Study Scheme & Syllabus of

Bachelor of Optometry

(Semester I - VI)

Batch 2021 Onwards

By

Board of Studies

I K GUJRAL PUNJAB TECHNICAL UNIVERSITY KAPURTHALA

IK Gujral Punjab Technical University

VISION

To be an institution of excellence in the domain of higher technical education that serves as the fountainhead for nurturing the future leaders of technology and techno- innovation responsible for the techno-economic, social, cultural and environmental prosperity of the people of the State of Punjab, the Nation and the World.

MISSION

To provide seamless education through the pioneering use of technology, in partnership with industry and society with a view to promote research, discovery and entrepreneurship and to prepare its students to be responsible citizens of the world and the leaders of technology and techno-innovation of the 21st Century by developing in them the desirable knowledge, skill and attitudes base for the world of work and by instilling in them a culture for seamlessness in all facets of life.

OBJECTIVES

To offer globally-relevant, industry-linked, research-focused, technology- enabled seamless education at the graduate, postgraduate and research levels in various areas of engineering & technology and applied sciences keeping in mind that the manpower so spawned is excellent in quality, is relevant to the global technological needs, is motivated to give its best and is committed to the growth of the Nation;

To foster the creation of new and relevant technologies and to transfer them to industry for effective utilization;

To participate in the planning and solving of engineering and managerial problems of relevance to global industry and to society at large by conducting basic and applied research in the areas of technologies. To develop and conduct continuing education programmes for practicing engineers and managers with a view to update their fundamental knowledge base and problem-solving capabilities in the various areas of core competence of the University;

To develop strong collaborative and cooperative links with private and public sector industries and government user departments through various avenues such as undertaking of consultancy projects, conducting of collaborative applied research projects, manpower development programmes in cutting-edge areas of technology, etc;

To develop comprehensive linkages with premier academic and research institutions within the country and abroad for mutual benefit;

To provide leadership in laboratory planning and in the development of instructional resource material in the conventional as well as in the audio- visual, the video and computer-based modes;

To develop programmes for faculty growth and development both for its own faculty as well as for the faculty of other engineering and technology institutions;

To anticipate the global technological needs and to plan and prepare to cater to them;

To interact and participate with the community/society at large with a view to inculcate in them a feel for scientific and technological thought and endeavour; and

To actively participate in the technological development of the State of Punjab through the undertaking of community development programmes including training and education programmes catering to the needs of the unorganized sector as well as that of the economically and socially weaker sections of society.

ACADEMIC PHILOSOPHY

The philosophy of the education to be imparted at the University is to awaken the "deepest **potential**" of its students as holistic human beings by nurturing qualities of self-confidence, courage, integrity, maturity, versatility of mind as well as a capacity to face the challenges of tomorrow so as to enable them to serve humanity and its highest values in the best possible way.

TITLE OF THE PROGRAM: B.Sc. OPTOMETRY

YEAR OF IMPLEMENTATION: New Syllabus will be implemented from June 2021 onwards.

DURATION: The course shall be four years, with semester system (6 semesters academic, with two semester's clinical posting). The Choice based credit system will be applicable to all the semesters.

ELGIBILITY FOR ADMISSION: Candidates with 50% marks (5% relaxation for SC/ST) in aggregate in 10+2 with Medical (Physics, Chemistry & Biology)/ Diploma in Optometry with minimum aggregate of 50% marks.

MEDIUM OF INSTRUCTION: English.

SCHEME OF THE PROGRAM:

| Semester-1 |
|------------|
|------------|

| Sr. No. | Course Code | Course Type | Course Title | L-T-P* | Credi ts | Marks D | Marks Distribution | |
|------------|-----------------|--|---|---------|-------------|----------|--------------------|-----|
| | | | | • | | Internal | External | |
| 1. | BOPT 101-21 | Core Theory | Basics of Anatomy-I | 3-1-0 | 4 | 40 | 60 | 100 |
| 2. | BOPT 102-21 | Core Theory | Basics of Physiology-I | 3-1-0 | 4 | 40 | 60 | 100 |
| 3. | BOPT 103-21 | Core Theory | Basics of Biochemistry-I | 3-1-0 | 4 | 40 | 60 | 100 |
| 4. | BOPT 104-21 | Core Practical/Lab | Basics of Anatomy-I Practical | 0-0-4 | 2 | 60 | 40 | 100 |
| 5. | BOPT 105-21 | Core Practical/Lab | Basics of Physiology-I Practical | 0-0-4 | 2 | 60 | 40 | 100 |
| 6. | BOPT 106-21 | Core Practical/Lab | Basics of Biochemistry-I Practical | 0-0-4 | 2 | 60 | 40 | 100 |
| 7. | BTHU 103-18 | Ability Enhancement Compulsory Course (AECC)-I | English | 3-0-0 | 3 | 40 | 60 | 100 |
| 8. | BTHU 104-18 | Ability Enhancement Compulsory Course- (AECC) | English Practical/Laboratory | 0-0-2 | 1 | 60 | 40 | 100 |
| 9. | HVPE- 101-18 | Ability Enhancement Compulsory Course- (AECC) | Human Values, De- addiction & Traffic Rules | 3-0-0 | 3 | 40 | 60 | 100 |
| 10. | HVPE- 102-18 | Ability Enhancement Compulsory Course- (AECC) | Human Values, De- addiction & Traffic Rules (Lab/Seminar) | 0-0-2 | 1 | 25 | - | 25 |
| 11. | BMPD 105-18 | | Mentoring & Professional Development | 0-0-2 | 1 | 25 | - | 25 |
| | | Total | <u> </u> | 15-3-18 | 25 | 490 | 460 | 950 |

| | Schiestel -11 | | | | | | | | |
|------------|----------------|---|---|---------|-------------|----------|--------------|-------|--|
| Sr. No. | Course Code | Course Type | Course Title | L-T-P* | Credi ts | Marks D | Distribution | Marks | |
| | | | | | | Internal | External | | |
| 1. | BOPT 201-21 | Core Theory | Basics of Anatomy-II | 3-1-0 | 4 | 40 | 60 | 100 | |
| 2. | BOPT 202-21 | Core Theory | Basics of Physiology-II | 3-1-0 | 4 | 40 | 60 | 100 | |
| 3. | BOPT 203-21 | Core Theory | Basics of Biochemistry-II | 3-1-0 | 4 | 40 | 60 | 100 | |
| 4. | BOPT 204-21 | Core Practical/Lab | Basics of Anatomy-II Practical | 0-0-4 | 2 | 60 | 40 | 100 | |
| 5. | BOPT 205-21 | Core Practical/Lab | Basics of Physiology-II Practical | 0-0-4 | 2 | 60 | 40 | 100 | |
| 6. | BOPT 206-21 | Core Practical/Lab | Basics of Biochemistry-II Practical | 0-0-4 | 2 | 60 | 40 | 100 | |
| 7. | EVS 202-18 | Ability Enhancement Compulsory Course (AECC) | Environmental Studies | 3-0-0 | 3 | 40 | 60 | 100 | |
| 8. | BMPD 203-18 | | Mentoring & Professional Development | 0-0-2 | 1 | 25 | ** | 25 | |
| | | Total | | 12-3-14 | 22 | 365 | 360 | 725 | |

Semester-II

*A course can either have four Hrs Lecture or Three Hrs Lecture + One Hrs Tutorial as per requirement

**The Human Values, De-addiction and Traffic Rules (Lab/ Seminar) and Mentoring and Professional

Development course will have internal evaluation only.

I.K. Gujral Punjab Technical University, Kapurthala

| | | THEOR | Y | | |
|-------|------------|----------------------|-----------------------|----|--|
| S.No. | | | Weightage in Marks | | Remarks |
| | | | | | |
| 1 | Internal | Mid-Semester | 30 | 20 | MSTs, Quizzes, |
| | Evaluation | Examination | | | assignments, attendance, |
| 2 | | Attendance | 5 | 5 | etc. Constitute internal evaluation Best of two |
| 3 | | Assignments | 5 | 5 | mid-semester exams will be considered for evaluation |
| 4 | External | End-Semester | 60 | 30 | Conduct and checking of |
| | Evaluation | Examination | | | the answer sheets will be at |
| | | | | | the university level. |
| | Total | | 100 | 60 | |
| I | PRACTICAL | | | | |
| 1 | Internal | Daily evaluation of | 30 | 10 | |
| | Evaluation | practical | | | |
| | | performance/ record/ | | | |
| | | viva voce | | | |
| 2 | | Attendance | 5 | 5 | |
| 3 | | Internal Practical | | 5 | 7 |
| | | Examination | 5 | | |
| 4 | External | Final Practical | 40 | 20 |] |
| | Evaluation | Examination | | | |
| | | Total | 80 | 40 |] |

EXAMINATION AND EVALUATION

PATTERN OF END-SEMESTER EXAMINATION

- I. Part A will be One Compulsory question consisting of short answer type questions
 [Q No. 1(a-h)] covering whole syllabus. There will be no choice in this question. It
 will be of 16 marks comprising of 8 questions of 2 marks each.
- II. Part B will be comprising of eight questions [2-9]. Student will have to attempt any six questions from this part. It will be of 24 marks with 6 questions of 4 marks each.
- III. Part C will be comprising of two compulsory questions with internal choice in both these questions [10-11]. It will be of 20 marks with 2 questions of 10 marks each.

SYLLABUS OF THE PROGRAM

The syllabus has been upgraded as per provision of the UGC module and demand of the academic environment. The contents of the syllabus have been duly arranged unit wise and included in such a manner so that due importance is given to requisite intellectual and laboratory skills. The application part of the respective contents has been appropriately emphasized.

SEMESTER-I

| I.K. GUJRAL PUNJAB TECHNICAL UNIVERSITY | | | | | | | |
|---|---------------------|--|-----|-----------|--|--|--|
| Course Name | Bach | Bachelor of Optometry | | | | | |
| Subject Code: | BOP | BOPT 101-21 | | | | | |
| Subject Title: | Basics of Anatomy-I | | | | | | |
| Contact Hours: | L:3 | T:1 | P:0 | Credits:4 | | | |
| Examination | 3 | | | | | | |
| Duration (hours) | | | | | | | |
| Objective(s): | To te | To teach the fundamental concepts of Human Anatomy | | | | | |

Details of the Course (Human Anatomy)

| Unit | Contents | Contact |
|------|--|---------|
| | | Hours |
| Ι | Introduction: Definition of anatomy and its divisions, Terms of | |
| | location, positions and planes. Embryology of Eye. General Anatomy | |
| | of Eye: Eye Orbit, Sclera, Cornea, Choroid, Ciliary Body, Iris & Retina. | |
| | Refractory media: Aqueous Humor, Anterior Chamber, Posterior | |
| | Chamber, Lens, Vitreous Body, Eyelids, Conjunctiva. | |
| | | |
| II | Cardiovascular System: Arteries & veins, Capillaries & arterioles, | |
| | Heart- size, location, chambers, blood supply of heart, pericardium, | |
| | Systemic & pulmonary circulation, Major blood vessels of Heart- | |
| | Aorta, pulmonary artery, common carotid artery, subclavian artery, | |
| | axillary artery, brachial artery, common iliac artery, femoral artery, | |
| | Inferior vena cava, portal circulation, great saphenous vein. | |
| | | |
| III | Central Nervous System: Brain, regions of brain, Cerebrum, | |
| | Cerebellum, Brainstem, Cerebral Cortex and Diencephalon. Brain | |
| | ventricles, Cranial Nerves. Types of Nerve Cells, Nerve Impulse: | |
| | Conduction & Transmission. | |
| IV | Musculoskeletal system: Structure of Bone & its types, Joints- | |
| | Classification of joints with examples; details of synovial joint, Bones | |
| | & joints of upper limb, lower limb and their movements, Axial skeleton | |
| | & appendicular skeleton, Skull, spine & its movements, intervertebral | |
| | disc, Muscles & its types, Muscles of the upper limb, lower limb, trunk | |

| and neck. | |
|-----------|---|
| | l |

| S. No. | Author(s) | Title of the Book | Publisher/Year |
|--------|---|---|------------------------------------|
| 1 | Ross & Wilson Anatomy and Physiology | Anne Waugh, Allison Grant | Churchill Livingstone |
| 2 | Principles of Anatomy & Physiology | Tortora & Bryan | WILEY |
| 3 | Kathleen J.W. Wilson | Anatomy and Physiology in Health and Illness | Churchill Livingstone, New York |
| 4 | Arthur C, Guyton and John.E | Text book of Medical Physiology | Hall. Miamisburg, OH, U.S.A |

| I.K. GUJRAL PUNJAB TECHNICAL UNIVERSITY | | | | | | | |
|---|-------|---|-----|-----------|--|--|--|
| Course Name | Bach | Bachelor of Optometry | | | | | |
| Subject Code: | BOP | BOPT 102-21 | | | | | |
| Subject Title: | Basi | Basics of Physiology-I | | | | | |
| Contact Hours: | L:3 | T:1 | P:0 | Credits:4 | | | |
| Examination | 3 | | | | | | |
| Duration (hours) | | | | | | | |
| Objective(s): | To te | To teach the fundamental concepts of Human Physiology | | | | | |

Details of the Course (Human Physiology)

| Unit | Contents | Contact |
|------|---|---------|
| | | Hours |
| Ι | Gastrointestinal System: Physiological Anatomy, functions of GIT, | 12 |
| | Salivary Gland-functions of saliva, Stomach- structure and functions, | |
| | Gastric secretions-composition, functions, Mechanism, Pancreas- | |
| | structure, functions, composition of Pancreatic juice, Liver-Functions of | |
| | liver, Bile-Composition, functions, Jaundice-Types and its causes, Gall | |
| | Bladder- Functions, Intestine- Movements of small and large intestine, | |
| | Digestion and Absorption of Carbohydrates, Proteins, Fats, Hormones of | |
| | GIT- Functions of Gastrin, Secretin, CCK-PZ. | |
| | | |
| II | Respiratory System: Physiological Anatomy, Functions of the respiratory | 12 |
| | system, Types of respiration, respiratory membrane, Lung volumes and | |
| | capacities, vital capacity and factors affecting it, Transport of Oxygen- | |
| | Forms of transportation, Oxy-hemoglobin dissociation curve and factors | |
| | affecting it, Transport of Carbon-Dioxide- Forms of transportation, | |
| | Hypoxia-Definition, types, effects of hypoxia, Cyanosis-Definition and | |
| | types, Artificial Respiration- CPR | |
| | | |
| III | Cardiovascular System: Heart-Physiological Anatomy, Nerve supply, | 10 |
| | Properties of cardiac muscle, Cardiac Cycle-Events -systole, diastole, | |
| | Cardiac Output-Definition and factors affecting it, Heart sounds-normal | |
| | heart sounds, its causes, areas of auscultations, Blood Pressure- | |

| | Definition, normal value, Physiological variations, its measurement, | |
|----|---|----|
| | ECG- normal waves, Shock-Definition, Types. | |
| IV | Blood: Red Blood Cells- Functions, count, Physiological variations. | 10 |
| | Erythropoisis-stages, Hemoglobin-Functions, Physiological variations, | |
| | White Blood cells-Functions, count, morphology, Platelets-count, | |
| | morphology, functions. Hemostasis-Definition, Mechanism, clotting | |
| | factors, Blood groups-ABO system, Rh system, Blood transfusion- | |
| | Indication, transfusion reactions, Anaemias-classification, morphological | |
| | and Etiological, effects of anaemia on body. | |
| | | |
| | | |

| S. No. | Author(s) | Title of the Book | Publisher/Year |
|--------|---|---|------------------------------------|
| 1 | Ross & Wilson Anatomy and Physiology | Anne Waugh, Allison Grant | Churchill Livingstone |
| 2 | Principles of Anatomy & Physiology | Tortora & Bryan | WILEY |
| 3 | Kathleen J.W. Wilson | Anatomy and Physiology in Health and Illness | Churchill Livingstone, New York |
| 4 | Arthur C, Guyton and John.E | Text book of Medical Physiology | Hall. Miamisburg, OH, U.S.A |

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|---|-------|---|-----|-----------|--|--|
| Course Name | Bach | Bachelor of Optometry | | | | |
| Subject Code: | BOP | T 103-2 | 1 | | | |
| Subject Title: | Basi | Basics of Biochemistry-I | | | | |
| Contact Hours: | L:3 | T:1 | P:0 | Credits:4 | | |
| Examination | 3 | | | | | |
| Duration (hours) | | | | | | |
| Objective(s): | To te | To teach the fundamental concepts of cell biology & biochemistry. | | | | |

| Unit | Contents | Contact |
|------|--|---------|
| | | Hours |
| Ι | Cell: Morphology, structure & functions of cell, cell membrane, | 12 |
| | Nucleus, chromatin, Mitochondria, Endoplasmic Reticulum, | |
| | Ribosomes. | |
| | Carbohydrates: Definition, chemical structure, functions, sources, | |
| | classifications, Monosaccharides, Disaccharides, Polysaccharides, | |
| | mucopoloysaccharide and its importance, glycoproteins | |
| | Lipids: Definition, function, sources, classification, simple lipid, | |
| | compound lipid, derived lipid, unsaturated and saturated fatty acid. | |
| | Essential fatty acids and their importance, Blood lipids and their | |
| | implications, cholesterol with its importance. | |
| | | |
| II | Proteins :Definition, sources, amino acids, structure of protein, their | 14 |
| | classification, simple protein, conjugated protein, derived proteins and | |
| | their properties. | |
| | Enzymes: Definitions, mechanism of action, factors affecting enzyme | |
| | action, enzyme of clinical importance. | |
| | | |
| III | Nutrition | 10 |
| | 1) Vitamins: Types, functions and role. | |
| | 2) Principal minerals and their functions(Ca, P, Mg, Na, K, Cl) | |
| | 3) Balanced diet, Diet for Chronically and terminally ill patients, post | |
| | operative patients | |
| | Bioenergetics: Energy rich compounds, Respiratory chain and | |

| | Biological oxic | lation. | | | | | |
|----|---|-----------------|-------------|-----|--------|----------|----|
| IV | Carbohydrate | Metabolism: | Glycolysis, | TCA | cycle, | Glycogen | 16 |
| | metabolism, Gluconeogenesis, Maintenance of Blood Glucose. Diabetes | | | | | | |
| | Mellitus and its | s complications | | | | | |

| Author(s) | Title of the Book | Publisher/Year |
|----------------------------|---|---|
| Lehninger | Principles of Biochemistry | W.H. Freeman & Company, |
| | | New York |
| Berg, J.M., Tymoczko, | Biochemistry | W.H. Freeman & Company, |
| J.L. and Stryer L | | New York |
| Voet, D.J., Voet, J.G. and | Principles of Biochemistry | John Wiley & Sons, New |
| Pratt, C.W | | York |
| Murray, R.K., Granner, | Harper's Biochemistry | Lange Medical |
| D.K., Mayes and P.A., | | Books/McGraw Hill |
| Rodwell, V.W | | |
| | | |
| | Author(s) Lehninger Berg, J.M., Tymoczko, J.L. and Stryer L Voet, D.J., Voet, J.G. and Pratt, C.W Murray, R.K., Granner, D.K., Mayes and P.A., Rodwell, V.W | Author(s)Title of the BookLehningerPrinciples of BiochemistryBerg, J.M., Tymoczko, J.L. and Stryer LBiochemistryVoet, D.J., Voet, J.G. and Principles of BiochemistryPratt, C.WPrinciples of BiochemistryMurray, R.K., Granner, D.K., Mayes and P.A., Rodwell, V.WHarper's Biochemistry |

| I.K. GUJRAL PUNJAB TECHNICAL UNIVERSITY | | | | | | |
|---|------|---|-----|-----------|--|--|
| Course Name | Bach | Bachelor of Optometry | | | | |
| Subject Code: | BOP | T 104-2 | 1 | | | |
| Subject Title: | Basi | Basics of Anatomy-I Practical | | | | |
| Contact Hours: | L:0 | T:0 | P:4 | Credits:2 | | |
| Examination | 3 | | | | | |
| Duration (hours) | | | | | | |
| Objective(s): | To 1 | To make the students learn practical aspects of Human Anatomy | | | | |

| Sr. | Contents | Contact | | | | | |
|-----|---|---------|--|--|--|--|--|
| No. | | Hours | | | | | |
| Ι | Histology: • Epithelium: Simple (squamous, cuboidal, columnar, ciliated), | | | | | | |
| | Stratified, Transitional • Bone, muscles (skeletal, smooth, cardiac) • | | | | | | |
| | Cartilage (hyaline, elastic, fibro cartilage). • Connective Tissue (loose and | | | | | | |
| | dense). • Arteries (large & medium sized), Veins. | | | | | | |
| | • Demonstration of various parts of Eye | | | | | | |
| | • Demonstration of tissues of body | | | | | | |
| | • Demonstration of parts of digestive system | | | | | | |
| | • Demonstration of parts of Nervous system : Brain & Spinal Cord | | | | | | |
| | • Demonstration of parts of respiratory system | | | | | | |
| | • Demonstration of various parts of circulatory system (Demonstration | | | | | | |
| | from models) | | | | | | |
| | • Demonstration of structural differences between skeletal, smooth | | | | | | |
| | and cardiac muscles (permanent mounts) | | | | | | |
| | • Demonstration of various bones and joints | | | | | | |
| | • To study circulatory system from charts and transverse section (TS) | | | | | | |
| | of artery and vein from permanent slides. | | | | | | |
| | • To study digestive system from charts and TS of liver, spleen and | | | | | | |
| | pancreas from permanent slides. | | | | | | |
| | • To study various body fluids. | | | | | | |
| | Note: Demonstrations can be done with the help of models, charts and | | | | | | |
| | histological slides | | | | | | |

| S. No. | Author(s) | Title of the Book | Publisher/Year |
|--------|---|---|------------------------------------|
| 1 | Ross & Wilson Anatomy and Physiology | Anne Waugh, Allison Grant | Churchill Livingstone |
| 2 | Principles of Anatomy & Physiology | Tortora & Bryan | WILEY |
| 3 | Kathleen J.W. Wilson | Anatomy and Physiology in Health and Illness | Churchill Livingstone, New York |
| 4 | Arthur C, Guyton and John.E | Text book of Medical Physiology | Hall. Miamisburg, OH, U.S.A |

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|---|------|--|-----|-----------|--|--|
| Course Name | Bach | Bachelor of Optometry | | | | |
| Subject Code: | BOP | T 105-2 | 1 | | | |
| Subject Title: | Basi | Basics of Physiology-I Practical | | | | |
| Contact Hours: | L:0 | T:0 | P:4 | Credits:2 | | |
| Examination | 3 | | | | | |
| Duration (hours) | | | | | | |
| Objective(s): | To 1 | To make the students learn practical aspects of Human Physiology | | | | |

| Sr. | Contents | Contact |
|-----|--|---------|
| No. | | Hours |
| Ι | Examination of blood film for various blood cells from stained slides. Blood | |
| | pressure estimation | |
| | Estimation of Hemoglobin Concentration | |
| | - Determination of Bleeding Time and Clotting Time | |
| | - Determination of Blood Groups | |
| | - Recording of normal Blood Pressure | |
| | - Clinical Examination of Arterial Pulse | |
| | - Determination of Vital Capacity | |

| S. No. | Author(s) | Title of the Book | Publisher/Year |
|--------|---|---|------------------------------------|
| 1 | Ross & Wilson Anatomy and Physiology | Anne Waugh, Allison Grant | Churchill Livingstone |
| 2 | Principles of Anatomy & Physiology | Tortora & Bryan | WILEY |
| 3 | Kathleen J.W. Wilson | Anatomy and Physiology in Health and Illness | Churchill Livingstone, New York |
| 4 | Arthur C, Guyton and John.E | Text book of Medical Physiology | Hall. Miamisburg, OH, U.S.A |

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|---|------|------------------------------------|----------|---|--|--|
| Course Name | Bach | elor of C | Optometr | у | | |
| Subject Code: | BOP | T 106-2 | 1 | | | |
| Subject Title: | Basi | Basics of Biochemistry-I Practical | | | | |
| Contact Hours: | L:0 | T:0 | P:4 | Credits:2 | | |
| Examination | 3 | | | | | |
| Duration (hours) | | | | | | |
| Objective(s): | To r | nake the | students | learn practical aspects of Biochemistry | | |

| Sr. | Conten | its | | | | | | | |
|-----|---------|---|--|--|--|--|--|--|--|
| No. | | | | | | | | | |
| Ι | 1. | Safety measures in laboratories. | | | | | | | |
| | 2. | Preparation of normal and molar solutions. | | | | | | | |
| | 3. | Preparation of buffers. | | | | | | | |
| | 4. | Determination of pKa of acetic acid and glycine. | | | | | | | |
| | 5. | 5. Qualitative tests for carbohydrates, lipids, amino acids, proteins and | | | | | | | |
| | nucleic | e acids. | | | | | | | |
| | 6. | Separation of amino acids/ sugars/ bases by thin layer | | | | | | | |
| | chroma | atography. | | | | | | | |
| | 7. | Estimation of vitamin C. | | | | | | | |
| | | | | | | | | | |

| S.No. | Author(s) | Title of the Book | Publisher/Year |
|-------|----------------------------|----------------------------|----------------------------|
| 1 | D. Shaheen | Physical Biochemistry | Wiley Blackwell Publishers |
| 2 | T. G. Coopers | The Tools of Biochemistry | Wiley India Pvt. Ltd. |
| 3 | Voet, D.J., Voet, J.G. and | Principles of Biochemistry | John Wiley & Sons, New |
| | Pratt, C.W | | York |
| 4 | Murray, R.K., Granner, | Harper's Biochemistry | Lange Medical |
| | D.K., Mayes and P.A., | | Books/McGraw Hill |
| | Rodwell, V.W | | |
| | | | |

| I.K. GUJRAL PUN. | I.K. GUJRAL PUNJAB TECHNICAL UNIVERSITY | | | | | |
|------------------|---|-----------------------|-----|-----------|--|--|
| Course Name | Bach | Bachelor of Optometry | | | | |
| Subject Code: | BTH | IU103-18 | 8 | | | |
| Subject Title: | Engl | English | | | | |
| Contact Hours: | L:3 | T:0 | P:0 | Credits:3 | | |
| Examination | 3 | | | | | |
| Duration (hours) | | | | | | |
| Objective(s): | To learn effective communication both oral & written. | | | | | |

| Unit | Contents | Contact |
|------|---|---------|
| | | Hours |
| Ι | Theory of Communication | 4 |
| | Types and modes of Communication | |
| II | Language of Communication | 6 |
| | Verbal and Non-verbal (Spoken & verbal), Personal, Social and | |
| | Business | |
| | Barriers and Strategies, Intra-personal, Inter-personal and Group | |
| | communication | |
| III | Reading and Understanding | 10 |
| | Close Reading, Comprehension, Summary Paraphrasing, Analysis and | |
| | Interpretation, Translation(from Hindi/Punjabi to English and vice- | |
| | versa), Literary/Knowledge Texts | |
| IV | Documenting, Report Writing, Making Notes, Letter Writing | 10 |

- 1. Fluency in English Part II, Oxford University Press, 2006.
- 2. Business English, Pearson, 2008.
- 3. Language, Literature and Creativity, Orient Blackswan, 2013.
- 4. Language through Literature (forthcoming) ed. Dr. Gauri Mishra, Dr Ranjana Kaul, Dr Brati Biswas
- 5. On Writing Well. William Zinsser. Harper Resource Book. 2001
- 6. Study Writing. Liz Hamp-Lyons and Ben Heasly. Cambridge University Press. 2006.

| I.K. GUJRAL PUNJAB TECHNICAL UNIVERSITY | | | | | | |
|---|---|-----------------------|-----|-----------|--|--|
| Course Name | Bach | Bachelor of Optometry | | | | |
| Subject Code: | BTH | U104-18 | 3 | | | |
| Subject Title: | Engl | English Practical | | | | |
| Contact Hours: | L:0 | T:0 | P:2 | Credits:1 | | |
| Examination | 3 | | | | | |
| Duration (hours) | | | | | | |
| Objective(s): | To learn effective communication both oral & written. | | | | | |

| Sr. | Contents |
|-----|---|
| No. | |
| Ι | Interactive practice sessions in Language Lab on Oral Communication |
| | Listening Comprehension |
| | Self-Introduction, Group Discussion and Role Play |
| | Common Everyday Situations: Conversations and Dialogues |
| | Communication at Workplace |
| | Interviews |
| | Formal Presentations, Effective Communication/ Mis-communication |
| | Public Speaking |
| | |

- 1. Fluency in English Part II, Oxford University Press, 2006.
- 2. Business English, Pearson, 2008.
- 3. Practical English Usage. Michael Swan. OUP. 1995.
- 4. Communication Skills. Sanjay Kumar and Pushp Lata. Oxford University Press.

2011.

5. Exercises in Spoken English. Parts. I-III. CIEFL, Hyderabad. Oxford University Press

| I.K. GUJRAL PUNJ | IAB T | ECHNIC | CAL UNI | VERSITY | |
|------------------|-------|---|---------|-----------|--|
| Course Name | Bach | Bachelor of Optometry | | | |
| Subject Code: | HVP | PE-101-1 | 8 | | |
| Subject Title: | Hum | Human Values, De-addiction & Traffic Rules | | | |
| Contact Hours: | L:3 | T:0 | P:0 | Credits:3 | |
| Examination | 3 | | | | |
| Duration (hours) | | | | | |
| Objective(s): | To d | To develop a sense of social responsibility, traffic rules and about menace | | | |
| | of dr | of drugs. | | | |

| Unit | Contents | Contact |
|------|--|---------|
| | | Hours |
| Ι | Course Introduction - Need, Basic Guidelines, Content and Process for | 6 |
| | Value Education | |
| | Understanding the need, basic guidelines, content and process for Value | |
| | Education | |
| | Self-Exploration-what is it? - its content and process; 'Natural | |
| | Acceptance' and Experiential Validation-as the mechanism for self- | |
| | exploration | |
| | Continuous Happiness and Prosperity- A look at basic Human Aspirations | |
| | Right understanding, Relationship and Physical Facilities- the basic | |
| | requirements for fulfilment of aspirations of every human being with their | |
| | correct priority | |
| | Understanding Happiness and Prosperity correctly- A critical appraisal of | |
| | the current scenario | |
| | Method to fulfil the above human aspirations: understanding and living in | |
| | harmony at various levels | |
| | | |
| II | Understanding Harmony in the Human Being – Harmony in Myself! | 6 |
| | Understanding human being as a co-existence of the sentient 'I' and the | |
| | material 'Body' | |
| | Understanding the needs of Self ('I') and 'Body' – Sukh and Suvidha | |
| | Understanding the Body as an instrument of 'I' (I being the doer, seer and | |
| | enjoyer) | |
| | Understanding the characteristics and activities of 'I' and harmony in 'I' | |

| | Understanding the harmony of I with the Body: Sanyam and Swasthya; | |
|-----|--|---|
| | correct appraisal of Physical needs, meaning of Prosperity in detail | |
| | Programs to ensure Sanyam and Swasthya | |
| | Practice Exercises and Case Studies will be taken up in Practice Sessions. | |
| III | Understanding Harmony in the Family and Society- Harmony in Human- | 6 |
| | Human Relationship | |
| | Understanding harmony in the Family- the basic unit of human interaction | |
| | Understanding values in human-human relationship; meaning of Nyaya | |
| | and program for its 22ulfilment to ensure Ubhay-tripti; | |
| | Trust (Vishwas) and Respect (Samman) as the foundational values of | |
| | relationship | |
| | Understanding the meaning of Vishwas; Difference between intention and | |
| | competence | |
| | Understanding the meaning of Samman, Difference between respect and | |
| | differentiation; the other salient values in relationship | |
| | Understanding the harmony in the society (society being an extension of | |
| | family): Samadhan, Samridhi, Abhay, Sah-astitva as comprehensive | |
| | Human Goals | |
| | Visualizing a universal harmonious order in society- Undivided Society | |
| | (AkhandSamaj), Universal Order (SarvabhaumVyawastha)- from family | |
| | to world family! | |
| | Practice Exercises and Case Studies will be taken up in Practice Sessions | |
| IV | Understanding Harmony in the Nature and Existence – Whole existence | 4 |
| | as Co-existence | |
| | Understanding the harmony in the Nature | |
| | Interconnectedness and mutual 22ulfilment among the four orders of | |
| | nature- recyclability and self-regulation in nature | |
| | Understanding Existence as Co-existence (Sah-astitva) of mutually | |
| | interacting units in all-pervasive space | |
| | Holistic perception of harmony at all levels of existence | |
| | Practice Exercises and Case Studies will be taken up in Practice Sessions. | |
| V | Implications of the above Holistic Understanding of Harmony on | 6 |
| | Professional | |
| | Natural acceptance of human values | |
| | Definitiveness of Ethical Human Conduct | |
| | Basis for Humanistic Education, Humanistic Constitution and Humanistic | |

Universal OrderCompetence in professional ethics:Ability to utilize the professional competence for augmenting universalhuman order,Ability to identify the scope and characteristics of people-friendlyand eco-friendly production systems,Ability to identify and develop appropriate technologies and managementpatterns for above production systems.Case studies of typical holistic technologies, management models andproduction systemsStrategy for transition from the present state to Universal Human Order:At the level of individual: as socially and ecologically responsibleengineers, technologists and managersb) At the level of society: as mutually enriching institutions andorganizations

Reference Books

Text Book

R R Gaur, R Sangal, G P Bagaria, 2009, A Foundation Course in Value Education.

Reference Books

 Ivan Illich, 1974, Energy & Equity, The Trinity Press, Worcester, and HarperCollins, USA
 E.F. Schumacher, 1973, Small is Beautiful: a study of economics as if people mattered, Blond & Briggs, Britain.

- 3. A Nagraj, 1998, Jeevan Vidya ek Parichay, Divya Path Sansthan, Amarkantak.
- 4. Sussan George, 1976, How the Other Half Dies, Penguin Press. Reprinted 1986, 1991
- 5. PL Dhar, RR Gaur, 1990, Science and Humanism, Commonwealth Purblishers.
- 6. A.N. Tripathy, 2003, Human Values, New Age International Publishers.

7. Subhas Palekar, 2000, How to practice Natural Farming, Pracheen(Vaidik) Krishi Tantra Shodh, Amravati.

8. Donella H. Meadows, Dennis L. Meadows, Jorgen Randers, William W. Behrens III, 1972, Limits to Growth– Club of Rome's report, Universe Books.

9. E G Seebauer & Robert L. Berry, 2000, Fundamentals of Ethics for Scientists & Engineers , Oxford University Press

10. M Govindrajran, S Natrajan & V.S. Senthil Kumar, Engineering Ethics (including Human Values), Eastern Economy Edition, Prentice Hall of India Ltd.

11. B P Banerjee, 2005, Foundations of Ethics and Management, Excel Books.

12.B L Bajpai, 2004, Indian Ethos and Modern Management, New Royal Book Co., Lucknow. Reprinted 2008.

Relevant CDs, Movies, Documentaries & Other Literature:

- 1. Value Education website, <u>http://uhv.ac.in</u>
- 2. Story of Stuff, <u>http://www.storyofstuff.com</u>
- 3. Al Gore, An Inconvenient Truth, Paramount Classics, USA
- 4. Charlie Chaplin, Modern Times, United Artists, USA
- 5. IIT Delhi, Modern Technology the Untold Story

| I.K. GUJRAL PUNJAB TECHNICAL UNIVERSITY | | | | | |
|---|---|--|----------|-----------|--|
| Course Name | Bach | elor of C | Optometr | у | |
| Subject Code: | HVP | E102-18 | } | | |
| Subject Title: | Hum | Human Values, De-addiction & Traffic Rules Lab/Seminar | | | |
| Contact Hours: | L:0 | T:0 | P:2 | Credits:1 | |
| Examination | 3 | | | | |
| Duration (hours) | | | | | |
| Objective(s): | To develop a sense of social responsibility, traffic rules and about menace | | | | |
| | of dr | of drugs. | | | |

| Sr. | Contents |
|-----|--|
| No. | |
| Ι | One each seminar will be organized on Drug De-addiction and Traffic |
| | Rules. Eminent scholar and experts of the subject will be called for the |
| | Seminar atleast once during the semester. It will be binding for all the |
| | students to attend the seminar |

| I.K. GUJRAL PUNJAB TECHNICAL UNIVERSITY | | | | | | |
|---|---|--------------------------------------|-----|-----------|--|--|
| Course Name | Bach | Bachelor of Optometry | | | | |
| Subject Code: | BMF | BMPD 105-18 | | | | |
| Subject Title: | Men | Mentoring & Professional Development | | | | |
| Contact Hours: | L:0 | T:0 | P:2 | Credits:1 | | |
| Examination | 3 | | | | | |
| Duration (hours) | | | | | | |
| Objective(s): | To learn the life long learning skills. | | | | | |

| Sr. | Contents | | | | | | | |
|-----|--|--|--|--|--|--|--|--|
| No. | | | | | | | | |
| Ι | Part-A (Class Activities) | | | | | | | |
| | 1. Expert and video lectures | | | | | | | |
| | 2. Aptitude Test | | | | | | | |
| | 3. Group Discussion | | | | | | | |
| | 4. Quiz (General/Technical) | | | | | | | |
| | 5. Presentations by the students | | | | | | | |
| | 6. Team building Exercises | | | | | | | |
| | 7* A part of above six points practicals on Fundamentals of Computers are also | | | | | | | |
| | added as per Annexure-I | | | | | | | |
| II | Part-B (Outdoor Activities) | | | | | | | |
| | 1. Sports/NSS/NCC | | | | | | | |
| | 2. Society Activities of various students chapter i.e. ISTE, SCIE, SAE, CSI, | | | | | | | |
| | Cultural Club, etc. | | | | | | | |
| | | | | | | | | |

Evaluation shall be based on rubrics for Part – A & B

Mentors/Faculty incharges shall maintain proper record student wise of each activity conducted and the same shall be submitted to the department.

SEMESTER-II

| I.K. GUJRAL PUNJAB TECHNICAL UNIVERSITY | | | | | | |
|---|--|-----------------------|-----|-----------|--|--|
| Course Name | Bach | Bachelor of Optometry | | | | |
| Subject Code: | BOP | BOPT 201-21 | | | | |
| Subject Title: | Basi | Basics of Anatomy-II | | | | |
| Contact Hours: | L:3 | T:1 | P:0 | Credits:4 | | |
| Examination | 3 | | | | | |
| Duration (hours) | | | | | | |
| Objective(s): | To teach the fundamental concepts of Human Anatomy | | | | | |

Details of the Course (Human Anatomy)

| Ι | Introduction: Ocular Muscles, Visual Pathways, Sympathetic & Para- | |
|-----|---|--|
| | sympathetic nervous system, Vascular supply of eye, Lacrimal apparatus, | |
| | , Aqueous Humor, Vitreous Humor. | |
| II | Excretory System: Morphology and Anatomy of Human Kidney, Ureters, | |
| | Urinary Bladder, Urethra. Structure of Nephron: Bowman's Capsule, | |
| | Proximal Convoluted Tubule, Distal Convoluted Tubule, Collecting | |
| | Tubule, Loop of Henle, Collecting Duct. | |
| III | Nervous System: Spinal Cord and Cranial Nerves, Sympathetic and Para- | |
| | sympathetic Nervous System. Reflex Action and its types, Reflex Arc. | |
| | Sensory Organs: Morphology and Anatomy of Ear, Tongue and Skin and | |
| | their receptors. | |
| | | |

| S. No. | Author(s) | Title of the Book | Publisher/Year |
|--------|-------------------------|---------------------------|----------------------------|
| 1 | Ross & Wilson Anatomy | Anne Waugh, Allison Grant | Churchill Livingstone |
| | and Physiology | | |
| 2 | Principles of Anatomy & | Tortora & Bryan | WILEY |
| | Physiology | | |
| 3 | Kathleen J.W. Wilson | Anatomy and Physiology in | Churchill Livingstone, New |
| | | Health and Illness | York |
| 4 | Arthur C, Guyton and | Text book of Medical | Hall. Miamisburg, OH, |
| | John.E | Physiology | U.S.A |

| I.K. GUJRAL PUNJAB TECHNICAL UNIVERSITY | | | | | | |
|---|-------|---|-----|-----------|--|--|
| Course Name | Bach | Bachelor of Optometry | | | | |
| Subject Code: | BOP | BOPT 202-21 | | | | |
| Subject Title: | Basi | Basics of Physiology-II | | | | |
| Contact Hours: | L:3 | T:1 | P:0 | Credits:4 | | |
| Examination | 3 | | | | | |
| Duration (hours) | | | | | | |
| Objective(s): | To te | To teach the fundamental concepts of Human Physiology | | | | |

Details of the Course (Human Physiology)

| Unit | Contents | Contact |
|------|---|---------|
| | | Hours |
| Ι | Ocular Physiology: Introduction of General Physiology of the eye, | 10 |
| | Extrinsic eye muscles and their actions (Ocular movements), Vision and | |
| | its general aspects, Pigments of eye and its photochemistry, | |
| | Electrophysiology of the eye, Visual acuity, Vernier acuity and its | |
| | measurement, Visual Perception: Binocular vision, Stereoscopic vision, | |
| | Scotopic and Photopic vision. Colour vision, Colour defects and Colour | |
| | mixing. Mechanism of Accommodation. | |
| II | Excretory System: Physiological functions of Kidneys and | 10 |
| | Osmoregulation. Mechanism of Urine formation, Counter-current | |
| | mechanism, Urea Cycle, Various types of Kidney disorders. Kidney | |
| | failure and its causes. Haemodialysis. | |
| III | Nervous System: Functions of Spinal cord and Cranial nerves. Reflex | 12 |
| | action and its mechanism, Conditioned and Unconditioned Reflex action, | |
| | Reflex arc. Mechanism of Nerve impulse generation and its transmission. | |
| | Transmission of Nerve Impulsa along the nerve fibre and at Synapse. The | |
| | physiology of various receptors in tongue, nose and skin. Mechanism of | |
| | hearing in ear. | |
| IV | Endocrine System: Hormones and its types, Mechanism of Hormone | 8 |
| | action, Various hormones secreted by endocrine glands and their | |
| | functions, Disorders of Endocrine Glands. | |

| S.No. | Author(s) | Title of the Book | Publisher/Year |
|-------|---|---|------------------------------------|
| 1 | Ross & Wilson Anatomy and Physiology | Anne Waugh, Allison Grant | Churchill Livingstone |
| 2 | Principles of Anatomy & Physiology | Tortora & Bryan | WILEY |
| 3 | Kathleen J.W. Wilson | Anatomy and Physiology in Health and Illness | Churchill Livingstone, New York |
| 4 | Arthur C,Guyton and John.E | Text book of Medical Physiology | Hall. Miamisburg, OH, U.S.A |

| r | | | | | | |
|---|---|---------------------------|-----|-----------|--|--|
| I.K. GUJRAL PUNJAB TECHNICAL UNIVERSITY | | | | | | |
| Course Name | Bach | Bachelor of Optometry | | | | |
| Subject Code: | BOP | BOPT 203-21 | | | | |
| Subject Title: | Basi | Basics of Biochemistry-II | | | | |
| Contact Hours: | L:3 | T:1 | P:0 | Credits:4 | | |
| Examination | 3 | | | | | |
| Duration (hours) | | | | | | |
| Objective(s): | To teach the fundamental concepts of cell biology & biochemistry. | | | | | |

| Unit | Contents | Contact |
|------|--|---------|
| | | Hours |
| Ι | Nucleic Acids & its metabolism: Nucleosides, Nucleotides, Purines, | 8 |
| | Pyrimidines, Structure of DNA & its types (A, B & Z DNA's), RNA & | |
| | its types, Metabolism of Purines & Pyrimidines and their disorders. | |
| II | Metabolism of Fatty Acids: Digestion, absorption of lipids. | 10 |
| | Chylomicrons, Oxidation of Fatty Acids. Disorders of Fat metabolism, | |
| | Fatty Liver & its causes. Ketosis & its salient features, causes and | |
| | diagnosis of Ketosis. Lipoproteins, classification & types of | |
| | Lipoproteins, LDL & HDL, their functions & clinical applications. | |
| | Hyperlipidemias and Cardiovascular Diseases. | |
| III | Metabolism of Amino Acids: Formation of ammonia, Transamination, | 8 |
| | Biological significance & clinical significance of Transamination. | |
| | Transdeamination: oxidative & non-oxidative deamination, Urea Cycle, | |
| | disorders of urea cycle. | |
| IV | Clinical Biochemistry: Water and Electrolyte, Fluid compartment, daily | 12 |
| | intake and output sodium and potassium balance | |
| | Hormones: Actions of Hormone Insulin, Glucagon, Thyroid and | |
| | Parathyroid hormones, Cortical hormones. | |
| | Acid Base Balance , role of lungs and kidneys,- Regulation of blood | |
| | pH, acidosis, Alkalosis, | |
| | Physical Chemistry: Osmosis, Dialysis, Donann membrane equilibirium | |
| | Liver, Gastric, Pancreatic and Kidney functions tests. | |

| S.No. | Author(s) | Title of the Book | Publisher/Year |
|-------|----------------------------|----------------------------|-------------------------|
| 1 | Lehninger | Principles of Biochemistry | W.H. Freeman & Company, |
| | | | New York |
| 2 | Berg, J.M., Tymoczko, | Biochemistry | W.H. Freeman & Company, |
| | J.L. and Stryer L | | New York |
| | | | |
| 3 | Voet, D.J., Voet, J.G. and | Principles of Biochemistry | John Wiley & Sons, New |
| | Pratt, C.W | | York |
| 4 | Murray, R.K., Granner, | Harper's Biochemistry | Lange Medical |
| | D.K., Mayes and P.A., | | Books/McGraw Hill |
| | Rodwell, V.W | | |
| | | | |

| I.K. GUJRAL PUNJAB TECHNICAL UNIVERSITY | | | | | | |
|---|------|---|-----|-----------|--|--|
| Course Name | Bach | Bachelor of Optometry | | | | |
| Subject Code: | BOP | BOPT 204-21 | | | | |
| Subject Title: | Basi | Basics of Anatomy-II Practical | | | | |
| Contact Hours: | L:0 | T:0 | P:4 | Credits:2 | | |
| Examination | 3 | | | | | |
| Duration (hours) | | | | | | |
| Objective(s): | To r | To make the students learn practical aspects of Human Anatomy | | | | |

| Sr. | Contents | Contact | | | | | | |
|-----|--|---------|--|--|--|--|--|--|
| No. | | Hours | | | | | | |
| Ι | • Study the Cross Section of Human Eye using Eye model. | | | | | | | |
| | • Study of the Eye receptor Cells: Rods & Cones through charts. | | | | | | | |
| | • Demonstration of parts of Human Excretory System using model: | | | | | | | |
| | Kidneys, Ureter, Urethera. | | | | | | | |
| | • Study the Structure of Nephron. | | | | | | | |
| | • Demonstration of parts of Nervous system : Spinal Cord and Cranial | | | | | | | |
| | Nerves along with Sympathetic & Para-sympathetic Nervous System. | | | | | | | |
| | • Demonstration of Morphology & Anatomy of Ear, Skin and Tongue | | | | | | | |
| | using various models. | | | | | | | |
| | • Demonstration various Endocrine Glands using Charts and Models. | | | | | | | |
| | Note: Demonstrations can be done with the help of models, charts and | | | | | | | |
| | histological slides | | | | | | | |

| S.No. | Author(s) | Title of the Book | Publisher/Year |
|-------|-------------------------|---------------------------|----------------------------|
| 1 | Ross & Wilson Anatomy | Anne Waugh, Allison Grant | Churchill Livingstone |
| | and Physiology | | |
| 2 | Principles of Anatomy & | Tortora & Bryan | WILEY |
| | Physiology | | |
| 3 | Kathleen J.W. Wilson | Anatomy and Physiology in | Churchill Livingstone, New |
| | | Health and Illness | York |
| 4 | Arthur C, Guytonand | Text book of Medical | Hall. Miamisburg, OH, |
| | John.E | Physiology | U.S.A |
| | | | |

| I.K. GUJRAL PUNJAB TECHNICAL UNIVERSITY | | | | | | | |
|---|--|-----------------------------------|-----|-----------|--|--|--|
| Course Name | Bach | Bachelor of Optometry | | | | | |
| Subject Code: | BOP | BOPT 205-21 | | | | | |
| Subject Title: | Basi | Basics of Physiology-II Practical | | | | | |
| Contact Hours: | L:0 | T:0 | P:4 | Credits:2 | | | |
| Examination | 3 | | | | | | |
| Duration (hours) | | | | | | | |
| Objective(s): | To make the students learn practical aspects of Human Physiology | | | | | | |

| Sr. | Contents | Contact | | | | |
|-----|---|---------|--|--|--|--|
| No. | | Hours | | | | |
| Ι | • Determine the Field of Vision using Students Perimeter. | | | | | |
| | • Determine the Physiological Blind Spot by Mariotte's Experiment. | | | | | |
| | • Test the distant and close vision using Snellen's chart and Jaeger's | | | | | |
| | chart. | | | | | |
| | Determine the Color Vision using Ishihara's chart. | | | | | |
| | • Conduct the Rinne's test, Schwabach's test and Weber's test for | | | | | |
| | aring. | | | | | |
| | Determine the taste sensation using Strong solutions of sucrose (10 | | | | | |
| | %), sodium chloride (15 %) and weak solutions of acetic acid (1 %), and | | | | | |
| | quinine sulphate (0.1 %). | | | | | |
| | • Calculate the Effective filtration pressure from the given data. | | | | | |
| | • Calculate the Glomerulus Filtration Rate (GFR) using the given data. | | | | | |

| S.No. | Author(s) | Title of the Book | Publisher/Year |
|-------|---|---|------------------------------------|
| 1 | Ross & Wilson Anatomy and Physiology | Anne Waugh, Allison Grant | Churchill Livingstone |
| 2 | Principles of Anatomy & Physiology | Tortora & Bryan | WILEY |
| 3 | Kathleen J.W. Wilson | Anatomy and Physiology in Health and Illness | Churchill Livingstone, New York |
| 4 | Arthur C, Guytonand John.E | Text book of Medical Physiology | Hall. Miamisburg, OH, U.S.A |

| I.K. GUJRAL PUNJAB TECHNICAL UNIVERSITY | | | | | | | |
|---|--|-------------------------------------|-----|-----------|--|--|--|
| Course Name | Bach | Bachelor of Optometry | | | | | |
| Subject Code: | BOP | BOPT 206-21 | | | | | |
| Subject Title: | Basi | Basics of Biochemistry-II Practical | | | | | |
| Contact Hours: | L:0 | T:0 | P:4 | Credits:2 | | | |
| Examination | 3 | | | | | | |
| Duration (hours) | | | | | | | |
| Objective(s): | To make the students learn practical aspects of Biochemistry | | | | | | |

| Sr. | Conte | nts | | | | | | |
|-----|-------|--|--|--|--|--|--|--|
| No. | | | | | | | | |
| Ι | • | Kidney function tests | | | | | | |
| | • | Renal function tests | | | | | | |
| | • | Analysis of Normal Urine | | | | | | |
| | • | Composition of urine | | | | | | |
| | • | Procedure for routine screening | | | | | | |
| | • | Common renal disease | | | | | | |
| | • | Urinary calculus | | | | | | |
| | • | Urine examination for detection of abnormal constituents | | | | | | |
| | • | Sugar and Protein levels in Urine | | | | | | |

| S.No. | Author(s) | Title of the Book | Publisher/Year |
|-------|---|----------------------------|------------------------------------|
| 1 | D. Shaheen | Physical Biochemistry | Wiley Blackwell Publishers |
| 2 | T. G. Coopers | The Tools of Biochemistry | Wiley India Pvt. Ltd. |
| 3 | Voet, D.J., Voet, J.G. and Pratt, C.W | Principles of Biochemistry | John Wiley & Sons, New York |
| 4 | Murray, R.K., Granner, D.K., Mayes and P.A., Rodwell, V.W | Harper's Biochemistry | Lange Medical Books/McGraw Hill |

| I.K. GUJRAL PUNJAB TECHNICAL UNIVERSITY | | | | | | | |
|---|--|----------------------------|-----|-----------|--|--|--|
| Course Name | B.Sc | B.Sc. in Forensic Sciences | | | | | |
| Subject Code: | EVS | EVS202-18 | | | | | |
| Subject Title: | Envi | Environmental Studies | | | | | |
| Contact Hours: | L:3 | T:0 | P:0 | Credits:3 | | | |
| Examination | 3 | | | | | | |
| Duration (hours) | | | | | | | |
| Objective(s): | To learn the basics of Environmental issues. | | | | | | |

Details of Syllabus

| Unit | Contents | Contact |
|------|---|---------|
| | | Hours |
| Ι | Introduction to Environmental Studies Multidisciplinary nature of | 4 |
| | Environmental Studies: Scope & Importance Need for Public | |
| | Awareness | |
| | Ecosystems Concept of an Ecosystem: Structure & functions of an | |
| | ecosystem (Producers, Consumers & Decomposers) Energy Flow in an | |
| | ecosystem: Food Chain, Food web and Ecological Pyramids | |
| | Characteristic features, structure & functions of following Ecosystems: | |
| | • Forest Ecosystem • Aquatic Ecosystem (Ponds, Lakes, River & | |
| | Ocean) | |
| II | Natural Resources Renewable & Non-renewable resources Forest | 8 |
| | Resources: Their uses, functions & values (Biodiversity conservation, | |
| | role in climate change, medicines) & threats (Overexploitation, | |
| | Deforestation, Timber extraction, Agriculture Pressure), Forest | |
| | Conservation Act Water Resources: Their uses (Agriculture, Domestic | |
| | & Industrial), functions & values, Overexploitation and Pollution of | |
| | Ground & Surface water resources (Case study of Punjab), Water | |
| | Conservation, Rainwater Harvesting, Land Resources: Land as a | |
| | resource; Land degradation, soil erosion and desertification. | |
| | Energy Resources: Renewable & non-renewable energy resources, use | |
| | of alternate energy resources (Solar, Wind, Biomass, Thermal), Urban | |

| | problems related to Energy | |
|-----|---|----|
| | | |
| III | Biodiversity & its conservation Types of Biodiversity: Species, Genetic | 8 |
| | & Ecosystem India as a mega biodiversity nation, Biodiversity hot spots | |
| | and biogeographic regions of India Examples of Endangered & | |
| | Endemic species of India, Red data book | |
| | Environmental Pollution & Social Issues Types, Causes, Effects & | |
| | Control of Air, Water, Soil & Noise Pollution Nuclear hazards and | |
| | accidents & Health risks Global Climate Change: Global warming, | |
| | Ozone depletion, Acid rain, Melting of Glaciers & Ice caps, Rising sea | |
| | levels Environmental disasters: Earthquakes, Floods, Cyclones, | |
| | Landslides | |
| IV | Field Work Visit to a National Park, Biosphere Reserve, Wildlife | 16 |
| | Sanctuary Documentation & preparation of a Biodiversity (flora & | |
| | fauna) register of campus/river/forest Visit to a local polluted site : | |
| | Urban/Rural/Industrial/Agricultural Identification & Photography of | |
| | resident or migratory birds, insects (butterflies) Public hearing on | |
| | environmental issues in a village | |

1. Carson, R. 2002. Silent Spring. Houghton Mifflin Harcourt.

2. Gadgil, M., & Guha, R.1993. This Fissured Land: An Ecological History of India. Univ. of California Press.

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 Co. Pvt. Ltd.

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13. Rosencranz, A., Divan, S., & Noble, M. L. 2001. Environmental law and policy in India. Tripathi 1992.

Sengupta, R. 2003. Ecology and economics: An approach to sustainable development.
 OUP.

15. Singh, J.S., Singh, S.P. and Gupta, S.R. 2014. Ecology, Environmental Science and Conservation. S. Chand Publishing, New Delhi.

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17. Thapar, V. 1998. Land of the Tiger: A Natural History of the Indian Subcontinent.

18. Warren, C. E. 1971. Biology and Water Pollution Control. WB Saunders.

19. Wilson, E. O. 2006. The Creation: An appeal to save life on earth. New York: Norton.

20. World Commission on Environment and Development. 1987.Our Common Future. Oxford University Press.

| I.K. GUJRAL PUNJAB TECHNICAL UNIVERSITY | | | | | | | |
|---|-------|---|-----|-----------|--|--|--|
| Course Name | Bach | Bachelor of Optometry | | | | | |
| Subject Code: | BMF | BMPD 203-18 | | | | | |
| Subject Title: | Men | Mentoring & Professional Development | | | | | |
| Contact Hours: | L:0 | T:0 | P:2 | Credits:1 | | | |
| Examination | 3 | | | | | | |
| Duration (hours) | | | | | | | |
| Objective(s): | To le | To learn the life long learning skills. | | | | | |

| Sr. | Contents |
|-----|--|
| No. | |
| Ι | Part-A (Class Activities) |
| | 1. Expert and video lectures |
| | 2. Aptitude Test |
| | 3. Group Discussion |
| | 4. Quiz (General/Technical) |
| | 5. Presentations by the students |
| | 6. Team building Exercises |
| | 7* A part of above six points practicals on Fundamentals of Computers are also |
| | added as per Annexure-I |
| II | Part-B (Outdoor Activities) |
| | 1. Sports/NSS/NCC |
| | 2. Society Activities of various students chapter i.e. ISTE, SCIE, SAE, CSI, |
| | Cultural Club, etc. |

Evaluation shall be based on rubrics for Part – A & B

Mentors/Faculty incharges shall maintain proper record student wise of each activity conducted and the same shall be submitted to the department.

Study Scheme & Syllabus of

Bachelor of Optometry

(Semester III & IV)

Batch 2021 Onwards

By

Board of Studies

I K GUJRAL PUNJAB TECHNICAL UNIVERSITY KAPURTHALA

IK Gujral Punjab Technical University

VISION

To be an institution of excellence in the domain of higher technical education that serves as the fountainhead for nurturing the future leaders of technology and techno- innovation responsible for the techno-economic, social, cultural and environmental prosperity of the people of the State of Punjab, the Nation and the World.

MISSION

To provide seamless education through the pioneering use of technology, in partnership with industry and society with a view to promote research, discovery and entrepreneurship and to prepare its students to be responsible citizens of the world and the leaders of technology and techno-innovation of the 21st Century by developing in them the desirable knowledge, skill and attitudes base for the world of work and by instilling in them a culture for seamlessness in all facets of life.

OBJECTIVES

To offer globally-relevant, industry-linked, research-focused, technology- enabled seamless education at the graduate, postgraduate and research levels in various areas of engineering & technology and applied sciences keeping in mind that the manpower so spawned is excellent in quality, is relevant to the global technological needs, is motivated to give its best and is committed to the growth of the Nation;

To foster the creation of new and relevant technologies and to transfer them to industry for effective utilization;

To participate in the planning and solving of engineering and managerial problems of relevance to global industry and to society at large by conducting basic and applied research in the areas of technologies. To develop and conduct continuing education programmes for practicing engineers and managers with a view to update their fundamental knowledge base and problem-solving capabilities in the various areas of core competence of the University;

To develop strong collaborative and cooperative links with private and public sector industries and government user departments through various avenues such as undertaking of consultancy projects, conducting of collaborative applied research projects, manpower development programmes in cutting-edge areas of technology, etc;

To develop comprehensive linkages with premier academic and research institutions within the country and abroad for mutual benefit;

To provide leadership in laboratory planning and in the development of instructional resource material in the conventional as well as in the audio- visual, the video and computer-based modes;

To develop programmes for faculty growth and development both for its own faculty as well as for the faculty of other engineering and technology institutions;

To anticipate the global technological needs and to plan and prepare to cater to them;

To interact and participate with the community/society at large with a view to inculcate in them a feel for scientific and technological thought and endeavour; and

To actively participate in the technological development of the State of Punjab through the undertaking of community development programmes including training and education programmes catering to the needs of the unorganized sector as well as that of the economically and socially weaker sections of society.

ACADEMIC PHILOSOPHY

The philosophy of the education to be imparted at the University is to awaken the "deepest **potential**" of its students as holistic human beings by nurturing qualities of self-confidence, courage, integrity, maturity, versatility of mind as well as a capacity to face the challenges of tomorrow so as to enable them to serve humanity and its highest values in the best possible way.

TITLE OF THE PROGRAM: B.Sc. OPTOMETRY

YEAR OF IMPLEMENTATION: New Syllabus will be implemented from June 2021 onwards.

DURATION: The course shall be four years, with semester system (6 semesters academic, with two semester's clinical posting). The Choice based credit system will be applicable to all the semesters.

ELGIBILITY FOR ADMISSION: Candidates with 50% marks (5% relaxation for SC/ST) in aggregate in 10+2 with Medical (Physics, Chemistry & Biology)/ Diploma in Optometry with minimum aggregate of 50% marks.

MEDIUM OF INSTRUCTION: English.

SCHEME OF THE PROGRAM:

| Sr. No. | Course Code | Course Type | Course Title | L-T-P* | Credi ts | Marks D | Distribution | Marks |
|------------|----------------|--------------------|-------------------------|--------|-------------|------------------|------------------|-------|
| | | | | | | Internal | External | |
| 1. | BOPT- | Core Theory | Ocular Microbiology | 3-1-0 | 4 | 40 | 60 | 100 |
| | 301-21 | Cole Theory | Ocular Microbiology | | | | | |
| 2. | BOPT- | | Viewel entire T | 3-1-0 | 4 | 40 | 60 | 100 |
| | 302-21 | Core Theory | visual oplics –1 | | | | | |
| 3. | BOPT- | | Onton atria antian I | 3-1-0 | 4 | 40 | 60 | 100 |
| | 303-21 | Core Theory | Optometric optics-1 | | | | | |
| 4. | BOPT- | Core Theory | Optometric | 3-1-0 | 4 | 40 | 60 | 100 |
| | 304-21 | | Instruments | | | | | |
| 5. | BOPT- | Core Theory | Onder Disease I | 3-1-0 | 4 | 40 | 60 | 100 |
| | 305-21 | | Ocular Disease –I | | | | | |
| 6. | BOPT- | Core Theory | Clinical examination of | 3-1-0 | 4 | 40 | 60 | 100 |
| | 306-21 | | visual system | | | | | |
| 7 | | Core Theory | Indian Medicine and | 3-0-0 | 3 | 40 | 60 | 100 |
| <i>,.</i> | 307-21 | core meory | | 500 | | | | 100 |
| 8 | | | Telemedicine | 0-0-6 | 3 | 60 | 40 | 100 |
| 0. | 208-21 | Core Practical/Lab | Clinical Optometry-I | 0.0-0 | 5 | 00 | 70 | 100 |
| | 300-21 | Total | | 2166 | 30 | 340 | 460 | 800 |
| | | 10141 | | 21-0-0 | 50 | J 4 0 | -00 - | 000 |

Semester-III

| Sr. No. | Course Code | Course Type | Course Title | L-T-P* | Credi ts | Marks D | Marks Distribution | |
|------------|-----------------|--------------------|---|---------|-------------|----------|--------------------|-----|
| | | | | | | Internal | External | |
| 1. | BOPT- 401-21 | Core Theory | Optometric optics – II & Dispensing Optics | 3-1-0 | 4 | 40 | 60 | 100 |
| 2. | BOPT- 402-21 | Core Theory | Visual Optics- II | 3-1-0 | 4 | 40 | 60 | 100 |
| 3. | BOPT- 403-21 | Core Theory | Ocular Disease –II and glaucoma | 3-1-0 | 4 | 40 | 60 | 100 |
| 4. | BOPT- 404-21 | Core Theory | Pathology | 3-1-0 | 4 | 40 | 60 | 100 |
| 5. | BOPT- 405-21 | Core Theory | Basic and Ocular Pharmacology | 3-1-0 | 4 | 40 | 60 | 100 |
| 6. | BOPT- 406-21 | Core Theory | Introduction to Quality & Patient safety | 3-0-0 | 3 | 40 | 60 | 100 |
| 7. | BOPT- 407-21 | Core Practical/Lab | Clinical optometry-II | 0-0-6 | 3 | 60 | 40 | 100 |
| | | Total | | 12-3-14 | 22 | 300 | 400 | 700 |

Semester-IV

| | THEORY | | | | | | | |
|-------|------------|----------------------|-------|-------|--|--|--|--|
| S.No. | | | Weig | htage | Remarks | | | |
| | | | in Ma | ırks | | | | |
| 1 | Internal | Mid-Semester | 30 | 20 | MSTs, Quizzes, | | | |
| | Evaluation | Examination | | | assignments, attendance, | | | |
| 2 | | Attendance | 5 | 5 | etc. Constitute internal evaluation Best of two | | | |
| 3 | | Assignments | 5 | 5 | mid-semester exams will | | | |
| | | | | | be considered for | | | |
| | | | | | evaluation | | | |
| 4 | External | End-Semester | 60 | 30 | Conduct and checking of | | | |
| | Evaluation | Examination | | | the answer sheets will be at | | | |
| | | | | | the university level. | | | |
| | Total | | 100 | 60 | | | | |
| F | PRACTICAL | | | | | | | |
| 1 | Internal | Daily evaluation of | 30 | 10 | | | | |
| | Evaluation | practical | | | | | | |
| | | performance/ record/ | | | | | | |
| | | viva voce | | | | | | |
| 2 | | Attendance | 5 | 5 | | | | |
| 3 | | Internal Practical | | 5 | | | | |
| | | Examination | 5 | | | | | |
| 4 | External | Final Practical | 40 | 20 | | | | |
| | Evaluation | Examination | | | | | | |
| | | Total | 80 | 40 | | | | |

EXAMINATION AND EVALUATION

PATTERN OF END-SEMESTER EXAMINATION

- J. Part A will be One Compulsory question consisting of short answer type questions [Q No. 1(a-h)] covering whole syllabus. There will be no choice in this question. It will be of 16 marks comprising of 8 questions of 2 marks each.
- JJ. Part B will be comprising of eight questions [2-9]. Student will have to attempt any six questions from this part. It will be of 24 marks with 6 questions of 4 marks each.
- JJJ. Part C will be comprising of two compulsory questions with internal choice in both these questions [10-11]. It will be of 20 marks with 2 questions of 10 marks each.

SYLLABUS OF THE PROGRAM

The syllabus has been upgraded as per provision of the UGC module and demand of the academic environment. The contents of the syllabus have been duly arranged unit wise and included in such a manner so that due importance is given to requisite intellectual and laboratory skills. The application part of the respective contents has been appropriately emphasized.

SEMESTER-III

| I.K. GUJRAL PUNJAB TECHNICAL UNIVERSITY | | | | | | | |
|---|-------|--|----------|---|--|--|--|
| Course Name | Bach | Bachelor of Optometry | | | | | |
| Subject Code: | BOP | T 301-2 | 1 | | | | |
| Subject Title: | Ocul | Ocular Microbiology | | | | | |
| Contact Hours: | L:3 | T:1 | P:0 | Credits:4 | | | |
| Examination | 3 | | | | | | |
| Duration (hours) | | | | | | | |
| Objective(s): | This | course | covers t | he basic biological, biochemical and pathogenic | | | |
| | chara | characteristics of pathogenic organisms. | | | | | |
| | | | | | | | |

| Unit-1 | Introduction to microbes and microscopes | 12 Hours | | | | | | |
|-------------|---|-----------------------|--|--|--|--|--|--|
| Chapter 1.1 | History of Microbiology and Microscopy | | | | | | | |
| | History of Microbiology and Microscopy- | | | | | | | |
| | Meaning, definition and history of Microbiology, | Importance and | | | | | | |
| | applications of Microbiology. | | | | | | | |
| Chapter 1.2 | Principles and mechanisms of different microscopy | | | | | | | |
| | Principles and mechanisms of different microscopy - | bright field, dark | | | | | | |
| | field, phase-contrast, fluorescent and electron microscopy (SEM and TEM). | | | | | | | |
| | Ocular and stage micrometers. Size determination of microorganisms. | | | | | | | |
| Chapter 1.3 | Principles and types of stains | | | | | | | |
| | Principles and types of stains -Simple stain, differential stain, negative | | | | | | | |
| | stain, structural stains - spore, capsule, flagella. Hanging-drop method, wet | | | | | | | |
| | mount | | | | | | | |
| | method Ocular bacterial, Fungal Infections | | | | | | | |
| Unit-2 | Bacteria and Virus | 12 Hours | | | | | | |
| Chapter 2.1 | Biology of Prokaryotic and Eukaryotic Microorganisms | | | | | | | |
| | Biology of Prokaryotic and Eukaryotic Microorganisms- | | | | | | | |
| | Outline classification of living organisms: | | | | | | | |
| | Prokaryotes - General characteristics of bacteria, archaeb | acteria, rickettsias, | | | | | | |
| | mycoplasmas, cyanobacteria and actinomycetes., Outlin | e classification for | | | | | | |
| | bacteria as per the second edition of Bergey's Man | ual of Systematic | | | | | | |
| | Bacteriology (up to order level Structure and multipl | ication of lambda | | | | | | |
| | bacteriophage. | | | | | | | |

| | Eukaryotes - General characteristics and classification (up to the order |
|-------------|--|
| | level) of eukaryotic microorganisms - Protozoa, microalgae, molds and |
| | yeasts. |
| | Hospital Infections- causative agents, transmission methods, investigation |
| | prevention and control, principles and practice of biomedical waste |
| | management |
| Chapter 2.2 | Bacteria |
| | Cell structure, elementary idea about classification and morphological |
| | basis. Staining reactions: Gram staining, spore staining, acid fast staining. |
| | Bacterial growth: nutritional requirements, physical factor affecting, culture |
| | media, and growth curve. Elementary idea about bactericidal agents: |
| | Phenol, alcohol. Sterilization (principles, types & methods). Pasteurization. |
| | Antibiotics: Bacteriostatic and bactericidal effects |
| Chapter 2.3 | Virus |
| | Elementary knowledge of viral-morphology, viral genome and |
| | classification, viral replication. Herpes viruses, hepatitis viruses, |
| | miscellaneous viruses, human immunodeficiency viruses. |
| Unit-3 | Disinfections, Sterilizations and Fungi and Immunity 14 Hours |
| Chapter 3.1 | Microbiological Techniques |
| | Sterilization and disinfection techniques, Principles and methods of |
| | sterilization., Physical methods -autoclave, hot-air oven, pressure cooker, |
| | laminar air flow, filter sterilization., Radiation methods – UV rays, gamma |
| | rays, ultrasonic methods., Chemical methods - Use of alcohols, aldehydes, |
| | fumigants, phenols, halogens and hypochlorite's |
| Chapter 3.2 | Disinfectants |
| | Mode of action, use of various disinfectants, testing efficiency of various |
| | disinfectants. |
| | Preservation of microbial cultures - sub culturing, overlaying cultures with |
| | mineral oils, lyophilization, sand cultures, storage at low temperature. |
| | Microbial growth & death, Laboratory culture, host pathogen interactions, |
| | antimicrobial chemotherapy, pathogenic mechanisms common to external |
| | ocular infections process - clinical pathology. Physiology, pathology, |
| | treatment & epidemiology of infectious diseases caused by bacteria, virus, |
| | fungi & parasitic organisms with emphasis to disease with ocular |
| | manifestations & infectious eye diseases in hot climate as in India. AIDS & |
| | eye. |
| Chapter 3.3 | Structure & function of immune system |

| Structure & function of immune system – Structure and function of thymus, |
|---|
| spleen & red Bone narrow- Immunity& its types, plasma proteins & |
| immune reaction, cells involved in immune system. Humoral immunity |
| theories of antibody formation. Structure & function of lymph nodes. |
| Structure & function of thymus, spleen & red Bone narrow. Nonspecific |
| immunity, |
| Antibody mediated immunity, specific immunity, cell modified immunity, |
| Active immunity, Passive immunity. Disorder of growth - metaplasia, |
| dysplasia, neoplasia. Circulatory disturbances - thrombosis, infarction, |
| ischemia, embolism. Degeneration (calcification). |

- 1. General Microbiology by Hans Günter Schlegel, C. ZaOMrosch, M. Kogut
- 2. General Microbiology by Roger Y. Stanier
- 3. General Microbiology by Robert F. OMyd

Reference Books

- 1. Text OMok of Microbiology by Ananthanereyan
- 2. Medical Microbiology by Paniker& Satish Gupte
- 3. Practical Medic.al Microbiology by Mackie &MacCartney Volume 1 and volume

| I.K. GUJRAL PUNJAB TECHNICAL UNIVERSITY | | | | | | | |
|---|-------|---|-----------|-----------------------|--|--|--|
| Course Name | Bach | elor of C | Optometr | У | | | |
| Subject Code: | BOP | T 302-2 | 1 | | | | |
| Subject Title: | Visu | Visual optics –I | | | | | |
| Contact Hours: | L:3 | T:1 | P:0 | Credits:4 | | | |
| Examination | 3 | | | | | | |
| Duration (hours) | | | | | | | |
| Objective(s): | То | To develop the insight of the basic visual techniques and their | | | | | |
| | optir | optimization and to develop an understanding of the structure of eye and | | | | | |
| | defe | defects of the eye and an understanding of the diffraction and their relation | | | | | |
| | to th | e correct | ness of v | arious vision defects | | | |

| Unit-1 | | 12 Hours | | | | | |
|-------------|---|-------------------|--|--|--|--|--|
| Chapter 1.1 | Review of Geometrical Optics | | | | | | |
| | Review of Geometrical Optics: Geometrical Optics, their properties. Optical | | | | | | |
| | constants of the eye and their measurement. Purkinje | e images. Corneal | | | | | |
| | curvature and thickness. | | | | | | |
| Chapter 1.2 | Optical Defects of the Eye | | | | | | |
| | Optical Defects of the Eye- Shape of Cornea, Shape of | & RI of the lens, | | | | | |
| | Optical axis, Visual axis (angle alpha, Fixation axis | s (angle gamma), | | | | | |
| | Aberration of the Optical system of eye, Depth of focus, Diffraction & | | | | | | |
| | resolving power | | | | | | |
| Unit-2 | | 12 Hours | | | | | |
| Chapter 2.1 | Refractive errors | | | | | | |
| | Emmetropia and ametropia, Axial versus spherical and | metropia, Myopia | | | | | |
| | Hypermetropia (Hyperopial) Astigmatism. | | | | | | |
| Chapter 2.2 | Accommodation | | | | | | |
| | Accommodation- possible mechanism of accommodation | on- Schiener disc | | | | | |
| | experiment- theories of accommodation- modern theory | y- changes in the | | | | | |
| | lens during accommodation- the amplitude of acc | ommodation- the | | | | | |
| | measurement of the amplitude of accommodation | | | | | | |
| Chapter 2.3 | Presbyopia | | | | | | |
| | Depth of field, luminance and blur tolerance- amplitude | of accommodation | | | | | |
| | versus age. | | | | | | |

| | Presbyopia-near vision addition- estimate of addition-unequal near vision | | | | | | |
|-------------|--|----------------------|--|--|--|--|--|
| | addition- effect of changing the spectacle distance - I | hypermetropia and | | | | | |
| | accommodation. | | | | | | |
| Unit-3 | | 14 Hours | | | | | |
| Chapter 3.1 | Spectro radiometric curve | | | | | | |
| | Spectro radiometric curve- V λ - λ curve- photopic and set | cotopic vision CIE | | | | | |
| | standard observes. Photometric quantities and units- | Luminous Flux, | | | | | |
| | Lumen- Illuminance, lux Luminous intensity, Cande | ela – Luminance, | | | | | |
| | Candela/m2. Inverse square law and Cosine law | of illumination | | | | | |
| | (Illuminance) | | | | | | |
| Chapter 3.2 | Photometry | | | | | | |
| | Photometry- Lumer Brodhum photometer, Guild Fl | icker photometer- | | | | | |
| | Photocells photo multipliers - photodiodes-noise in phy | vsical photometers. | | | | | |
| | Determination lighting of Polar curve of lamps. | | | | | | |
| | Glare and glare index- disability glare- discomfort glare | e- control of glare- | | | | | |
| | contrast | | | | | | |
| | Light sources- Special energy distribution- luminou | is efficacy- color | | | | | |
| | rendering properties- Flicker contracts- Daylight, its prop | perties- color lamp | | | | | |
| | - Incandescent. lamps - low pressure Hg-lamps- High p | pressure Hg-lamps- | | | | | |
| | Low-pressure NA- lamp- High pressure NA-lamps- Typic | cal applications | | | | | |

- 1. Principles & Practice of Refraction, Duke Elder
- 2. Ophthalmic Optics & Refraction (System of Opthalmology-Vol. 5), Duke Elder
- 3. Visual Optics & Refraction- A clinical approach, David D. Michaels
- 4. OMrish's-Clinical Refraction.

Reference Books

- 1. Anatomy and physiology of the eye- A.K. Khurrana
- 2. Ocular Diseases- A.k.Khurrana
- 3. Will's Eye Manual- Will's

| I.K. GUJRAL PUNJAB TECHNICAL UNIVERSITY | | | | | | | |
|---|------|---|-----|-----------|--|--|--|
| Course Name | Bach | Bachelor of Optometry | | | | | |
| Subject Code: | BOP | Т 303-2 | 1 | | | | |
| Subject Title: | Opto | Optometric optics-I | | | | | |
| Contact Hours: | L:3 | T:1 | P:0 | Credits:4 | | | |
| Examination | 3 | | | | | | |
| Duration (hours) | | | | | | | |
| Objective(s): | To N | To Measurement of lens power, lens centration using conventional techniques | | | | | |

| Unit-1 | | 12 Hours |
|-------------|---|----------------------|
| Chapter 1.1 | Introduction –Light, Mirror, Reflection, Refraction and A | bsorption |
| Chapter 1.2 | Prisms –Definition, properties, Refraction through I | prisms, Thickness |
| | difference, Base-apex notation, uses, nomenclature | and units, Sign |
| | Conventions, Fresnel's prisms, rotary prisms | |
| Chapter 1.3 | Lenses –Definition, units, terminology used to describe, f | orm of lenses |
| Chapter 1.4 | Vertex distance and vertex power, effectively calculations | 5 |
| Unit-2 | | 12 Hours |
| Chapter 2.1 | Lens shape, size and types i.e., Spherical, cylindrical and | Sphero-cylindrical |
| | Transpositions –Simple, Toric and Spherical equivalent | |
| Chapter 2.2 | Prismatic effect, centration, decentration and Prentice rul | le, Prismatic effect |
| | of Planocylinder and Spherocylindrical lenses | |
| Chapter 2.3 | Spherometer & Sag formula, Edge thickness calculations | |
| Unit-3 | | 14 Hours |
| Chapter 3.1 | Magnification in high plus lenses, Magnification in high r | ninus lenses |
| Chapter 3.2 | Tilt induced power in spectacles | |
| Chapter 3.3 | Aberration in Ophthalmic Lenses | |

Suggested Books

1.Jalie M: The principles of Ophthalmic Lenses, The Association of Dispensing Opticians, London, 1994.

Reference Books

1.David Wilson: Practical Optical Dispensing, OTEN- DE, NSW TAFE Commission,1999 2.C V Brooks, IM OMrish: System for Ophthalmic Dispensing, Second edition, Butterworth Heinemann, USA, 1996

| I.K. GUJRAL PUNJAB TECHNICAL UNIVERSITY | | | | | | | | |
|---|------|------------------------|----------|--|--|--|--|--|
| Course Name | Bach | Bachelor of Optometry | | | | | | |
| Subject Code: | BOP | BOPT 304-21 | | | | | | |
| Subject Title: | Opto | Optometric Instruments | | | | | | |
| Contact Hours: | L:3 | T:1 | P:0 | Credits:4 | | | | |
| Examination | 3 | | | | | | | |
| Duration (hours) | | | | | | | | |
| Objective(s): | 1. | To Vi | sual Acu | ity chart/drum ,Retinoscope, Trail OMx | | | | |

| Unit-1 | | 12 Hours |
|-------------|--|----------|
| Chapter 1.1 | Optotypes and MTF, Spatial Frequency | |
| Refractive | Test charts standards. | |
| instruments | Choice of test charts | |
| | Trial case lenses | |
| | Refractor (phoropter) head units | |
| | Optical considerations of refractor units | |
| | Trial frame design | |
| Chapter 1.2 | Near vision difficulties with units and trial frames | |
| | Retinoscope – types available | |
| | Adjustment of Retinoscopes- special features | |
| | Objective optometry. | |
| | Infrared optometric devices. | |
| | Projection charts | |
| Chapter 1.3 | | |
| | Illumination of the consulting room. | |
| | Brightness acuity test | |
| | Vision analyzer | |
| | Pupil meter | |
| | Potential Acuity Meter | |
| | Aberrometer | |
| Unit-2 | Ophthalmoscopes and related devices | 12 Hours |
| Chapter 2.1 | | • |
| | Design of ophthalmoscopes – illumination | |
| | Design of ophthalmoscopes- viewing | |
| Chapter 2.2 | | |

Bachelor of Optometry, Choice Based Credit System, Batch 2021 and onwards

| | Ophthalmoscope disc | |
|-------------|---|-------------|
| | Filters for ophthalmoscopy | |
| Chapter 2.3 | | |
| | Indirect ophthalmoscope | |
| Unit-3 | | 14 Hours |
| Chapter 3.1 | | |
| | Design of ophthalmoscopes – illumination | |
| | Design of ophthalmoscopes- viewing | |
| Chapter 3.2 | | |
| | Refractometer, Orthoptic Instruments (Synaptophore Only | <i>r</i>) |
| | Color Vision Testing Devices. Fields of Vision and Screen | ing Devices |
| Chapter 3.3 | | |
| | Scans, ERG, New Instruments | |

1. David Henson: Optometric Instrumentations, Butterworth- Heinnemann, UK, Instrumentation 1991

Reference Books

1. P R Yoder: Mounting Optics in Optical Instruments, SPIE Society of Photo- Optical Instrumentation, 2002

2. G Smith, D A. Atchison: The Eye and Visual Optical Instruments, Cambridge University Press, 1997

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|---|--------|---|----------|-----------|--|--|
| Course Name | Bach | elor of (| Optometr | у | | |
| Subject Code: | BOP | T 305-2 | 1 | | | |
| Subject Title: | Ocul | ar Disea | se-I | | | |
| Contact Hours: | L:3 | T:1 | P:0 | Credits:4 | | |
| Examination | 3 | | | | | |
| Duration (hours) | | | | | | |
| Objective(s): | In the | In this course the student will learn general idea of the fundamental aspect of the | | | | |
| | topic | topic regarding infectious disease of eye and the steps for diagnosing and | | | | |
| | preve | prevention and management of the infection | | | | |
| | | | | | | |

| Unit-1 | 12 Hours |
|-------------|--|
| Chapter 1.1 | Anterior segment ocular diseases |
| | Anterior segment ocular diseases involving orbit, eyelids, adnexa, |
| | conjunctiva, cornea, urea, sclera, anterior chamber, iris and lens. |
| | Symptomatology, clinical signs, diagnosis, pathogenesis, pathophysiology, |
| | systemic disease relationships and treatment of degenerative, infections and |
| | inflammatory conditions affecting these structures Disease of the |
| Chapter 1.2 | Lids |
| | Lids – Congenital Deformities of the Lids. |
| Chapter 1.3 | Inflammatory Conditions of the Lids |
| | Oedema of the Lids. Inflammatory Conditions of the Lids. Deformities of |
| | the Lid Margins. Deranged Movement of the Eyelids. Neoplasm's of the |
| | Lids. Injuries of the Lids. |
| Unit-2 | 12 Hours |
| Chapter 2.1 | Diseases of the Lachrymal Apparatus |
| | Diseases of the Lachrymal Apparatus Dry Eye. Disease of the Lachrymal |
| | Gland. Disease of the Lachrymal Passages. Operations for Chronic |
| | Dacryocystitis. |
| | |
| Chapter 2.2 | Disease of the Conjunctiva |
| | Disease of the Conjunctiva- Subconjunctival Haemorrhage Infective |

Bachelor of Optometry, Choice Based Credit System, Batch 2021 and onwards

| | Conjunctivitis. Follicular Conjunctivitis. Granulomato | ous Conjunctivitis. | | | | | | |
|-------------|---|---------------------|--|--|--|--|--|--|
| | Allergic Conjunctivitis. Conjunctivitis Associated with | n Skin conditions. | | | | | | |
| | Degenerative conditions of the Conjunctiva. Vitamin- A | Deficiency. | | | | | | |
| Chapter 2.3 | Cysts and Tumours | | | | | | | |
| | Cysts and Tumours of the Conjunctiva. Conjunctival Pig | mentation. Injuries | | | | | | |
| | of the Conjunctiva. | | | | | | | |
| Unit-3 | | 14 Hours | | | | | | |
| Chapter 3.1 | Disease of the Cornea | | | | | | | |
| | Disease of the Cornea –Congenital Anomalies. Inflamma | ation of the Cornea | | | | | | |
| | (Keratitis). Superficial Keratitis. Deep Keratitis. Vascula | risation of Cornea. | | | | | | |
| | Opacities of the Cornea. Keratoplasty. Corneal Dege | nerations. Corneal | | | | | | |
| | Dystrophy's. Corneal Pigmentation. Corneal Injuries. Refractive Corneal | | | | | | | |
| | Surgery. Corneal Ulcer (Bacterial, Viral, Fungal) | | | | | | | |
| | | | | | | | | |
| Chapter 3.2 | Disease of the Ciliary Body | | | | | | | |
| | Disease of the Ciliary Body- Inflammations of the Cilia | ary Body. Purulent | | | | | | |
| | Iriodocyclitis, Panophthalmitis). Evisceration. | | | | | | | |
| Chapter 3.3 | Sympathetic Opthalmia | | | | | | | |
| | Sympathetic Opthalmia. Vogt- Koyanagi – Harada Sync | lrome. Tumours of | | | | | | |
| | the Celery Body. Injuries of the Celery Body. Glauco | ma Formation of | | | | | | |
| | Aqueous Humor. Drainage of Aqueous. Intraocular Press | ure (IOP). | | | | | | |
| | Ocular Rigidity. | | | | | | | |

1. Adrian bruce, Michael Loughnan: Anterior Eye Disease and Therapeutics A-Z 2nd Edition

2. Ashok Garg: Anterior & Posterior Segment OCT: Current Technology & Future Applications

Reference Books

- 1. Arturo Perez Arteaga: Anterior Segment Diseases, edition- 2010
- 2. Roger F. Steinert: Anterior segment optical coherence tomography.

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|---|-------|--|------------|------------------|--|--|
| Course Name | Bach | elor of C | Optometr | у | | |
| Subject Code: | BOP | T 306-2 | 1 | | | |
| Subject Title: | Clini | ical exan | nination (| of visual system | | |
| Contact Hours: | L:3 | T:1 | P:0 | Credits:4 | | |
| Examination | 3 | 3 | | | | |
| Duration (hours) | | | | | | |
| Objective(s): | Knov | Knowing the purpose, setup and devices required for the test, indications and | | | | |
| | contr | contraindications of the test, step-by-step procedures, documentation of the | | | | |
| | findi | findings, and interpretation of the findings of the various clinical optometry | | | | |
| | proce | edures | | | | |

| Unit-1 | | 12 Hours |
|-------------|---|----------|
| Chapter 1.1 | History taking | |
| Chapter 1.2 | Visual acuity estimation | |
| Chapter 1.3 | Extraocular motility, Cover teat, Alternating cover test | |
| Chapter 1.4 | Hirschberg test, Modified Krimsky | |
| Chapter 1.5 | Pupils Examination | |
| Chapter 1.6 | Maddox Rod | |
| Chapter 1.7 | Van Herrick. External examination of the eye, Lid Eversi | on |
| Unit-2 | | 12 Hours |
| Chapter 2.1 | Schirmer's, TBUT, tear meniscus level, NITBUT (kerato | meter), |
| Chapter 2.2 | Color Vision | |
| Chapter 2.3 | Stereopsis | |
| Chapter 2.4 | Confrontation test | |
| Chapter 2.5 | Photo stress test | |
| Unit-3 | | 14 Hours |
| Chapter 3.1 | Slit lamp bio microscopy. Ophthalmoscopy | |
| Chapter 3.2 | Tonometry, ROPLAS | |
| Chapter 3.3 | Amsler test 19, Contrast sensitivity function test | |
| Chapter 3.4 | Contrast sensitivity function test 20. Saccades and pursuit | t test |

- 1.Devlin, Thomas M., ed. "TextOMok of biochemistry: with clinical correlations." (2006)
- 2. Ananthanarayan, R "TextOMok Of Microbiology" Orient Longman 6th Edition
- 3.Ball, A.S." Bacterial Cell Culture" Wiley Pub. 1st Edition

Reference Books

- 1. Greenwoodd. "Medicalmicrobiology" Churchill Livingstone 17th Edition
- 2. Panjarathinam, R. "Medical Microbiology" New Age Pub.1st Edition

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|---|-------|--|-----------|------------------------------------|--|--|
| Course Name | Bach | Bachelor of Optometry | | | | |
| Subject Code: | BOP | T 307-2 | 1 | | | |
| Subject Title: | India | n Medic | ine and T | Felemedicine | | |
| Contact Hours: | L:3 | L:3 T:0 P:0 Credits:3 | | | | |
| Examination | 3 | | | | | |
| Duration (hours) | | | | | | |
| Objective(s): | At th | At the end of the course student will be aware of the traditional and the latest | | | | |
| | healt | nealthcare system. The student also will get basic knowledge about the | | | | |
| | telen | nedicine | practices | s in India especially in eye care. | | |

| Unit-1 | | 12 Hours | | | | | |
|--------------|---|---------------------|--|--|--|--|--|
| Chapter 1.1 | Introduction to healthcare delivery system | | | | | | |
| Chapter 1.2 | Healthcare delivery system in India at primary, seco | ndary and tertiary | | | | | |
| | care | | | | | | |
| Chapter 1.3 | Community participation in healthcare delivery system | | | | | | |
| Chapter 1.4 | Health system in developed countries. | | | | | | |
| Chapter 1.5 | Private Sector in healthcare | | | | | | |
| Chapter 1.6 | National Health Mission | | | | | | |
| Chapter 1.7 | National Health Policy | | | | | | |
| Chapter 1.8 | Issues in Health Care Delivery System in India | | | | | | |
| Chapter 1.9 | National Health Program-Background objectives, ac | tion plan, targets, | | | | | |
| | operations, achievements and constraints in variou | s National Heath | | | | | |
| | Programme. | | | | | | |
| Chapter 1.10 | Introduction to AYUSH system of medicine | | | | | | |
| | Introduction to Ayurveda. | | | | | | |
| | Yoga and Naturopathy | | | | | | |
| | Unani | | | | | | |
| | Siddha | | | | | | |
| | Homeopathy | | | | | | |
| | Need for integration of various system of medicine | | | | | | |
| Unit-2 | Health scenario of India- past, present and future | 12 Hours | | | | | |
| Chapter 2.1 | Demography & Vital Statistics | 1 | | | | | |
| | Demography – its concept | | | | | | |
| | | | | | | | |

Bachelor of Optometry, Choice Based Credit System, Batch 2021 and onwards

| | Vital events of life & its impact on demography | | | |
|-------------|---|---------------------|--|--|
| Chapter 2.2 | Significance and recording of vital statistics | | | |
| Chapter 2.3 | . Census & its impact on health policy | | | |
| Unit-3 | Epidemiology | 14 Hours | | |
| Chapter 3.1 | Principles of Epidemiology | | | |
| | Natural History of disease. | | | |
| Chapter 3.2 | Methods of Epidemiological studies | | | |
| Chapter 3.3 | Epidemiology of communicable & non-communicable | e diseases, disease | | |
| | transmission, host defense immunizing agents, cold ch | ain, immunization, | | |
| | disease monitoring and surveillance | | | |

Text Books

Margie Lovett Scott, Faith Prather. Global health systems comparing strategies for delivering health services. Joney& Bartlett learning, 2014 (page 167 -178)

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|---|-------|---|-----|-----------|--|
| Course Name | Bach | Bachelor of Optometry | | | |
| Subject Code: | BOP | BOPT 307-21 | | | |
| Subject Title: | Clini | Clinical optometry- I | | | |
| Contact Hours: | L:0 | T:0 | P:6 | Credits:3 | |
| Examination | 3 | | | | |
| Duration (hours) | | | | | |
| Objective(s): | The | The resident will efficiently develop diagnosis differentials and diagnosis plans | | | |
| | base | based on history intake | | | |

| Unit-1 | 12 Hours | |
|-------------|---|--|
| Chapter 1.1 | Students will gain additional skills in clinical procedures, interaction w patients and professional personnel. Students will apply knowledge from previous clinical learning experience under the supervision of a register optometrist. Students are tested on intermediate clinical optometry skill The practical aspects of the dispensing optics (hand-on in optical optometric instruments, clinical examination of visual system (Hands- under supervision) and ocular diseases (Slides and case discussion) will given to the students during their clinical training. | rith om red lls. al), -on be |
| Unit-2 | 12 Hours | |
| Chapter 2.1 | Practice of Streak Retinoscopy Direct Ophthalmoscopy-Normal Fundus Subjective refraction – fogging, clockdial, fan, JCC, prism balance, TI duochrome, cyclodeimia, Slit refraction Measurement of amplitude of accommodation. Assessment of children Vision & Paediatric evaluation, diagnosis management Writing prescription. | IB, & |
| Unit-3 | 14 Hours | |
| Chapter 3.1 | The students will perform vision examination, refraction and relat measurements under the guidance of working clinical optometri Evaluation, Diagnosis & Optometric management of children with men retardation C.P. Dyslexia, Multiple Sensory Motor Haudicap. Visual Disorders in senior citizens, evaluation, diagnosis+ management | ted ist. ıtal |

SEMESTER-IV

| I.K. GUJRAL PUNJAB TECHNICAL UNIVERSITY | | | | |
|---|-------|---|-----------|---------------------|
| Course Name | Bach | Bachelor of Optometry | | |
| Subject Code: | BOP | T 401-2 | 1 | |
| Subject Title: | Opto | ometric C | Optics-II | & Dispensing Optics |
| Contact Hours: | L:3 | T:1 | P:0 | Credits:4 |
| Examination | 3 | | | |
| Duration (hours) | | | | |
| Objective(s): | This | This course covers the the tool power for grinding process, Different | | |
| | types | types of materials used to make lenses and its characteristics. Lens | | |
| | desig | gns–Bifo | cals, pro | gressive lens |
| | | | | |
| | | | | |

| Unit-1 | | 12 Hours | | | | | | |
|-------------|--|----------------------|--|--|--|--|--|--|
| Chapter 1.1 | Spectacle Lenses – II | | | | | | | |
| | Manufacture of glass | | | | | | | |
| | • Lens materials | | | | | | | |
| | • Lens surfacing | | | | | | | |
| | • Principle of surface generation and glass cements | | | | | | | |
| | • Terminology used in Lens workshop | | | | | | | |
| | • Lens properties | | | | | | | |
| | • Lens quality | | | | | | | |
| | • Faults in lens material | | | | | | | |
| | • Faults on lens surface | | | | | | | |
| | • Methods of Inspecting the quality of lenses | | | | | | | |
| | • Safety standards for ophthalmic lenses (FDA, AN | SI, ISI, Others) | | | | | | |
| Chapter 1.2 | Spectacle Frames | | | | | | | |
| | • Types and parts | | | | | | | |
| | • Classification of spectacle frames-material, weigh | nt, temple position, | | | | | | |
| | Coloration • Frame construction | | | | | | | |
| | • Frame selection | | | | | | | |
| | • Size, shape, mounting and field of view of ophthal | lmic lenses | | | | | | |

| Chapter 1.3 | Tinted & Protective Lenses | | | | | | | |
|-------------|---|----------------------|--|--|--|--|--|--|
| | Characteristics of tinted lenses Absorptive Glasses | | | | | | | |
| | • Polarizing Filters, Photochromic & Reflecting filt | ers | | | | | | |
| | • Safety lenses-Toughened lenses, Laminated | Lenses, CR 39, | | | | | | |
| | PolycarOMnate | | | | | | | |
| Chapter 1.4 | Multifocal Lenses | | | | | | | |
| | • Introduction, history and development, types | | | | | | | |
| | • Bifocal lenses, Trifocal & Progressive addition len | nses | | | | | | |
| Unit-2 | | 12 Hours | | | | | | |
| Chapter 2.1 | Reflection from spectacle lens surface & lens coatings: | | | | | | | |
| | • Reflection from spectacle lenses - ghost imag | ges -Reflections in | | | | | | |
| | bifocals at the dividing line | | | | | | | |
| | • Antireflection coating, Mirror coating, Hard Mul | ti Coating [HMC], | | | | | | |
| | Hydrophobic coating | | | | | | | |
| Chapter 2.2 | Miscellaneous Spectacle | | | | | | | |
| | Iseikonic lenses | | | | | | | |
| | Spectacle magnifiers | | | | | | | |
| | Recumbent prisms | | | | | | | |
| | • Fresnel prism and lenses | | | | | | | |
| | • Lenticular & A spherical lenses | | | | | | | |
| | • High Refractive index glasses | | | | | | | |
| Unit-3 | Dispensing Optics | 14 Hours | | | | | | |
| Chapter 3.1 | Components of spectacle prescription & interpretation, | transposition, Add | | | | | | |
| | and near power relation | | | | | | | |
| Chapter 3.2 | Frame selection -based on spectacle prescript | ion, professional | | | | | | |
| | requirements, age group, face shape | | | | | | | |
| Chapter 3.3 | Measuring Inter-pupillary distance (IPD) for distance & r | near, bifocal height | | | | | | |
| Chapter 3.4 | Lens & Frame markings, Pupillary centers, bifocal he | eights, Progressive | | | | | | |
| | markings & adjustments - facial wrap, pantoscopic tilt | | | | | | | |
| Chapter 3.5 | Recording and ordering of lenses (power, add, diamet | ter, base, material, | | | | | | |
| | type, lens enhancements) | | | | | | | |
| Chapter 3.6 | Faults in spectacles (lens fitting, frame fitting, pa | tients complaints, | | | | | | |
| | description, detection and correction) | | | | | | | |
| Chapter 3.7 | Final checking & dispensing of spectacles to custome | ers, counseling on | | | | | | |
| | wearing & maintaining of spectacles, Accessories -Band | ds, chains, OMxes, | | | | | | |
| | slevets, cleaners, screwdriver kit | | | | | | | |

Bachelor of Optometry, Choice Based Credit System, Batch 2021 and onwards

| Chapter 3.8 | Spectacle repairs -tools, methods, soldering, riveting, frame adjustments | | | | | |
|--------------|---|--|--|--|--|--|
| Chapter 3.9 | Special types of spectacle frames | | | | | |
| | Monocles | | | | | |
| | Ptosis crutches | | | | | |
| | • Industrial safety glasses | | | | | |
| | • Welding glasses | | | | | |
| Chapter 3.10 | Frame availability in Indian market | | | | | |
| | FAQ's by customers and their ideal answers | | | | | |

1. Jalie MO: Ophthalmic lens and Dispensing, 3rd edition, Butterworth -Heinemann, 2008

2. Troy E. Fannin, Theodore Grosvenor: Clinical Optics, 2nd edition, Butterworth – Heinemann, 1996

Reference Books

1.C W Brooks, IM OMrish: System for Ophthalmic Dispensing, 3rdedition, Butterworth -Heinemann, 2007

2. Michael P Keating: Geometric, Phisical & Visual Optics, 2nd edition, Butterworth Heinemann, 2002.

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|------------------|-------|------------|-------------|--|
| Course Name | Bach | nelor of C | Optometr | У |
| Subject Code: | BOP | Т 402-2 | 1 | |
| Subject Title: | Visu | al Optics | s-II | |
| Contact Hours: | L:3 | T:1 | P:0 | Credits:4 |
| Examination | 3 | | | |
| Duration (hours) | | | | |
| Objective(s): | The | course a | to d | levelop the insight of the basic visual techniques |
| | and | their o | ptimizati | on and to develop an understanding of the |
| | diffr | action ar | nd their re | elation to the correctness of various vision defects |

| Unit-1 | | 12 Hours |
|-------------|--|----------------------|
| Chapter 1.1 | Spectacle refraction (F) &ocular refraction(K) | I |
| | Correction of myopia- spectacle refraction (F) - ocul | ar refraction(K) – |
| | Relationship between F and K. correction of hypermetr | opia- the effect of |
| | vertex distance change. Correction of ametropia with t | hick lenses. Some |
| | problems involving K. | |
| Chapter 1.2 | Blurred images in the reduced and simplified schematic e | yes |
| | Clear and blurred images in the reduced and simplified so | chematic eyes. The |
| | visual axis. Pupil size and blur disc diameter. Depth of f | field. retinal image |
| | size in uncorrected reduced eye. Spectacle magnification | on in reduced and |
| | corrected eyes. Nodal points and clear image size. Reti | inal images with a |
| | near object. | |
| Chapter 1.3 | Magnification | |
| | Spectacle magnification in near vision. The simple n | nagnifier. Relative |
| | spectacle magnification. Correction of spherical ametr | copia with contact |
| | lens. Spectacle magnification with a contact lens. | |
| Unit-2 | | 12 Hours |
| Chapter 2.1 | Ammetropia | I |
| | Ammetropia in the actual human eye. The growth of | the human eye in |
| | emmetropia. Spherical ametropia in adult eye. Genetic as | spects of refractive |
| | error. Summary of the causative factors involved in ametr | copia. |

Bachelor of Optometry, Choice Based Credit System, Batch 2021 and onwards

| Chapter 2.2 | Progressive myopia | |
|-------------|---|---------------------|
| | Progressive myopia. Juvenile stress myopia. | |
| Chapter 2.3 | Aphakia | |
| | Aphakia. Reflective error in aphakia. The retinal imag | ge size in aphakia. |
| | Correction of aphkia by a contact lens. Use of an intraocu | ılar implant. Power |
| | of the implant and retinal image size. Clinical aspects of a | aphakia. |
| Unit-3 | | 14 Hours |
| Chapter 3.1 | Astigmatism | |
| | Astigmatism. \rightarrow Oblique astigmatism. Astigmatism in th | e reduced eye. The |
| | retinal images of point and extended objects. | |
| Chapter 3.2 | Correction of astigmatism | |
| | Classification of astigmatism. Correction of astigm | atism by sphero- |
| | cylindrical, toric and contact lenses Retinoscopy - j | principle and use. |
| | Clinical recording of standard of vision-visual acuity. Re | eview of subjective |
| | refractive methods. | |
| Chapter 3.3 | Review of objective refractive methods | |
| | Problem of review of objective refractive methods Cross | cylindrical method |
| | of detecting astigmatism | |

1. William Davis (P): Understanding Human Anatomy and Physiology MC Graw Hill

2. Chaurasia: A Text OMok of Anatomy

3. Steven H. Schwartz: Geometrical and Visual Optics, Second Edition

Reference Books

1. Ronald B. Rabbetts: Bennett and Rabbett's Clinical Visual Optics, 4th Edition

2.<u>Alan H. Tunnacliffe</u>: Introduction to Visual Optics.

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|------------------|--------------------------------|--|--------|-----------|--|
| Course Name | Bach | Bachelor of Optometry | | | |
| Subject Code: | BOP | T 403-2 | 1 | | |
| Subject Title: | Ocular Disease-II and Glaucoma | | | | |
| Contact Hours: | L:3 | T:1 | P:0 | Credits:4 | |
| Examination | 3 | | | | |
| Duration (hours) | | | | | |
| Objective(s): | At t | At the end of the course the students will be knowledgeable in the | | | |
| | follo | following aspects of ocular diseases: knowledge on vision defects | | | |

| Unit-1 | 12 Hours | | | | | | |
|-------------|---|--|--|--|--|--|--|
| Chapter 1.1 | Retina and Vitreous | | | | | | |
| | Applied Anatomy | | | | | | |
| | • Congenital and Developmental Disorders (Optic Disc: ColoOMma, | | | | | | |
| | Drusen, Hypoplasia, Medullated nerve fibers; Persistent Hyaloid Artery) | | | | | | |
| | • Inflammatory disorders (Retinitis: Acute purulent, Bacterial, Virus, | | | | | | |
| | mycotic | | | | | | |
| | • Retinal Vasculitis (Eales's) | | | | | | |
| | Retinal Artery Occlusion (Central retinal Artery occlusion) | | | | | | |
| | • Retinal Vein occlusion (Ischaemic, Non-Ischaemic, Branch retinal | | | | | | |
| | vein occlusion) | | | | | | |
| | • Retinal degenerations: Retinitis Pigmentosa, Lattice degenerations | | | | | | |
| | • Macular disorders: Solar retinopathy, central serous retinopathy, | | | | | | |
| | cystoid macular edema, Age related macular degeneration. | | | | | | |
| | • Retinal Detachment: Rhegmatogenous, Tractional, Exudative) | | | | | | |
| | Retina blastoma | | | | | | |
| | • Diabetic retinopathy | | | | | | |
| Chapter 1.2 | Ocular Injuries: Terminology | | | | | | |
| | Closed globe injury (Contusion, lamellar laceration) Open globe injury | | | | | | |
| | (Rupture, laceration, penetrating injury, perforating injury) | | | | | | |
| | • Mechanical injuries (Extraocular foreign Body, blunt trauma, | | | | | | |
| | perforating injury, sympathetic ophthalmitis) | | | | | | |
| | • Non-Mechanical Injuries (Chemical injuries, Thermal, Electrical, | | | | | | |
| | Radiational) | | | | | | |
| | • Clinical approach towards ocular injury patients | | | | | | |

| Unit-2 | | 12 Hours | | | | |
|-------------|---|---|--|--|--|--|
| Chapter 2.1 | Lens | | | | | |
| | Applied Anatomy and Physiology | | | | | |
| | Clinical examination | | | | | |
| | Classification of cataract | | | | | |
| | Congenital and Developmental cataract | | | | | |
| | • Acquired (Senile, Traumatic, Complicated, Me | taOMlic, Electric, | | | | |
| | liational, Toxic) | | | | | |
| | Morphological: Capsular, Subcapsular, Cortical, Supranuclear, | | | | | |
| | iclear, Polar. | | | | | |
| | Management of cataract (non-surgical and surgical measures; | | | | | |
| | preoperative evaluation, Types of surgeries,) | operative evaluation, Types of surgeries,) | | | | |
| | • Complications of cataract surgery | Complications of cataract surgery | | | | |
| | • Displacement of lens: Subluxation, Displacement | Displacement of lens: Subluxation, Displacement | | | | |
| | • Lens coloOMma, Lenticonus, Microsperophakia. | | | | | |
| Chapter 2.2 | Clinical Neuro-ophthalmology | | | | | |
| | Anatomy of visual pathway | | | | | |
| | • Lesions of the visual pathway | | | | | |
| | • Pupillary reflexes and abnormalities (Amaur | otic light reflex, | | | | |
| | fferent pathway defect, Wernicke's hemianopic pupil, Marcus gunn pupil. | | | | | |
| | Argyll Robetson pupil, Adie's tonic pupil) | | | | | |
| | Optic neuritis, Anterior Ischemic optic neuropathy, Papilledema, | | | | | |
| | optic atrophy | | | | | |
| | Cortical blindness | | | | | |
| | • Malingering | | | | | |
| | • Nystagmus | | | | | |
| | Clinical examination | | | | | |
| | | | | | | |
| Unit-3 | | 14 Hours | | | | |
| Chapter 3.1 | Glaucoma | | | | | |
| | • Applied anatomy and physiology of anterior segm | ent | | | | |
| | Clinical Examination | | | | | |
| | • Definitions and classification of glaucoma | • Definitions and classification of glaucoma | | | | |
| | • Pathogenesis of glaucomatous ocular damage | | | | | |
| | Congenital glaucoma's | | | | | |
| | Primary open angle glaucoma | | | | | |

| Ocular hypertension | | | | | |
|---|--|--|--|--|--|
| Normal Tension Glaucoma | | | | | |
| • Primary angle closure glaucoma (Primary angle closure suspect, | | | | | |
| Intermittent glaucoma, acute congestive, chronic angle closure) | | | | | |
| Secondary Glaucoma's | | | | | |
| • Management: common medications, laser intervention and surgical | | | | | |
| techniques | | | | | |

1.A K Khurana: Comprehensive Ophthalmology, 4th edition, new age international (p) Ltd. Publishers, New Delhi, 2007

Reference Books

1. Stephen J. Miller : Parsons Diseases of the Eye, 18th edition, Churchill Livingstone, 1990

2. Jack J. Kanski Clinical Ophthalmology: A Systematic Approach, 6th edition, Butterworth

Heinemann, 200

| I.K. GUJRAL PUNJAB TECHNICAL UNIVERSITY | | | | |
|---|---|-----|-----|-----------|
| Course Name | Bachelor of Optometry | | | |
| Subject Code: | BOPT 404-21 | | | |
| Subject Title: | Pathology | | | |
| Contact Hours: | L:3 | T:1 | P:0 | Credits:4 |
| Examination | 3 | | | |
| Duration (hours) | | | | |
| Objective(s): | At the end of the course the students will be knowledgeable | | | |
| | Inflammation and repair aspects, Pathology of various eye parts and | | | |
| | adne | xa. | | |

| Unit-1 | | 12 Hours | | | |
|-------------|-----------------------------------|----------|--|--|--|
| Chapter 1.1 | Inflammation and repair | | | | |
| | | | | | |
| Chapter 1.2 | Infection in general | | | | |
| Chapter 1.3 | Specific infections | | | | |
| | Tuberculosis | | | | |
| | • Leprosy | | | | |
| | • Syphilis | | | | |
| | • Fungal infection | | | | |
| | • Viral chlamydial infection | | | | |
| Chapter 1.4 | Neoplasia | | | | |
| Unit-2 | | 12 Hours | | | |
| Chapter 2.1 | Hematology | | | | |
| | Anemia | | | | |
| | • Leukemia | | | | |
| | • Bleeding disorders | | | | |
| Chapter 2.2 | Circulatory disturbances | | | | |
| | ThromoMsis | | | | |
| | • Infarction | | | | |
| | EmOMlism | | | | |
| Chapter 2.3 | Clinical pathology | | | | |
| | • Interpretation of urine report | | | | |
| | • Interpretation of blood smears. | | | | |
| Unit-3 | | 14 Hours | | | |

Bachelor of Optometry, Choice Based Credit System, Batch 2021 and onwards

| Chapter 3.1 | Immune system |
|-------------|--------------------|
| Chapter 3.2 | Shock, Anaphylaxis |
| Chapter 3.3 | Allergy |

1. K S Ratnagar: Pathology of the eye & orbit, Jaypee brothers Medical Publishers, 1997

Reference Books

1. Corton Kumar and Robins: Pathological Basis of the Disease, 7th Edition, Elsevier, New Delhi, 2004.

2. S R Lakhani Susan AD & Caroline JF: Basic Pathology: An introduction to the mechanism of disease, 1993.

| I.K. GUJRAL PUNJAB TECHNICAL UNIVERSITY | | | | |
|---|--|-----|-----|-----------|
| Course Name | Bachelor of Optometry | | | |
| Subject Code: | BOPT 405-21 | | | |
| Subject Title: | Basic and Ocular Pharmacology | | | |
| Contact Hours: | L:3 | T:1 | P:0 | Credits:4 |
| Examination | 3 | | | |
| Duration (hours) | | | | |
| Objective(s): | At the end of the course the students will be knowledgeable of basic | | | |
| | principle of pharmacokinetics & Pharmacodynamics and Commonly | | | |
| | used ocular drugs, mechanism, indications, contraindications, drug | | | |
| | dosage and adverse effects | | | |

| Unit-1 | General Pharmacology | 12 Hours | | | | |
|-------------|---|----------------------|--|--|--|--|
| Chapter 1.1 | Introduction & sources of drugs, Routes of dru | ig administration, | | | | |
| | Pharmacokinetics (emphasis on ocular | pharmacokinetics), | | | | |
| | Pharmacodynamics & factors modifying drug actions | | | | | |
| Chapter 1.2 | Systemic Pharmacology | | | | | |
| | Autonomic nervous system: Drugs affecting papillary size | ze and light reflex, | | | | |
| | Intraocular tension, Accommodation; Cardiovascular system: | | | | | |
| | Antihypertensive sand drugs useful in Angina; Diuretics: Drugs used in | | | | | |
| | ocular disorders; Central Nervous System: Alcohol, sedative hypnotics, | | | | | |
| | General & local anesthetics, Opioids & non-opioids; Chemotherapy : | | | | | |
| | Introduction on general chemotherapy, Specific chemot | herapy –Antiviral, | | | | |
| | antifungal, antibiotics; Hormones : Corticosteroids, Antidiabetics; Blood | | | | | |
| | Coagulants | | | | | |
| Unit-2 | | 12 Hours | | | | |
| Chapter 2.1 | Ocular Pharmacology | | | | | |
| | Ocular preparations, formulations and requirements of an ideal agent; | | | | | |
| | Ocular Pharmacokinetics, methods of drug administration & Special drug | | | | | |
| | delivery system; Ocular Toxicology | | | | | |
| Unit-3 | | 14 Hours | | | | |
| Chapter 3.1 | Diagnostic & Therapeutic applications of drugs used in Ophthalmology: | | | | | |
| | Diagnostic Drugs & biological agents used in ocular surgery, Anesthetics | | | | | |
| | used in ophthalmic procedures, Anti-glaucoma drugs; P | harmacotherapy of | | | | |
| ocular infections -Bacterial, viral, fungal & chlamydial; Drugs used in |
|---|
| allergic, inflammatory& degenerative conditions of the eye; Immune |
| modulators in Ophthalmic practice, Wetting agents & tear substitutes, |
| Antioxidants |

- 1. K D Tripathi: Essentials of Medical Pharmacology. 5th edition, Jaypee, New Delhi, 2004
- 2. Ashok Garg: Manual of Ocular Therapeutics, Jaypee, New Delhi, 1996

Reference Books

1. T J Zimmerman, K S Kooner : Text OMok of Ocular Pharmacology, Lippincott-Raven, 1997

| I.K. GUJRAL PUNJAB TECHNICAL UNIVERSITY | | | | | | | |
|---|-------|--|-----------|--|--|--|--|
| Course Name | Bach | Bachelor of Optometry | | | | | |
| Subject Code: | BOP | BOPT 406-21 | | | | | |
| Subject Title: | Intro | Introduction to Quality & Patient safety | | | | | |
| Contact Hours: | L:3 | T:1 | P:0 | Credits:3 | | | |
| Examination | 3 | | | | | | |
| Duration (hours) | | | | | | | |
| Objective(s): | At th | he end o | of the co | burse, students will gain introductory knowledge | | | |
| | abou | t quality | and pati | ent safety aspects from Indian perspectives | | | |

| Unit-1 | | 12 Hours |
|-------------|--|----------|
| Chapter 1.1 | Quality assurance and management | |
| Chapter 1.2 | Basics of emergency care and life support skills | |
| Unit-2 | | 12 Hours |
| Chapter 2.1 | Biomedical waste management and environment safety | |
| Chapter 2.2 | Infection and prevention control | |
| Unit-3 | | 14 Hours |
| Chapter 3.1 | Antibiotic resistance | |
| Chapter 3.2 | Disaster preparedness and management | |

Suggested Books

1. Patricia Barkway. Psychology for health professionals, 2nd edition, Elsevier, 2013

| I.K. GUJRAL PUNJAB TECHNICAL UNIVERSITY | | | | | | | | |
|---|-------|-----------------------|----------|--------------|---------|-----------|---------------|-----|
| Course Name | Bach | Bachelor of Optometry | | | | | | |
| Subject Code: | BOP | BOPT 407-21 | | | | | | |
| Subject Title: | Clini | Clinical optometry-II | | | | | | |
| Contact Hours: | L:3 | T:1 | P:6 | Credits:3 | | | | |
| Examination | 3 | | | | | | | |
| Duration (hours) | | | | | | | | |
| Objective(s): | The | resident | t will | efficiently | develop | diagnosis | differentials | and |
| | diagi | nosis pla | ns based | d on history | intake. | | | |

| Unit-1 | 12 Hours |
|-------------|--|
| Chapter 1.1 | Students will improve their skills in clinical procedures, and then |
| | monitored as students practice optometry in supervised setting Additional |
| | area includes problem solving and complications of various managements |
| | will be inculcated. Students should have exposure to eve bank facilities and |
| | must be made aware of eve donation, collection of eves, preservation, pre |
| | and post-operative instructions and latest techniques for preservation of |
| | donor cornea. The students will get clinical training on the practical aspects |
| | of the following courses namely optometric opticII & dispensing optics, |
| | visual optics – II and ocular disease -II. |
| Unit-2 | 12 Hours |
| Chapter 2.1 | Sports vision. |
| | Refraction in special cases (pseudophakia, aphakia, irregular corneal |
| | astigmatism, coloboma of iris, |
| | choroids, retina, nystagmus, post R.K., PRK, LASIK) |
| | Congenital cataract, glaucoma. |
| | Patient with low vision. |
| | Patient with anisometropia (Anisokonia) |
| Unit 2 | Monocular & binocular subjective refraction |
| Chapter 2.1 | Non Strahismic Rivoculan Disorders |
| Chapter 5.1 | Neuro, Ontometric Behabilitation |
| | Strahismus & Aniblyonia |
| | Evaluation Diagnosis & Ontometric management of children with mental |
| | retardation C.P. Dyslexia |
| | Multiple Sensory Motor Haudicap. |
| | Refraction in special cases (pseudophakia, aphakia, irregular corneal |
| | astigmatism, coloboma of iris, |
| | choroids, retina, nystagmus, post R.K., PRK, LASIK) |

Study Scheme & Syllabus of

Bachelor of Optometry

(Semester V & VI)

Batch 2021 Onwards

By

Board of Studies

I K GUJRAL PUNJAB TECHNICAL UNIVERSITY KAPURTHALA

Bachelor of Optometry, Choice Based Credit System, Batch 2021 and onwards

IK Gujral Punjab Technical University

VISION

To be an institution of excellence in the domain of higher technical education that serves as the fountainhead for nurturing the future leaders of technology and techno- innovation responsible for the techno-economic, social, cultural and environmental prosperity of the people of the State of Punjab, the Nation and the World.

MISSION

To provide seamless education through the pioneering use of technology, in partnership with industry and society with a view to promote research, discovery and entrepreneurship and to prepare its students to be responsible citizens of the world and the leaders of technology and techno-innovation of the 21st Century by developing in them the desirable knowledge, skill and attitudes base for the world of work and by instilling in them a culture for seamlessness in all facets of life.

OBJECTIVES

To offer globally-relevant, industry-linked, research-focused, technology- enabled seamless education at the graduate, postgraduate and research levels in various areas of engineering & technology and applied sciences keeping in mind that the manpower so spawned is excellent in quality, is relevant to the global technological needs, is motivated to give its best and is committed to the growth of the Nation;

To foster the creation of new and relevant technologies and to transfer them to industry for effective utilization;

To participate in the planning and solving of engineering and managerial problems of relevance to global industry and to society at large by conducting basic and applied research in the areas of technologies. To develop and conduct continuing education programmes for practicing engineers and managers with a view to update their fundamental knowledge base and problemsolving capabilities in the various areas of core competence of the University;

To develop strong collaborative and cooperative links with private and public sector industries and government user departments through various avenues such as undertaking of consultancy projects, conducting of collaborative applied research projects, manpower development programmes in cutting-edge areas of technology, etc; To develop comprehensive linkages with premier academic and research institutions within the country and abroad for mutual benefit;

To provide leadership in laboratory planning and in the development of instructional resource material in the conventional as well as in the audio- visual, the video and computer-based modes;

To develop programmes for faculty growth and development both for its own faculty as well as for the faculty of other engineering and technology institutions;

To anticipate the global technological needs and to plan and prepare to cater to them;

To interact and participate with the community/society at large with a view to inculcate in them a feel for scientific and technological thought and endeavour; and

To actively participate in the technological development of the State of Punjab through the undertaking of community development programmes including training and education programmes catering to the needs of the unorganized sector as well as that of the economically and socially weaker sections of society.

ACADEMIC PHILOSOPHY

The philosophy of the education to be imparted at the University is to awaken the "deepest **potential**" of its students as holistic human beings by nurturing qualities of self-confidence, courage, integrity, maturity, versatility of mind as well as a capacity to face the challenges of tomorrow so as to enable them to serve humanity and its highest values in the best possible way.

TITLE OF THE PROGRAM: B.Sc. OPTOMETRY

YEAR OF IMPLEMENTATION: New Syllabus will be implemented from June 2021 onwards.

DURATION: The course shall be four years, with semester system (6 semesters academic, with two semester's clinical posting). The Choice based credit system will be applicable to all the semesters.

ELGIBILITY FOR ADMISSION: Candidates with 50% marks (5% relaxation for SC/ST) in aggregate in 10+2 with Medical (Physics, Chemistry & Biology)/ Diploma in Optometry with minimum aggregate of 50% marks.

MEDIUM OF INSTRUCTION: English.

SCHEME OF THE PROGRAM:

| Sr. No. | Course Code | Course Type | Course Title | L-T-P* | Credi ts | Marks D | istribution | Marks |
|------------|----------------|--------------------|--------------------|---------|-------------|----------|-------------|-------|
| | | | | | | Internal | External | |
| 1. | BOPT 501-21 | Core Theory | Contact lens-I | 3-1-0 | 4 | 40 | 60 | 100 |
| 2. | BOPT | ~ ~ | Low vision & | 3-0-0 | 3 | 40 | 60 | 100 |
| | 502-21 | Core Theory | Rehabilitation | | | | | |
| 3. | BOPT | | Geriatric | 3-0-0 | 3 | 40 | 60 | 100 |
| | 503-21 | a | Optometry & | | | | | |
| | | Core Theory | Pediatric | | | | | |
| | | | optometry | | | | | |
| 4. | BOPT | Core Theory | Binocular vision-I | 3-0-0 | 3 | 40 | 60 | 100 |
| | 504-21 | | | | | | | |
| 5. | BOPT | Core Theory | Systemic disease | 3-1-0 | 4 | 40 | 60 | 100 |
| | 505-21 | | - | | | | | |
| 6. | BOPT | Core Theory | Research | 3-1-0 | 4 | 40 | 60 | 100 |
| | 506-21 | | Methodology & | | | | | |
| | | | Biostatistics | | | | | |
| 7. | BOPT | Core Practical/Lab | Contact lens-I | 0-0-4 | 2 | 60 | 40 | 100 |
| | 507-21 | | | | | | | |
| 8. | BOPT | Core Practical/Lab | Binocular vision-I | 0-0-4 | 2 | 60 | 40 | 100 |
| | 508-21 | | | | | | | |
| 9 | BOPT | Core Practical/Lab | Clinics-III | 0-0-6 | 3 | 60 | 40 | 100 |
| | 509-21 | | | | | | | |
| | | Total | | 18-3-14 | 28 | 420 | 480 | 900 |

Semester-V

| Sr. | Course | Course Type | Course Title | L-T-P* | Credi | Marks D | istribution | Marks |
|-----|--------|--------------------|-------------------------------|---------|-------|----------|-------------|-------|
| No. | Code | | | | ts | | | |
| | | | | | | Internal | External | |
| 1. | BOPT | G T | Contact lens-II | 0.1.0 | | 10 | <i>c</i> 0 | 100 |
| | 601-21 | Core Theory | | 3-1-0 | 4 | 40 | 60 | 100 |
| 2. | BOPT | о т і | Binocular vision-II | 2 1 0 | 4 | 10 | | 100 |
| | 602-21 | Core Theory | | 3-1-0 | 4 | 40 | 60 | 100 |
| 3. | BOPT | Con Theorem | Community Optometry | 200 | 2 | 40 | 60 | 100 |
| | 603-21 | Core Theory | | 3-0-0 | 3 | | | |
| 4. | BOPT | Core Theory | Low Vision Rehabilitation | 200 | 2 | 40 | 60 | 100 |
| | 604-21 | | | 3-0-0 | 3 | 40 | 00 | 100 |
| 5. | BOPT | Core Theory | Medical Law and Ethics | 200 | 2 | 40 | 60 | 100 |
| | 605-21 | | | 3-0-0 | 3 | 40 | 00 | 100 |
| 6. | BOPT | Come Dreatical/Lab | Contact lens-II Practical | 0.0.4 | 2 | 60 | 40 | 100 |
| | 607-21 | Cole Flactical/Lab | | 0-0-4 | 2 | 00 | 40 | 100 |
| 7 | BOPT | Cana Drastical/Lab | Binocular vision-II Practical | 0-0-4 | 2 | (0) | 40 | 100 |
| | 608-21 | Core Practical/Lab | | | 2 | 00 | 40 | 100 |
| 8 | BOPT | Core Prestical/Lab | Clinics-IV | 0-0-6 | 2 | 60 | 40 | 100 |
| | 609-21 | Cole Flactical/Lab | | | 3 | 00 | 40 | 100 |
| | | Total | | 15-2-14 | 22 | 380 | 420 | 800 |

Semester-VI

| | | THEO | RY | | |
|-------|------------------------|---|--------------|--------------|--|
| S.No. | | | Weigl | ntage | Remarks |
| | | | in Ma | rks | |
| 1 | Internal | Mid-Semester | 30 | 20 | MSTs, Quizzes, |
| | Evaluation | Examination | | | assignments, attendance, |
| 2 | | Attendance | 5 | 5 | etc. Constitute internal evaluation Best of two |
| 3 | | Assignments | 5 | 5 | mid-semester exams will |
| | | | | | be considered for |
| | | | | | evaluation |
| 4 | External | End-Semester | 60 | 30 | Conduct and checking of |
| | Evaluation | Examination | | | the answer sheets will be at |
| | | | | | the university level. |
| | Total | | 100 | 60 | |
| F | PRACTICAL | | | | |
| 1 | Internal | Daily evaluation of | 30 | 10 | |
| | Evaluation | practical | | | |
| | | performance/ record/ | | | |
| | | viva voce | | | |
| 2 | | A 1 | ~ | - | |
| | | Attendance | þ | 5 | |
| 3 | | Attendance Internal Practical | <u>р</u> | 5 5 | - |
| 3 | - | Attendance Internal Practical Examination | 5 | 5 | |
| 3 | External | Attendance Internal Practical Examination Final Practical | 5 5 40 | 5 5 20 | - |
| 3 | External Evaluation | Attendance Internal Practical Examination Final Practical Examination | 5 5 40 | 5 5 20 | |

EXAMINATION AND EVALUATION

PATTERN OF END-SEMESTER EXAMINATION

- K. Part A will be One Compulsory question consisting of short answer type questions [Q No. 1(a-h)] covering whole syllabus. There will be no choice in this question. It will be of 16 marks comprising of 8 questions of 2 marks each.
- KK. **Part B** will be comprising of eight questions [2-9]. Student will have to attempt any six questions from this part. It will be of 24 marks with **6 questions of 4 marks each**.
- KKK. **Part C** will be comprising of two compulsory questions with internal choice in both these questions [10-11]. It will be of 20 marks with **2 questions of 10 marks each**.

SYLLABUS OF THE PROGRAM

The syllabus has been upgraded as per provision of the UGC module and demand of the academic environment. The contents of the syllabus have been duly arranged unit wise and included in such a manner so that due importance is given to requisite intellectual and laboratory skills. The application part of the respective contents has been appropriately emphasized.

SEMESTER-V

| I.K. GUJRAL PUNJAB TECHNICAL UNIVERSITY | | | | | | | |
|---|--------|----------------|------------|---|--|--|--|
| Course Name | Bach | elor of C | Optometr | у | | | |
| Subject Code: | BOP | T 501-2 | 1 | | | | |
| Subject Title: | Cont | Contact Lens-I | | | | | |
| Contact Hours: | L:3 | T:1 | P:0 | Credits:4 | | | |
| Examination | 3 | | | | | | |
| Duration (hours) | | | | | | | |
| Objective(s): | This | course de | al with th | e definition of low vision, epidemiology aspect of visual | | | |
| | impai | rment, ty | pes of 1 | ow vision devices and its optical principles, clinical | | | |
| | appro | ach of | the low | vision patients, assistive devices for totally visually | | | |
| | challe | enged, art | t of prese | cribing low vision devices and training the low vision | | | |
| | patier | nts. | | | | | |
| | | | | | | | |

| Unit-1 | 10Hours |
|----------|--|
| | Introduction to Contact lenses |
| | Definition; Classification / Types; History of Contact Lenses |
| | Optics of contact lens |
| | Magnification & Visual field; Accommodation & Convergence; Back & Front |
| | Vertex power / Vertex distance calculation |
| | Tear film; Cornea; Lids & Conjunctiva |
| Unit-II | 10Hours |
| | Introduction to CL material |
| | Monomers; Polymers |
| | Properties of CL materials |
| | Physiological (Dk, Ionicity, |
| | Water content); Physical (Elasticity, Tensile strength, Rigidity); Optical |
| | (Transmission, Refractive index) |
| | Indications and contraindications Parameters / Designs of Contact Lenses & |
| | Terminology |
| Unit-III | 10Hours |
| | RGP Contact Lens materials |
| | Manufacturing Rigid and Soft Contact Lenses – various methods |
| L | |

| | Pre-Fitting examination steps, significance, recording of results; Correction of |
|---------|--|
| | Astigmatism with RGP lens, |
| | Types of fit |
| | Steep, Flat, Optimum – on spherical corneawith spherical lenses |
| Unit-IV | 10Hours |
| | Calculation and finalising Contact lens |
| | Ordering Rigid Contact Lenses – writing a prescription to |
| | the Laboratory |
| | Checking and verifying Contact lenses |
| | Checking and verifying Contact lenses from Laboratory; Modifications possible |
| | with Rigid lenses |
| | Common Handling Instructions |
| | Insertion & Removal Techniques; Do's and Dont's |
| | Care and Maintenance |
| | Cleaning agents & Importance; Rinsing agents & Importance; Disinfecting |
| | agents & importance; Lubricating & Enzymatic cleaners Follow up visit |
| | examination; Complications of RGP lenses |
| 1 | |

• Christine Dickinson: Low Vision: Principles and Practice Low vision care, 4th edition, Butterworth Heinemann, 1998

• Low vision : jaypee Bros : Monica Chaudhry

• E Vaithilingam: practice of Low vision – A guidebook, Medical Research Foundation, 2000.

References books

• Richard L. Brilliant: Essentials of Low Vision Practice, Butterworth-Heinemann, 1999

 Helen Farral: optometric Management of Visual Handicap, Blackwell Scientific publications, 1991AJ Jackson, J S Wolffsohn: Low Vision Manual, Butterworth Heinnemann, 2007

| I.K. GUJRAL PUNJAB TECHNICAL UNIVERSITY | | | | | | | |
|---|--------|-----------------------------|-------------|---|--|--|--|
| Course Name | Bach | Bachelor of Optometry | | | | | |
| Subject Code: | BOP | 'T 502-2 | 1 | | | | |
| Subject Title: | Low | Low Vision & Rehabilitation | | | | | |
| Contact Hours: | L:3 | T:0 | P:0 | Credits:3 | | | |
| Examination | 3 | | | | | | |
| Duration (hours) | | | | | | | |
| Objective(s): | This | course de | al with the | e definition of low vision, epidemiology aspect of visual | | | |
| | impai | irment, ty | ypes of le | ow vision devices and its optical principles, clinical | | | |
| | appro | oach of | the low | vision patients, assistive devices for totally visually | | | |
| | challe | enged, art | t of presc | eribing low vision devices and training the low vision | | | |
| | patier | nts. | | | | | |
| | | | | | | | |

| Unit-1 | | 10Hours |
|----------|---|----------|
| | Introduction to Contact lenses | |
| | Definition; Classification / Types; History of Contact Lenses | |
| | Optics of contact lens | |
| | Magnification & Visual field; Accommodation & Convergence; | |
| | Back & Front VertexPower / Vertex distance calculation | |
| | Tear film; Cornea; Lids & Conjunctiva | |
| Unit-II | | 10 Hours |
| | Introduction to CL material | |
| | Monomers; Polymers | |
| | Properties of CL materials | |
| | Physiological (Dk, Ionicity,Water content); | |
| | Physical (Elasticity, Tensile strength, Rigidity); | |
| | Optic(Transmission, Refractive index) | |
| | Indications and contraindications | |
| | Parameters / Designs of Contact Lenses & Terminology | |
| Unit-III | | 10Hours |
| | RGP Contact Lens materials | |
| | Manufacturing Rigid and Soft Contact Lenses – various | |
| | methods | |
| | Pre-Fitting examination, steps, significance, recording of results; | |

Bachelor of Optometry, Choice Based Credit System, Batch 2021 and onwards

| | Correction of Astigmatism with RGP lens, | |
|---------|---|---------|
| | Types of fit, Steep, Flat, Optimum - on spherical cornea with | |
| | spherical lenses | |
| Unit-IV | | 10Hours |
| | Calculation and finalising Contact lens | |
| | Ordering Rigid Contact Lenses – writing a prescription to | |
| | the Laboratory | |
| | Checking and verifying Contact lenses | |
| | Checking and verifying Contact lenses from Laboratory; | |
| | Modifications possible with Rigid lenses | |
| | Common Handling Instructions | |
| | Insertion & Removal Techniques; Do's and Dont's | |
| | Care and Maintenance | |
| | Cleaning agents &Importance Rinsing agents & Importance; | |
| | Disinfecting | |
| | agents & importance; Lubricating & Enzymatic cleaners, | |
| | Follow up visit examination; Complications of RGP lenses | |

• Christine Dickinson: Low Vision: Principles and Practice Low vision care, 4th edition, Butterworth Heinemann, 1998

• Low vision : jaypee Bros : Monica Chaudhry

• E Vaithilingam: practice of Low vision – A guidebook, Medical Research Foundation, 2000.

References books

• Richard L. Brilliant: Essentials of Low Vision Practice, Butterworth-Heinemann, 1999

 Helen Farral: optometric Management of Visual Handicap, Blackwell Scientific publications, 1991AJ Jackson, J S Wolffsohn: Low Vision Manual, Butterworth Heinnemann, 2007

| I.K. GUJRAL PUN | JAB T | ECHNI | CAL UN | IVERSITY | | |
|------------------|-------|---|-----------|----------------------------|--|--|
| Course Name | Bach | nelor of C | Optometr | у | | |
| Subject Code: | BOP | Т 503-2 | 1 | | | |
| Subject Title: | Geri | atrics op | tometry a | & Pediatric Optometry | | |
| Contact Hours: | L:3 | T:0 | P:0 | Credits:3 | | |
| Examination | 3 | | | | | |
| Duration (hours) | | | | | | |
| Objective(s): | This | This course deals with general and ocular physiological changes of | | | | |
| | ageii | ageing, common geriatric systemic and ocular diseases, clinical | | | | |
| | appr | approach of geriatric patients, pharmacological aspects of ageing and | | | | |
| | spec | tacle disj | pensing a | spects in ageing patients. | | |

| Unit-1 | | 10Hours |
|----------|---|---------|
| | Introduction & Structural changes of eye in elderly | |
| | Morphological changes of eye in elderly | |
| | Physiological changes in eye in the course of aging. | |
| Unit-II | | 10Hours |
| | Introduction to geriatric medicine – epidemiology | |
| | Need for optometry care | |
| | Systemic diseases(Hypertension, Atherosclerosis, coronary heart | |
| | disease, congestive Heart failure, | |
| | Cerebrovascular disease, Diabetes, COPD) | |
| Unit-III | | 20Hours |
| | Optometric Examination of the Older Adult | |
| | Ocular diseases common in old eye, with special | |
| | reference to cataract, glaucoma, macular disorders, | |
| | Vascular diseases of the eye | |
| | Contact lenses in elderly | |
| | Pharmacological aspects of aging | |
| | Low vision causes, management and rehabilitation in geriatrics. | |

• A.J. ROSSENBLOOM Jr & M.W.MORGAN: Vision and Aging, Butterworth-Heinemann, Missouri, 2007.

References books

• OP Sharma: Geriatric Care –A textbook of geriatrics and Gerontology, viva books, New Delhi, 2005

• VS Natarajan: An update on Geriatrics, Sakthi Pathipagam, Chennai, 1998

• DE Rosenblatt, VS Natarajan: Primer on geriatric Care A clinical approach to the older patient, Printers Castle, Cochin, 2002

| I.K. GUJRAL PUN | JAB T | ECHNI | CAL UN | IVERSITY | | |
|------------------|-------|---|-----------|----------------------------|--|--|
| Course Name | Bach | Bachelor of Optometry | | | | |
| Subject Code: | BOP | Т 504-2 | 1 | | | |
| Subject Title: | Bino | cular Vi | sion-I | | | |
| Contact Hours: | L:3 | T:0 | P:0 | Credits:3 | | |
| Examination | 3 | | | | | |
| Duration (hours) | | | | | | |
| Objective(s): | This | This course deals with general and ocular physiological changes of | | | | |
| | ageii | ageing, common geriatric systemic and ocular diseases, clinical | | | | |
| | appr | approach of geriatric patients, pharmacological aspects of ageing and | | | | |
| | spec | tacle disj | pensing a | spects in ageing patients. | | |

| Unit-1 | | 15Hours |
|----------|--|---------|
| | Binocular Vision and Space perception | |
| | Relative subjective visual direction; Retinomotor value;Grades | |
| | of BSV; SMP and Cyclopean Eye; | |
| | Correspondence; Fusion, Diplopia, Retinal rivalry | |
| | Horopter; Physiological Diplopia and Suppression; Stereopsis, | |
| | Panum's area, BSV; Stereopsis and monocular clues – | |
| | significance, Egocentric location, clinical applications; Theories | |
| | of Binocular vision | |
| Unit-II | | 10Hours |
| | Anatomy of Extra Ocular Muscles: Recti and Obliques, | |
| | LPS; Innervation & Blood Supply. Near Vision Complex | |
| | Accommodation 6.1 Definition and mechanism (process); | |
| | Methods of measurement, Stimulus and innervations; Types of | |
| | accommodation; Anomalies of accommodation – aetiology and | |
| | management. | |
| Unit-III | | 10Hours |
| | Convergence: Definition and mechanism; Methods of | |
| | measurement; Types and components of convergence - Tonic, | |

Bachelor of Optometry, Choice Based Credit System, Batch 2021 and onwards

| | accommodative, fusional, proximal; Anomalies of Convergence | |
|---------|--|---------|
| | - aetiology and management. | |
| Unit-IV | | 10Hours |
| | Sensory adaptations: Confusion, | |
| | Suppression: Investigations; Management; Blind spot syndrome | |
| | | |
| | Management | |
| | Abnormal Retinal Correspondence: Investigation and | |
| | management; Blind spot syndrome, | |
| | Eccentric Fixation: Investigation and management | |

• Pradeep Sharma: Strabismus simplified, New Delhi, First edition, 1999, Modern publishers.

• Fiona J. Rowe: Clinical Orthoptics, second edition, 2004, Blackwell Science Ltd

Gunter K. V. Mosby Company

• Mitchell Scheiman; Bruce Wick: Clinical Management of Binocular Vision Heterophoric, Accommodative, and Eye Movement Disorders, 2008, Lippincot Williams & Wilkins publishers

References books

 Mitchell Scheiman; Bruce Wick: Clinical Management of Binocular VisionHeterophoric, Accommodative, and Eye Movement Disorders, 2008, Lippincot Williams & Wilkinspublisher

| I.K. GUJRAL PUNJAB TECHNICAL UNIVERSITY | | | | | | |
|---|-------|---|-----------|----------------------------|--|--|
| Course Name | Bach | Bachelor of Optometry | | | | |
| Subject Code: | BOP | т 505-2 | 1 | | | |
| Subject Title: | Syste | emic Dis | ease | | | |
| Contact Hours: | L:3 | T:1 | P:0 | Credits:4 | | |
| Examination | 3 | | | | | |
| Duration (hours) | | | | | | |
| Objective(s): | This | This course deals with general and ocular physiological changes of | | | | |
| | ageii | ageing, common geriatric systemic and ocular diseases, clinical | | | | |
| | appr | approach of geriatric patients, pharmacological aspects of ageing and | | | | |
| | spec | tacle dis | pensing a | spects in ageing patients. | | |

| Unit-1 | | 15Hours |
|----------|---|---------|
| | Hypertension, | |
| | Definition, classification, Epidemiology, clinical examination, | |
| | complications, and management. | |
| | Hypertensive retinopathy | |
| | Diabetes Mellitus | |
| | Classification, pathophysiology, clinical presentations, diagnosis, | |
| | and management, Complications | |
| | Diabetic Retinopathy | |
| | Thyroid Disease | |
| | Physiology, testing for thyroid disease, Hyperthyroidism, | |
| | Hypothroidism, Thyroiditis, Thyroid tumors | |
| Unit-II | | 10Hours |
| | Cancer incidence | |
| | Etiology of Retinoblastoma & choroidal melanoma | |
| | Therapy and Ophthalmic consideration | |
| | Connective Tissue Disease | |
| | Rheumatic arthritis, Systemic lupus erythematosus, Scleroderma | |
| | Eye and connective tissue disease | |
| | Tuberculosis & Ocular Manifestations | |
| Unit-III | | 10Hours |

Bachelor of Optometry, Choice Based Credit System, Batch 2021 and onwards

| | Herpes virus (Herpes simplex, Varicella Zoster, | | | | | | | | |
|---------|---|---------|--|--|--|--|--|--|--|
| | Cytomegalovirus, Epstein Barr Virus) ,Herpes and the eye | | | | | | | | |
| | Acquired Immunodeficiency Syndrome & Ocular | | | | | | | | |
| | Manifestations | | | | | | | | |
| | Anemia (Diagnosis, clinical evaluation, consequences, Sickle | | | | | | | | |
| | cell disease, treatment, Ophthalmologic considerations) | | | | | | | | |
| | Hyperlipidemias | | | | | | | | |
| Unit-IV | · · · · · · | 10Hours | | | | | | | |
| | Vitamin A & Eye Disease | | | | | | | | |
| | | | | | | | | | |
| | General Medical Emergencies Preoperative precautions in | | | | | | | | |
| | ocular surgery | | | | | | | | |

• C Haslett, E R Chilvers, N A boon, N R Coledge, J A A Hunter: Davidson's Principles andPractice of Medicine, Ed. John Macleod, 19th Ed., ELBS/Churchill Livingstone. (PPM), 2002

• Basic and clinical Science course: Update on General Medicine, American Academy of Ophthalmology, Section 1, 1999

| I.K. GUJRAL PUN | JAB T | ECHNI | CAL UN | NIVERSITY | | |
|------------------|--------|--|--------|-----------|--|--|
| Course Name | Bach | Bachelor of Optometry | | | | |
| Subject Code: | BOP | BOPT 506-21 | | | | |
| Subject Title: | Rese | Research Methodology & Biostatistics | | | | |
| Contact Hours: | L:3 | T:1 | P:0 | Credits:4 | | |
| Examination | 3 | | | | | |
| Duration (hours) | | | | | | |
| Objective(s): | The o | The objective of this module is to help the students understand the basic principles | | | | |
| | of res | f research and methods applied to draw inferences from the research findings. | | | | |

| Unit-1 | | 15Hours |
|----------|--|---------|
| | Introduction to research methods | |
| | Identifying research problem | |
| | Ethics of research | |
| Unit-II | | 10Hours |
| | Research Methodology | |
| | Basics of Research design | |
| | Basics of Types of Data | |
| | Basics of Research tools and Data collection methods | |
| | Basics of Sampling methods | |
| | Developing a research proposal | |
| Unit-III | | 10Hours |
| | Biostatistics | |
| | Basics of Biostatistics | |
| | Introduction of Biostatistics, Sampling, Statistical significance, | |
| | Correlation, Sample size determination. | |
| | Statistics– Collection of Data, presentation including | |
| | classification and diagrammatic representation-frequency | |
| | distribution. Measures of central tendency; measures of | |
| | dispersion | |
| Unit-IV | | 10Hours |
| | Theoretical distributions | |
| | Binomial Normal | |

| Sampling –necessity of methods and techniques. Chi. Square test | |
|---|--|
| (2 x 2) | |

- Mausner & Bahn: Epidemiology-An Introductory text, 2nd Ed., W. B. Saunders Co.
- Richard F. Morton & J. Richard Hebd: A study guide to Epidemiology and Biostatistics, 2ndEd., University Park Press, Baltimore.
- Sylvia W Smoller, J Smoller, Biostatistics & Epidemiology A Primer for health and Biomedical professionals, 4th edition, Springs, 2015

| I.K. GUJRAL PUN. | JAB T | ECHNI | CAL UN | IVERSITY |
|------------------|-------------|------------|-----------|--|
| Course Name | Bach | nelor of (| Optometr | у |
| Subject Code: | BOPT 507-21 | | | |
| Subject Title: | Cont | act Lens | e-I | |
| Contact Hours: | L:0 | T:1 | P:4 | Credits:2 |
| Examination | 3 | | | |
| Duration (hours) | | | | |
| Objective(s): | This | course | provides | theoretical aspects of Binocular Vision and its |
| | clini | calapplic | ation. It | deals with basis of normal binocular vision and |
| | space | e perce | ption, C | cross anatomy and physiology of extraocular |
| | muse | cles, vari | ious binc | ocular vision anomalies, its diagnostic approaches |
| | and 1 | managen | nent | |

- 1. Measurement of Ocular dimensions
- 2. Pupillary diameter and lid characteristics
- 3. Blink rate and TBUT
- 4. Schrimers test, Slit lamp examination of tear layer
- 5. Keratometry
- 6. Placido's disc
- 7. Soft Contact Lens fitting Aspherical
- 8. Soft Contact Lens fitting Lathe cut lenses
- 9. Soft Contact Lens over refraction
- 10. Lens insertion and removal
- 11. Lens handling and cleaning

Suggested Books

- IACLE modules 1 5; CLAO Volumes 1, 2,
- Anthony J. Phillips : Contact Lenses, 5th edition, Butterworth-Heinemann, 2006
- Elisabeth A. W. Millis: Medical Contact LensPractice, Butterworth-Heinemann, 2004
- E S. Bennett ,V A Henry :Clinical manual of ContactLenses, 3rd edition, Lippincott

Williams and Wilkins, 2008; Contact lens Primer : Jaypee Bros : Monica Chaudhry

| I.K. GUJRAL PUN. | JAB T | ECHNIC | CAL UN | IVERSITY |
|------------------|-------|------------|-----------|--|
| Course Name | Bach | elor of (| Optometr | у |
| Subject Code: | BOP | T 508-2 | 1 | |
| Subject Title: | Bino | cular Vi | sion-I | |
| Contact Hours: | L:0 | T:1 | P:4 | Credits:2 |
| Examination | 3 | | | |
| Duration (hours) | | | | |
| Objective(s): | This | course | provides | theoretical aspects of Binocular Vision and its |
| | clini | cal appli | cation. I | t deals with basis of normal binocular vision and |
| | space | e perce | ption, G | cross anatomy and physiology of extraocular |
| | musc | eles, vari | ious binc | ocular vision anomalies, its diagnostic approaches |
| | and r | managen | nent | |

Comprehensive oral examination

Investigation & Management of binocular vision anomalies & Interpret clinical results

- 1. AC/A Ratio
- 2. ARC
- 3. Eccentric fixation
- 4. Amblyopia
- 5. Suppression

Suggested Books

• Pradeep Sharma: Strabismus simplified, New Delhi, First edition, 1999, Modern publishers.

• Fiona J. Rowe: Clinical Orthoptics, second edition, 2004, Blackwell Science Ltd

• Gunter K. V. Mosby Company

• Mitchell Scheiman; Bruce Wick: Clinical Management of Binocular Vision Heterophoric, Accommodative, and Eye Movement Disorders, 2008, Lippincot Williams & Wilkins publishers

| I.K. GUJRAL PUN. | JAB TECHNICAL UNIVERSITY | | | |
|------------------|--------------------------|-------------|--------------|---|
| Course Name | Bach | elor of O | Optometi | ry |
| Subject Code: | BOPT 509-21 | | | |
| Subject Title: | Clinic | es-III | | |
| Contact Hours: | L:0 | T:1 | P:6 | Credits:3 |
| Examination | 3 | | | |
| Duration (hours) | | | | |
| Objective(s): | The o | course pro | ovides stu | dents the opportunity to continue to develop confidence |
| | and in | ncreased s | skill in dia | agnosis and treatment delivery. Students will demonstrate |
| | comp | etence in | basic, int | ermediate and advance procedure in those areas. Students |
| | will p | participate | in advan | ce and specialized diagnostic and management procedure. |
| | Stude | ents will g | get practio | cal experience of the knowledge acquired from geriatric |
| | and p | ediatric c | ptometry | courses. Hands- on experience under supervision will be |
| | provi | ded in v | various o | utreach programmes namely, school vision screening, |
| | glauc | oma and | diabetic | retinopathy screening etc., Students also get hand-on |
| | practi | ical sessio | ons. | |

SEMESTER-VI

| I.K. GUJRAL PUN | JAB T | ECHN | ICAL UN | NIVERSITY |
|------------------|-------|-----------|-------------|--|
| Course Name | Bach | nelor of | Optome | try |
| Subject Code: | BOP | T 601-2 | 21 | |
| Subject Title: | Cont | act Len | s-II | |
| Contact Hours: | L:3 | T:1 | P:0 | Credits:4 |
| Examination | 3 | | | |
| Duration (hours) | | | | |
| Objective(s): | The s | subject p | provides th | he student with suitable knowledge both in theoretical and |
| | pract | ical aspe | cts of Con | ttact Lensest |
| | | | | |

Details of the Course

| Unit-1 | | 15Hours |
|----------|---|---------|
| | Pre fitting examination | |
| | Review of Basics | |
| | Patient Selection; Pre screening for contact lens wear | |
| | Slit Lamp examination; Assessment of Cornea Assessment of Tear film | |
| Unit-II | | 10Hours |
| | Contact lens fitting | |
| | Soft contact lens fitting, | |
| | Soft Toric Contact Lens fitting | |
| Unit-III | | 10Hours |
| | Rigid Contact lens fitting; Managing the Presbyope | |
| | Silicone Hydrogel Lenses, Extended Wear | |
| Unit IV | | 100000 |
| Unit-1V | | TOHOUIS |
| | Contact lens care | |
| | Contact lens after Care | |
| | Overview of Special considerations for fitting contact lenses | |
| | Therapeutic and Prosthetic contact lenses | |

Suggested Books

Christine Dickinson: Low Vision: Principles and Practice Low vision care, 4th

edition, Butterworth Heinemann, 1998

Low vision : jaypee Bros : Monica Chaudhry

• E Vaithilingam: practice of Low vision – A guidebook, Medical Research Foundation, 2000.

References books

•

• Richard L. Brilliant: Essentials of Low Vision Practice, Butterworth-Heinemann, 1999

• Helen Farral: optometric Management of Visual Handicap, Blackwell Scientific publications, 1991AJ Jackson, J S Wolffsohn: Low Vision Manual, Butterworth Heinnemann, 2007

| I.K. GUJRAL PUN. | JAB T | ECHNIC | CAL UN | IVERSITY |
|------------------|-------|------------|-------------|--|
| Course Name | Bach | elor of C | Optometr | У |
| Subject Code: | BOP | T 602-2 | 1 | |
| Subject Title: | Bino | cular Vi | sion-II | |
| Contact Hours: | L:3 | T:1 | P:0 | Credits:4 |
| Examination | 3 | | | |
| Duration (hours) | | | | |
| Objective(s): | This | course de | als with | understanding of strabismus, its classification, necessary |
| | ortho | ptic inve | stigations, | diagnosis and non-surgical management. Along with |
| | theor | etical kno | wledge it | teaches the clinical |
| | aspec | ts and app | plication. | |
| | | | | |

| Unit-1 | | 15 Hours |
|----------|---|----------|
| | Neuro-muscular anomalies; Classification and etiological factors | |
| | History – recording and significance, Accommodative and Non | |
| | Accommodative convergent squint; Classification; | |
| | Investigation and Management | |
| | Divergent Strabismus: Classification; A& V phenomenon; | |
| | Investigation and Management, | |
| Unit-II | | 10 Hours |
| | Vertical strabismus: Classification; Investigation and | |
| | Management Paralytic Strabismus: Acquired and Congenital; | |
| | Clinical Characteristics | |
| Unit-III | | 10 Hours |
| | Distinction from comitant and restrictive Squint, Investigations: | |
| | History and | |
| | symptoms; Head Posture; Diplopia Charting; Hess chart; PBCT; | |
| | Nine directions; Binocular field of vision | |
| | Amblyopia and Treatment of Amblyopia, Nystagmus, | |
| | Non-surgical Management of Squint | |
| Unit-IV | | 10 Hours |
| | Restrictive Strabismus | |
| | Features; Musculo-fascial anomalies; Duane's Retraction | |

| syndrome; Clinical features and management, Brown's Superior | |
|--|--|
| oblique sheath syndrome; Strabismus fixus; Congenital muscle | |
| fibrosis | |

• Pradeep Sharma: Strabismus simplified, New Delhi, First edition, 1999, Modern publishers.

• Fiona J. Rowe: Clinical Orthoptics, second edition, 2004, Blackwell Science Ltd

• Gunter K. V. Mosby Company

• Mitchell Scheiman; Bruce Wick: Clinical Management of Binocular Vision Heterophoric, Accommodative, and Eye Movement Disorders, 2008, Lippincot Williams & Wilkins publishers

References books

 Mitchell Scheiman; Bruce Wick: Clinical Management of Binocular VisionHeterophoric, Accommodative, and Eye Movement Disorders, 2008, Lippincot Williams & Wilkinspublisher

| I.K. GUJRAL PUN | JAB TECHNICAL UNIVERSITY | | | |
|------------------|--------------------------|-------------------|------------|---|
| Course Name | Bach | nelor of (| Optomet | ry |
| Subject Code: | BOPT 603-21 | | | |
| Subject Title: | Com | munity | Optomet | ry |
| Contact Hours: | L:3 | T:0 | P:0 | Credits:3 |
| Examination | 3 | | | |
| Duration (hours) | | | | |
| Objective(s): | Intro | duction to | the foun | dation and basic sciences of public health optometry with |
| | an en | nphasis oi | n the epid | emiology of vision problems especially focused on Indian |
| | scena | rio. | | |
| | Also | deals with | h general | aspects of occupational health, Visual demand in various |
| | job, t | ask analy | sing meth | od ,visual standards for various jobs, occupational hazards |
| | and r | emedial a | spects thr | ough classroom sessions and field visit to the factories. |
| | | | | |

| Unit-1 | | 10Hours |
|----------|---|---------|
| | Public Health Optometry | |
| | Concepts and implementation; Stages of diseases; | |
| | Epidemiology of blindness – Defining blindness and visual | |
| | impairment; Eye in primary health care; Contrasting between | |
| | Clinical and community health programs; | |
| Unit-II | | 10Hours |
| | Community Eye Care Programs; Community based rehabilitation | |
| | programs; | |
| | Nutritional Blindness with reference to Vitamin A deficiency; | |
| Unit-III | | 10Hours |
| | Vision 2020: The Right to Sight; Screening for eye diseases; | |
| | National and International health agencies, | |
| | NPCB; Role of an optometrist in Public Health; | |
| | | |
| Unit-IV | | 10Hours |
| | Organization and Management of Eye Care Programs – Service | |
| | Delivery models; Health manpower and planning& Health | |
| | Economics; Evaluation and assessment of health programmers' | |

Bachelor of Optometry, Choice Based Credit System, Batch 2021 and onwards

| Optometrists' role in school eye health programme; Ba | asics of |
|---|----------|
| Tele Optometry and its application in Public | Health; |
| Information, Education and Communication for | |
| Eye Care programs | |

- R V North: Work and the eye, Second edition, Butterworth Heinnemann, 2001
- BHVI student notes
- GVS Murthy, S K Gupta, D Bachani: The principles and practice of community Ophthalmology, National programme for control of blindness, New Delhi, 2002
- Newcomb RD, Jolley JL : Public Health and Community Optometry, Charles C Thomas Publisher, Illinois, 1980
- Community eye health journals

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|---|--|--|-----|-----------|--|
| Course Name | Bachelor of Optometry | | | | |
| Subject Code: | BOPT 604-21 | | | | |
| Subject Title: | Low Vision & Rehabilitation-II | | | | |
| Contact Hours: | L:3 | T:0 | P:0 | Credits:3 | |
| Examination | 3 | | | | |
| Duration (hours) | | | | | |
| Objective(s): | This course deal with the definition of low vision, epidemiology aspect of visual | | | | |
| | impai | impairment, types of low vision devices and its optical principles, clinical | | | |
| | approach of the low vision patients, assistive devices for totally visually challenged, art of prescribing low vision devices and training the low vision | | | | |
| | | | | | |
| | patients. | | | | |
| | | | | | |

| Unit-1 | | 15Hours |
|----------|---|---------|
| | Introduction | |
| | Definitions & classification of Low vision; | |
| | Epidemiology of low vision [magnitude] | |
| | Pre-clinical evaluation of low vision patients | |
| | Functional needs assessment, prognostic & psychological | |
| | factors; psycho-social impact of low vision; | |
| Unit-1I | | 10Hours |
| | Types of low vision aids – optical aids; non-optical aids; | |
| | electronic devices; | |
| | Assistive technology devices, Optics of low vision aids | |
| | assessment of visual acuity, visual | |
| | field; Selection of low vision aids, instruction & training ; | |
| | Pediatric Low Vision care; | |
| Unit-1II | | 15Hours |
| | Dispensing Low vision devices | |
| | Low vision aids – dispensing & prescribing aspects Visual | |
| | rehabilitation & counseling; Legal aspects of Low vision in | |
| | India; Eye Disorders & Rehabilitation: Model of Low Vision | |
| | services in India; Low vision; Introduction to Optometry | |

| rehabilitation Practice; Model of Low Vision services in India; | |
|--|--|
| Introduction to Optometry rehabilitation Practice; Clinical Case | |
| Presentation | |
| | |

• Christine Dickinson: Low Vision: Principles and Practice Low vision care, 4th edition, Butterworth Heinemann, 1998

• Low vision : jaypee Bros : Monica Chaudhry

• E Vaithilingam: practice of Low vision – A guidebook, Medical Research Foundation, 2000.

References books

• Richard L. Brilliant: Essentials of Low Vision Practice, Butterworth-Heinemann, 1999

 Helen Farral: optometric Management of Visual Handicap, Blackwell Scientific publications, 1991AJ Jackson, J S Wolffsohn: Low Vision Manual, Butterworth Heinnemann, 2007

| I.K. GUJRAL PUNJAB TECHNICAL UNIVERSITY | | | | | |
|---|---|-------------|-----|-----------|--|
| Course Name | Bachelor of Optometry | | | | |
| Subject Code: | BOP | BOPT 605-21 | | | |
| Subject Title: | Medical Law & Ethics | | | | |
| Contact Hours: | L:3 | T:0 | P:0 | Credits:3 | |
| Examination | 3 | | | | |
| Duration (hours) | | | | | |
| Objective(s): | Legal and ethical considerations are firmly believed to be an integral part of medical practice in planning patient care. Advances in medical sciences, growing sophistication of the modern society's legal framework, increasing awareness of human rights and changing moral principles of the community at large, now result in frequent occurrences of healthcare professionals being caught indilemmas over aspects arising from daily practice. | | | | |

| Unit-I | | 15Hours |
|----------|---|---------|
| | Medical ethics - Definition - Goal - Scope | |
| | Introduction to Code of conduct | |
| | Basic principles of medical ethics –Confidentiality | |
| | Malpractice and negligence - Rational and irrational drug therapy | |
| | Autonomy and informed consent - Right of patients | |
| Unit-II | | 15Hours |
| | Introduction –Medico legal case and type- Records and | |
| | document related to MLC - ownership of medical records - | |
| | Confidentiality Privilege communication - Release of medical | |
| | information - Unauthorized disclosure - retention of medical | |
| | records - other various aspects. | |
| | | |
| Unit-III | | 10Hours |
| | Professional Indemnity insurance policy, Development of | |
| | standardized protocol to avoid near miss or sentinel events | |

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|---|--|--|-----|-----------|--|
| Course Name | Bachelor of Optometry | | | | |
| Subject Code: | BOP | BOPT 606-21 | | | |
| Subject Title: | Contact Lens-II | | | | |
| Contact Hours: | L:0 | T:1 | P:4 | Credits:2 | |
| Examination | 3 | | | | |
| Duration (hours) | | | | | |
| Objective(s): | This course provides theoretical aspects of Binocular Vision and its | | | | |
| | clini | clinical application. It deals with basis of normal binocular vision and | | | |
| | space perception, Gross anatomy and physiology of extraocular | | | | |
| | muscles, various binocular vision anomalies, its diagnostic approaches | | | | |
| | and management | | | | |

Contact Lens II (Practical) BOPT 607-21

- Soft Contact Lens fitting Aspherical
- Soft Contact Lens fitting Lathe cut lenses
- Soft Contact Lens over refraction
- Lens insertion and removal
- Lens handling and cleaning
- Examination of old soft Lens
- RGP Lens fitting
- RGP Lens Fit Assessment and fluorescein pattern
- Special RGP fitting (Aphakia, pseudophakia & Keratoconus)
- RGP over refraction and Lens flexure
- Examination of old RGP Lens
- RGP Lens parameters
- Slit lamp examination of Contact Lens wearers
- Anthony J. Phillips : Contact Lenses, 5th edition, Butterworth-Heinemann, 2006
- Elisabeth A. W. Millis: Medical Contact LensPractice, Butterworth-Heinemann, 2004
- E S. Bennett ,V A Henry :Clinical manual of Contact Lenses, 3rd edition, Lippincott Williamsand Wilkins, 2008
- Contact lens Primer: Jaypee Bros : Monica Chaudhry

| I.K. GUJRAL PUNJAB TECHNICAL UNIVERSITY | | | | | | | |
|---|--|--|-----|-----------|--|--|--|
| Course Name | Bachelor of Optometry | | | | | | |
| Subject Code: | BOPT 607-21 | | | | | | |
| Subject Title: | Binocular Vision-II | | | | | | |
| Contact Hours: | L:0 | T:1 | P:4 | Credits:2 | | | |
| Examination | 3 | | | | | | |
| Duration (hours) | | | | | | | |
| Objective(s): | This course provides theoretical aspects of Binocular Vision and its | | | | | | |
| | clini | clinical application. It deals with basis of normal binocular vision and | | | | | |
| | space perception, Gross anatomy and physiology of extraocular muscles, various binocular vision anomalies, its diagnostic approaches | | | | | | |
| | | | | | | | |
| | and management | | | | | | |

Practicals

Investigations and also Management of Non Strabismic Binocular vision Anomalies

Suggested Books

• Pradeep Sharma: Strabismus simplified, New Delhi, First edition, 1999, Modern publishers.

• Fiona J. Rowe: Clinical Orthoptics, second edition, 2004, Blackwell Science Ltd

• Gunter K. Von Noorden: BURIAN- VON NOORDEN'S Binocular vision and ocular motility theory and management of strabismus, Missouri, Second edition, 1980, C. V. Mosby Company

Reference Book

• Mitchell Scheiman; Bruce Wick: Clinical Management of Binocular Vision Heterophoric, Accommodative, and Eye Movement Disorders, 2008,Lippincot Williams & Wilkins publisher

| I.K. GUJRAL PUNJAB TECHNICAL UNIVERSITY | | | | | | |
|---|--|---------------------|-----|-----------|--|--|
| Course Name | Bachelor of Optometry | | | | | |
| Subject Code: | BOPT 608-21 | | | | | |
| Subject Title: | Clinics-IV | | | | | |
| Contact Hours: | L:0 | T:1 | P:6 | Credits:3 | | |
| Examination | 3 | | | | | |
| Duration (hours) | | | | | | |
| Objective(s): | The course provides students the opportunity to continue to develop confidence and increased skill in diagnosis and treatment delivery. Students will demonstrate competence in basic, intermediate and advance procedure in those areas. Students will participate in advance and specialized diagnostic and management procedure. Students will get practical experience of the knowledge acquired from geriatric and pediatric optometry courses. Hands- on experience under supervision will be provided in various outreach programmes namely, school vision screening, | | | | | |
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| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | glaucoma and diabetic retinopathy screening etc., Students also get hand-on | | | | | |
| | practi | practical sessions. | | | | |