

NECO | New England
College of Optometry

College Catalog

2021-2022

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About the New England College of Optometry

New England College of Optometry, NECO, prepares the next generation of eye care providers, educators, and innovators through a rigorous curriculum and extensive clinical experiences. NECO graduates compassionate and skilled optometrists prepared to practice in diverse settings.

Experience Great Opportunities and Possibilities

At New College of Optometry, we educate students for careers in eye care delivery, research, and education. We challenge students to think creatively about vision and sight and to contribute to the future of the field. In doing so, we provide quality optometric care to more than 150,000 individuals annually and serve the community through a network of health care organizations and access to vision screenings. Our comprehensive vision centers, NECO Center for Eye Care are part of the NECO Clinical Network, the and clinical education affiliate of the College.

We've played an integral role in the field of optometry for nearly 125 years. When you join NECO, you join a community of caring, thoughtful individuals who seek to create impact and change the world. We recruit and admit socially-minded, intellectually curious, and compassionate students with the demonstrated academic credentials and interpersonal competencies necessary to achieve excellence in the practice of optometry.

Leadership, Location, and Opportunity

At NECO, we foster a community that provides opportunities to question, challenge, and explore. We believe great optometrists are compassionate and skilled practitioners, thoughtful collaborators, innovative diagnosticians and lifelong learners.

Our curriculum is designed and continually enhanced to reflect the evolving needs of the optometric profession and public health. We combine classroom learning with extensive work in a variety of health care settings throughout our clinical network. These allow you to learn, explore, and hone your abilities as a doctor of optometry in Boston's innovative and active healthcare community.

Great doctors understand the people and communities they serve, the ever-changing inter-professional health care environment, and the new technologies for the diagnosis, treatment, and management of vision and visual disorders.

We prepare doctors not only for the practice of optometry today, but ready to adapt to new discoveries, innovations, and patient expectations for future practice.

What is an Optometrist?

An optometrist is a primary health care provider that specializes in eye care and visual health. The American Optometric Association explains that optometrists “examine, diagnose, treat and manage diseases, injuries, and disorders of the visual system, the eye, and associated structures and their related systemic conditions.”

Mission, Vision, and Values

Our Mission

Changing the way people see the world through optometric education, discovery and service by:

- integrating innovative education with early and diverse clinical experiences to prepare students to become outstanding Doctors of Optometry
- advancing the frontiers of optometric knowledge through research, and translating that knowledge to improve patients' lives worldwide
- cultivating compassionate care of the highest level of proficiency, integrity, and professionalism; influencing public policy; expanding access to comprehensive and specialty optometric services; and instilling sensitivity to the health and social welfare of diverse communities

Our Vision

New England College of Optometry will continue to be a leading college of optometry in the rapidly evolving world of professional education and healthcare.

Our Values

The following shared beliefs guide our actions, decisions, planning, and interactions with students, patients, faculty, staff, and the community.

- **Relationships**

We believe that all relationships matter. Our identity is rooted in our highly personal, community-oriented ethos. We believe that our relationships with students, patients, clinical affiliates, and each other matter. Each relationship we develop and nurture makes us stronger.

- **Collaboration**

We believe people working together towards a common purpose can accomplish far more than adding the contributions of individual efforts. We strive to develop relationships that reflect this belief and pursue meaningful and mutually beneficial partnerships.

- **Professionalism**

We value a culture of integrity, accountability, proficiency, transparency, and mutual respect in how we work and communicate with one another. We emphasize the importance of experience, competence, resourcefulness, knowledge, and inquiry as we work through a shared vision for the common good.

- **Excellence**

We strive to achieve the highest quality standards in patient care and satisfaction, education, and research through continued reflection, assessment, and improvement. We foster an environment where individuals are encouraged to explore their interests, take risks, develop their intellectual and human potential, and continue to question and make discoveries as lifelong learners.

- **Diversity & Inclusion**

We value and respect the diversity of our students, staff, and patients. We help each other develop a greater awareness towards the complexity of individuals, human life, and health and well-being. We seek to learn from one another through our diverse experiences and perspectives and foster an atmosphere of compassion, courtesy, and mutual respect.

Mission, Vision, and Values

- **Social Responsibility**

We value our tradition of serving the community and bringing vision care to underserved populations. We integrate knowledge with social responsibility at a local, national, and international level. We encourage engagement and purpose through our commitment to community service. Our work promotes vision health and eye care, education, and advocacy, as we work towards sustainable models of health care delivery.

- **Legacy and Innovation**

We recognize that our College has a rich history and honor the best parts of our past. We also realize we are continuously changing and evolving and have an obligation to the future of the institution and our students by being forward-looking in our approach to education, research, patient care, and financial and operational sustainability.

Student Learning Outcomes

Educational Objectives

The faculty of the New England College of Optometry has established a common set of objectives for all of its Doctor of Optometry educational programs. These objectives reflect the competencies expected of every graduate of the College, to enable the graduate to independently practice optometry anywhere in North America.

A Doctor of Optometry graduate from the New England College of Optometry must be knowledgeable in ophthalmic and systemic care, and possess a commitment to continuously improve knowledge and abilities. The graduate will be skillful in techniques and new technologies, skillful in problem solving, and will possess professional, ethical and compassionate behavior and standards. The graduate will be able to address community health issues and thrive in a changing health care environment.

Knowledgeable in visual, ocular and systemic care—the graduate shall:

- Know the structure and function of visual and systemic systems.
- Know the normal range of clinical findings.
- Recognize pre-disposing epidemiological, environmental, and etiological factors that require intervention to prevent visual deterioration or ocular disease.
- Understand the principles underlying the use of ophthalmic devices and procedures in the diagnosis, treatment, and management of visual conditions.
- Understand the mechanisms and interactions of pharmacological agents along with their safe and effective use in the diagnosis and treatment of ocular conditions.
- Understand the pathogenesis of disease and the implications for ocular health and function and be knowledgeable in ocular and laboratory testing used in the assessment of systemic, visual and ocular function.
- Know the scientific and statistical principles underlying the practice of optometry.
- Possess the initiative and critical acumen required to continuously improve their knowledge.

Skillful—the graduate shall demonstrate the ability to:

- Obtain the pertinent information about a patient using communication, observation, and diagnostic testing.
- Interpret results of common procedures, develop differential and definitive diagnoses, devise and implement treatment and management strategies, including the skillful use of ophthalmic materials.
- Recognize and triage life threatening and sight threatening problems.
- Be aware of the limitations of current procedures and the need to continuously learn, understand, develop and incorporate new technologies and procedures into examination strategies.
- Be skillful in organizing, integrating and applying knowledge.
- Apply scientific principles to problem solving by:
 - identifying the problem
 - retrieving relevant information from current knowledge of basic sciences
 - judging its adequacy, pursuing additional information and assessing its value
 - interpreting and relating all data to the information obtained
 - applying deductive reasoning to solve the problem
 - monitoring outcomes and modifying management strategies

Student Learning Outcomes

Professional and ethical—the graduate shall demonstrate:

- Knowledge of principles that govern ethical decision making and respect for the dignity of the patient.
- Honesty and integrity in patient and professional interactions and be mindful of ethical pitfalls, conflicts of interest and legal issues in various practice arrangements.
- Ability to provide compassionate care.
- Commitment to provide eye care regardless of the patient's economic means.
- Skill to identify and relate to the special needs of diverse patient populations.
- Understanding of community health issues.
- How to use epidemiological factors to identify and respond appropriately to environmental issues affecting eye disease.
- How to thrive in a changing health care (eye care) marketplace.
- Understanding of organizational and financial issues of private practices, health centers, HMOs and hospitals.
- Recognition that healthcare is a team approach which includes a wide range of professionals and practitioners in both the local and global communities.
- Ability to participate and take leadership in inter-disciplinary and multi-disciplinary healthcare communities.
- Understanding of the standard of care for various disease entities and to recognize the risks, consequences and legal implications of the failure to adhere to established and recognized standard

Academic Degree Programs

Doctor of Optometry (OD) Programs

Four-year OD Program

The four-year Doctor of Optometry Program is our core academic program. It consists of three years of study in classroom, clinic, laboratory, and seminar settings, followed by an all-clinical fourth year. The student's final year is entirely clinical with assignments available in an array of diverse practice settings and locations. Clinical experiences provide students with exposure to diverse patient populations, state of the art instrumentation, and supervisory faculty who are committed to exemplary patient care and education. The preceptorship method is used throughout our programs, with licensed and experienced faculty serving as mentors for our students.

The College's four-year Doctor of Optometry degree program provides students with a strong foundation in the visual, biomedical and clinical sciences, which are then integrated through a rich and diverse patient care experience. This program prepares students for a career as a clinician, researcher, or educator. Our unique elective program provides the opportunity for advanced education in an area of personal interest with options for pursuing a postgraduate education.

The curriculum of the four-year program is organized and delivered through four academic departments: Vision Sciences, Biomedical Sciences and Disease, Primary Care, and Specialty and Advanced Care, as well as the departments of Clinical Education and Graduate Studies. Each course is developed as one step in a sequence designed to facilitate each student's mastery of the knowledge and skills required of an optometric professional capable of managing conditions of the human eye and visual system.

Clinical experiences enable students to become competent optometric professionals who can integrate scientific knowledge with clinical insights to diagnose, treat, manage visual and ocular problems, and co-manage related systemic conditions. The preceptor-ship method is used throughout the program. It calls for close initial supervision by licensed faculty, with the students assuming more responsibility over time. The role of the preceptor slowly changes from supervisor to consultant. The students' final year is entirely clinical with assignments to an array of diverse practice settings.

Accelerated Optometric Degree Program

The Accelerated Optometric Degree Program, AODP, is an accelerated program for scientists and physicians who hold a doctoral degree in science or medicine (or equivalent experience). Applicants demonstrate high scholarship in previous graduate study, as well as a firm career commitment to optometry. The program was established in 1972 to attract highly qualified candidates who can provide unique contributions to the profession of optometry through teaching, research and clinical care.

This program is designed to provide an accelerated education for qualified applicants with either an earned doctorate in one of the biological, behavioral, or physical sciences; or a doctoral-level health profession degree. Once admitted, AODP students follow an intense thirty-six-month curriculum, which includes a full year of clinical rotations, engaging in full time patient care. Upon completion, graduates of the program are prepared to enter the profession in clinical practice, optometric education, or research.

Graduates of the program have gone on to become college deans, department chairs, professors in both optometry and medical programs, and successful optometric practitioners in a variety of practice settings.

Academic Degree Programs

Doctor of Optometry (OD) Programs

Most of the PhD's in the program have been previously educated in the biological sciences and have extensive research experience. However, the College seeks to attract a diverse group of applicants who can contribute to the program and to the profession of optometry. Graduates of the program have held previous experience in a variety of disciplines, including aeronautical and space engineering, anatomy, anthropology, biochemistry, biology, biomedical engineering, chemistry, dentistry, electrical engineering, experimental psychology, mathematics, neuroscience, parasitology, and physics. Research based PhD's in other fields are also encouraged to apply.

Although several of the medical doctors who have graduated from the program were trained in the United States, most of the physicians in the program are international MDs with extensive clinical and/or research experience in ophthalmology. Physicians in cardiac surgery, general practice, oncology, pediatrics, and many other specialties have also become excellent optometrists through the program.

Advanced Standing International Program

Through the College's Advanced Standing International Program (ASIP), graduates of international optometry programs may be admitted with advanced standing to the doctor of optometry degree program. ASIP students have to meet the same standards as the other program students, and reach the same competency standards in clinics in order to receive the Doctor of Optometry degree. Once admitted, ASIP students follow an intense two-year curriculum, which includes one year of clinical externship rotations. Course work centers on basic sciences, disease, and advanced optometry skills and concepts.

While this program helps to assist in advancing internationally-trained Optometrists to achieve their career goals, the ASIP program in Boston has also created a more dynamic, multicultural-based academic environment, giving the campus a global perspective of Optometry outside the US, expanding the administration, faculty and student knowledge of optometry worldwide.

Approximately 150 optometrists from 22 countries have received their doctor of optometry degrees from the College's Advanced Standing International Program. Graduates of the ASIP have gone on to become faculty at optometric institutions, have been involved in curriculum development, and have become contributors, authors, and editors for journals and articles. They have also gone back to their country of origin to increase the level of optometry in their respective countries.

ASIP graduates are involved with legislative issues, are active in providing lectures of continuing education programs, have established international clinical externships, and have gone on to sub-specialize in residency programs, clinical research, and humanitarian work.

Specific Accomplishments of ASIP graduates:

- Part- or Full-time faculty at pre-existing Optometry programs in: Argentina, Australia, Colombia, England, France, Hong Kong, Italy, South Africa, Spain, USA
- Involvement in curriculum design of Optometry degree programs in: Argentina, Italy, South Africa, Spain
- Contributors, editors and authors of text books, journals and articles for journals related to Optometry: Argentina, France, Italy, South Africa, Spain, US
- Involvement in legislative issues to update and change the pre-existing Optometry law: Argentina, Italy, South Africa

Academic Degree Programs

Doctor of Optometry (OD) Programs

- Advocates and active participants and lecturers of continuing education programs: Argentina, Spain, South Africa, USA
- Establishment of clinical externship programs overseas affiliated with NECO: Italy, Spain, South Africa
- Educational program development with NECO either at certificate, degree, visiting scholar level
- Involvement with industry and clinical research in US
- Completion of a residency program in a sub-specialty area in US
- Involved with developing countries and volunteer Optometric activities
- Fellows of the American Academy of Optometry and College of Optometrists in Vision Development

MS/OD China Program

The MS/OD China Program is a unique joint degree program between Wenzhou Medical University (WMU) and the New England College of Optometry (NECO) established in 2000. Students who complete the program earn two degrees: the master of science and doctor of optometry degrees. The MS/OD China curriculum combines the AODP curriculum and the Master of Science degree with joint clinical externships that include six months in Boston-based rotations and six months at Wenzhou Medical University developing a cadre of knowledgeable and skilled optometrists in China who could assume the highest positions in China's medical education and health care system. The program's goal is to develop a core group of individuals trained in optometry and educated as scientists to advance the quality of eye care and the development of educational programs within the field of optometry in China.

In China, optometric education only began in 1988 at the Wenzhou Medical University. Since that time, the discipline and the profession have emerged as a five-year, medically-based program within the medical education system of China. Students in the program receive the highest level of training in Optometry and are provided with the credentials needed to assume positions of leadership in China's medical education and health care systems. In 2000, the Ministry of Health formally accepted Optometry as a subspecialty of medicine.

Graduates of the program have gone on to hold the following positions:

- President of Wenzhou Medical University, Wenzhou, China
- Vice President of Wenzhou Medical University, Wenzhou, China
- Director of Research and Development at the Affiliated Eye Hospital, Wenzhou, China
- Director of International Programs for the School of Optometry and Ophthalmology, Wenzhou, China
- Country Coordinator of Health Services for the International Special Olympics
- Editor of *Contact Lenses*, *Optometric Instrumentation*, *Visual Neurophysiology*, and *Ophthalmic Lenses*
- Vice Director of the Affiliated Eye Hospital, Wenzhou, China
- Principle Lecturer at Wenzhou Medical College, Wenzhou, China

Graduates of the MS/OD China Program have also received grants from the National Natural Science Foundation of China, The Natural Science Foundation of Zhejiang Province, and the Ministry of Health in Beijing. They have been elected to the People's National Congress, lectured nationally, and have provided significant continuing education in the area of contact lenses for the ophthalmic industry.

Academic Degree Programs

Doctor of Optometry (OD) Programs

Equal Exchange

Twelve NECO faculty members have traveled to Wenzhou, China to teach courses at the WMU. In addition, the clinical externship established at Wenzhou Medical University in the recent years has been included as an elective externship rotation site for the fourth year OD students of NECO.

3+4 Accelerated Program Partners

Accomplished and motivated students may accelerate their education and professional opportunities by participating in a joint degree partnership program with NECO and an undergraduate institution. Through the 3+4 Accelerated Program undergraduate partnership, students are awarded a joint bachelor of science degree from an undergraduate partner, and later, an OD degree from New England College of Optometry.

3+4 Accelerated Program Partnership

The College values its growing number of partnerships with undergraduate institutions with strong pre-health professional programs. Students accepted into the 3+4 program receive a conditional acceptance into the College as they begin their first year of undergraduate studies at an undergraduate partner, following a prescribed curriculum. Upon completion of three years of specified course work (providing predetermined grade point average and OAT scores are met), these students will enroll at the College for the four-year OD program. While a student is enrolled in this program, there will be ongoing communication between the undergraduate partner and NECO through our work with campus liaisons and our peer mentor network.

After the first year of professional study at NECO, the student will earn a bachelor of science degree from their undergraduate institution. After completion of the fourth year of professional study at NECO, the student will earn the doctor of optometry degree from NECO.

Current Undergraduate Partners

Our current undergraduate partners include:

- Assumption College, Worcester, MA
- Providence College, Providence, RI
- Regis College, Weston, MA
- Siena College, Loudonville, NY
- Stonehill College, Easton, MA
- SUNY-Fredonia, Fredonia, NY
- University of Hartford, Hartford, CT
- University of Maine, Orono, ME
- Western New England University, Springfield, MA
- Wheaton College, Norton, MA

For more information on these and other partner programs, please contact the NECO Admissions Office.

Academic Degree Programs Graduate Programs

MS in Vision Science

The MS degree program is designed for candidates who wish to earn the master of science in vision science degree without enrolling in the College's four-year program. Qualified candidates must have a college level background in science or a professional degree. The MS degree is usually completed in two years.

The MS program features graduate-level courses, seminars, an original research project, and completion of a thesis with a thesis defense. The program is designed to develop the analytical thinking and problem-solving skills needed to be a successful scientist. The program emphasizes research in an area of vision science that is determined by the student's interests and the expertise of the graduate faculty.

Students accepted into the MS program receive a broad background in vision science and strong training in research. The program provides graduates with enhanced career opportunities and skills that enable them to contribute new knowledge to the field, help them assess new scientific developments relevant to optometry and vision science, and enables them to be more competitive for residencies and academic or industry positions following graduation.

OD/MS Dual Degree Program

Designed for optometry students who wish to earn a Master of Science in Vision Science (MS) degree while studying for the Doctor of Optometry (OD) degree. The dual OD/MS degree is completed within the timeframe of the four-year OD degree program and involves modifications to the course sequence in the OD curriculum.

The MS portion of the program features graduate-level courses, seminars, an original research project, and completion of a thesis with a thesis defense. The MS program is designed to develop the analytical thinking and problem-solving skills needed to be a successful scientist. The program emphasizes research in an area of vision science that is determined by your interests and the expertise of our graduate faculty.

The curriculum is based on a total of 36.25 credit hours of study: 12.75 credit hours earned for dual degree courses are also included in the OD curriculum, 11 credit hours are graduate-level courses for MS candidates, and 12.5 credit hours involve the planning and execution of the research project.

OD/PhD Dual Degree Program

The Division of Graduate Medical Sciences at the Boston University School of Medicine (BUSM) and the New England College of Optometry (NECO) have established a combined Doctor of Optometry (OD) and PhD program. The core curriculum for the program incorporates NECO's four-year OD curriculum with the requisite curriculum of the post-Master's graduate programs of the Division of Graduate Medical Sciences. This sequence is similar in its programmatic elements to the BUSM MD/PhD program.

Students in the combined degree program will complete the first three years of the four-year OD program. Assuming satisfactory academic performance standards have been met during these three years, the student will then begin the post-Master's PhD curriculum at BUSM. Students can choose from the following disciplines offered by the Division of Graduate Medical Sciences: anatomy,

Academic Degree Programs Graduate Programs

biochemistry, cell and molecular biology, genetics and genomics, molecular and translational medicine, behavioral neuroscience, biomedical neuroscience, microbiology, immunology, pathology, pharmacology, physiology, biophysics or medical nutrition sciences.

Upon completion of the PhD program and a satisfactory defense of a dissertation, the student will return to NECO to complete their clinical training. Upon completion of the requirements for the OD degree, both degrees will be conferred at the respective commencements of the two participating institutions.

Admissions

Experience Lifelong Success in Optometry. At NECO, experience is everything. We believe that the key to preparing great doctors lies in providing innovative, enlightening experiences that shape the earliest stages of your career. From invaluable clinical work to vibrant classroom discussions and research opportunities, every moment of your NECO training will pay dividends for a lifetime. Come discover your passion in the field as you find your place in the profession.

Your Journey Begins Here

We've played an integral role in the field of optometry for nearly 125 years. When you join NECO, you join a community of caring, thoughtful individuals who seek to create impact and change the world. We recruit and admit socially-minded, intellectually curious, and compassionate students with the demonstrated academic credentials and interpersonal competencies necessary to achieve excellence in the practice of optometry. The Office of Admissions is committed to assisting all students who express an interest in applying to the College. As a candidate, you will receive periodic updates from the admissions staff regarding the state of your application.

All applicants to four-year optometric programs utilize the OptomCAS web application process. Upon submission, the Admissions Committee reviews applications and selected candidates are invited to come to the College for an interview.

Applicants for the Advanced Standing International Program (ASIP) and Accelerated Optometric Degree Program (AODP) programs apply through the GradCAS centralized application. Candidates for the MS standalone program apply directly to the College.

What is the application process?

1. Select a program.

Which program is right for you? NECO offers a variety of programs for students to obtain their OD degree, a dual OD/MS or OD/PhD degrees, an Accelerated Optometric Degree for medical doctors and scientists interested in becoming optometrists, an Advanced Standing International Program for international optometrists or medical professionals, and an international MS/OD China Program.

2. Review Requirements, Fees, and Deadlines.

Each specific program has its own application fees, dates, and deadlines.

3. Apply

- **Four-Year Applicants:** Four-year optometric program applicants apply through the **OptomCAS** web application process. Using one, centralized process, applicants can enter their data through OptomCAS and utilize the system to apply to various optometric colleges. Upon submission, the Admissions Committee reviews applications against NECO admission standards. Selected candidates are invited to come to the College for an interview. Personal interviews are required for admission. Admissions decisions are finalized within three weeks of the interview.
- **Special Programs:** submit their applications through the GradCAS centralized application. Upon submission, the Admissions Committee reviews applications against NECO admission standards. Selected candidates are invited to come to the College for an interview. Personal interviews are required for admission.

4. Complete Supplemental Fee Payment

In addition to the OptomCAS fee, prospective students submit a **supplemental application fee** to the College.

Admissions

Additional Application Information

Standardized Tests: Optometry Admission Test (OAT) or Graduate Record Exam (GRE) scores are required for entrance for the four-year Doctor of Optometry (OD) program and the Accelerated Optometric Degree Program (AODP).

In some cases, we will consider the acceptance of other graduate/professional school tests such as the MCAT or DAT for admissions. If you have questions related to the acceptance of tests other than the OAT or GRE, we recommend you send them along with a resume/CV and unofficial transcripts to admissions@neco.edu.

Language Testing

Applicants whose native language is not English may take the Internet-based TOEFL exam (minimum score of 88 and 22 on the speaking section) or the IELTS exam (minimum total score of 6.5 and speaking score of 7). You may request to have this requirement waived if you attended an undergraduate institution where English is the language of instruction. Only one language test is required.

Transfer Requirements: When openings in classes permit, the College will review applications for transfer from students who are currently enrolled in other accredited schools or colleges of optometry. Acceptance is contingent upon satisfactory completion of courses equivalent to those at the New England College of Optometry. Students requesting transfer must apply through the regular OptomCAS application and provide a personal statement with supporting documentation demonstrating a compelling need to transfer to complete their optometric education. The dean at the applicant's present optometry school is required to provide official acknowledgment of the student's request for transfer and certification of good academic standing.

Academic Requirements

Each academic OD program at NECO has specific requirements for eligibility. Please review the guidelines below to learn more.

Four Year OD Program

We recommend applicants have a strong background in the sciences. You are welcome to apply to the Doctor of Optometry program before you have finished the requirements. However, you must complete the following prerequisites by the time of matriculation:

Course	Requirement
<p>Biology (with lab) Covers the fundamental principles of biochemistry, genetics, molecular biology, cell biology, developmental biology, neurobiology, and evolution. Should also cover the structure and regulation of genes, the structure and synthesis of proteins, and how these molecules are integrated into cells.</p>	2 semesters or 3 quarters
<p>Chemistry (with lab) Provides an introduction of the chemistry of biologic, inorganic, and organic molecules with an emphasis on basic principles of atomic and molecular electronic structure, thermodynamics, acid-base and redox equilibria, chemical kinetics, and catalysis.</p>	2 semesters or 3 quarters
<p>Physics (with lab) Covers the basic principles of physics, emphasizing Newtonian mechanics, conservation laws, thermal physics, electricity and magnetism, and geometrical optics.</p>	2 semesters or 3 quarters
<p>Organic Chemistry (with lab) Covers the various classes of aliphatic and aromatic compounds as well as the diversity of functional groups with regard to their reactivity and mechanism. Nucleophilic and electrophilic reaction mechanisms, stereochemistry, and the concepts of hydrophobicity and hydrophilicity and their uses in chromatography and other processes should also be covered.</p>	1 course
<p>Biochemistry Provides an understanding of the biochemical basis of physiological processes. Topics should include the structure of major biological substances and of enzymatic reactions, the genetics of molecular cloning, protein and enzyme structure and function, carbohydrate metabolism, lipid metabolism, protein metabolism, nucleic acid metabolism, and cellular energetics.</p>	1 course
<p>Microbiology Describes bacteria, viruses, and other microbial agents of human disease. Provides details about bacterial structure and growth, bacteriophage biology, the structure of viruses, the life cycles of RNA and DNA viruses, the role of viruses in human oncogenesis, the role of viruses in gene therapy, and the biology of fungi and parasites.</p>	1 course

Academic Requirements

<p>Calculus Covers mathematic principles, including linear and polar coordinate systems, vectors, matrices, plane analytic geometry, linear transformations, trigonometric functions, logarithmic and exponential functions, differential and integral calculus, optimization, infinite series, multiple-variable integration, partial derivatives, differential equations</p>	1 course
<p>Statistics Covers the basic principles of statistics, including probability, random sampling, hypothesis testing and estimation, statistical significance, confidence intervals, means testing, chi-square tests, nonparametric statistics, analysis of variance, regression, correlation, study design, categorical data, contingency tables</p>	1 course
<p>Psychology Serves as an introduction to the field of psychology; including key figures, diverse theoretical perspectives, and research findings that have shaped some of the major areas of contemporary psychology; research methods used to study the origins and variations in human behavior.</p>	1 course
<p>English Includes an intensive writing component applied to study of English and social sciences and research methods applicable to these subject areas.</p>	2 courses

Prerequisite courses form the entering knowledge base for our optometry program. Therefore, to demonstrate mastery of this knowledgebase, we require a grade no lower than C in these courses.

- If a grade of less than C is attained in a prerequisite course the requirement may be waived if the student has received a score of no lower than 300 on the corresponding section of the Optometry Admissions Test (OAT).
- Prerequisite courses taken at a community college may be accepted; however, we strongly prefer courses taken at your College or University at which your degree will be conferred.
- Advanced Placement (AP) and International Baccalaureate (IB) courses may be used for prerequisites as long as the appropriate number of credit hours was received. These courses must appear on your official college transcript, in a letter from your university registrar's office, or on an official score report.

Accelerated Doctor of Optometry Program (AODP)

Applicants to the Accelerated Doctor of Optometry Program:

- Hold doctorate-level degrees in a science or medicine. Graduates of the program represent such diverse fields as physics, psychology, anatomy, biology, chemistry, biochemistry, electrical engineering, biomedical engineering, dentistry, and medicine.
- Demonstrate high scholarship in previous graduate study, as well as a firm career commitment to optometry.

Advanced Standing International Program (ASIP)

Applicants to the Advanced Standing International Program:

- Have at least two years of full-time optometric clinical experience following graduation from an optometry college and completed within four years prior to applying to qualify for our program.

Master of Science in Vision Science Degree (MSVS/OD or MSVS Stand Alone)

Academic Requirements

- BA or BS degree.
- College transcripts indicating a minimum 3.0 GPA on pre-requisites for the OD program, including a course in statistics.
- Optometric Admissions Test (OAT) or Graduate Record Exam (GRE general) scores.
- An admissions essay detailing the candidate’s interests in the MS program.
- Names and contact information for 3 references who can attest to the applicant’s analytical or research skills.

Bachelor of Science in Optometry

Students in the four-year OD program who have not earned a Bachelor's Degree may be awarded the Bachelor of Science degree by the College, provided they have completed 12 semester hours of humanities, 12 semester hours of social sciences, and have met other requirements set forth by the College.

Among Humanity and Social Science courses the following are acceptable:

Humanities	Social Sciences
Language: Ancient and Modern	Psychology
Literature: Ancient, Modern Theory	Anthropology
Fine Arts	History of Civilization
Drama	Geography
Philosophy	Political Science
History of Philosophy	Economics
Historical Biography	Sociology
Theology	Criminology
History and Philosophy of Science	Jurisprudence
	Ethnology
	Demography
	Law
	Statistics
	History

Tuition and Fees

An Investment in Your Future. Pursuing a doctor of optometry degree is an investment you make for your future. Employment of optometrists continues to grow, and more optometrists will be needed to meet the health needs of an aging population.

For the 2020 - 2021 academic year (May 11, 2020 to May 15, 2021), the Board of Trustees of the New England College of Optometry has set the tuition and fees as follows. Fees, health insurance, and estimated living expenses are included for the total cost of attendance.

Four Year OD Program (Academic Year 2020-2021)

	OD 2024 (1st Year)	OD 2023 (2nd Year)	OD 2022 (3rd Year)	OD 2021 (4th Year)
Tuition*	\$42,592	\$42,592	\$42,592	\$42,592
Activity Fee	\$375**	\$375	\$375	\$375
Lab Fee	\$300	0	0	0
Equipment Fee	\$1,250	0	0	0
Health Insurance***	\$2,287	\$2,287	\$2,287	\$2,287
Books/Equipment	\$1,440	\$2,240	\$300	0
Living Allowance	\$19,800	\$25,500	\$25,500	\$27,160
TOTAL	\$68,044	\$72,994	\$71,054	\$72,414

Accelerated and International Programs

	AODP 2023	AODP 2022	AODP 2021	ASIP 2022	ASIP 2021
Tuition*	\$58,268	\$58,268	\$42,592	\$58,268	\$42,592
Activity Fee	\$375	\$375	\$375	\$375	\$375
Lab Fee	\$300	0	0	\$300	0
Equipment Fee	\$1,250	0	0	0	0
Health Insurance***	\$2,984	\$2,287	\$2,287	\$2,984	\$2,287
Books/Equipment	\$2,030	\$500	0	\$1,850	0
Living Allowance	\$26,400	\$26,400	\$27,160	\$26,400	\$27,160
TOTAL	\$91,607	\$87,830	\$72,414	\$90,177	\$72,414

* This rate is effective for students enrolled in both the OD and MS/Vision Science Programs. The per credit hour rate is \$1,331.

** Includes a \$10 enrollment fee to the Massachusetts Society of Optometrists for first year students.

*** The estimated cost of pro-rated health insurance fee is listed. The current fee is for a single student with no dependents. The fee can be waived with proof of alternative coverage. Rate for ASIP 2021 also includes summer coverage.

Tuition and Fees

MS in Vision Science, Stand- Alone Program

	MS 2022	MS2021
Tuition*	\$21,296	\$21,296
Activity Fee	\$375	\$375
Health Insurance	\$2,287	\$2,287
Program Supplies	\$100	\$100
Living Allowance	\$19,800	\$19,800
TOTAL	\$43,858	\$43,858

*For the MS Program, this is an annual charge covering Fall, Winter, and Spring.

Payment Policy

All tuition and fees are due and payable on or before the first day of classes of each term. Students may not register or attend classes if tuition and fees are not paid in full or appropriate arrangements have not been made with the Chief Financial Officer at least two weeks prior to the beginning of the term. The College does not accept credit cards for the payment of tuition and fees.

Tuition Refund Policy

The College's Tuition Refund Policy is as follows:

Withdrawal Date	Percentage of Tuition and Fees Refunded
Prior to the 1st day of the academic period	100%
During the 1st week	90%
During the 2nd to 3rd weeks	50%
During the 4th to 6th weeks	25%
After 6 weeks	0%

When calculating refunds, a reasonable administrative fee may be charged. This fee shall be the lesser of 5% of charges assessed the student or \$100. **All fees, except for the mandatory equipment fee, are non-refundable. The equipment fee is refundable only if the equipment is returned intact and unopened within the first two weeks of the term.*

Repeated Courses Tuition Charges

A student will be charged on a per credit basis for the repeated course as well as any other courses as applicable. Please refer to the per credit charge from the billing office.

Extended Program Tuition Charges

A student whose program is extended will be subject to applicable tuition and fee charges. A student enrolled less than full-time will be charged at a per credit rate.

Tuition and fees are subject to change without notice.

Financial Aid

The Office of Financial Aid helps answer any questions related to the financing of your education. If you have any questions at any point during the process of applying for financial aid, please contact a member of our staff by email or call the office for more general questions.

The US federal government uses a formula called the Federal Methodology (FM) to determine a US student's eligibility for need based loans, grants, and Expected Family Contribution (EFC).

Financial aid is offered on the basis of need and availability of funds, so early application is encouraged. Please follow the steps below to be considered for the loan, scholarship, and employment programs administered by the Office of Financial Aid. You will follow this same process each year in which you want financial aid. Please note the deadlines and forms needed.

To qualify for US federal student assistance, you must:

- be a US citizen or eligible non-citizen
- be enrolled as a regular student working towards a degree
- be enrolled at least half-time, i.e., 8 – 15.99 credit hours for fall or spring semesters, or 4.5 – 8.99 credit hours for March or summer terms. (When a student drops to less than half-time study, she or he becomes ineligible for federal aid and enters the student loan grace period.)
- be making satisfactory academic progress according to the College's Student Handbook
- qualify for aid according to federal need analysis
- not be in default on a previous education loan or owe a repayment of an education grant
- have a valid social security number
- be registered with selective service, if required to do so

How to Apply

Submit the **Free Application for Federal Student Aid** (FAFSA) for every year you want loans and/or work study. **NECO'S FEDERAL CODE IS 002164.**

Parent information is not required for graduate students applying only for Stafford loan and work study. If you think your family is "economically disadvantaged" and you want to be considered for less expensive Health Professions Student Loan (HPSL), Loans for Disadvantaged Students (LDS), and NECO's Fund For Education (FFE) loan, you are encouraged to provide parent information on the FAFSA so you can be considered for these more favorable loans.

When to Apply for U.S. Federal Financial Aid

Program	Academic Year Start Date	Application Priority Date	Deadline for NECO to Receive FAFSA	Form to Submit
4-Year OD	Summer or Fall, 2020	April 1, 2020	May 1, 2021	2020-21 FAFSA
ASIP	Summer 2020	April 1, 2020	May 1, 2021	2020-21 FAFSA
AODP	Summer 2020	April 1, 2020	May 1, 2021	2020-21 FAFSA

Types of Financial Aid for U.S. Students

Financial Aid

Loans

The Financial Aid Office maintains information about loans available for students from the US such as the Stafford Loan, the Health Professions Student Loan Program (HPSL), Loans for Disadvantaged Students (LDS), the Fund for Education Loans, and Federal Direct Grad PLUS Loan. In addition, the office can assist international students in learning about financing options.

Emergency Loan

The College encourages students to exercise good spending habits and to live within the College's established education budget. Nonetheless, we realize unforeseen emergencies occur from time-to-time. Therefore, the College makes the NECO Emergency Loan available to any student who can justify the need for this money and show that the need was unanticipated. In order to have a stream of money available for other students who experience of financial crisis, the student must repay the loan in 90 days or less. The Financial Aid Office administers the NECO Emergency Loan on a case-by-case basis.

Scholarships

The Admissions Office has a modest number of scholarships to offer promising new students. Scholarships administered by the Financial Aid Office are limited in number and amount (the average scholarship is \$1,000), but contributions by private donors fund the following awards. The scholarships are awarded to students with the expectation that the recipient will continue to make satisfactory academic progress and conduct herself or himself in an ethical and professional manner. If a student who receives an award is later judged by the Student Affairs Committee as not meeting the College's standards (please refer to the Student Handbook), the award may be rescinded for at least one term of study. For awards that require an application, enrolled students will be sent the application each fall and an invitation to apply.

In addition, students can apply for scholarships specifically for optometry students. The Financial Aid office emails updated scholarship opportunities and announcements weekly for awards offered by optometric associations and industry providers. The AOA provides some resources for scholarships through this Guide to Optometric Loans, Grants, and Scholarships. This includes scholarships such as the IHS (Indian Health Scholarship) program for American Indian and Alaska Native students and the HPSP, Health Professionals Scholarship Program, for students who are interested in pursuing military optometry service in exchange for tuition and living stipends.

Work Study

This need-based program provides part-time employment so you can earn some of the money you need instead of borrowing it. The two types of work study programs at NECO, Federal Work Study (FWS) and Student Employment(SE) differ only in how they are funded. Seventy-five percent of the wages paid to US students who are funded by FWS come directly from the federal government; 25% is funded by NECO. The nonfederal program for international students is funded entirely by NECO.

Additional Information

[U.S. Federal Student Aid Resources and Information](#)

The Financial Aid Office strives to support your efforts financing your professional education, and to educate you about the financial responsibility to which you are about to commit. Learn more

Financial Aid

about federal student aid, loans, loan repayment, and loan forgiveness programs by logging on to www.studentaid.gov/h/manage-loans or by contacting the Financial Aid office.

Canadian and Other International Student Aid Information

Although international students do not qualify for US federal student aid, there are options for financing your optometric education. Some US lenders offer private education loans to international students who have a credit-worthy co-signer who is a US citizen or permanent resident. The website www.finaid.org/loans/privatestudentloans.phtml may help you find and compare loans. Canadian students can utilize the CANLearn Site to learn more about financing options such as loans and scholarships, www.canlearn.ca/eng.index.shtml.

How You Receive Your U.S. Student Financial Aid

Federal and College financial aid is disbursed in equal installments at the beginning of each term according to the College's calendar, and are applied to student accounts. The Business Office will notify you when the College receives your loan funds.

Loan proceeds are applied first to any outstanding tuition or other charges the student may have at the College, then excess funds are released to you, either by direct deposit to your bank account or in the form of a "refund" check for living expenses and equipment purchases. At the beginning of the academic year "refunds" are usually released to students at the end of the first week of class. Please review the Financial Aid Handbook on NECO's Financial Aid webpage for more details.

Manage Loans/Repayment

More and more of our students not only accumulate debt earning their professional degree, but they may have debt from undergraduate school, credit cards, car loans, and mortgages. Student loans are a bargain compared to the long-term gain you will realize from your education, but for your financial health borrow carefully and manage your finances. The average federal student loan debt accumulated at NECO by the most recent graduating class was \$195,000.

Planning, sticking to your budget, keeping credit card use to a minimum, and delaying unnecessary purchases are crucial to your future financial well-being. These financial literacy websites may be useful: National Foundation for Credit Counseling, www.feedthepig.org, and www.MyMoney.gov. There are also a number of free apps for your smart phone to help you budget and pay bills, like CHECK, MINT, and BILL GUARD.

Keep track of your borrowing and estimated repayment. The website <https://studentaid.gov/loan-simulator/> provides a great resource called the Loan Simulator, which is a new tool to help you make decisions about your student loans. Use it to compare student loan repayment programs, and for projecting monthly payments with different repayment options, among a lot of other very useful financial information. It combines information about your federal loans with interactive debt management and a budget planner.

The National Student Loan Data System (NSLDS) will have a cumulative record of your borrowing history.

Student Tuition Recovery Fund (STRF)

The Student Tuition Recovery Fund (STRF) is a fund administered by the Bureau for Private Postsecondary Education (Bureau) that relieves or mitigates economic loss suffered by a student while enrolled in a qualifying institution – generally one that is approved or registered by the

Financial Aid

Bureau. At the time of his or her enrollment, the student must have been a California resident or enrolled in a California residency program, prepaid tuition, and suffered economic loss.

STRF Requirements

Approved and registered institutions are required to comply with the following STRF requirements:

"The State of California established the Student Tuition Recovery Fund (STRF) to relieve or mitigate economic loss suffered by a student in an educational program at a qualifying institution, who is or was a California resident while enrolled, or was enrolled in a residency program, if the student enrolled in the institution, prepaid tuition, and suffered an economic loss. Unless relieved of the obligation to do so, you must pay the state-imposed assessment for the STRF, or it must be paid on your behalf, if you are a student in an educational program, who is a California resident, or are enrolled in a residency program, and prepay all or part of your tuition.

You are not eligible for protection from the STRF and you are not required to pay the STRF assessment, if you are not a California resident, or are not enrolled in a residency program."

"It is important that you keep copies of your enrollment agreement, financial aid documents, receipts, or any other information that documents the amount paid to the school. Questions regarding the STRF may be directed to the Bureau for Private Postsecondary Education, 2535 Capitol Oaks Drive, Suite 400, Sacramento, CA 95833, (916) 431-6959 or (888) 370-7589.

To be eligible for STRF, you must be a California resident or are enrolled in a residency program, prepaid tuition, paid or deemed to have paid the STRF assessment, and suffered an economic loss as a result of any of the following:

1. The institution, a location of the institution, or an educational program offered by the institution was closed or discontinued, and you did not choose to participate in a teach-out plan approved by the Bureau or did not complete a chosen teach-out plan approved by the Bureau.
2. You were enrolled at an institution or a location of the institution within the 120 day period before the closure of the institution or location of the institution, or were enrolled in an educational program within the 120 day period before the program was discontinued.
3. You were enrolled at an institution or a location of the institution more than 120 days before the closure of the institution or location of the institution, in an educational program offered by the institution as to which the Bureau determined there was a significant decline in the quality or value of the program more than 120 days before closure.
4. The institution has been ordered to pay a refund by the Bureau but has failed to do so.
5. The institution has failed to pay or reimburse loan proceeds under a federal student loan program as required by law, or has failed to pay or reimburse proceeds received by the institution in excess of tuition and other costs.
6. You have been awarded restitution, a refund, or other monetary award by an arbitrator or court, based on a violation of this chapter by an institution or representative of an institution, but have been unable to collect the award from the institution.

Financial Aid

7. You sought legal counsel that resulted in the cancellation of one or more of your student loans and have an invoice for services rendered and evidence of the cancellation of the student loan or loans.

To qualify for STRF reimbursement, the application must be received within four (4) years from the date of the action or event that made the student eligible for recovery from STRF.

A student whose loan is revived by a loan holder or debt collector after a period of noncollection may, at any time, file a written application for recovery from STRF for the debt that would have otherwise been eligible for recovery. If it has been more than four (4) years since the action or event that made the student eligible, the student must have filed a written application for recovery within the original four (4) year period, unless the period has been extended by another act of law.

However, no claim can be paid to any student without a social security number or a taxpayer identification number."

Clinical Education

The New England College of Optometry offers a superior clinical education that introduces the aspiring optometrist to a richly diverse patient base in a variety of settings, including hospitals, community health centers, and private practices. The College's unique clinical programs put students on the forefront of community-based, collaborative care, emphasizing the important role optometrists play in developing patient-centered health care models.

Our Clinical Program Sets Us Apart

With access to more than 150 clinics and 200 schools in the greater Boston area and beyond, New England College of Optometry uses the city's vast medical network to provide you with real-world clinical education starting in your very first weeks here. Rated by US World News and Reports as one of the cities with the best health care and best hospitals in the country, Boston is the perfect location for an optometrist in training. In addition, our fourth-year students have the opportunity to travel all over the U.S., Canada, and China for their rotations.

Our Unique Approach to Clinical Education

The College is fortunate to be located in a city known for its world-class hospitals and superb medical care. Our wide-reaching New England College of Optometry (NECO) Clinical Network provides the ideal training ground for the student optometrist interested in a thorough and forward-looking education.

Our two comprehensive vision centers are known today as the NECO Center for Eye Care, (formerly known as New England Eye). At our two flagship locations at Commonwealth and Roslindale, we are at the forefront of providing care to our patients by attracting top optometry professionals, obtaining innovative technology, and integrating the support of our skilled optometry students from the College. Placements throughout the NECO Clinical Network also allow students to experience clinical placements in private practices, community health centers, VA medical centers, academic teaching hospitals, group practices, school-based programs, and facilities for individuals with disabilities such as New England Eye SEMA (Southeastern MA), Perkins School for the Blind, and the Cotting School for Multi-Handicapped Students.

In addition to Boston area health facilities in the NECO Clinical Network, the college maintains teaching and service affiliations with VA hospitals, US Public Health Service centers, major ophthalmic practices and other health facilities throughout the country and in Canada and China for the final year externship rotations.

An Immersive, Comprehensive Experience Starting in Your First Few Weeks

Students participate in patient care beginning in their first few weeks, conducting clinical observations of optometrists examining patients and participating in vision screenings in a variety of settings. Within the first four weeks of your first year, you will participate in vision screenings at local elementary schools or Head Start programs. Second year students are assigned to clerkships in practices in the Boston area such as private practices, HMOs, hospitals, and corporate and multidisciplinary clinics. During the third year, students experience three different clinical rotations in primary care, along with the first of two contact lens rotations. The final year of the Doctor of Optometry degree program is entirely clinical—spanning 12 months of full-time clinical rotation assignments available at more than 50 clinical practice sites throughout New England, the United States, and even worldwide.

Academic Departments

Biomedical Science and Disease

BIOMEDICAL SCIENCE AND DISEASE

The faculty of the Department of Biomedical Science and Disease teach courses that cover basic human cell biology, anatomy, and neuroanatomy, as well as biochemistry, physiology, and immunology. These courses form the foundation for the more advanced study of clinical medicine, systemic and ocular pathological processes, and the diagnosis, treatment, and management of ocular disease.

Department Chair

Koevary, Steven B., PhD

Full-time Faculty

Hanley, Maureen, OD

Nickla, Debora L., PhD

Mertz, James, PhD, OD

Patel, Bina J., OD, FAAO

Rucker, Frances, Dip Opt Optics,

MSc, PhD, MCOptom, FAAO

Sleight, William, OD

Part-time Adjunct Faculty

Adamczyk, Diane T., OD, FAAO

Aylward, James, OD, FAAO

Caruso, Joanne, OD

Catano, Whitney, OD

Cavallerano, Tony, OD, FAAO

Chia, Lin, OD

Druckenbrod, Rachel C., OD, FAAO

Gladstone, Karen J., MA, OD

Gong, Haiyan, MD, PhD

Krenzer, Kathleen, OD, PhD

Shein, David, MD

Stefanik, Joshua, PhD

Zimmerman, Brandon, PhD

Professor Emeritus

Zorn, Mark B., OD, PhD

Natrajan, Srinivas, OD, PhD

Academic Departments
Biomedical Science and Disease

BIOMEDICAL SCIENCE AND DISEASE COURSES

Advanced Ocular Disease I (BSD30701), Advanced Ocular Disease II (BSD30702)

Instructor of Record: William Sleight, OD

The AOD course sequence is a blended-learning course consisting of 100 hours of classroom discussion and 10 hours of online material. The didactic material is taught from a clinical-pathological perspective with the emphasis on diagnosis, treatment, and appropriate referral. Approximately 20 percent of the face-to-face time consists of interactive case discussion using a classroom response system. All lectures are recorded and all materials are available for review online. Instructional aids include online interactive cases and instructional quizzes for extra credit.

Anatomy and Physiology I (BSD10320)

Instructor of Record: Frances Rucker, Dip. Opt. Optics., MSc., Ph.D., MCOptom., FAAO

This course provides a solid grounding in the principles of human anatomy as a basis for understanding disease. Head and neck anatomy is covered in extensive detail, as is the detailed anatomy of the orbit and external eye. Laboratory exposure to the material is also through human cadaver prosection, anatomical models, and computer-based teaching tools. The ocular physiology component of the course examines the physiology of the tears, cornea, lens, vitreous and retina. A strong emphasis is placed on understanding the normal functioning of these tissues so that the student can understand how dysfunction can lead to ocular disease. The material covered in this course provides essential background for clinical medicine, pharmacology, and ocular disease.

Anatomy and Physiology II (BSD10321)

Instructor of Record: Steven Koevary, PhD

This course examines the anatomy of the major thoracic and abdominal organ systems as well as the physiology of excitable cells (nerve and muscle) and the cardiovascular, respiratory, renal, endocrine, and digestive systems. The material covered in this course provides essential background for clinical medicine, pharmacology, and ocular disease.

Anterior and Posterior Interactive Case Studies

Instructor of Record: William Sleight, OD

This course is delivered online via the college's learning management system. The course consists of interactive cases which students work through asynchronously while on external rotations during the all clinical fourth year. Students are required to complete 25-30 anterior segment cases and 25-30 posterior segments for 1.0 credit of required course material. The cases are scored and the course is graded. The topics of the cases were selected to cover diseases which are less common, but have high morbidity, as well as common conditions with unusual manifestations. The rationale for this case selection is to ensure that all students are exposed to pathologies which they may or may not encounter during their 4th year depending on their clinical populations. The primary goal of this course is to expose students to uncommon or complex clinical presentations so that they are prepared to appropriately manage these conditions in real world settings. A second goal is to provide a diverse selection of learning interactions which will serve to ensure that all students are getting exposed to a broad range of ocular pathology.

Cell Biology, Histology, and Ocular Anatomy (BSD10300), (BSD10305)

Academic Departments

Biomedical Science and Disease

Instructor of Record: Debora Nickla, PhD

This course provides an introduction to cell biology and the cellular components that make up tissues and determine their functions. Topics include epithelium, connective tissue, muscle, and nerve. Basic principles of organic molecules, cell biology, development, and tissue organization are covered, with an emphasis on relationships to ocular anatomy. The gross and microscopic anatomy of the ocular tissues are covered in detail. Laboratory sessions reinforce this material.

Clinical Medicine (BSD30901)

Instructor of Record: David Shein, MD

This course addresses a wide range of medical illnesses seen in clinical practice. Systemic diseases with ocular manifestations will receive the most focus, with specific attention given to the systemic findings. The optometry student will gain an understanding of epidemiology, pathogenesis, clinical findings, treatment strategies, and referral guidelines. From the optometry perspective, students will learn when systemic diseases should be considered based upon ocular symptoms or findings on eye examination.

Clinical Neuro-ophthalmic Topics (BSD20350)

Instructor of Record: Rachel C. Druckenbrod, OD, FAAO

This course provides a comprehensive overview of various neurologically related conditions that present to the optometrist's office. Included are such topics as orbital disease, nystagmus, transient monocular vision loss, headache disorders, and neuro-ophthalmic emergencies. An overview of neuro-imaging will be provided including understanding how to order and interpret various imaging techniques such as CT scans, and MRI.

General Pharmacology (BSD20805)

Instructor of Record: Brandon Zimmerman, PhD

This course covers selected topics in pharmacology pertaining to the nervous, cardiovascular, endocrine, and metabolic systems. Pathologies of the various systems and the mechanisms of pharmacological intervention will be covered. Side effects and contraindications of pharmacological treatments will also be explored. Additionally, basic principles of pharmacology will be explored to allow a better understanding of factors to consider when using or prescribing therapeutic drugs.

Human Anatomy (BSD10013)

Instructor of Record: Frances Rucker, Dip. Opt. Optics., MSc., Ph.D., MCOptom., FAAO

The Human Anatomy course presents a selective discussion of human gross anatomy as a basis for understanding disease and ocular function. A strong emphasis is placed on head and neck anatomy, including the orbit. This course complements a section of the histology course in which there is intensive consideration of the gross, microscopic and ultrastructural anatomy of the normal human eye. The didactic material in the gross anatomy course is illustrated with online access to Acland's videos of human anatomy dissection and in the laboratory with dissection of the bovine eye and anatomical models.

Immunology (BSD20401)

Instructor of Record: Steven Koevary, PhD

This course teaches the basic principles of immune system function. The cells and factors which mediate the various types of immune responses, as well as their mechanisms of action in such

Academic Departments

Biomedical Science and Disease

processes as hypersensitivity reactions, inflammation, and neoplastic transformation, are described. Immunological principles are applied to the understanding of human disease, with emphasis placed on the eye, including the special nature of the intraocular immune response.

Neuroanatomy (BSD10009), (BSD10011)

Instructor of Record: Steven Koevary, PhD

This course provides the student with information concerning the structure of the central nervous system as it relates to physical, reflexive, sensory, cognitive, and emotional behavior. All structures are studied in their clinical context. Students learn how to select and prioritize information to solve clinical problems.

Ocular Biochemistry and Genetics (BSD10340)

Instructor of Record: James Mertz, OD, PhD

This course covers the study of the molecular composition of living cells, the organization of biological molecules within the cell, and the structure and function of these biological molecules. It concentrates on the structures of these molecules, their functions, and the strong relationship between structure and function and ocular disease. Other topics examined include the study of lipids as well as the kinetics and catalytic mechanisms of enzymes. The general concepts of genetics are reviewed during the discussion of the relationship of genetic information to various ocular genetic diseases.

Ocular Disease Principles I (BSD10721)

Instructors of Record: Maureen Hanley, OD, Bina Patel, OD, FAAO

This course will provide students an intermediate level of understanding regarding the diagnosis and management of common anterior segment findings in the eye.

Ocular Disease Principles II (BSD20722)

Instructors of Record: Maureen Hanley, OD, Bina Patel, OD, FAAO

This course will provide students an intermediate level of understanding regarding the diagnosis and management of common variations and disease conditions affecting the uvea and posterior segment of the eye. The course will be complemented with diagnostic laboratory procedures. At the end of the course, students will be able to provide a comprehensive eye examination including dilation.

Ocular Disease Principles III (BSD20723)

Instructor of Record: Maureen Hanley, OD

This course provides a comprehensive survey of glaucoma and ocular emergencies. The glaucoma portion of the course will include a comprehensive understanding of the diagnostic tools necessary to diagnose primary and secondary open and closed angle glaucoma. Proper follow-up management including observation, pharmaceutical treatment, and laser treatment will be discussed. Concepts will also be reinforced with interactive workshops.

Ocular Pharmacology I (BSD20811), Ocular Pharmacology II (BSD20812)

Instructor of Record: Lance McNaughton, OD, PhD

Ocular pharmacology is a blended learning course. The course content is divided into 11 self-study modules. There are 5 modules in Part 1 (Fall) and 6 modules in Part 2 (Spring). Each module consists of an online introductory lecture which is followed up with face to face lectures.

Academic Departments

Biomedical Science and Disease

Modules cover current concepts regarding the management of ocular disease with systemic and topical pharmaceutical agents. Graded self-assessment quizzes are given online. Students learn current indications, off label indications, side effects, and the most common drug interactions of current drugs used in ocular therapy. Moreover, the student will learn the mechanism of action of specific drugs as it relates to the pathophysiology of the condition for which the drug is prescribed. Pros and cons of particular drugs will be discussed so as to aid the clinical decision-making process. The emphasis will be on application of pharmaceutical agents in clinical practice.

Ocular Physiology (BSD10288)

Instructor of Record: Frances Rucker, Dip. Opt. Optics., MSc., Ph.D., MCOptom., FAAO
Ocular Physiology examines the physiology of the tears, cornea, lens, vitreous and retina. A strong emphasis is placed on understanding the normal functioning of these tissues so that the student can understand how dysfunction can lead to ocular disease. This course complements the head and neck section of Human Anatomy and Cell biology relating to the orbital structures.

Optic Nerve Diseases (BSD10725)

Instructor of Record: Maureen Hanley, OD
This course provides a comprehensive survey of glaucoma, visual fields, and optic nerve head evaluation. The glaucoma portion of the course will include a comprehensive understanding of the diagnostic tools necessary to diagnose primary and secondary open and closed angle glaucoma. Proper follow-up management including observation, pharmaceutical treatment, and laser treatment will be discussed. Concepts will also be reinforced with interactive workshops.

Principles of Anterior Segment Disease (BSD10720)

Instructors of Record: Maureen Hanley, OD, Bina Patel, OD, FAAO
This course covers anterior segment ocular diseases at an intermediate level of knowledge that will include variations from the normal and common pathological presentations. The course is complemented with diagnostic laboratory procedures.

Special Topics: Ocular Disease and Advanced Clinical Care (BSD30711)

Instructor of Record: James Aylward, OD, FAAO
This course provides advanced, clinically-relevant education for optometrists-in-training who have completed their second professional year and who have been exposed to patient care. The course is designed to expand clinical knowledge and enhance understanding in the area of secondary and tertiary eye care. It presents an overview of advanced clinic topics related to both anterior and posterior segment disease. Each presentation consists of lecture and case studies, and is designed to be interactive and participatory. Instructors are active clinicians/educators who have expertise in their specific topical areas. Topics include: diagnosis and management of corneal infections; surgical approach to cataracts, refractive procedures and corneal transplantation; management of retinal breaks and detachments; tertiary care of glaucoma, ocular oncology, acquired macular disease; and fluorescein angiography.

Biomedical Science and Disease Courses (cont.)

Systems Physiology (BSD10286)

Instructor of Record: Steven Koevary, PhD
This course examines the anatomy and physiology of excitable cells (nerve and muscle), and the cardiovascular, respiratory, renal, endocrine, and digestive systems, as well as the physiology of

Academic Departments

Biomedical Science and Disease

receptors and membrane channels. The course uses an integrative approach that includes the examination of biochemical, cellular, histological, and whole-organ mechanisms. The material covered in this course provides essential background material for the clinical medicine, pharmacology, and ocular disease courses.

The Etiology of Diabetes and Glaucoma (BSD10204)

Instructor of Record: Maureen Hanley, OD

This multidisciplinary course provides a comprehensive discussion of the pathogenesis of diabetes and glaucoma, two of the leading causes of blindness. The course examines the underlying physiology, neuroanatomy, psychophysics, epidemiology, public health, (including screening and compliance issues), examination methods, and treatment options for these conditions and includes an in-depth analysis of the relevant underlying biochemical pathways. Laboratories that teach techniques for diagnosing and managing these two diseases are coordinated with the lectures.

Academic Departments Primary Care

PRIMARY CARE

The department of Primary Care provides classroom education, technical workshops, and clinical training to help students develop their patient care skills and to understand the role of optometric care within the greater health care delivery system. The clinical education is supported by the primary care department. Clinical assignments are selected based upon factors that include diverse patient populations, exposure to state-of-the-art instrumentation, and supervisory faculty who are committed to both patient care and education.

Department Chair

Denial, Aurora, OD, FAAO, DipOE

Full-time Faculty

Biffi, Elena Z., OD, MS, FAAO

Gaiser, Hilary, OD, MS

Reilly, Jennifer, OD, MS, FAAO

Russo, Diane, OD, MPH, FAAO

Vera-Diaz, Fuensanta A., OD, PhD

Young, Benjamin, OD, FAAO

Part-time Adjunct Faculty

Chu, Gary Y., OD, MPH, FAAO

Dunphy, Robert W., OD, FAAO

Edmonds, Heather, MLIS

Jotie, Jenalyn, OD, FAAO

Garston, Matthew, OD, FAAO

Hoffman, Douglas J., OD

Mills, David, OD, MBA

President Emeritus

Scott, Clifford A., OD, MPH

Professor Emeritus

Carlson, Nancy B., OD, FAAO, DipOE

Chauncey, Bill, OD, PhD

Kurtz, Daniel, PhD, OD

Wilson, Roger, OD

Academic Departments Primary Care

PRIMARY CARE COURSES

Advanced Procedures (PC32005)

Instructor of Record: Elena Z. Biffi, OD, MSc, FAAO

The Advanced Procedures course is a computer and laboratory-based course designed to introduce optometry students to advanced screening, diagnostic, and therapeutic techniques. Skills covered in this course add upon the basic examination techniques taught in the first- and second-year Principles and Practices of Optometry (PPO) series and Ocular Disease Principles (ODP) series. Topic areas covered: lacrimal dilation and irrigation, A-scan and B-scan ultrasound, corneal foreign body removal, scleral depression and Intravenous (IV) and Intramuscular (IM) injections.

Clinical Ocular-Imaging Topics (PC32500)

Instructor of Record: Elena Z. Biffi, OD, MSc, FAAO

Clinical Ocular Imaging Topics is a lecture course designed to provide third year optometry students with the foundation for imaging-driven diagnostic approach to clinical care. The course will promote: 1) an integrated approach to understanding of disease conditions; 2) a unification strategy of various Ocular Imaging modalities (fundus photography, OCT, visual field, Fundus Autofluorescence (FAF) and ultrasound (taught in Advanced Diagnostic Techniques course).

Via interactive discussions and case-based presentations students will learn how data extracted from an instrument can transform into valuable clinical information used in patients' management and every-day clinical decision making. Topics covered in this course include: diagnosis and management of Glaucoma, Macular Degeneration, Diabetes and other systemic disorders, macular disorders and retinal abnormalities. The course will explore a ground-breaking area in the field of Optometry co-relating retinal neuro-vascular unit and cerebral neuro-vascular unit.

Clinical Reasoning AODP (PC 22042)

Instructor of Record: Aurora Denial, OD, FAAO

This course is designed to develop the clinical reasoning needed for case presentation to a preceptor and the analytical skills needed to care for patients. The teaching methodology is active learning with students presenting cases from their clinical experience followed by robust discussion. The course is meant to integrate students' existing knowledge base and develop skills in critical and clinical thinking.

Clinical Reasoning Ia (PC12041)

Instructor of Record: Aurora Denial, OD, FAAO

This is a core course for all first-year students. It is mainly lecture-based and provides foundational information for the entire sequence of clinical reasoning courses. The purpose of this course is to develop an appreciation and skill set for clinical and critical thinking, which can be applied to problem solving and ethical decision making. The course includes a group project which involves working with a volunteer "personal patient" who provides real life health and ocular conditions. One grade (letter grade) will be issued at the end of the spring semester. A criterion for grading has been established if a student does not complete the two semesters.

Clinical Reasoning Ib (PC12042)

Instructor of Record: Aurora Denial, OD, FAAO

Academic Departments

Primary Care

This is a core course for all first-year students. The spring course is a small group discussion format highlighting case discussion and “personal patient” presentations by students. This course emphasizes application of strategies learned in the fall. This course will help to develop the cognitive skills needed for patient care.

Clinical Reasoning II (PC22041)

Instructor of Record: Aurora Denial, OD, FAAO

This is a core course presented to students at the end of their second year of study. The purpose of the course is to develop the clinical thought process and integration of knowledge. This course emphasizes forming a differential diagnosis and an appropriate data base. Skills learned in the first-year course, along with clinical experience, are applied to cases and presentations.

Clinical Reasoning III (PC32041)

Instructor of Record: Aurora Denial, OD, FAAO

A core course for third-year students. This course emphasizes all aspects of clinical reasoning and patient care, with special attention to diagnosis and management of ocular diseases/conditions.

Introduction to Clinical Care (PC22080)

Instructor of Record: Bina Patel, OD, FAAO

This intent of this course is to assimilate previously-acquired optometric skills, both educational and via clinical practice, into American-based optometry, including terminology, aspects of public health, visual field and application, and an introduction to billing procedures and standards of care. Credentialing in order to proceed to patient care is achieved upon successful completion of this course.

Introduction to Public Health (PC12402)

Instructors of Record: Diane Russo, OD, MPH, FAAO, Gary Chu, OD, MPH, FAAO

This course is designed to provide the foundations of public health concepts, preparing students for the current health care environment. The course presents social, ethical, and policy topics to first year optometry students, prior to being exposed to patient care. The public health principles of prevention, populations, and health promotion will be emphasized throughout the course.

Ophthalmic Business and Management Policy I (PC22701), OBMP II (PC32702)

Instructor of Record: David Mills, MBA, OD

These courses endeavor to teach students the knowledge, skill, and background required to manage an ophthalmic business in all eye and health care delivery systems. Topics include goal setting, patient communication, office design, accounting and finance in an optometric setting, fee computation, practice purchase valuation, human resources, relevant business law, professional liability and risk management, and marketing. The development of a formal business plan is required.

Principles and Practice of Optometry I (PC12021)

Instructor of Record: Fuensanta Vera-Diaz, OD, PhD

Principles and Practice of Optometry (PPO) I is the first of three team taught courses (PPO-I, II and III) that prepare first year students to participate in Patient Care 1 (vision screenings) and Patient Care 2 clerkship clinical assignments by teaching them the basic principles of clinical science and patient care. In these three courses, the student will acquire the knowledge, technical skills,

Academic Departments

Primary Care

professional attitudes and ethics needed to participate in patient care. Principles and procedures learned in PPO-I, II, III provide the foundation for what optometrists do every day in clinical practice and for many courses that come later in the NECO curriculum. These courses include both lectures and vision screenings, optometry clinical observations, and medical clinical laboratory sessions throughout the year.

Principles and Practice of Optometry II (PC12022)

Instructors of Record: Fuensanta Vera-Diaz, OD, PhD, Daniel Bastian, OD, FAAO

Principles and Practice of Optometry (PPO) II is the second of three team taught courses (PPO-I, II and III) that prepare first year students to participate in Patient Care 1 (vision screenings) and Patient Care 2 clerkship clinical assignments by teaching them the basic principles of clinical science and patient care. In these three courses, the student will acquire the knowledge, technical skills, professional attitudes and ethics needed to participate in patient care. Principles and procedures learned in PPO-I, II, III provide the foundation for what optometrists do every day in clinical practice and for many courses that come later in the NECO curriculum. These courses include both lectures and vision screenings, optometry clinical observations, and medical clinical laboratory sessions throughout the year.

Principles and Practices of Optometry III (PC22023)

Instructor of Record: Hilary Gaiser, OD, MSc, Benjamin Young, OD

Principles and Practice of Optometry (PPO) III is the third of three courses (PPO-I, II and III) that prepare first year students to participate in Patient Care 2 clinical assignments by teaching them the basic principles of clinical science and patient care. In these three courses, the student will acquire the knowledge, technical skills, professional attitudes and ethics needed to participate in patient care. Principles and procedures learned in PPO-I, II, III provide the foundation for what optometrists do every day in clinical practice and for many courses that come later in the NECO curriculum. PPOIII consists of lecture, lab and clinical simulation.

Public Health & Clinical Practice (PC 12406)

Instructors of Record: Diane Russo, OD, MPH, FAAO, Gary Chu, OD, MPH, FAAO

This course will build upon the public health concepts covered in the first half of the course, Introduction to Public Health. Greater emphasis will be placed on the integration of public health principles into clinical practice. In particular, epidemiology, social determinants of health, and evidence-based medicine will be discussed and analyzed through the use of case discussions and active learning strategies.

Academic Departments Specialty and Advanced Care

SPECIALTY AND ADVANCED CARE

The Department of Specialty and Advanced Care includes courses and clinical programs to develop specific background, skills, clinical insights, and patient-management capabilities required of optometrists within the specialized clinical realm of contact lenses, low vision, geriatric optometry, individuals with disabilities, pediatric optometry, and binocular vision. The curriculum provides a foundation that integrates basic science with clinical science and is directly related to the provision of clinical care of patients within these specialized subject areas.

Department Chair

Lyons, Stacy A., OD, FAAO

Full-time Faculty

Donahue, Alicia, OD

Kerber, Kristen, OD, MS, FAAO

Kran, Barry S., OD, FAAO

Liao, Jennifer, OD, FAAO, FSLs

Malkin, Alexis G., OD, FAAO

McNaughton, Lance, OD, PhD

Quinn, Nicole, OD

Ross, Nicole, OD, MSc, FAAO

Srinivasan, Gayathri, MS, OD, FAAO

Williams, Sarah, OD

Part-time Adjunct Faculty

Berman, Morris, OD, MS

Jeong, Grace, OD

Hom, Richard, OD, PhD, MPA

Mayer, Dale L., PhD

Mazza, Brittney J., OD

Nau, Amy C., OD, FAAO

Phillis, Kendra M., OD

Purcell, Howard, OD, FAAO

Riccobono, Kellen, OD, FAAO

Watanabe, Ronald, OD, FAAO

Weissberg, Erik M., OD, FAAO

Wright, Darick, CLVT, COMS, MA

Professor Emeritus

Jamara, Richard, OD

Moore, Bruce, OD

Richman, Jack, OD

Academic Departments Specialty and Advanced Care

SPECIALTY AND ADVANCED CARE COURSES

Advanced Contact Lenses (SAC23005)

Binocular & Accommodative Anomalies (SAC33405)

Instructors of Record: Gayathri Srinivasan, MS, OD, FAAO

This lecture and laboratory course provides the student with the ability to diagnose as well as to initiate treatment for patients who present with non-strabismic binocular dysfunctions, accommodative anomalies, and non-pathologic oculomotor dysfunction. From a diagnostic perspective, it will integrate the clinical information gained in the PPO sequence with the theoretical and practical information covered in other courses discussing binocular vision. Treatment options discussed will include the judicious application of lenses and prisms, as well as an introduction to optometric vision therapy.

Contact Lenses I (SAC23002)

Instructor of Record: Jennifer Liao, OD, FAAO

Contact lenses are an essential part of optometric practice, not only for practice success, but also in the management of certain ocular conditions that require visual and/or therapeutic rehabilitation. This course introduces the basic aspects of contact lens fitting to the optometry student. It begins with a review of corneal topography and anterior segment anatomy to set the stage for contact lens fitting. The course then covers the fitting of spherical, astigmatic, and presbyopic soft hydrophilic contact lenses. This includes lens materials, designs, and fitting processes that result in optimal vision and comfort. The course concludes with the discussion of custom soft contact lenses, including prosthetic and colored lenses, ocular physiology and complications with soft contact lens wear, and a brief discussion of contact lens optics. A hands-on laboratory provides practical experience with the various lens types, and online materials encourage independent learning and application of material to clinical settings.

Contact Lenses II (SAC23003)

Instructor of Record: Lance McNaughton, PhD, OD

This course builds off of the soft lens education acquired in Contact Lenses I with a transitional shift into more advanced topics. A broad variety of lens concepts will be examined, in theory and in practice, culminating in the acquisition of skills necessary for fitting and management of specialized contact lens designs. Of particular interest, gas permeable contact lenses, both corneal and scleral, will be examined in spherical, toric, multifocal, and hybrid designs. Additionally, prosthetic lenses, along with those designed for irregular corneas, contact lens related complications, and orthokeratology, will all be covered. By way of the hands-on laboratory, students will acquire necessary practical experience for each of the lenses discussed above. Self-study is the key to maximizing learning and success in this course.

Development, Strabismus, and Amblyopia (SAC33402)

Instructor of Record: Sarah Williams, OD

Normal and abnormal visual development, from the basic underlying principles and supporting science to the diagnosis and management of clinical conditions resulting from abnormal development such as strabismus and amblyopia, are presented. Basic topics include the development of refractive errors; the normal and abnormal development of the neural visual system in animals; the effects of monocular eye closure, strabismus, anisometropia and

Academic Departments Specialty and Advanced Care

astigmatism on the development of the visual system and visual behavior; the critical period for neural flexibility; the testing of vision in human infants; and research on the nature of vision in amblyopia and binocular vision loss. The course then takes a more clinical turn, as it provides the student with an organized approach to the clinical evaluation and management of a patient with strabismus and/or amblyopia. Discussions focus on natural history, etiology, signs and symptoms, related characteristics, significance and practical management of amblyopia, esotropia, exotropia, and noncomitant strabismus. There is special emphasis on the clinical decisions and procedures needed to recognize functional versus pathological etiologies with a laboratory component, setting the stage for discussion and hands-on experience with relevant diagnostic and treatment procedures.

Low Vision Rehabilitation Throughout the Life Span (SAC33203)

Instructor of Record: Nicole Ross, OD, MSc, FAAO

This one-semester lecture and laboratory course provides an introduction to low vision rehabilitation throughout the life span with an emphasis on geriatrics. The course explores the role primary care optometrists have in treating the level 1 low vision patient with moderate visual impairment. The course also addresses how to refer the level 2 advanced low vision patient for comprehensive low vision care. The strategies for low vision care include the functional low vision evaluation, the low vision device selection, and patient management. Interactive laboratories provide hands-on experience and practice performing the low vision methods of evaluation.

Pediatric Optometry (SAC33605)

Instructor of Record: Kristen Kerber OD, MS, FAAO

The Pediatric Optometry course prepares the student to understand, diagnose, and manage vision problems found in children. Topics include examination techniques used for infants and toddlers, diagnosis and management of refractive error and ocular disease in children, child development, learning-related vision problems, evaluation of children with disabilities, and the ocular and systemic manifestations of child abuse. Seminars will provide hands-on opportunities to reinforce techniques and concepts discussed in lectures. At the conclusion of the course, students will have the foundation needed to deliver high-quality eye care to their pediatric patients.

Strabismus and Amblyopia (SAC33483)

Instructor of Record: Sarah Williams, OD

Normal and abnormal visual development from the basic underlying principles and supporting science to the diagnosis and management of clinical conditions resulting from abnormal development such as strabismus and amblyopia are presented. Basic topics include: the development of refractive errors, the normal and abnormal development of the neural visual system in animals, the effects of monocular eye closure, strabismus, anisometropia and astigmatism on the development of the visual system and visual behavior, the critical period for neural flexibility, the testing of vision in human infants, and research on the nature of vision in amblyopia and binocular vision loss. The course then takes a more clinical turn as it provides the student with an organized approach to the clinical evaluation and management of a patient with strabismus and/or amblyopia. Discussions focus on natural history, etiology, signs and symptoms, related characteristics, significance and practical management of amblyopia, esotropia, exotropia and noncomitant strabismus. There is special emphasis on the clinical decisions and procedures needed to recognize functional versus pathological etiologies with a lab component setting the stage for discussion and case analysis.

Academic Departments Vision Science

VISION SCIENCE

This department provides courses that promote an understanding of the theory and application of optics, as well as the structure and function of normal and abnormal visual systems. The curriculum includes optics, vision testing, binocular vision, and visual neuroscience.

Department Chair

McCormack, Glen L., OD, PhD

Full-time Faculty

Gwiazda, Jane, PhD

Metlapally, Sangeetha, BSOpt, PhD

Panorgias, Athanasios, MSc, PhD, FAAO

Research Scientist Faculty

Taylor, Christopher P., BSc, PhD

Part-time Adjunct Faculty

He, Ji-Chang, MS, PhD

Lewis, Alan Laird, OD, PhD

Peli, Eliezer, OD, MSc

Rosenfield, Mark, PhD, MCOptom, FAAO

Wang, Guang-Ji, MD, OD

Wong, Blair C., BS, ABOM

Professor Emeritus

Comerford, James P., PhD, OD

Lappin, Paul, OD, PhD

Thorn, Frank, OD, PhD

Academic Departments Vision Science

VISION SCIENCE COURSES

Binocular Vision and Ocular Motility (VS21203), Lectures in Binocular Vision (VS21217) Lectures in Ocular Motility (VS21218)

Instructor of Record: Glen McCormack, OD, PhD

This course presents elements of binocular vision and ocular motility. Binocular vision topics include oculocentric and egocentric localization, binocular correspondence and the horopter, fusion and Panum's areas, binocular rivalry and suppression, depth cues and stereopsis, stereoacuity, and the pathophysiological aspects of strabismus, amblyopia, and stereoblindness. The ocular motility material includes principles of saccadic, pursuit, vestibular, optokinetic, vergence, and accommodative movements and addresses the anatomical, kinematic, physiological, cybernetic, and pathophysiological properties of ocular motility. Laboratory sessions support the lecture material with hands-on experiments.

Color Vision (VS11210)

Instructor of Record: Athanasios Panorgias, MSc, PhD

This course presents the evolution of trichromatic vision and trichromatic theories. Neurophysiology for color perception, color discrimination, mixture and appearance are explained. Theory of color spaces and chromaticity coordinates are covered. Inherited and acquired color vision deficiencies and theory of color vision tests are covered. Societal and vocational implications of color vision defects are discussed.

Neural Basis of Vision (VS21207), Neural Basis of Vision (VS21291)

Instructor of Record: Athanasios Panorgias, MSc, PhD

This course shows how the retina and the brain work together to produce human vision. The course starts with the encoding and transmission of information through single neurons in the visual system, and the relationship between this information and specific aspects of human vision. The central visual system and a variety of higher cerebral cortex areas are examined with an emphasis on functional MRI for their role in vision, visually-guided behavior, visual decision making and visual learning. Student should feel comfortable with understanding of how an image on the retina is translated into visual information and how the brain processes the information.

Optics I (VS11001)

Instructor of Record: Sangeetha Metlapally, BSOpt, PhD, FAAO

This course provides the student with the basic theory of optics as it relates to optometric refraction, ophthalmic corrective lenses, ophthalmic instruments, and low vision devices. In addition, the course covers the optical properties of the eye and the techniques used for assessing these properties. Topics include vergence, refraction, reflection, ray tracing, prisms, thin and thick lenses, mirrors, optical models of the eye, refractive errors, and optical effects of correcting lenses. Laboratory sessions support the lecture material with hands-on experiments.

Optics II (VS11002)

Instructor of Record: Sangeetha Metlapally, BSOpt, PhD, FAAO

This course emphasizes the application of geometric optics to the properties of ophthalmic lenses, including the imaging properties of spherocylindrical lenses, base curves, lens thickness, magnification properties, lens shapes, and prismatic effects of lenses. Additional material covers principles of ophthalmic optical devices for low vision, including the magnification and field

Academic Departments Vision Science

properties of telescopes and magnifiers. Lensometry skills, eyewear design, and the production of eyewear are included in the laboratory.

Optics III (VS21003)

Instructor of Record: Sangeetha Metlapally, BS Opt, PhD, FAAO

This course covers physical optics, aberrations, and light measurement. Topics include light scatter, polarization, interference, diffraction, and factors that set limitations on the sensitivity and resolving power of optical instruments, including the eye. Additional material covers measurement of light, ambient radiation, lasers, photic damage to the eye, glare sensitivity, wavefront aberrations and optical quality, and advanced ophthalmic imaging methods.

Solving Complex Refractive Issues (VS31006)

Instructor of Record: Blair Wong, ABOM, BS

This course presents the optometric approach to optimal patient care through the clinical visualization, analysis, application and ultimate design specific to ophthalmic prescription eyewear and contact lenses. A thorough review of intermediate level optics will be presented in the beginning of the course as a means to prepare students for case analyses involving anisometropia, aniseikonia, post-cataract care and post corneal surgical considerations. Upon completion of this course, students will develop a greater understanding for the delivery of optimal optometric patient care, and analyze patients' eye care and eyewear needs in regards to refraction, frame selection, and ophthalmic lens selection.

Visual Development (VS21292)

Instructor of Record: Christopher Taylor, B.Sc., Ph.D.

This course presents the development of normal and abnormal vision, from the basic underlying principles and supporting science to the diagnosis and management of clinical conditions resulting from abnormal development, such as strabismus and amblyopia. Basic topics include: testing vision in human infants, the normal and abnormal development of animal's neural visual system, the effects of monocular eye closure, strabismus, anisometropia and astigmatism on the development of the visual system and visual behavior, and the sensitive period for neuroplasticity. Research on the nature of vision in amblyopia and binocular vision loss in patients is then described and related to the mechanisms revealed in the first parts of the course.

Visual Sensation and Perception (VS11221)

Instructor of Record: Athanasios Panorgias, MSc, PhD

This course covers the basic visual neurophysiology and describes the visual pathway from the retina to the cortex. Light sensitivity and dark and light dark adaptation mechanisms are discussed. Spatial vision and limiting factors of visual acuity and contrast sensitivity are covered. Temporal sensitivity and time-related phenomena are explained. The maximum sensitivity of the human visual system is discussed and psychophysical methodology used for vision testing is covered. Signal detection theory and differences between sensitivity and specificity are explained. Motion, size, depth, and scene perception, visual illusions and entoptic phenomena are discussed. Extrastriate brain activity related to visual information processing is covered. Finally, the aging of the visual system (media, retina) and visual function are discussed.

Academic Departments Clinical Education

CLINICAL EDUCATION

This department supports the clinical work component of the curriculum at New England College of Optometry. Students work under the careful supervision of faculty mentors who help them hone their clinical skills and develop expertise in specialty areas of interest. They work in a clinical environment that familiarizes them with a contemporary health care model that emphasizes visual health through community-based collaborations.

Associate Dean for Clinical Affairs

Kristen Brown, OD, FAAO

Director of Externships

Jonathon Jimmerson, OD

Clinical Track Faculty

Andrejko, Phyllis, OD

Aneja, Nikita, OD

Bastian, Daniel, OD, FAAO

Chuang, Brandon, OD

Darrow, Judith, OD

Gulmiri, Anita, OD, FAAO

Ho, Jeffrey, OD, FAAO

Humphreys, Emily, OD

Jimmerson, Jonathon H., OD

Kong, Jacky, OD

Lewandowski, Crystal, OD, FAAO

McPhail, Megan, OD

Merritt, Michael, OD, FAAO

O'Donoghue, Mark W., OD

Pham, Linda, OD, FAAO

Pogue, Nicole D., OD, FAAO

Strake, Benjamin, OD

Xu, Meng Meng, OD, FAAO

Part-time Adjunct Faculty

Abraham, Angela B., OD

Bossie, Timothy, OD, FAAO

Brown, Kristen, OD, FAAO

Chan, Ceida, OD

Moy, Amy Roan, OD, FAAO, CPCO

Sacco Clegg, Christine, OD

Santos, Michael, OD

Academic Departments Clinical Education

CLINICAL EDUCATION COURSES

A sequence of Patient Care courses gives students direct patient care experience and responsibilities in affiliated health centers, Veterans Affairs hospitals, private practices, or in the New England College of Optometry clinical system, the NECO Clinical Network. Clinical preceptors will evaluate and guide the student through the process of providing eye care. Students are graded on key clinical tools: technical skills, knowledge base, analytical skills, diagnostic skills, management and treatment, communication skills, efficiency, attitude, and professionalism.

Patient Care I (PC12120), Patient Care Ia (PC12125), Patient Care Ib (PC12126)

Instructor of Record: Hilary Gaiser, OD, MS

Patient Care I is the first introduction to patient care as a student clinician. Students in the Advanced Optometric Degree Program begin vision screenings and clinical observations during the spring of their initial year. This course consists of pediatric vision screenings, clinical observations, training in medical professionalism and Dr./Pt. communication. A vision screening is a tailored set of tests performed to determine if an individual should be referred for a complete eye examination. Student clinicians will perform vision screenings with local schools and other community partners under the oversight of a preceptor. Students will be evaluated by the preceptor on examination techniques, record keeping, attitude/professionalism, and maintenance of patient logs.

The second part of this course focuses on proficiency in medical professionalism and doctor-patient communications. Students learn communication techniques via lectures, readings, online assignments, observations of health care professionals, and by application and practice during assigned screenings. The observation program places students in different health care settings to critically observe how communication techniques are utilized.

For all of Patient Care I, clinical performance is graded as Pass, Remedial or Fail based on meeting all of the requirements and on clinical performance at screenings. The requirements include fulfilling immunizations, CPR training, HIPAA training, and submitting clinical observation forms, log forms, and preceptor evaluations. Clinical performance is evaluated by screening preceptors after each screening assignment, as well as a final on-line grade submitted at the end of the term.

Patient Care II (PC22120), Patient Care IIa (PC22125), Patient Care IIb (PC22126)

Instructor of Record: Diane Russo, OD, MPH, FAAO

Patient Care II is the primary clinical component of the second-year curriculum. Through assignments to practices in the NECO Clinical Network - a network of clinics, health centers, VA hospitals and affiliated practices in the Boston area - students become active members of an eye care delivery team. In addition to applying their current level of knowledge and skills, students are expected to acquire an understanding of patient care delivery, effective patient communication, ancillary office skills, and an understanding of ocular health and disease detection through the use of automated and other diagnostic equipment. As skills are developed during the year, preceptors are encouraged to incorporate those techniques into patient care responsibilities. The students are evaluated with a midterm progress report and a final evaluation, and receive a final clinical grade (honors, pass, remedial, or fail) at the end of each term based on meeting all of the requirements and on clinical performance. The requirements include fulfilling immunizations, CPR training, HIPAA training, and submitting clinical observation forms, log forms, and preceptor evaluations.

Academic Departments Clinical Education

Patient Care III (PC32124), Patient Care IIIa (PC32125), Patient Care IIIb (PC32126), Patient Care IIIc (PC32127)

Instructor of Record: Diane Russo, OD, MPH, FAAO

This sequence of courses gives students direct patient care experience and responsibilities in affiliated health centers, Veterans Affairs hospitals, private practices, or in the New England College of Optometry (NECO) operated clinical system, the NECO Clinical Network. Clinical preceptors will evaluate and guide the student through the process of providing eye care. Students are graded on key clinical components: technical skills, knowledge base, analytical skills, diagnostic skills, management and treatment, communication skills, efficiency, attitude, and professionalism. The students are evaluated with a midterm progress report and a final evaluation, and receive a final clinical grade (honors, pass, remedial, or fail) at the end of each term based on meeting all of the requirements and on clinical performance. The requirements include fulfilling immunizations, CPR training, HIPAA training, and submitting clinical observation forms, log forms, and preceptor evaluations.

Final Year Rotations

Instructor of Record: Jonathon Jimmerson, OD

Four rotations during the final year complete the clinical requirements, with mandatory assignments in Primary Care, Advanced Care and Specialty Care. Students choose an additional assignment in one of the mandatory categories or from a list of elective sites. The College currently has affiliated clinical sites located in over thirty states, Canadian provinces, and China. Student assignments are based on a variety of factors, including student choices and program needs.

Primary Care Rotation, Clinical sites that provide comprehensive eye care services for patients of all ages are categorized as Primary Care sites. Typically, these sites are community health centers, community clinic, or private optometric practices.

Advanced Care Rotation, Clinical sites that provide comprehensive eye care services in hospitals or surgical centers and have associated medical staff are categorized as Advanced Care sites. These include Veterans Affairs hospitals, surgical centers, and eye institutes.

Specialty Care Rotation, Clinical sites that provide professional specialty care are categorized as Specialty Care clinics. These include clinics specializing in visual therapy/binocular vision, contact lenses, pediatrics, geriatrics, patients with disabilities, or low vision. The College's Special Populations rotation provides training in many of these specialty areas.

Academic Departments Graduate Research Studies

GRADUATE RESEARCH STUDIES

This department supports students accepted into the graduate MS and dual OD/MS and OD/PhD degree programs at NECO. Through these programs, students receive a broad background in vision science and strong training in research. Candidates develop skills that enable them to contribute new knowledge to the field, help them assess new scientific developments relevant to optometry and vision science, and enable them to be more competitive for residencies and academic or industry positions following graduation. The graduates of these programs have the potential to become intellectual leaders in the profession.

Director

Jane Gwiazda, PhD

Faculty

Peter Bex, PhD

Research Interests

Visual Function in Amblyopia and Myopia
Northeastern University

Alex Bowers, MCOptom, PhD

Vision Rehabilitation
Schepens Eye Research Institute, Harvard Medical School

Anne Fulton, MD

Retinopathy of Prematurity in Infants
Children's Hospital, Boston

Hilary Gaiser, OD, MS

Vision screening, Binocular Vision
New England College of Optometry

Haiyan Gong, MD, PhD

Hemodynamics of Aqueous Humor Flow
Boston University Medical School

Jane Gwiazda, PhD

Development of Vision and Myopia in Humans
New England College of Optometry

Ji-Chang He, PhD

Visual Optics and Visual Performance
New England College of Optometry

Kevin Houston, OD, MS

Vision Rehabilitation
Schepens Eye Research Institute, Harvard Medical School

Steven Koevary, PhD

Ocular Drug Delivery
New England College of Optometry

Donald Korb, OD

Cornea and Contact Lens; Meibomian Gland Disease
Korb Associates

Barry Kran, OD

Pediatric Vision, Cortical Visual Impairment
New England College of Optometry

D. Luisa Mayer, PhD

Clinical Testing of Pediatric Vision
New England College of Optometry

Glen McCormack, OD, PhD

Binocular Vision
New England College of Optometry

Sangeetha Metlapally, PhD

Aberrations and Binocular Vision

Academic Departments
Graduate Research Studies

Amy Nau, OD	<i>New England College of Optometry</i> Cornea and Contact Lens; Meibomian Gland Disease <i>Korb Associates</i>
Debora Nickla, PhD	Animal Models of Myopia <i>New England College of Optometry</i>
Athanasios Panorgias, PhD	Mechanisms of Retinal Processing and Disease <i>New England College of Optometry</i>
Eli Peli, OD, MS	Low Vision and Image Enhancement <i>Schepens Eye Research Institute, Harvard Medical School</i>
Nicole Ross, OD, MS	Vision Rehabilitation <i>New England College of Optometry</i>
Frances Rucker, MCOptom, PhD	Chromatic Mechanisms, Emmetropization <i>New England College of Optometry</i>
Magali Santgeniez, PhD	Novel molecular pathways in retinal degeneration <i>Schepens Eye Research Institute, Harvard Medical School</i>
Gayathri Srinivasan, OD, MS	Pediatric Vision <i>New England College of Optometry</i>
Christopher Taylor, PhD	Visual performance in myopia and presbyopia <i>New England College of Optometry</i>
Frank Thorn, OD, PhD	Effects of Visual Degradation <i>Massachusetts Institute of Technology</i>
Vickery Trinkaus-Randall, PhD	Wound Healing in Corneal Epithelial Cells <i>Boston University Medical Center</i>
Fuensanta Vera-Diaz, OD, PhD	Myopia and Visual Performance <i>New England College of Optometry</i>

**Academic Departments
Graduate Research Studies**

GRADUATE STUDIES COURSES

Biostatistics and Research Design I (GRS97003)

Instructor of Record: Christopher Taylor, B.Sc., Ph.D.

This course provides an understanding of data analysis and statistical issues in the design of experiments, as well as the techniques, terminology, and software commonly used. Students learn to interpret the strength of statistical arguments made by researchers, and how to weigh evidence when evaluating scientific hypotheses. This course will provide students with a strong foundation in basic statistical reasoning that will help them in more advanced courses.

Biostatistics and Research Design II (GRS97004)

Instructor of Record: Christopher Taylor, B.Sc., Ph.D.

This course augments the material learned in Biostatistics and Research Design I. Students learn how to analyze real datasets, including their own, and others drawn from sources such as clinical research, public health studies, and psychophysical experiments.

Graduate Research Seminar I: Biomedical Research in Vision (GRS97020)

Instructor of Record: Steven Koevary, PhD

This seminar examines selected areas of recent biological research in vision. Current advances in methodology and the impact of research findings will be emphasized. Selected topics are based on participating faculty expertise and include ocular immunology, diabetic retinopathy, nutrition and the eye, ocular circadian rhythms, anterior segment physiology, regulation of IOP and glaucoma.

Graduate Research Seminar II: Optics in Vision (GRS97021)

Instructor of Record: Sangeetha Metlapally, PhD

This seminar discusses current research in visual optics, with a concentration on the theory and methods of non-invasive techniques for measuring characteristics of the eye's optics. Topics include optical aberrations of the eye and their role in vision, optical characteristics of blur, and optical limitations on neural processing.

Graduate Research Seminar III: Special Topics–Eye Growth, Emmetropization, Development of Myopia (GRS97022)

Instructors of Record: Frances Rucker, Ph.D., MCOptom, Debora Nickla, PhD

This seminar surveys and critiques the recent experimental and epidemiological research on the control of eye growth and the development of refractive state. Topics include the visual regulation of eye growth, emmetropization and refractive error development, animal models of myopia, the biochemistry and biomechanics of eye growth, and the genetics of eye growth and refractive error development. Occasionally, other special topics in vision science may be selected.

Graduate Research Seminar IV: Visual Neurophysiology and Development of Vision (GRS97023)

Instructor of Record: Thanasis Panorgias, MSc, PhD

This seminar covers a wide range of material examining recent work on the neurophysiology of the visual system in health and disease. Emphasis is placed on the development of visual system functions. Topics include binocular vision, strabismus and amblyopia, control of eye movements and accommodation, color vision, retinal processing, and spatial vision.

Academic Departments Graduate Research Studies

Laboratory Research I (GRS97040)

Instructor of Record: Jane Gwiazda, PhD

In this course students work with their advisors in planning the research project, including obtaining permission for use of human subjects by the Institutional Review Board (IRB) or animals by the Institutional Animal Care and Use Committee (IACUC). At the end of this course students should have identified a research problem to study and outlined experiments to conduct the MS research. An average of four hours/week lab work is required for Laboratory Research I.

Laboratory Research II (GRS97041)

Instructor of Record: Jane Gwiazda, PhD

In this course students start to collect data for the thesis, working in the laboratory of the MS advisor. At the end of this course students should demonstrate knowledge of the experimental methods and should have started conducting experiments to answer the research question. An average of 4 hours/week of lab work is required for Laboratory Research II.

Laboratory Research III (GRS97042)

Instructor of Record: Jane Gwiazda, PhD

In this course students collect and analyze data for the thesis project and review results with their advisors. By the end of the semester data collection should be fully or nearly complete, and students should start working on the thesis organization. At the end of this course students should be able to write up and interpret the results of experiments. They also should submit an abstract and present their results at a scientific meeting, either as a poster or oral presentation. An average of 4 hours/week of lab work is required for Laboratory Research III.

Laboratory Research IV (GRS97043)

Instructor of Record: Jane Gwiazda, PhD

In this course students finalize data analysis for the thesis project, and review results with the MS advisor. They also begin writing their thesis. If not done previously, the student should submit an abstract of his/her research to a relevant scientific meeting (e.g., ARVO, AAO) and then present the research. An average of 4 hours/week of lab work is required for Laboratory Research IV.

Laboratory Research Survey (GRS97001)

Instructor of Record: Glen McCormack, OD, PhD

This course provides an overview of the basic areas of research conducted at the College and in affiliated laboratories, which are potentially available to students in the MS program. In separate lectures, members of the graduate faculty discuss details of their research, including the major hypotheses, experimental designs, and main results. A short paper is required for credit; the course is graded Pass/Fail.

Research Lecture Series (GRS97010, GRS97011, GRS97012, GRS97013)

Instructor of Record: Thanasis Panorgias, MSc, PhD

Colloquia are held throughout the academic year. The series features invited lectures on a wide variety of topics by an international group of researchers. Whenever possible, graduate students participate in discussions with the speaker.

Thesis Preparation I (GRS97050)

Instructor: Jane Gwiazda, PhD

Academic Departments Graduate Research Studies

This course is an independent study involving preparation of the thesis. The thesis must include introduction of the research topic with a comprehensive review of the literature, appropriately organized methods, results, and discussion sections, and a final conclusions section summarizing the outcome of the project. The student should submit a draft of the thesis to the advisor by the end of the semester. Plans should be in place for the thesis examination to be held in the spring semester.

Thesis Preparation II (GRS97051)

Instructor: Jane Gwiazda, PhD

This course is an independent study involving final preparation of the thesis. A completed thesis, ready for binding, must be submitted to the thesis advisor, thesis committee members and the Director of Library Services. For the MS student to be recognized at the spring commencement, a thesis examination must be completed by April 23. The final version of the thesis must be submitted in early May during the spring semester of the fourth year for the OD/MS program, or the second year in the stand-alone MS program.

Thesis Proposal (GRS97031)

Instructor: Jane Gwiazda, PhD

At the end of the semester in May of the second year (OD/MS program), or at the end of January of the first year for the stand-alone MS program, each student must submit to the Graduate Studies Committee (GSC), with the signed approval of the advisor, a thesis proposal defining the thesis project, the methods and design of the experiments, the progress to date, and plans for completion. The GSC reviews and approves the thesis proposals.

Thesis Proposal Development (GRS97030)

Instructor: Jane Gwiazda, PhD

Thesis Proposal Development is an independent tutorial conducted by the student's advisor. Through regular meetings the student and advisor discuss the relevant literature in detail, and the student writes a paper, reviewed by the advisor, summarizing the literature. This paper helps in the development of the thesis proposal.

Elective Courses

Advanced Contact Lenses (ELC62001)

Instructor: Ron Watanabe, OD

This elective course presents advanced contact lens and corneal science topics in a seminar and laboratory grand rounds format. Course topics build on the material covered in the required Contact Lens course to provide the student with a more substantial understanding of specialized topics. This course is highly recommended for those students who plan to pursue post-graduate residency training or specialty practice in contact lenses.

American Academy of Optometry Experience (ELC61715)

Instructor: Aurora Denial, OD

This course allows students to choose 22 hours of educational programs from the American Academy of Optometry's annual meeting program. All educational programs are COPE approved and all courses, papers and published abstracts are peer reviewed. Students self-direct their learning in an individual and specific manner. One student may choose 22 hours of credit in the field of contact lenses whereas another may choose 22 hours in a variety of specialties.

Class time, outside of the AAO meeting will consist of two classes, each meeting for 2 hours in duration. Before the AAO meeting, students will attend a class meeting. This meeting will include an overlook of professional organizations, history of the Academy and provide students guidance for their course selection. Students will identify areas of interest and/or areas where they would like to augment their knowledge. The requirements include one written report.

Clinical Ocular Disease Cases in Primary Care: Anterior Segment (ELC61705), Posterior Segment and Glaucoma (ELC61706)

Instructor: Matthew J. Garston, OD

This elective is structured around an informal interactive discussion of conditions frequently encountered in a primary care optometry/ophthalmology H.M.O. practice. Emphasis is placed on presenting cases that reinforce diagnosis and management. Over 150 cases will be presented (about 6 cases per class hour). Excellent photos, complete case histories, treatment, and follow-up photos make up the base for this course.

Co-Management of Refractive and Cataract Surgery (ELC67105)

Instructor: Lin Chia, OD

In real-world practice, a majority of OD's will be presented with opportunities to co-manage patients with local surgeons. The goal of this 10-hour lecture series is to provide students with the foundation for this niche in eye care. We begin with a review of the current technologies in refractive surgery (e.g. LASIK/PRK/LASEK, CXL, RLE, premium IOL's). Students will learn how to apply their clinical knowledge to surgical cases, including how to determine surgical candidacy, the importance of an OD's role in pre- and post-operative care, and how to identify and manage complications.

Nutrition (ELC61003)

Instructor: Steven Koevary, PhD

We will discuss the nutritional pyramid, the roles of carbohydrates, fats, proteins, phytochemicals, zoo chemicals, vitamins, and minerals in the diet, the relationship between diet and acute and chronic diseases, the role of zinc, xanthophylls, and various other combinations of vitamins on possible prevention of macular degeneration and cataract formation, the specific effects of salt and fat intake on the development of cardiovascular disease, stroke, diabetes, and cancer, and the

Elective Courses

USDA dietary guidelines for Americans. In all of our discussions, implications for ocular health will be highlighted.

Principles and Practice of Ocular Imaging (ELC67003)

Instructor: Robert W. Dunphy, OD

Diagnostic imaging data has become the foundation for modern clinical practice. What was once a specialty test procedure has now become the clinical norm meaning providers must understand the role and potential that imaging means for patients. Patients now expect to be evaluated and assessed using latest technology. Clinicians need to know how to order and interpret diagnostic imaging studies. This course provides enrollees with an overview of the operational principles of various diagnostic imaging modalities and their application in the clinical evaluation of a variety of patient presentations. Students will learn how to operate and interpret imaging tests. Students will learn to differentiate among various potential diagnoses through appreciating the details in imaging data. Clinical case presentations illustrate the contribution each imaging modality makes in the development of a clinical diagnosis. Patient outcomes will be improved through earlier and more refined diagnoses made possible by these imaging modalities. Global understanding of disease pathophysiology is enhanced via presentation of structural changes occurring as a consequence of the disease process. This course will also enhance participants' understanding of interventions for ocular disease by demonstrating response to therapy as represented by different imaging modalities.

This course supports other courses in ocular disease by reinforcing understanding of the relationships between fundusoscopic appearances of abnormal ocular conditions with additional information revealed by diagnostic imaging.

Primary Care: Anterior Segment (ELC61710)

Instructor: Matthew J. Garston, OD

This elective is structured around an informal interactive discussion of conditions frequently encountered in a primary care optometry/ophthalmology HMO practice. Emphasis is placed on presenting cases that reinforce diagnosis and management. Over 150 cases will be presented (about 6 cases per class hour). Excellent photos, complete case histories, treatment, and follow-up photos make up the base for this course. Stereo views of several cases are presented.

Special Populations Experience Course: Advanced Contact Lenses (ELC63012)

Special Populations Experience Course: Individuals with Disabilities (ELC63013)

Special Populations Experience Course: Low Vision (ELC63011)

Special Populations Experience Course: Pediatrics (ELC63010)

Special Populations Experience Course: Vision Therapy (ELC63014)

Instructor: Alexis Malkin, OD, FAAO

This elective course focuses on the specialties of Optometry including; Pediatrics, Low Vision, Advanced Contact Lenses, Vision Therapy, and Individuals with Disabilities. Through weekly clinical mentor meetings, participation in the already existent Special Populations CEreal Thursday's grand rounds presentations, required self-study written papers, case presentations and journal clubs, the student will gain an earlier and stronger experience in these specialties. Moreover, through concurrent supporting clinical assignments with a mentor in one of their specialty clinics, the student will be able to apply the knowledge gained through these small group discussions and self-studies to patient care. Enrollment into this elective will be application based.

Elective Courses

The application evaluates interest, academic standing, and potential extra-curricular scheduling conflicts (e.g. VOSH, etc.)

Vision beyond the Eyes: Brain Damage, Injury and Learning (ELC63020)

Instructor: Barry Kran, OD, FAAO

This one credit (A, B, C, Fail) elective, in which 50% of the grade is based upon participation and 50% on assignments, will meet weekly from after Spring break/boards until the last week of class and will cover vision issues related to pediatric brain damage, adult brain injury and vision and learning. Case study and literature review will be main sources of information that will be expanded upon during class time. Active discussion will be encouraged. There will be opportunities to review visual perceptual testing, pediatric testing, use of CVI surveys and how they tie into a clinical approach to the evaluation and how all of this information is used to best advocate the child. Dr. Raghuram (from Boston Children's Hospital) will overview Dyslexia and share the results of her current research in this area. She will also engage you on the topic of TBI/concussion via her findings from clinical practice and research. The last session will be devoted to cases presented by our current pediatric residents which may cover any of the topic areas of this elective.

Residency Programs

An optometric residency is an additional year of postgraduate clinical education that can be pursued by optometrists who desire to advance their patient care abilities beyond entry level practice. Residency training typically includes supervised clinical care, and learning opportunities such as grand rounds, teaching experiences, scholarship and self-directed learning.

The New England College of Optometry offers 19 specific one-year residency opportunities throughout New England that include 41 total positions. New England College of Optometry offers residencies in community health, cornea and contact lens, low vision rehabilitation, ocular disease, pediatric optometry, and primary care optometry.

Each residency program is unique and consists of a specific clinical, didactic, and educational curriculum. NECO's residencies are designed to provide cutting edge experiences that prepare the residents for challenging and rewarding careers in unique clinical venues.

All programs are structured in accordance with the accreditation guidelines of the Accreditation Council on Optometric Education (ACOE). NECO residents have gone on to a variety of careers including hospital-based optometry, specialty optometric practices, and optometric education.

Residency Eligibility

Residency candidates must be graduates of an ACOE accredited school or college of optometry.

Residency Application Process

Interested candidates should obtain information and application instructions from the Optometric Residency Matching Service (ORMatch) or by contacting the program supervisors at each site. All residents will be placed through ORMatch. The application deadline for all programs is January 31. Candidates will be notified of placement in early March.

Information about NECO's residency programs can also be obtained from the Director of Residencies, Dr. Nicole Quinn or from the Assistant Director of Residencies, Dr. Diane Russo.

2021-2022 Academic Calendar

SUMMER TERM 2021	
May 3-May 7	Orientation for AODP I, ASIP, MS/OD China
May 10	First day of classes for AODP I, AODP II, ASIP, MS/OD China
May 17	Mandatory clinic orientation AODP II, OD3
May 18	First day of classes for OD3 Session 1
May 31	Memorial Day (no classes; check with individual clinics re: closure)
June 14	First day of classes for OD 2
June 18	Juneteenth observed (no classes; check w/individual clinics re: closure)
July 02	Last day of classes for OD3 session 1
July 03	Last day of clinic for OD3 session 1
July 05	Independence Day, observed (no classes; check w/individual clinics re: closure)
July 06	Mandatory clinic orientation for OD3 session 2
July 07	First day of classes for OD3 Session 2
August 06	Last day of classes for OD 2, AODP I & II, ASIP, MS/OD China
August 9-13	*Final Examinations for OD 2, AODP I & II, ASIP, MS/OD China
August 20	Last day of classes for OD3 session 2
August 21	Last day of clinic for OD3 session 2
FALL TERM 2021	
August 23	Mandatory clinic orientation and clinic assignments: OD 2, OD 3, AODP II, ASIP, MS/OD China
August 24	First day of classes for OD 2, OD 3, AODP I & II, ASIP, MS/OD China
September 2-3	Orientation for OD 1
September 06	Labor Day (no classes; check with individual clinics re: closure)
September 07	First day of classes for OD 1
October 11	Indigenous People Day (no classes; check with individual clinics re: closure)
October 16-24	*Midterm Examinations*
October 23-27	APHA Annual Meeting
November 3-6	American Academy of Optometry Annual Meeting
November 11	Veterans Day (classes and labs in session; check with individual clinics re: closure)
November 24-28	Thanksgiving Break
December 7 or 9	National Board Examinations, PAM, Part II
December 10	Last day of classes for all
	Last day of clinic and screenings for OD 1, OD 2, AODP I & II, ASIP, MS/OD China
December 11-19	*Final Examinations*
December 18	Last day of clinic for OD 3
Dec 20-Jan 02	Winter Break
Spring TERM 2022	
January 03	First day of classes and screening assignments for OD 1. Mandatory clinic orientation and clinic assignments: OD 2, OD 3, AODP I & II, ASIP, MS/OD China
January 04	First day of classes for OD 2, OD 3, AODP I & II, ASIP, MS/OD China
January 17	Martin Luther King Day (no classes; check with individual clinics re: closure)
February 21	Presidents' Day (no classes; check with individual clinics re: closure)
TBD	SECO International
Feb. 26-March 6	*Midterm Examinations*
March 7-13	Spring Break
March 15-18	National Board Examinations, ABS, Part I
March 31-April 3	International Vision Expo & Convention East
April 05	National Board Examinations, PAM, Part II
April 06	Congressional Advocacy Conference
April 18	Patriots' Day (no classes; check with individual clinics re: closure)
May 1-5	ARVO Annual Meeting
May 06	Last day of classes for all
	Last day of clinic and screenings for OD 1, OD 2, AODP I & II, ASIP, MS/OD China
May 7-14	*Final Examinations*
May 11	Last day of clinic for OD3
May 15	Graduation: Class of 2022

2021-2022 Academic Calendar

Please note: These dates are subject to change due to the unknown circumstances of COVID related issues

2021-2022 FINAL YEAR ROTATION CALENDAR

Rotation 1: Monday, May 17, 2021 - Thursday, August 19, 2021

Rotation 2: Monday, August 23, 2021 – Thursday, November 18, 2021

Rotation 3: Monday, November 22, 2021– Thursday, February 17, 2022

Rotation 4: Monday, February 21, 2022 – Thursday, May 12, 2022

Please note: OD 4 students may not register to take the NBEO Part III board exam during the first and last weeks of each rotation period. For questions, please contact Dr. Jimmerson at jimmersonj@neco.edu.

Updated 2/1/21

Continuing Education

NECO provides patient-centered, clinically relevant education to support lifelong learning for optometrists. By presenting new and current information, we help our colleagues provide an enhanced level of care to their patients and community. In achieving our mission, we offer an array of accredited contemporary courses in varied formats, practical learning options employing state of the art technologies, and programs which address diverse patient groups and practice settings.

Sunday Series: This series of seminars presents a variety of optometric topics which augment clinical skills and excellence in patient care. They typically offer five hours of COPE-accredited CE for each Sunday program.

HomeTown Series: Professional dinner lectures present relevant optometric topics in local alumni communities throughout the country. Attendees are eligible for one hour of complimentary COPE-accredited CE.

Online Continuing Education: Online case studies and online topics series delivered by nationally recognized subject matter experts are available on-demand for COPE credit.

Research Lecture Series: This series of lectures invites recognized vision scientists to present their latest research with students, faculty, and alumni on Tuesday nights. Typically, one hour of Mass CE credit is offered.

VA Healthcare System Lectures

VA Boston Healthcare System and NECO have partnered to provide MASS CE lectures presented by residents on a variety of optometric topics at the VA in West Roxbury. This series does not offer COPE CE.

Behavioral Scholar-in-Residence

Each spring New England College of Optometry hosts Behavior Scholar-in-Residence program. This annual program brings to campus a nationally renowned specialist in the field of pediatric and developmental vision and vision therapy to share their knowledge and experience in this field with students, faculty, and area clinicians. Visit the events section of our website to learn more or view the program flyer.

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Board Chair and President serve as Ex-officio voting members on all Standing Committees except on the Executive Committee where they serve as named members.

Accreditation Information

HIGHER EDUCATION OPPORTUNITY ACT CONSUMER INFORMATION UNDER 34 CFR 643.43B

New England College of Optometry (the College) is accredited by both the Accreditation Council on Optometric Education (ACOE) of the American Optometric Association and by the New England Commission of Higher Education (NECHE) through its Commission on Institutions of Higher Education (CIHE). Both ACOE and NECHE are recognized by the U.S. Secretary of Education as reliable authorities on the quality of education and adhere to the standards of the Council for Higher Education Accreditation. The College has been continuously accredited by ACOE since 1941 and by NECHE since 1976.

Periodically the College undergoes a peer review process. As a result of their November 2012 joint accreditation visit, both ACOE and NECHE (*formerly NEASC, New England Association of Schools and Colleges*) determined that the College should continue to be accredited. ACOE's next visit is planned for November 2020; NECHE's for the fall 2022. During that time, the College is required to submit annual accreditation reports to ACOE and NECHE that meet their respective standards and address any recommendations that may have resulted from either the joint accreditation visit or interim filings.

Separately, ACOE reviews each of the College's residency programs on a different timetable.

Inquiries and requests for written documentation regarding the College's accreditation may be directed in writing to the Office of the President, 424 Beacon Street, Boston, MA 02115.

If you have any further questions or complaints regarding the College's accreditation, you may contact:

Accreditation Council on Optometric Education

243 N. Lindbergh Boulevard, Floor 1 St. Louis, MO 63141 314-991-4100 or www.theacoe.org

New England Commission of Higher Education

3 Burlington Woods Drive, Suite 100, Burlington, MA 01803, 855-886-3272 or <http://cihe.neasc.org>

Massachusetts Board of Higher Education

One Ashburton Place, Room 140, Boston, MA 02108, 617-994-6950

or <http://www.mass.edu/forstufam/complaints/complaints.asp>

Family Educational Rights and Privacy Act (FERPA)

The Family Educational Rights and Privacy Act (FERPA) affords students certain rights with respect to their education records. They are:

1. The right to inspect and review the student's education records within 45 days of the day the College receives a request for access. Students should submit to the Registrar, Dean, Head of the Academic or Clinical Departments/Offices, or other appropriate official, a written request that identifies the record(s) he/she wishes to inspect. The College official will make arrangements for access and notify the student of the time and place where the records may be inspected. If the records are not maintained by the College official to whom the request was submitted, that official shall advise the student of the correct official to whom the request should be addressed.
2. The right to request the amendment of the student's education records that the student believes is inaccurate, misleading, or otherwise in violation of the student's privacy rights under FERPA. The student may ask the College to amend a record that he/she believes is inaccurate or misleading. A student who wishes to ask the College to amend a record should write the College official responsible for the record, clearly identify the part of the record the student wants changed, and specify why it should be changed. If the College decides not to amend the record as requested, the College will notify the student in writing of the decision and advise the student of his/her right to a hearing regarding the request for amendment. Additional information regarding the hearing procedures will be provided to the student when notified of the right to a hearing.
3. The right to provide written consent before the College discloses personally identifiable information from the student's education records, except to the extent that FERPA authorizes disclosure without consent.

One exception that permits disclosure without consent is the disclosure to college officials with legitimate educational interests. A college official is defined as a person employed by the College in an administrative, supervisory, academic or research, or support staff position (including law enforcement unit personnel and health staff); a person or company with whom the College has contracted (such as an attorney, auditor, or collection agent); a person serving on the Board of Trustees; or a student serving on an official committee, such as a disciplinary or grievance committee, or assisting another school official in performing his/her tasks. A school official has a legitimate education interest if the official needs to review an education record in order to fulfill his/her professional responsibilities for the College.

As of January 3, 2012, the U.S. Department of Education's FERPA regulations expand the circumstances under which your education records and personally identifiable information (PII) contained in such records – including your Social Security Number, grades, or other private information may be accessed without your consent. First, the U.S. Comptroller General, the U.S. Attorney General, the U.S. Secretary of Education, or state and local education authorities ("Federal and State Authorities") may allow access to your records and PII without your consent to any third party designated by a Federal or State Authority to evaluate a federal- or state-supported education program. The evaluation may relate to any program that is "principally engaged in the provision of education," such as early childhood education and job training, as well as any program that is administered by an education agency or institution. Second, Federal and State Authorities may allow access to your education records and PII without your consent to researchers performing certain types of studies, in certain cases even when we object to or do not request such research. Federal and State Authorities must obtain certain use-restriction and data security

Family Educational Rights and Privacy Act (FERPA)

promises from the entities that they authorize to receive your PII, but the Authorities need not maintain direct control over such entities. In addition, in connection with Statewide Longitudinal Data Systems, State Authorities may collect, compile, permanently retain, and share without your consent PII from your education records, and they may track your participation in education and other programs by linking such PII to other personal information about you that they obtain from other Federal or State data sources, including workforce development, unemployment insurance, child welfare, juvenile justice, military service, & migrant student records systems.

Administrative office for FERPA: Family Policy Compliance Office, U.S. Department of Education,
400 Maryland Avenue, SW, Washington, DC 20202-5920

Notices and Policies

Academic Policies

For information regarding academic policies and procedures, please consult the Student Handbook found on the NECO website at www.neco.edu.

Non-discrimination Notice

The Corporation affirms it is the policy of the New England College of Optometry (NECO) to provide equal opportunity to all employees without regard to race, color, religion, sex (including pregnancy), sexual orientation, gender identity or expression, age, physical or mental disability, marital status, citizenship, ancestry, national origin, ethnicity, genetic information, military or veteran status.

NECO provides reasonable accommodations to qualified individuals with disabilities, as well as for religious practice and observance. We are committed to providing an environment in which each member of the community is treated with dignity and respect.

NECO is committed to fostering an environment that supports respect for individual and academic freedom and in which all members of the community can pursue careers and study free from any type of harassment or discrimination. NECO will not tolerate any retaliation against an individual who, in good faith, has reported (whether informally or formally) a violation of this policy or has cooperated with an investigation of an alleged violation of this policy.

Professional Licensure and Certification Notice

Students who are pursuing degrees leading to application for professional licensure or certification and/or who will be participating in clinical placements or internships through their degree program should be aware that their host facility may require a criminal background check, fingerprinting, or drug screening. Although students at the College are required to have a background check before matriculating, the clinical site may require additional checks/screenings before commencement of clinical responsibilities. In the case of the latter, the student is responsible for obtaining and paying for the background check or other screening process and for delivering required documentation to the facility. Although the College will make reasonable efforts to place admitted students in clinical sites, it will be up to the host facility to determine whether a student will be allowed to work at that facility. Students should further be aware that a criminal record may jeopardize licensure by the state certification body. Students may consult the certification body for more details. Successful completion of a program of study at the New England College of Optometry does not guarantee licensure, certification, or employment in the relevant occupation.

Study in Clinical Settings

The New England College of Optometry's programs of study require as a condition of graduation the completion of training programs in a clinical setting, such as a hospital, community health center clinic, private practice, or school-based clinic. Participation in these programs may require students to execute releases or contracts with the entity providing clinical services, which release it from liability and mandate that students comply with all requirements and regulations, such as health examinations and immunizations. The College assumes that students enrolling in courses involving outside clinical study will comply with such requirements and procedures.

Notices and Policies

Use of this Catalog

This catalog provides information to students but should not be considered a contract between a student and the New England College of Optometry. While we make every effort to provide information that is accurate at the time the catalog is prepared, changes may occur without prior notice in such areas as program offerings, curricula, tuition and fees, degree requirements, regulations and policies, schedules, courses, and other matters contained herein. Such changes may apply to students currently enrolled as well as to prospective students.

Contents as of 6/4/2021