

NSUOCO Course Catalog

4101 Introduction to Optometry

The history and philosophy of optometry as a health care profession; introduction to the practice of optometry; optometric terminology, and optometry's role in contemporary society and its present and projected scope.

4126 Geometric and Physical Optics

Imaging of light: ray tracing through optical systems; aberrations and optical systems design. Physics of light: sources, spectra, scatter, polarization, refraction, reflection, absorption, interference, diffraction. Theory behind diagnostic and therapeutic **ophthalmic lasers**. Lecture and laboratory.

4133 Clinical Immunology and Microbiology

A study of the cellular and biochemical aspects of the human immune system and the immune response to infectious disease. Abnormal immune responses will be discussed. Lectures will also cover microbial aspects of infectious diseases (including **postoperative infections**) caused by bacteria, viruses, fungi and parasites, with emphasis on pathogenic mechanisms, host-pathogen interaction and antimicrobial therapy.

4167 Human Anatomy and Physiology

A survey of the anatomy and physiology of all systems of the human body with special emphasis on the physiological and anatomical basis of diseases relevant to optometry. Lectures cover the histology and physiology of the following systems: skeletal, integumentary, muscular, cardiovascular, respiratory, lymphatic, digestive, urinary, reproductive, endocrine and nervous, and a survey of the microanatomy and physiology of cells, **biomechanics of tissue planes as relevant to periocular oncology, surgical wound planning and wound healing**, embryology and genetics. Laboratories cover gross anatomy through cadaver dissection, histology, and demonstrations of principles of physiology. Emphasis is on the anatomy of the head and neck and physiology of the cardiovascular systems. Lecture and laboratory.

4184 Optometric Clinical Methods I

Initial tests and procedures of monocular and binocular functions, including visual acuity measurements; cover test results; retinoscopic techniques; keratometer findings; and direct ophthalmoscopic evaluations. Credit will not be awarded for Optometry 4184 until the semester's cumulative pre-clinical practicum has been passed. Upon receiving credit for Optometry 4184, a student then may participate in supervised clinical vision screenings. Lecture and laboratory.

4203 General Pathology

General mechanisms of disease; sources, modes, prevention; tissue changes; inflammation, repair, immunological processes; cardiovascular diseases, neoplasms and other general health threats. Includes **histopathology of common ocular malignancies, evaluation of pathology reports** and appropriate follow-up procedures.

4213 The Human Nervous System

Structure and function of the central, peripheral, and autonomic nervous systems including anatomic correlates to **periocular sensory anesthesia**. Particular emphasis is placed on the anatomy and physiology of the visual system as it applies to the processing of visual information. Lecture and laboratory.

4234 Vision Science I: Optics

The eye as an optical instrument; optical components; measurement of optical components; schematic eye, accommodation; role of the pupil; image forming properties; optical defects and blur of the retinal image; optical nature and development of ametropia; animal models of refractive development; photometry. Lecture and laboratory.

4264 Ocular Anatomy and Physiology

Gross and microscopic anatomy of the orbit and its contents including the globe, muscles, bone structure, blood and nerve supplies; embryology, histology, anatomy and physiology of the eye including the chemical composition, metabolic activities; physiological functions of the various tissues of the eye and related structures including sensory and motor innervation of the face and biomechanics of the eyelid as relevant to office-based eyelid surgical procedures. Lecture and laboratory.

4271 Interpersonal Communications

Interpersonal and interprofessional relationships. Creating and enhancing a professional image; communicating with patients; interpreting patient complaints and concerns; enhancement of patient understanding and compliance; interviewing and history taking techniques; referrals; surgical co-management; dealing with difficult patients.

4283 Optometric Clinical Methods II

The theoretical and clinical aspects of refractive and photometric testing. Credit will not be awarded for Optometry 4283 until the second pre-clinical examination has been completed successfully. Lecture and laboratory.

4291 Introduction to Clinic I

Performance of clinical screening procedures, and observations of examinations with case discussion.

5103 General Pharmacology

General principles of drug action and specific systemic treatment. Mechanisms of action and therapeutic guidelines for: autonomic drugs, anti-infective agents including those used for prophylaxis pre- and post-operatively, anti-inflammatory agents, agents used in the treatment of allergy, major drugs acting on the CNS, cardiovascular, kidney, and endocrine systems, agents used for local or infiltrative anesthesia and analgesia relevant to office-based procedures, antiseptic agents and common over-the-counter drugs. Adverse side effects and drug interaction of commonly prescribed pharmaceuticals.

5113 Binocular and Refractive Anomalies

Methods of organizing and analyzing optometric data; diagnosis and management of conditions of vision, including accommodation and convergence disorders and refractive problems; determination of the most efficient optometric treatment procedures.

5134 Vision Science II: Sensory Aspects

Basic aspects of monocular vision: visual acuity, form sense, color vision, electrophysiology including ERG, EOG, and VER; dark adaptation, flicker phenomena, brightness discrimination. Lecture and laboratory.

5153 Contact Lenses I

Clinical anatomy and physiology of the cornea. Instrumentation used in contact lens assessment. Historical development of contact lenses. Contact lens materials, fabrication methods, and parameters. Contact lens care systems. Care and handling of contact lenses. Patient selection, management, and follow-up care. Introduction to gas-permeable and soft lens designs and fitting philosophies. Effects of lens parameters on physical fit, corneal metabolism, and patient comfort.

5164 Ophthalmic Optics I

Physical and optical characteristics of lenses, prisms, frames, and mountings. Fitting of frames and mountings. Lecture and laboratory.

5183 Optometric Clinical Methods III

This course emphasizes instrumentation and procedures for the detection, diagnosis, and management of pathological conditions. Includes **introduction to office-based surgical procedures**. Credit will not be awarded for Optometry 5183 until the pre-clinical examination has been completed successfully. Lecture and laboratory.

5191 Introduction to Clinic II

Performance of clinical screening procedures and observation of examinations with case discussion.

5203 Ocular Pharmacology

Principles of ocular pharmacology and medical treatment, clinical administration of oral, topical, and injectable drugs and utilization of diagnostic **agents in the clinical/surgical care of the eye** and adnexa. Principles and specific management and treatment of ocular disease, trauma, anterior segment surgery, and **laser treatment/surgery** by systemic, local, and topical therapy, including antisepsis. Clinician responsibility in the treatment and management of ocular and systemic complications of pharmaceutical use.

5215 Vision Science III

Actions and dysfunctions of the intraocular and extraocular muscles integrated with the basic principles of binocular vision. Neurophysiological pathways and control of ocular movements: saccade, pursuit, vergence, version, OKN, VOR, reading, nystagmus. Functions and control of accommodation and accommodative-convergence. Motor and sensory fusion, the horopter, fixation disparity, stereopsis and binocular interactions, aniseikonia, anomalous correspondence, neurophysiology and development of binocular vision. Lecture and laboratory.

5223 Ophthalmic Optics II

Physical and optical characteristics of multifocal, protective, absorptive and aniseikonic lenses: theory of lens design; theory and design of special optical appliances. Lecture and laboratory.

5233 Pediatrics

Developmental characteristics of the normal child, including normal vision and motor development. Clinical techniques and tests to assess the development and evaluate the vision of the infant, toddler, pre-school, and school age child. Clinical characteristics of children who deviate from normal patterns of development, and epidemiology of development disorders. Ocular diseases with particular significance in caring for children will be discussed.

5253 Contact Lenses II

Further investigation into the design and fitting of contact lenses, including specialty soft and gas-permeable contact lenses. Contact lens complications. Verification and modification of gas-permeable lenses. Clinical laboratory exercises provide hands-on experience with verification, modification, insertion, removal, fitting, and evaluation of contact lenses. Lecture and laboratory.

5273 Ocular Disease I: Cataracts, Corneal, and External Ocular Disease

Epidemiology, pathophysiology, differential diagnosis, management, and treatment of cataract, corneal and external ocular diseases, including disorders of the crystalline lens, eyelids, lacrimal system, conjunctiva, cornea, sclera and episclera. Includes cataract pre-operative and post-operative care as well as indications for treatment of posterior capsular haze with the Nd:YAG laser. Also includes instruction of office-based surgical procedures and post-operative management of sequelae including surgical site infections for the treatment and relief of ocular abnormalities.

5291 Clinical Practice I

Performance of clinical procedures and observation with case discussion. Optometric examinations conducted under the supervision of clinical faculty within clinical and hospital settings. Includes observing and assisting faculty, residents and upper class students with office-based surgical procedures, including anterior segment laser procedures.

6023 Ocular Disease II: Glaucoma and Anterior Uveal Disease

This course emphasizes differential diagnosis and management of primary and secondary glaucomas and disorders of the anterior uveal tract. Current technologies and pharmacologic management for glaucoma are taught. Indications for treatment of glaucoma with laser and other surgical procedures are taught. Includes pre-operative and post-operative care.

6031 Physical Diagnosis Laboratory

History and problem-focused physical examination of the patient including observation of patient, ENT examination, evaluation of cardiovascular and respiratory systems, neurological history and examination, and mental state assessment.

6051 Environmental Vision

Caring for visual and ocular needs that are related to occupational or recreational environmental factors. Topics include laser eye safety, UV protection, eye protection in the workplace or at home, vision and computers, sports vision, vision and driving and occupational vision.

6061 Functional Analysis

Test procedures, case diagnosis, and prescribing for visual dysfunctions as incorporated by the Behavioral Model of Optometric data analysis. Characteristics of human visual adaptation to stress are discussed, and clinical guidelines are given for the application of lens therapy and vision training.

6081 Optometric Case Studies I

Case presentation and a discussion of selected topics in optometric clinical care including optometric surgical and laser procedures by faculty, students, and invited speakers. Current literature will be explored which applies to the subjects under discussion.

6093 Clinical Practice II

Clinical practice under supervision of clinical faculty in the screening, examination, diagnosis, treatment and management of vision conditions and other health problems. Optometric examinations conducted under the supervision of clinical faculty within clinical and hospital settings. **Includes performance of office-based surgical procedures, including anterior segment laser procedures.**

6111 Research Methodology

Proper use of the different research design strategies and statistical tests; guidelines for critical evaluation of research papers.

6122 Optometry Project I

The optometry project extends through three semesters. The project is to be conducted under the supervision of a faculty member and the Student Project Committee. A student or a group of students not to exceed three persons is to select and develop a topic relating to optometry. The topic may be pursued in the laboratory, library, or clinic culminating in a written paper. Consultation with faculty advisor and research activity. Optometry Project I requires a review of the literature which will be submitted for a letter grade at the end of the semester.

6141 Gerontology

An examination of the primary health care needs and concerns of the elderly. Normal and pathological changes associated with aging; perceptual changes associated with aging; examining, diagnosing, and treating ocular and visual disorders in an elderly patient.

6153 Binocular and Perceptual Disorders

Test administration and test data analysis. Evaluation of spatial orientation perceptual/cognitive factors, size-distance perception, stereopsis, oculomotor skills of pursuits, saccades, accommodation, and introduction to binocular dysfunctions. Lecture and Laboratory.

6163 Healthcare System and Epidemiology

Concepts of epidemiology including descriptive methods, morbidity, mortality, distribution of ocular and systemic disease in various patient populations and the basis for screening for disease. Concepts of evidence-based medicine and analysis of research studies. Identification and analysis of local, state, and federal government organizations in vision and general health care. Delivery of health services including health care legislation, trends, planning and financing. Ethical issues in health care.

6173 Ocular Disease III: Vitreal, Choroidal, and Retinal Disease

This course covers the epidemiology, pathophysiology, symptoms, and signs necessary to differentially diagnose, manage, and treat disorders of the vitreous, choroid, and retina. **Indications for treatment and overview of techniques used for laser, surgical and medical management of posterior segment conditions are taught.**

6182 Systemic Disease

Clinical manifestations including problem focused history and review of systems, laboratory testing, general approach to treatment, and public health aspects of systemic diseases and other health conditions.

6195 Clinical Practice III

Clinical practice under supervision of clinical faculty in the screening, examination, diagnosis, treatment, and management of vision conditions and other health problems. Optometric examinations conducted under the supervision of clinical faculty within clinical and hospital settings. Includes performance of office-based surgical procedures, including anterior segment laser procedures.

6223 Strabismus and Amblyopia

Basic principles of strabismus and amblyopia. This will include the symptoms, signs, diagnosis, test administration, test data analysis and therapy with lenses/prisms, vision therapy, and surgical options including procedures, referral criteria and outcomes. Lecture and laboratory.

6231 Optometric Clinical Methods IV

Course topics covered include instrumentation and technical skills necessary for surgical procedures performed in the primary eye care setting. Includes OSHA regulations pertaining to blood borne pathogens. Included techniques are: asepsis, iv injections, fluorescein angiography, management of anaphylaxis, wound management, basic suturing, and in-office surgical procedures. The course discusses the indications for, alternatives to, and risk/benefits of all techniques, as well as the management of complications. The course includes lecture and hands-on participation.

6243 Practice Development and Administration I

Developing and administering an optometric practice; personnel management, accounting, bookkeeping, visit slips, tax law, office policies and procedures, office assistants and technician duties, insurance, investments and estate planning.

6251 Optometric Case Studies II

Case presentation and a discussion of selected topics including optometric surgical and laser procedures in optometric clinical care by faculty, students, and invited speakers. Current literature will be explored which applies to the subjects under discussion.

6262 Optometry Project II

Continuation of Optometry 6122. Research activity under the supervision of a faculty advisor.

6272 Ocular Disease IV: Orbital and Neurological Disease

This course emphasizes visual fields analysis. Additional topics covered include disorders of the optic nerve, parasellar territory, postchiasmal visual pathways, orbit, cavernous sinus, and brain.

6283 Vision Rehabilitation

Rehabilitation of the patient with low vision; examination procedures; evaluation of the patient; design and application of optical devices or other aids; social services; psychological and physical problems encountered.

6295 Clinical Practice IV

Clinical practice under supervision of clinical faculty in the screening, examination, diagnosis, treatment and management of vision conditions and other health problems. Optometric examinations conducted under the supervision of clinical faculty within clinical and hospital settings. Includes performance of office-based surgical procedures, including anterior segment laser procedures.

7031 Ophthalmic Applications of Lasers

Laser biophysics, hazards, safety precautions, indications and contraindications for specific procedures, performance of the procedures, and follow-up care including management of complications are reviewed.

7042 Office-Based Surgery

The role of office-based surgical practice within the comprehensive scope of current optometric practice. Application of evidence-based medicine and basic science human anatomy to office-based surgical patient selection, planning, instrumentation, procedures, anesthesia, and pre- and post-operative care.

7062 Optometry Project III

Continuation of Optometry 6262. Research activity under the supervision of a faculty advisor.

7081 Optometric Case Studies III

Case presentation and a discussion of selected topics in optometric clinical care including optometric surgical and laser procedures by faculty, students, and invited speakers. Current literature will be explored which applies to the subjects under discussion.

7095 Clinical Practice V

Clinical practice under supervision of clinical faculty in the screening, examination, diagnosis, treatment and management of vision conditions and other health problems. Optometric examinations conducted under the supervision of clinical faculty within clinical and hospital settings. Includes performance of office-based surgical procedures, biopsy and anterior segment laser procedures.

7101 Systemic Therapy in Ocular Disease and Trauma

Basic systemic therapy in ocular disease. Clinical indications, dosage, drug interactions, and common complications of enteral and parenteral medications utilized in ocular disease. Management of surgical post-operative complications with systemic medications.

7132 Differential Diagnosis of Ocular Disease and Trauma

A review of ocular disease, including eyelid lesions, and trauma with emphasis on clinical presentation, adjunctive testing, differential diagnosis as well as treatment with oral agents, topical agents, office-based surgical procedures and therapeutic lasers.

7143 Practice Development and Administration II

Practice analysis of optometric practices, modes of practicing optometry, office design, practice location, patient communication in office and community, malpractice and clinico-legal aspects of optometry, emergencies and urgencies, management of contact lenses and ophthalmic materials, scheduling your day, keeping your enthusiasm for optometry.

7153 Contact Lenses III

Further investigation of cornea-contact lens topics. Updates and modifications in contact lens fitting, design, materials, solutions, and cornea-contact lens relationships. Contact lens care and problem solving in optometric practice. Recent advances in cornea and contact lens management and treatment. Lecture and laboratory.

7171 Optometric Case Studies IV

Case presentations and discussions of selected topics in optometric clinical care including optometric surgical and laser procedures by faculty, students, and invited speakers. Current literature will be explored which applies to the subjects under discussion.

7196 Clinical Practice VI

Clinical practice under supervision of clinical faculty in the screening, examination, diagnosis, treatment, and management of vision conditions and other health problems. Optometric examinations conducted under the supervision of clinical faculty within clinical and hospital settings. Includes performance of office-based surgical procedures, biopsy and anterior segment laser procedures.

7293 Clinical Practice VII

Clinical practice under supervision of clinical faculty in the screening, examination, diagnosis, treatment, and management of vision conditions and other health problems in on- and off-campus clinics. Optometric examinations conducted under the supervision of clinical and adjunct faculty within clinical, private practice and hospital settings. Includes performance of office-based surgical procedures, biopsy and anterior segment laser procedures.

Note: All courses in the professional program require successful completion of all preceding semester's courses and clinics.