or misled** | | | | | |
| | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Week 10 | 5.1 | Cultural Sensitivity | Explain | CHALK | | | |
| | 5.2 | Non verbal communication | Explain | | | | |
| Week 11 | 5.3 | Using appropriate language | Explain | + | | | |
| | 5.4 | Interpret patient responses | Explain | BOARD | | | |
| | 5.5 | Confirming understanding | Explains | | | | |

| | | | |
|---|---|---|---|
| **PROGRAMME: Optics** | **Code: DDO 315** | **Total Hours: 3** | |
| **Course: clinical ophthalmic laboratory** | **Pre-requisite: none** | **Theoretical: 2** | **Hours/week- %** |
| **Semester: first** | | **Practical: 3** | **Hours/week- %** |

| | |
|---|---|
| **Goal:** | **To help the student understand various terminology, verifications and tasks involved in a clinical settings.** |

| **GENERAL OBJECTIVES** | |
|---|---|
| **On completion of this module students should be able to** | |
| **1** | **Understand the various terminologies, instruments, lens, frames used in optical prescription eyewear.** |
| **2** | **Understand fundamental optical laboratory tasks at the entry level** |
| **3** | **Verification and neutralization techniques** |
| **4** | **Present personal, clinical skills and environmental safety issues** |
| **5** | **Focus on the development and refinement of the skills necessary for students to becoming a renowned optician** |
| **6** | **Occupational and vocational frame and lens design.** |

| Theoretical Content | | | | Practical Content | | |
|---|---|---|---|---|---|---|
| **Week 1** | **General Objective 1: Understand the various terminologies, instruments, lens, frames used in optical prescription eyewear.** | | | | | |
| | **Specific learning outcomes** | **Teacher's Activities** | **Resources** | **Specific learning outcomes** | **Teacher's Activities** | **Resources** |
| | 1.1 Understand optical terminologies used in the eye care setting.<br>1.2 Ability to differentiate between wrong and the right terminology. | Define, explain. | White board and marker. | 1.1: ability to translate optical terms, prescriptions and specifications. | Show the student the the terms used in describing the right eye, left eye, both eyes. | |
| | 1.3 Ability to differentiate between wrong and the right terminology. | Define, explain. | White board and marker. | 1.2: ability to find terminological errors, deviation. | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Week 2** | **General Objective 1: Understand the various terminologies, instruments, lens, frames used in optical prescription.** | | | | | |
| | **Specific learning outcomes** | **Teacher's Activities** | **Resources** | **Specific learning outcomes** | **Teacher's Activities** | **Resources** |

| | | | | | | |
|---|---|---|---|---|---|---|
| | 1.3 Ability to interpret optical prescriptions.<br>1.4 Ability to identify and use instruments frame heaters. | Define, explain. | White board and marker. | 1.3: Ability to write an optical prescription. | Demonstrate how to perform, write the experiment, and analyze it. | prescription sheet.<br>Lensmeter, frame warmers.<br>Different frames. |
| | 1.5 Ability to distinguish between rimless, half rim, plastic,matal frames and the materials they are made of. | Define, explain. | White board and marker. | 1.4: identify and distinguish between the different frames and prescription given, stating its merits and demerits. | | |
| | | | | | | |

| Week | General Objective 2: Understand fundamental optical laboratory tasks at the entry level |
|---|---|

| 3 | Specific learning outcomes | Teacher's Activities | Resources | Specific learning outcomes | Teacher's Activities | Resources |
|---|---|---|---|---|---|---|
| | 2.1 Understand the rules and regulations guiding the laboratory.<br><br>2.2 ability to interact and know the patients need and choice of eyewear.. | Define, explain. | White board and marker. | 2.1: Ability to measure and coordinate frames with facial and eye measurements and optical prescription. | Demonstrate how to conduct the experiment, analyse the data and calculate errors. | Optical labouratory. |

| Week 4 | General Objective 2: Understand fundamental optical laboratory tasks at the entry level | | | | | |
|---|---|---|---|---|---|---|
| | Specific learning outcomes | Teacher's Activities | Resources | Specific learning outcomes | Teacher's Activities | Resources |

| | | | | | | |
|---|---|---|---|---|---|---|
| | 2.3 Ability to prepare for work order for optical laboratory containing instructions for grinding and mounting lenses in frames.<br><br>2.4 ability to maintain patients records , prescriptions, work orders and payments | Define, explain | White board and marker | . 2.3 ability to prepare a work order in the lab. | | |

| Week 5 | General Objective 2: Understand fundamental optical laboratory tasks at the entry level | | | | | |
|---|---|---|---|---|---|---|
| | **Specific learning outcomes** | **Teacher's Activities** | **Resources** | **Specific learning outcomes** | **Teacher's Activities** | **Resources** |

| | | | | | |
|---|---|---|---|---|---|
| 5 Ability to measure clients bridge, temple length, vertex distance, papillary distance, optical centers, using measuring devices.<br><br>2.6 prepare work orders, verify the finished lenses | Define, explain | White board and marker | .5 the students should be able to measure clients bridge, temple length, vertex distance, papillary distance, optical centres, using measuring devices | | Measuring devices.<br><br>PD RULE |

| Week 6 | General Objective 3: Verification and neutralization techniques | | | | | |
|---|---|---|---|---|---|---|
| | **Specific learning outcomes** | **Teacher's Activities** | **Resources** | **Specific learning outcomes** | **Teacher's Activities** | **Resources** |
| | 3.1 Understand neutralization techniques.<br><br>3.2 understand lens verification. | Define, explain.<br><br>Define, explain. | White board and marker. | 3.1: Ability to neutralize lens, especially cylindrical varifocals.<br><br>Ability to verify orderd lenses. | Teach, demonstrate lens neutralization to the students. | Lensmeter and lenses.<br><br>Optical lab |

| Week 7 | General Objective 4: Present personal, clinical skills and environmental safety issues | | | | | |
|---|---|---|---|---|---|---|
| | **Specific learning outcomes** | **Teacher's Activities** | **Resources** | **Specific learning outcomes** | **Teacher's Activities** | **Resources** |
| | 4.1 what are environmental safety<br><br>4.2 understand the benefits of environmental safety. | Define, explain | White board and marker | | | |

| Week 8 | General Objective 4: Present personal, clinical skills and environmental safety issues | | | | | |
|---|---|---|---|---|---|---|
| | **Specific learning outcomes** | **Teacher's Activities** | **Resources** | **Specific learning outcomes** | **Teacher's Activities** | **Resources** |
| | 4.3 understand clinical skills, the various steps in clinical steps.<br>4.4 clinical skills vs communication skills<br>4.5 ability to develop the competences necessary for the proper professional practice. | Define and explain. | White board and chalk. | . | . | |

| Week 9 | General Objective 5: Focus on the development and refinement of the skills necessary for students to becoming a renowned optician. | | | | | |
|---|---|---|---|---|---|---|
| | **Specific learning outcomes** | **Teacher's Activities** | **Resources** | **Specific learning outcomes** | **Teacher's Activities** | **Resources** |
| | 5.1 understand the overview of who an optometrist is.<br><br>5.2 what are the difference between an optometrist, an optician, ophthalmologists, ocularists, ophthalmic nurse, orthoptist. | Define and explain | White board and chalk | | | |

| Week 10 | General Objective 5: Focus on the development and refinement of the skills necessary for students to becoming a renowned optician | | | | | |
|---|---|---|---|---|---|---|
| | **Specific learning outcomes** | **Teacher's Activities** | **Resources** | **Specific learning outcomes** | **Teacher's Activities** | **Resources** |
| | 5.3 Ability to understand the basic skills needed to be renowned optician.<br>5, 4 Understand the need to have strong communication skill to be able to inspire confidence in your patients. | Define and explain | White board and chalk | Ability to communicate fluently with patients ,putting into consideration the patients response. | | Dispensary lab. |

| Week 11 | General Objective 5: Focus on the development and refinement of the skills necessary for students to becoming a renowned optician. | | | | | |
|---|---|---|---|---|---|---|
| | **Specific learning outcomes** | **Teacher's Activities** | **Resources** | **Specific learning outcomes** | **Teacher's Activities** | **Resources** |

| | | | | | | |
|---|---|---|---|---|---|---|
| | 5.5 ability to understand and have good organizational and administrative skills | Define, explain . | White board and marker. | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Week 12** | **6** | **General objectives 6; Occupational and vocational frame and lens design.** | | | | |
| | **Specific learning outcomes** | **Teacher's Activities** | **Resources** | **Specific learning outcomes** | **Teacher's Activities** | **Resources** |

| | | | | | | |
|---|---|---|---|---|---|---|
| | 6.1 understanding of occupational health. Also an overview of occupational health and safety relating to different occupation.<br><br>6.2 understanding the choice of frame as it relates to occupation.<br><br>6.3 understand occupational safety. | Define, explain . | White board and marker. | | | |

| Week 13 | General objectives 6; Occupational and vocational frame and lens design…… | | | | | |
|---|---|---|---|---|---|---|
| | | **Teacher's Activities** | **Resources** | **Specific Learning Outcomes** | **Teacher's Activities** | **Resources** |
| | 6:4 Understand spherical lens design. | Define, explain | Board chalk | | | Spherical lenses |
| | 6:5 Understand aspheric lens design. | Define, explain | Board chalk | Identify with reasons an aspheric ,spherical lenses. | | Finished lenses |
| | 6.6: understand the difference in both designs including its merits and demerits. | Define, explain | Board chalk | What are the criterias in selecting a lens design for your patients. | | Aspheric lenses |
| | | Define, explain | Board chalk | | | |

| Week 14 | General objectives 6; Occupational and vocational frame and lens design.. | | | | | |
|---|---|---|---|---|---|---|
| | | **Teacher's Activities** | **Resources** | **Specific Learning Outcomes** | **Teacher's Activities** | **Resources** |

| | | | | | | |
|---|---|---|---|---|---|---|
| | 6.7: understand the surface curvatures and optical indices of lenses, as parameters required in lens design | Define, explain | Board chalk | Know lens surface curvatures. | Explain and show different lens designs. | Different occupation in relation to lens design. |

| **General objectives 6; Occupational and vocational frame and lens design.** | | | | | |
|---|---|---|---|---|---|
| **Specific learning outcomes** | **Teacher's Activities** | **Resources** | **Specific learning outcomes** | **Teacher's Activities** | **Resources** |
| 6.8: understand lens design in relation to various occupation. | Define, explain . | White board and marker. | | | |

| ***ASSESSMENT CRITERIA*** | | | |
|---|---|---|---|
| ***Coursework*** <br> ***(Laboratory manual)*** | ***Course test*** <br> ***%*** | ***practical*** <br> ***(End of module exam.)*** | ***Other (Examination lprojectlprotfolio)*** <br> ***%*** |

| | | | |
|---|---|---|---|
| *%70* | | *%30* | |

| | | |
|---|---|---|
| **PROGRAMME:HND OPTICIANRY** | **Code: DDO 406** | **Total Hours: 3** |

| | | | |
|---|---|---|---|
| **Subject/Course : Research and methodology** | **Pre-requisite: none** | **Theoretical: 3** | **Hours/week- %** |
| **Semester: third** | | **Practical:** | **Hours/week- %** |

| | |
|---|---|
| **GOAL:** To PREPARE THE STUDENTS TO WRITE A PROJECT | |
| **GENERAL OBJECTIVES** | |
| **On completion of this module students should be able to** | |
| **1** | Understand the Rules of Report Writing. |
| **2** | Understand project Planning |
| **3** | Understand methods of collection of project materials. |
| **4** | Collect and record the Data for the Project Work. |
| **5** | Analyze the Collected Data. |
| **6** | Check the Accomplished Work |
| **7** | Finalize Project and write final report. |

| Theoretical Content | | | | Practical Content | | |
|---|---|---|---|---|---|---|
| **Week** | **General Objective 1.0: Understand the Rules of Report Writing** | | | | | |
| **1** | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** |
| | 1.1 Explain the technical writing with:<br>• Principles<br>• Report types<br>• Writing stages<br>• Writing guidelines<br><br>1.2 Report presentation with:<br>• Use of computers and projectors<br><br>Skills of presentation. | Illustrate with examples report writing and discuss with the students. | References and white board. | | | Board, chalk |

| | | | | | | |
|---|---|---|---|---|---|---|
| | **General Objective 2.0: Understand project Planning** | | | | | |
| WEEK 2 | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** |
| | 2.1 Plan the project with :<br>• Target & objectives.<br>• Schedule<br>• Required materials and facilities<br><br>2.2 Describe problem that may face the student during project and find out the possible solutions. | • Illustrate with examples project planning, writing and discuss with the students. Describe some of the problems which may face students and how to deal with them. | | | | |

| Week 3 | General Objective 2.0: Understand project Planning | | | | | |
|---|---|---|---|---|---|---|
| | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** |
| | 2.3 Understanding the<br>▪ Work load distribution to each student group<br>▪ Work area for each group.<br>▪ Methods, procedures, and facilities that are required to accomplish and test the work. | Define clearly to each group of students their work load, work area, methods and procedure. | | | | |
| | | | | | | |

| Week 4 | General Objective 3.0 : Understand methods of collection of project materials | | | | | |
|---|---|---|---|---|---|---|
| | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** |
| | 3.1 Understanding of how to conduct literature survey. | Explain the topic with examples, hold group discussion then instruct student to follow-up. | | | | |

| Week 5 | General Objective 3.0 : Understand methods of collection of project materials | | | | | |
|---|---|---|---|---|---|---|
| | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** |
| | 3.2 Understanding of how to prepare for the practical work**.** | Explain the topic with examples, hold group discussion then instruct student to follow-up. | | | | |

| Week 6 | General Objective 4.0: Collect and record the Data for the Project Work | | | | | |
|---|---|---|---|---|---|---|
| | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** |
| | 4.1 Development of an understanding of the data collection and recording methods. | • Follow up the students with more instructions and guidance. | | | | |

| Week 7 | General Objective 4.0: Collect and record the Data for the Project Work | | | | | |
|---|---|---|---|---|---|---|
| | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** |
| | 4.1 Development of an understanding of the data collection and recording methods. | • Follow up the students with more instructions and guidance. | | | | |

| Week 8 | General Objective 4.0: Collect and record the Data for the Project Work | | | | | |
|---|---|---|---|---|---|---|
| | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** |
| | 4.1 Development of an understanding of the data collection and recording methods. | • Follow up the students with more instructions and guidance. | | | | |

| Week 9 | General Objective 4.0: Collect and record the Data for the Project Work | | | | | |
|---|---|---|---|---|---|---|
| | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** |
| | 4.1 Development of an understanding of the data collection and recording methods. | • Follow up the students with more instructions and guidance. | | | | |

| Week 10 | General Objective 4.0: Collect and record the Data for the Project Work | | | | | |
|---|---|---|---|---|---|---|
| | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** |

| Week 11 | General Objective 5: Analyse the collected data | | | | | |
|---|---|---|---|---|---|---|
| | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** |
| | 5.1 development of an understanding of methods of data analysis. | Follow up the students with more instruction, corrections of their work and feedback | | | | |
| | 4.1 Development of an understanding of the data collection and recording methods. | • Follow up the students with more instructions and guidance. | | | | |

| Week 12 | **General Objective 5: Analyse the collected data** | | | | | |
|---|---|---|---|---|---|---|
| | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** |
| | 5.1 development of an understanding of methods of data analysis. | Follow up the students with more instruction, corrections of their work and feedback | | | | |

| Week 13 | **General Objective 6:** Check the Accomplished Work | | | | | |
|---|---|---|---|---|---|---|
| | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** |
| | 6.1: Understand how to review the work done, and revise and correct as appropriate | Follow up the students with more instruction, corrections of their work and feedback | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | **General Objective 7:** Finalize Project and write final report. | | | | | |
| | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** |
| | 7.1 Understand how to make inferences and draw conclusions<br><br>7.2 Understand how to make reasonable recommendations for future work based on the current findings | Follow up the students with more instruction, corrections of their work and feedback | | | | |

| **Week** | **General Objective 7:** Finalize Project and write final report. | | | | | |
|---|---|---|---|---|---|---|
| **15** | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** | ***Specific learning outcomes*** | ***Teacher's Activities*** | ***Resources*** |

| | | | | | | |
|---|---|---|---|---|---|---|
| | 7.3 Ability to complete the technical requirements of the report and present the results in an effective way. | Follow up the students with more instruction, corrections of their work and feedback | | | | |

| ***ASSESSMENT CRITERIA*** | | | |
|---|---|---|---|
| ***Coursework*** | ***Course test*** ***%*** | ***practical*** | ***Other (project report)*** ***%*100** |

## OPHTHALMIC LABORATORY EQUIPMENT FOR TRAINING INSTITUTIONS OF DISPENSING OPTICIANRY

| S/NO | EQUIPMENT/ITEM | MINIMUM QUANTITY REQUIRED |
|---|---|---|
| **A. HAND TOOLS AND PLIERS** | | |
| 1. | PD Rule | 30 |
| 2. | Geneva Lens Clock | 2 |
| 3. | Dial Caliper | 1 |
| 4. | Wide Mouth Lens Caliper | 1 |
| 5. | Set of Screw Drivers (with assortment, all sizes of screw) | 10 |
| 6. | Set of Opticians' Files | 1 |
| 7. | Set of Ophthalmic Pliers | 10 |
| 8. | Rimless Compression Tool Kit | 5 |
| 9. | Ergonomic Handle Adjustment Kit | 5 |
| 10. | Spring Hinge Alignment Tool | 1 |
| 11. | Riveting Hammer | 3 |
| 12. | Pupilometer | 3 |
| 13. | Protractor units | 30 |
| 14. | One Meter Optical Bench | 5 |
| 15. | Clavulus-type Frame Repair Centre (Optional) | 1 |
| 16. | Tables to Fit Bench with Vernier Adjustment | 3 |
| 17. | Aspheric Hand Magnifier | 5 |
| 18. | Neck-held Magnifier | 5 |
| **B. OPHTHALMIC ACCESSORIES** | | |
| 19. | Lens Holders for Tints | 5 |
| 20. | Lens Dye Colors (Liquid or Powder Pack) | 5 |
| 21. | Neutralizer | |
| 22. | Temple Tips Assortment | |
| 23. | Nose Pad Kit Assortment (Symmetrical Silicone) | 1 pack |
| 24. | Job Trays | 10 |
| 25. | Lens Spray | 10 |

| | | |
|---|---|---|
| 26. | Lens Cloth | 5 packs |
| 27. | Plastic Lens Assortment | 30 |
| 28. | Fitted Frames with Various Lens for Focimeter and Hand Neutralization<br>Plastic Frames<br>Metal Frames | <br>15<br>15 |
| 29. | Frame Stand/Rack | 1 |
| 30. | Set of Demonstration Lenses (Semi-Finished and Finished)<br>Single Vision Lenses<br>Bi-Focal Lenses (Fused, D-Top & Invisible)<br>Progressive Lenses | <br>10<br>10 each<br>10 |
| 31. | Equilateral and Small Angle Prisms | 1 pack |
| 32. | Plastic container for Lens chipping | 10 |
| 33. | Sinks with running water | 5 |
| 34. | Fire Extinguisher | 3 |
| 35. | Safety Googles | 25 |
| 36. | First Aid Kit | 1 |
| 37. | Sand Bucket | 8 |
| 38. | Contact Lenses<br>Hydrogel<br>Rigid Glass Permeable (RGP) | <br>(4 packs)<br>(2 Packs) |
| 39 | Acrylic Resins | 5 Packs |
| 40 | Silicon | 5 Packs |
| | Adhesives | Varied |
| | Colouring agent | Varies |
| **C. MACHINES** | | |
| 39. | Lensometer<br>Manual<br>Electronic | <br>10<br>1 |
| 39. | Edging machine<br>Manual | <br>10 |

| | | |
|---|---|---|
| | Automatic with accessories<br>Pattern Lens Edger | 1<br>1 |
| 40. | Ultrasonic Cleaning Machine | 2 |
| 41. | Soldering Kit with complete Accessories | 5 |
| 42. | Hot Air Frame Warmer | 5 |
| 43. | Lens Grooving Machine with complete Accessories | 5 |
| 44. | Lens Polishing Machine with complete Accessories | 3 |
| 45. | Lens Tinting Machine | 3 |
| 46. | Lens Drilling Machine | 2 |
| 47. | Hand Held Binocular Telescope | 2 |
| 48. | Clip-on Telescope | 2 |
| 49 | Flip-on Telescope | 2 |
| 50 | Minifiers/Field Expander | 2 |
| 52. | Computer systems | 10 |
| 53 | Impression Trays | 10 |
| | | |