

**NECO** | New England  
College of Optometry

# College Catalog 2023-2024

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# ABOUT

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 England 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. In doing so, we provide quality optometric care to more than 150,000 individuals annually and serve the community through our comprehensive vision centers, NECO Center for Eye Care Commonwealth and NECO Center for Eye Care Roslindale, a network of healthcare organizations, and access to vision screenings.

We've played an integral role in the field of optometry for over 125 years. When you join NECO, you join a community of caring, thoughtful individuals who seek to 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 healthcare 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 interprofessional healthcare 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, vision, and values shape the educational experience, the work we do together, and the communities we work with.

### Mission

The mission of New England College of Optometry is to change the way people see the world. We do so by:

- Integrating innovative education with early and diverse clinical experiences to prepare today’s optometrists for tomorrow’s optometry.
- Advancing the frontiers of optometric knowledge through evidence-based research and then applying this 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 emphasizing a sensitivity to the health and social welfare of diverse communities.

### Vision

NECO will continue to be a leading college of optometry in the rapidly evolving world of professional education and healthcare.

### Values

**Purpose & Impact:** We commit to high quality and compassionate patient care, access and advocacy for underserved populations, and impact that improves lives.

**Excellence & Discovery:** We encourage curiosity, explore innovation, embrace and adapt to change, and dedicate ourselves to advancing eye care in the midst of evolving healthcare delivery systems and patient expectations.

**Leadership & Inspiration:** We inspire each other to think differently, we hold ourselves accountable for our actions, words and results, and we communicate clearly and respectfully.

**Collegiality & Collaboration:** We approach our work and our relationships with a spirit of teamwork, helpfulness, honesty and civility.

**Diversity, Equity, Inclusion, and Belonging:** We celebrate the diverse community that different individuals cultivate - at NECO, throughout our clinical network, and at home. As an equal

opportunity employer, we ensure that NECO is a place where all people feel welcome, appreciated, and have a sense of belonging.

## 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

### 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 health care 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 standards.

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

### What is the application process?

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 degree program
- an Accelerated Optometric Degree program for medical doctors and scientists interested in becoming optometrists
- an Advanced Standing International program for international optometrists or medical professionals
- an international MS/OD China program

Review Requirements, Fees, and Deadlines

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

## 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

All other 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.

## Complete Supplemental Fee Payment

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

## Additional Application Information

### Standardized Tests

Optometry Admission Test (OAT) or Graduate Record Exam (GRE) scores are required for entrance to 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.

### TOEFL/IELTS

All applicants to the Four-year Doctor of Optometry program whose native language is not English are required to take the TOEFL or the IELTS exam.

## Transfer Credit Policy

### Overview

Upon request, the College will review applications for transfer from students who enrolled in other accredited schools or colleges of optometry. NECO requires that all students (including transfers) complete the regular four-year optometry degree admissions process. Transfer students must be willing to complete the application

process through OptomCAS and to be considered to start as a new first-year student. If a transfer student is accepted to NECO, they may then work with the Dean of Academic Affairs to apply for advanced standing.

### Required Documents

- Completed OptomCAS application and all NECO application materials including standardized test scores
- Official transcripts from any and all undergraduate and postgraduate programs including your current optometry program
- Three letters of recommendation
  - One letter of recommendation from a faculty member
  - One letter of recommendation from OD
  - One letter of recommendation from the Dean at your present optometry school providing official acknowledgement of your request for transfer and certification of good academic standing
- A personal statement demonstrating a compelling need to transfer to complete your optometric education.
- Course descriptions are not required upfront, but may be requested on a case-by-case basis to help determine eligibility for transfer credit.

### Deadline

Please contact the Office of Admissions for the application deadline to apply to NECO.

Upon acceptance to the four-year program, a transfer student may apply for advanced standing at NECO, which would include an interview with the Dean of Academic Affairs. The Office of Academic Affairs will then conduct a transfer credit evaluation, in tandem with the Academic Department Chairs. This evaluation will show the courses that have been approved for transfer credit.

### Transfer Course Requirements

- Courses have been successfully completed with a grade of C (2.0) or better at a regionally accredited college or university. (International college credit is not transferable).
- Courses have been completed within the last 10 years at the time of enrollment.
- Comparable in breadth and depth to those in the preprofessional studies of New England College of Optometry's Four-year Doctoral Program.
- Comparability is determined by the Dean of Academic Affairs/Office of Academic Affairs in collaboration with the Program Directors, and faculty in related discipline(s). Course descriptions may be requested by these offices to help determine transfer credit eligibility.
- In some cases, the Dean of Academic Affairs may require an applicant to sit for a proficiency examination in order to demonstrate proficiency.

Approved classes for transfer will be recorded on a student's official transcript by the Registrar at the time of matriculation. The Registrar's Office will add the transfer credit evaluation to the student's permanent record.

Additionally, the Office of Academic Affairs will create a modified program letter for the student to follow as they progress through their program. This will also be added to the student's permanent record.

All decisions made by the Dean of Academic Affairs' Office regarding transfer credit are final.

## Academic Requirements

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

### Four-year Doctor of Optometry 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><u>Biology (with lab)</u> 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><u>Chemistry (with lab)</u> 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><u>Physics (with lab)</u> 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><u>Organic Chemistry (with lab)</u> 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><u>Biochemistry</u> Provides an understanding of the biochemical basis of physiological processes. Topics should include the structure of major biological substances and of enzymatic</p>	1 course



reactions, the genetics of molecular cloning, protein and enzyme structure and function, carbohydrate metabolism, lipid metabolism, protein metabolism, nucleic acid metabolism, and cellular energetics.	
<b>Microbiology</b> 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.	1 course
<b>Calculus</b> 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.	1 course
<b>Statistics</b> 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.	1 course
<b>Psychology</b> 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.	1 course
<b>English</b> Includes an intensive writing component applied to study of English and social sciences and research methods applicable to these subject areas.	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 Optometric Degree 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 a bachelor's degree in optometry from an accredited, recognized international optometric school.
- Have at least two years of full-time optometric clinical experience (not including a pre-registration year) after graduation from optometry school.

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

- BA or BS degree
- College transcripts indicating a minimum of 3.0 GPA
- Any professional degree transcripts
- GRE (general) scores
- An admission essay detailing interest in the MS program
- Three references attesting to the applicant's analytical or research skills and potential for success in a research program

### 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
Fine Arts	Anthropology
Drama	History of Civilization
Philosophy	Geography
History of Philosophy	Political Science
Historical Biography	Economics

Theology	Sociology
History and Philosophy of Science	Criminology
	Jurisprudence
	Ethnology
	Demography
	Law
	Statistics
	History

## TUITION AND FEES

*An Investment in Your Future.* Selecting an optometry school 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 2023-2024 academic year (May 22, 2023 to May 18, 2024), the Board of Trustees of the New England College of Optometry has set the tuition and fees as shown below. Allowances for books, equipment, supplies, and estimated living expenses are included in the total cost of attendance.

### Four-year OD and OD/MS Dual Degree Programs

	OD2027 First Year	OD2026 Second Year	OD2025 Third Year	OD2024 Fourth Year
Tuition	\$46,316	\$46,316	\$46,316	\$46,316
Activity Fee	\$375	\$375	\$375	\$375
Lab Fee	\$300	0	0	0
Equipment Fee	\$1,350	\$110	0	0
Health Insurance*	\$2,510	\$2,510	\$2,510	\$2,510
Books/Equipment	\$1,500	\$1,000	\$300	0
Living Allowance	\$19,890	\$25,620	\$25,620	\$27,320
<b>TOTAL</b>	<b>\$72,241</b>	<b>\$75,931</b>	<b>\$75,121</b>	<b>\$76,521</b>

### Accelerated and International Programs

	AODP 2026	AODP 2025	AODP 2024	ASIP 2025	ASIP 2024
Tuition	\$63,362	\$63,362	\$46,316	\$63,362	\$46,316
Activity Fee	\$375	\$375	\$375	\$375	\$375
Lab Fee	\$300	0	0	\$300	0
Equipment Fee	\$1,350	\$110	0	\$110	0
Health Insurance*	\$3,315	\$2,510	\$2,510	\$3,315	\$2,510
Books/Equipment	0	0	0	0	0
Living Allowance	\$26,520	\$26,520	\$27,320	\$26,520	\$27,320
<b>TOTAL</b>	<b>\$95,222</b>	<b>\$92,877</b>	<b>\$76,521</b>	<b>\$93,982</b>	<b>\$76,521</b>

## MS in Vision Science Stand-Alone Program

	MS2025 First Year	MS2024 Second Year
Tuition	\$23,158	\$23,158
Activity Fee	\$375	\$375
Lab Fee	\$300	0
Health Insurance*	\$2,510	\$2,510
Books and Supplies	0	0
Living Allowance	\$19,890	\$19,890
<b>TOTAL</b>	<b>\$46,233</b>	<b>\$45,933</b>

\* Note – Health insurance rates are not yet final for the academic year 2023-2024.

## Tuition Policies

### Payment Policy

All tuition and fees are due and payable on or before the first day of classes of each term, except for first-year students in the Four-Year OD Program. Tuition and fees for the first term for first-year students in the Four-Year OD Program are due by August 15th (about two weeks before the beginning of the 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 Business Office 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. The College may charge a late fee of \$100 for accounts not paid by the due date.

### Veterans Tuition and Fees Policy

Pursuant to Section 103 of the Veterans Benefit Act of 2018 and Transition Act, a student who is entitled to educational benefits under Chapter 31-Vocational Rehabilitation and Employment or chapter 33-Post 911 GI Bill® benefits will be permitted to attend classes at the New England College of Optometry and will not be imposed any penalty, including late fees or access to facilities due to a delayed disbursement of VA funding.

Protection begins when the student provides NECO with a Certification of Eligibility or a Statement of Benefit.

- Any Portion of the student bill not covered by VA benefits is still expected to be settled by the due date.
- Protection ends when VA makes payment or 90 days after the date the NECO certifies tuition and fees.

## Tuition Refund Policy

Withdrawal Date	Refunded
Before the 1 <sup>st</sup> day of the academic term	100%
During the 1 <sup>st</sup> week	90%
During the 2 <sup>nd</sup> week	80%
During the 3 <sup>rd</sup> week	70%
During the 4 <sup>th</sup> week	60%
After the 4 <sup>th</sup> week	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 who is not registered full time in the term that the repeated course is given will be charged on a per credit basis for the repeated course as well as any other course as applicable. A student who is registered full time in the term that the repeated course is given will not be charged more than full time tuition for the term.

## Exempted Courses Tuition Charges

A student in a degree program who is exempted from a course will not receive a reduction in tuition.

## Extended Program Tuition Charges

A student whose program is extended will be subject to applicable tuition and fee charges.

## FINANCIAL AID

The Office of Financial Aid is committed to serving students by providing financing options in the form of scholarships, work study opportunities, federal and institutional loans, necessary in financing your education. If you have any questions at any point during the process of applying for financial aid, please contact the office by email or by phone.

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 – 11.99 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 Financial Aid Handbook and 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.

### 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**.

Graduate students applying only for federal student aid are not required to report parent information. If you consider your family "economically disadvantaged," you may want to provide parent information on the FAFSA to be considered for the more favorable Health Professions Student Loan (HPSL), Loans for Disadvantaged Students (LDS), and NECO's Fund for Education (FFE) Loan.

If you accept a Federal Direct Unsubsidized Loan, you must complete the loan's master promissory note (MPN) found on the [FSA website](#) and the entrance counseling before funds can disburse. The Graduate PLUS Loan has a separate MPN. Entrance counseling results are used for both loans.

## When to Apply

Program	Academic Year Start Date	Application Priority Date	Last Day to file the 2023-24 FAFSA	Form to Submit
4-Year OD	Summer or Fall 2023	April 1, 2023	June 30, 2024	2023-24 FAFSA
ASIP	Summer 2023	April 1, 2023	June 30, 2024	2023-24 FAFSA
AODP	Summer 2023	April 1, 2023	June 30, 2024	2023-24 FAFSA

## Types of Financial Aid for U.S. Students

### 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. Recipients can receive up to \$1000 in emergency loans. Recipients of this interest-free cash advance will either have it deducted from a future refund or added to their existing balance.

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 also limited in number and amount (the average scholarship is \$1,000), funded by private donors. 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 in the fall with an invitation to apply.



## 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 (SE) 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 about federal student aid, loans, loan repayment, and loan forgiveness programs by logging on to [www.studentaid.gov/h/manage-loans](http://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 cosigner who is a US citizen or permanent resident. The website [www.finaid.org/loans/privatestudentloans.phtml](http://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](http://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, <http://www.feedthepig.org/>, and <http://www.MyMoney.gov>. There are also a number of free apps for your smartphone to help you budget and pay bills, like CHECK, MINT, and BILL GUARD.

Keep track of your borrowing and estimated repayment. The [studentaid.gov](http://studentaid.gov) website provides a great resource called the Loan Simulator, <https://studentaid.gov/loan-simulator/> which is a 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. Studentaid.gov 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 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.
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 non-collection 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."

# ACADEMIC 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.

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
- 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
- Principal 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.

### 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 express interest in the 3+4 program in either their first or second year of their undergraduate education and follow a prescribed curriculum. Upon completion of three years of specified course work (providing predetermined grade point average, OAT scores and all other admissions criteria 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.

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.

## 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, 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.

## Residency Programs

An optometric residency is a post-doctoral educational program centered on clinical training that results in the resident's attainment of advanced competencies in eye, vision, and health care. The New England College of Optometry is affiliated with 19 residency programs throughout New England that offer 43 residency positions each year. New England College of Optometry offers residencies in Cornea and Contact Lenses, Ocular Disease, Pediatric Optometry, Primary Care Optometry and Vision Rehabilitation.

Residency training typically includes supervised clinical care in a focused area of optometry, and learning opportunities such as grand rounds, teaching experiences, scholarship and self-directed learning. Each residency program is one year in length and 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 residency site. All residents will be placed through ORMatch. The application deadline for all programs is January 31. Candidates will be notified of placement in March.

Information about NECO's residency programs can also be obtained from the Director of Residencies, Dr. Nicole Quinn (QuinnN@neco.edu) or from the Assistant Director of Residencies, Dr. Diane Russo (RussoD@neco.edu).

## CLINICAL AFFAIRS

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, a non-profit school for students with a broad spectrum of learning and communication disabilities, physical challenges and complex medical conditions.

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

NECO students are able to participate in patient care their first semester of first year. The first-year clinical program includes vision screening with local schools and other community partners and observation sessions

of optometrists providing clinical care. Second year students are assigned to clerkships in NECO's owned and operated clinics and practices in the NECO Clinical Network such as community health centers, private practices, hospitals, and multidisciplinary clinics. During the third year, students experience three different clinical rotations in primary care, along with the potential opportunity to rotate through specialty clinics in contact lens, pediatrics, and low vision. 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.

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.

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.

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.

## 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 offer enhanced 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 that address diverse patient groups and practice settings.

### Advanced OCT

This follow-up series is designed for ODs who already have a strong foundation in optical coherence tomography (OCT) and want to further their knowledge and skills in this field. Throughout the course, we will cover advanced topics in OCT, including new techniques, applications, and challenges.

### Behavioral Scholar-in-Residence

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

### Compassionate Care Series

This compassionate care series will address different perspectives, and challenges optometrists face when caring for themselves, their patients, and their community. We intend to provide an updated look at mental health, implicit bias, and cultural competency education, enhancing the provider-patient relationship in diverse communities.

### International Low Vision Grand Rounds

Low vision rehabilitation is essential in managing all patients with visual impairment and has been repeatedly demonstrated to improve quality of life. This international grand rounds in low vision rehabilitation webinar highlights local and global approaches to low vision rehabilitation through clinical cases, research presentations, and discussions regarding telerehabilitation in light of the COVID-19 global pandemic. This program emphasizes international approaches to low vision rehabilitation and the importance of a multidisciplinary approach.

## Jack Asarkof Residency Conference

This conference is the capstone end-of-the-year event where residents present their research or case studies highlighting various optometric topics. 6-8 hours of COPE-accredited CE is offered.

## Online Distance 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.

## Treatment and Management of Refractive Procedures with Boston Vision

In partnership with Boston Vision, this series will provide a comprehensive look at refractive procedures. It will include everything, such as the science of lasers and the history of refractive surgery, Lasik/PRK surgery, ICL/CLE surgery, and pre-and post-op management.

## 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.

# FACULTY DEPARTMENTS

## BIOMEDICAL SCIENCES AND DISEASE

The faculty of the department of Biomedical Sciences 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.

### Chair

Koevary, Steven B., PhD

### Faculty

Aneja, Nikita, OD, FAAO  
 Bastian, Daniel, OD, FAAO  
 Biffi, Elena Z., OD, MSc, FAAO  
 Datta, Ananya, BSOpt, MPhil, PhD  
 Hanley, Maureen, OD  
 Ho, Jeffrey, OD, FAAO  
 Humphreys, Emily, OD, FAAO  
 Lancaster, Alyssa, OD, FAAO  
 Merritt, Michael, OD, FAAO  
 Nickla, Debora L., PhD  
 O'Donoghue, Mark W., OD  
 Patel, Bina J., OD, FAAO  
 Pogue, Nicole D., OD, FAAO  
 Sickinger, Amy, OD  
 Strake, Benjamin, OD

*\*Ross, Nicole, OD, MSc, FAAO, DAAO(LV)*

### Administrative Adjunct Appointments

Brown, Kristen, OD, FAAO  
 Moy, Amy Roan, OD, FAAO, CPCO

### Adjunct Faculty

Adamczyk, Diane T., OD, FAAO  
 Bui, Jenifer, OD  
 Carell, Emily M., OD, FAAO  
 Caruso, Joanne, OD  
 Druckenbrod, Rachel C., OD, FAAO  
 Garston, Matthew, OD, FAAO  
 Gong, Haiyan, MD, PhD  
 Krenzer, Kathleen, OD, PhD  
 McNaughton, Lance, OD, PhD  
 Mertz, James, PhD, OD  
 Rabkin, Andrew, OD  
 Rabkin-Bergstrom, Cayla M., OD  
 Rucker, Frances, PhD, MSc, MCOptom, FAAO  
 Scott, Mary, OD  
 Shein, David, MD  
 Sleight, William, OD  
 Stefanik, Joshua, PhD, MSPT  
 Zimmerman, Brandon, PhD

### Emeriti Faculty

Srinivas, Natrajan, OD, PhD  
 Zorn, Mark B., OD, PhD

*\*Secondary department assignment*

## CLINICAL EDUCATION AND CLINICAL SCIENCES

The department of Clinical Education and Clinical Sciences 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.

### Chair

Denial, Aurora, OD, DAAO (OE)

### Faculty

Andrejko, Phyllis, OD  
 Asimellis, George, PhD  
 Darrow, Judith, OD  
 Filadelfo, Megan, OD  
 Fung, Kimberly, OD, FAAO, DiplABO  
 Gaiser, Hilary, OD, MS  
 He, Ji-Chang, MS, PhD  
 Jimmerson, Jonathon H., OD  
 Lewandowski, Crystal, OD, FAAO  
 Reilly, Jennifer, OD, MSc, FAAO  
 Russo, Diane, OD, MPH, MBA, FAAO  
 Vera-Diaz, Fuensanta A., OD, PhD, FAAO  
 Xu, Meng Meng, OD, MPH, FAAO  
 Young, Benjamin, OD, FAAO

*\*Biffi, Elena Z., OD, MSc, FAAO*

*\*Metlapally, Sangeetha, BSOpt, PhD, FAAO*

### Administrative Adjunct Appointments

Bossie, Timothy, OD, FAAO  
 Chu, Gary Y., OD, MPH  
 Edmonds, Heather, MLIS  
 Lewis, Alan Laird, OD, PhD

### Adjunct Faculty

Berman, Morris, OD, MS  
 Boychev, Nikolay, MOptom, PhD, MEd  
 Chan, Ceida, OD  
 Chein, Joyce, OD  
 Dunphy, Robert W., OD  
 Hoffman, Douglas J., OD  
 Jotie, Jenalyn, OD, FAAO  
 Laboy, Evangelina  
 Wang, Guang-Ji, MD, OD

### Emeriti Faculty

Carlson, Nancy, OD  
 Chauncey, Bill, OD, PhD  
 Lappin, Paul, OD, PhD  
 Wilson, Roger, OD

*\*Secondary department assignment*



## SPECIALTY CARE AND VISION SCIENCES

The department of Specialty Care and Vision Sciences 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.

### Chair

Lyons, Stacy A., OD, FAAO

### Faculty

Gobeille, Micaela, OD, MS, FAAO  
 Gulmiri, Anita, OD, FAAO  
 Kerber, Kristen L., OD, MS, FAAO  
 Kong, Jacky, OD, FAAO  
 Kran, Barry S., OD, FAAO  
 Liao, Jennifer, OD, FAAO, FSLs  
 Malkin, Alexis G., OD, FAAO  
 Martin, Jem, OD, FAAO  
 Metlapally, Sangeetha, BSOpt, PhD, FAAO  
 Pallante, Elizabeth, OD  
 Panorgias, Athanasios, MSc, PhD  
 Quinn, Nicole, OD, FAAO  
 Ross, Nicole, OD, MSc, FAAO, DAAO (LV)  
 Taylor, Christopher P., PhD  
 Williams, Sarah, OD, FAAO

### Administrative Adjunct Appointments

Purcell, Howard, OD, FAAO  
 Weissberg, Erik M., OD, FAAO

### Adjunct Faculty

Arabejo, Arabella, OD  
 DiBiase Italia, Haley, OD  
 Ferrucci, Jeff, OD  
 Hinrichs, Celia, OD  
 Hom, Richard, OD, PhD, MPA  
 Jeong, Grace, OD  
 Mayer, Dale L., PhD  
 Meloottu, Asha, OD  
 Munoz, Joel, OD  
 Nau, Amy C., OD, FAAO  
 Peli, Eliezer, OD, MSc  
 Phillis, Kendra M., OD  
 Stewart, Jennifer L. OD  
 Thamel, Lauren A., OD  
 Tolls, Dot, OD  
 Watanabe, Ronald, OD, FAAO  
 Wong, Blair C., MEd, ABOM, NCLC, LDO  
 Wright, Darick, CLVT, COMS, MA

### Emeriti Faculty

Comerford, James P., PhD, OD  
 Gwiazda, Jane, PhD, FAAO, FARVO  
 Jamara, Richard, OD  
 McCormack, Glen L., OD, PhD  
 Moore, Bruce, OD  
 Richman, Jack, OD  
 Thorn, Frank, OD, PhD

## 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

Panorgias, Athanasios, MSc, PhD

### Faculty

Peter Bex, PhD

Elena Z. Biffi, OD, MSc, FAAO

Alex Bowers, MCOptom, PhD

Ananya Datta, BSOpt, MPhil, PhD

Francesca Fortenbaugh, PhD

Anne Fulton, MD

Hilary Gaiser, OD, MS

Haiyan Gong, MD, PhD

Jane Gwiazda, PhD

Ji-Chang He, MS, PhD

Kevin Houston, OD, MS

### Research Interests

Visual Function in Amblyopia and Myopia  
*Northeastern University*

Imaging, Cerebral Small Vessel Disease  
*New England College of Optometry*

Vision Rehabilitation  
*Schepens Eye Research Institute, Harvard Medical School*

Bacterial Colonization of Contact Lens Cases and its Inhibition using Antimicrobial Contact Lens Storage Cases  
*New England College of Optometry*

Cognitive Neuroscience, Sensory Function in TBI Patients  
*VA Medical Center, Boston*

Retinopathy of Prematurity in Infants  
*Children's Hospital, Boston*

Vision screening, Binocular Vision  
*New England College of Optometry*

Hemodynamics of Aqueous Humor Flow  
*Boston University Medical School*

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

Visual Optics and Visual Performance  
*New England College of Optometry*

Vision Rehabilitation  
*Schepens Eye Research Institute, Harvard Medical School*

Steven Koevary, PhD	Ocular Drug Delivery <i>New England College of Optometry</i>
Barry Kran, OD, FAAO	Pediatric Vision, Cortical Visual Impairment <i>New England College of Optometry</i>
Gang Luo, PhD	Vision Screening <i>Schepens Eye Research Institute, Harvard Medical School</i>
D. Luisa Mayer, PhD	Clinical Testing of Pediatric Vision <i>New England College of Optometry</i>
Glen McCormack, OD, PhD	Accommodation, Convergence, and Aniseikonia <i>New England College of Optometry</i>
Sangeetha Metlapally, BSOpt, PhD, FAAO	Aberrations and Binocular Vision <i>New England College of Optometry</i>
Amy Nau, OD	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, MSc, 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>
Aparna Raghuram, OD, PhD	Visual Dysfunction Post-concussion and Learning Disability <i>Children's Hospital, Boston</i>
Nicole Ross, OD, MSc, FAAO, DAAO(LV)	Vision Rehabilitation <i>New England College of Optometry</i>
Christopher Taylor, PhD	Visual performance in myopia and presbyopia <i>New England College of Optometry</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>
Emily Wiecek, OD, PhD	Quantification of Visual Function <i>Schepens Eye Research Institute, Harvard Medical School</i>

## COURSE DESCRIPTIONS

### Advanced Care Rotation

Instructor of Record: Jonathon Jimmerson, OD

ECP4921 | ECP4922  
ECP4923 | ECP4924

Final-year 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.

### Advanced Contact Lenses

Instructor of Record: Anita Gulmiri, OD, FAAO

SAC23005

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.

### Advanced Ocular Disease I

BSD30701

### Advanced Ocular Disease II

BSD30702

Instructor of Record: Nicole Ross, OD, MSc, FAAO, DAAO(LV) and Bina Patel, OD, FAAO

The Advanced Ocular Disease (AOD) course sequence is a blended learning course, which consists of classroom discussion and online material over two semesters. The didactic material is taught from a clinical-pathologic 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 smart phone polling app (Turning Point Response Ware). Examinations are conducted using ExamSoft for computer-based assessments. All lectures are recorded and all materials are available for review online. Instructional aids include online interactive cases and instructional quizzes.

### Advanced Surgical and Laser Procedures

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

PC32006

Advanced, Surgical and Laser Procedures (ASLP) course is a combination of Lecture and Lab based learning, designed to introduce optometry students to advanced screening, diagnostic, and therapeutic techniques. The goal of the course is to provide students with the theoretical and practical basis to integrate the topic of advanced ophthalmic techniques into their clinical practice at the time of graduation. The course is sub-divided into three units, focusing on providing the foundations of Microsurgical Procedures (Unit 1), Anterior Segment LASERs (Unit 2) and other advanced procedures (Unit 3) used in eye care. As a

part of the 32-hour didactic and hands-on training (Units 1 and 2), students learn IV/IM injections, office-based local anesthesia, oculo-facial biopsy, chalazion management, suturing techniques, LASER physics and tissue interaction, types of LASERs, YAG Capsulotomy, LPI, SLT, safety and Pre- and Post- procedure patient management. In addition, the course includes other advanced diagnostic and therapeutic procedures (Unit 3), such as Intense Pulsed Light (IPL), scleral depression, lacrimal dilation/irrigation, corneal foreign body removal and ocular ultrasound. Students learn the necessary information and skills to both understand and to begin to use these procedures in the treatment and management of ocular diseases. Upon successful completion of the course and all its requirements, students will receive a "Training Certificate of IV/IM Injections, Lasers and Microsurgical procedures".

## Advanced Topics in Low Vision Rehabilitation

ELC63006

Instructor of Record: Alexis G. Malkin, OD, FAAO

This course expands beyond the fundamentals presented in the Low Vision Rehabilitation Throughout the Ages course to cover advanced topics in low vision rehabilitation care. The low vision and legally blind patient population, evaluation, and management are explored in detail. Interactive case studies challenge the participant's critical thinking skills and encourages one to begin developing an approach for evaluating a low vision patient and formulating a detailed multidisciplinary rehabilitation plan, while providing the opportunity to gain feedback from both peers and clinicians experienced in these areas. Emphasis is placed on expanding clinical decision-making skills, relating visual function to ocular conditions, and improving the visual function of patients with a variety of ocular and systemic diseases.

## American Academy of Optometry Experience

ELC61715

Instructor of Record: Aurora Denial, OD, DAAO(OE)

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.

## Anatomy and Physiology I

BSD10320

Instructor of Record: Steven B. Koevary, PhD

This course is divided into two sections - the first part presents a selective discussion of human gross anatomy of the head and neck while the second covers the physiology of the eye. 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.

## **Anatomy and Physiology II**

BSD10321

Instructor of Record: Steven B. Koevary, PhD

This course examines the physiology of excitable cells (nerve and muscle), and the anatomy and physiology of the cardiovascular, respiratory, renal, endocrine, reproductive, and digestive systems. The class consists of 35 hours of zoom lectures. Upon its completion, you should have a working knowledge of all of the above physiological processes, and the underlying gross and microscopic anatomy that drives them. This information will be vital to your understanding of clinical medicine, which is integral to dealing with patients.

## **Anterior and Posterior Interactive Cases**

BSD40510

Instructor of Record: Jeffrey Ho, OD, FAAO

This course will be delivered online via the College's learning management system. The course will consist of interactive cases which students work through asynchronously while on external rotations. The topics of the cases will be selected to cover diseases which are less common, but have high morbidity, as well as common conditions with unusual manifestations. 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 during their PCIV clinical program and in real world settings. This course will provide a diverse selection of learning interactions which will serve to ensure that all students are immersed in a broad range of ocular pathology. Students will have the opportunity to self-assess their preparedness for part 2 of the NBEO examination.

## **Binocular Vision and Ocular Motility**

VS21203

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

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, stereoscopic distortions and the pathophysiological aspects of strabismus, amblyopia, and stereoblindness. The ocular motility material includes principles of accommodative and vergence movements, saccadic, pursuit, vestibular and optokinetic movements. The course addresses the kinematic, physiological, cybernetic, anatomical and pathophysiological properties of ocular motility. Laboratory sessions support the lecture material with hands-on experiments.

## **Binocular and Accommodative Anomalies**

SAC33405

Instructor of Record: Barry S. Kran, OD, FAAO

This course aims to teach you how to diagnose and manage patients with non-strabismic binocular disorders namely accommodative, non-pathologic oculomotor, and vergence anomalies. It will build on the foundational knowledge acquired in the PPO course, specifically related to tests of accommodation and

vergence, and introduces you to new diagnostic procedures that are essential for detecting these disorders. From a treatment perspective, you will learn about the different treatment choices including optical correction (lenses, prisms) and vision therapy and how to sequence these choices depending on the underlying disorder. The lectures are organized in a way similar to a clinical evaluation of patients with this disorder - evaluation/analysis of clinical data/optical treatment/vision therapy. Labs offer you hands-on experience on how to perform binocular vision tests and administer vision therapy. Lab schedules mirror what is taught in class so that you have the didactic knowledge.

## Biostatistics and Research Design I

GRS97003

Instructor of Record: Christopher Taylor P., PhD

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 the evidence when evaluating scientific hypotheses. This course will give students 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 P., PhD

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

## Cell Biology, Histology, and Ocular Anatomy

BSD10300 | BSD10305

Instructor of Record: Debora Nickla L., PhD

BSD90300

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 and Emily Humphreys, OD, FAAO

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

BSD20355

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.

## Clinical Ocular-Imaging Topics

PC32505

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

PC32055

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, OCT-Anterior Segment, OCT-Angiography, visual field, Fundus Autofluorescence (FAF) and ocular ultrasound). Via interactive discussions and case-based presentations, students 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 multimodal diagnostic approach in optometric clinical care, as well as diagnosis and management of Glaucoma, Age Related Macular Degeneration, and many other macular and retinal abnormalities. The course also focuses on the role of Optometry in diagnosis and management of ocular manifestations of systemic vascular diseases (Diabetes, HTN, etc.) and ocular toxicity from systemic medications (Plaquenil, etc.). In addition, the course explores a ground-breaking area in the field of Optometry co-relating retinal neuro-vascular unit and cerebral neuro-vascular unit in patients with neurodegenerative diseases (Alzheimer's, etc.).

## Clinical Reasoning

PC22042

Instructor of Record: Aurora Denial, OD, DAAO(OE)

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 Ic

PC12041

Instructor of Record: Aurora Denial, OD, DAAO(OE)

This is a core course for all first-year students. The course runs for both the fall and spring semester. The fall is mainly lecture-based and provides foundational information for the entire sequence of clinical reasoning courses. The spring course is small group discussion format highlighting case discussion and "personal patient" presentations by students. The spring portion of the course emphasizes application of strategies learned in the fall. The purpose of this course is to develop an appreciation and skill set for clinical and critical thinking, which can be applied to information literacy, 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. A grade of pass/fail is given after completion of the fall semester and a letter grade is given at the completion of spring semester. This course will help to develop the cognitive skills needed for patient care.

## Clinical Reasoning II

PC22041

Instructor of Record: Aurora Denial, OD, DAAO(OE)

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 clinical thought process and integration of knowledge. The course emphasizes the clinical reasoning needed for case presentation to a preceptor and the forming of 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, DAAO(OE)

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.

## Co-Management of Refractive and Cataract Surgery

ELC67105

Instructor of Record: Anita Gulmiri, OD, FAAO

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.

## 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.

## Contact Lenses I

SAC23002

Instructor of Record: Jennifer Liao, OD, FAAO

Contact lenses are an essential part of optometric practice. The knowledge and skill of handling contact lenses is crucial for practice success, as well as the management of ocular conditions that require visual or therapeutic rehabilitation. This course introduces the basic aspects of fitting contact lenses to the optometry student. It begins with a review of corneal topography and anterior segment anatomy to set the stage for

contact lens fittings. 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: Anita Gulmiri, OD, FAAO

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 of Vision

SAC33403

Instructor of Record: Christopher Taylor P., PhD

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 animals' neural visual systems, 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. Also discussed are emmetropization and aging.

## Graduate Research Seminar I: Biomedical Research in Vision

GRS97020

Instructor of Record: Steven B. 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: George Asimellis, PhD and Sangeetha Metlapally, BSOpt, PhD, FAAO

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

Instructor of Record: Fuensanta A. Vera-Diaz, OD, 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: Sangeetha Metlapally, BSOpt, PhD, FAAO and Christopher Taylor P., 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.

### **Human Anatomy**

BSD10013

Instructor of Record: Ananya Datta, BSOpt, MPhil, PhD

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 B. 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 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.

### **Intro to Sports/Performance Vision**

ELC61006

Instructor of Record: Sarah Williams, OD, FAAO

This elective course will provide baseline knowledge for students interested in working with athletes. Different lecturers will discuss specific areas of performance vision, from the basic optometric needs to a thorough performance vision training program for different sports. Students will not only learn how to evaluate an athlete but also how to enhance overall athletic performance.

## Introduction to Clinical Care

PC22080

Instructor of Record: Bina Patel, OD, FAAO

This course's intent is to assimilate previously acquired optometric skills, both educational and clinical practice, into US based optometry, including terminology, aspects to 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 at the successful completion of this course, in order to proceed to patient care is achieved upon successful completion of this course.

## Introduction to Public Health

PC22402

Instructor of Record: Diane Russo, OD, MPH, MBA, 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 second year optometry students, prior to being exposed to patient care in clinic. The public health principles of prevention, populations, and health promotion will be emphasized throughout the course.

## Laboratory Research I

GRS97040

Instructor of Record: Athanasios Panorgias, MSc, 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: Athanasios Panorgias, MSc, 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: Athanasios Panorgias, MSc, 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: Athanasios Panorgias, MSc, 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: Christopher Taylor P., PhD

ELC66001

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.

### Lectures in Binocular Vision

VS21217

### Lectures in Ocular Motility

VS21218

Instructor of Record: Sangeetha Metlapally, BSOpt, PhD

These courses present elements of binocular vision and ocular motility respectively. 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, stereoscopic distortions and the pathophysiological aspects of strabismus, amblyopia, and stereoblindness. The ocular motility material includes principles of accommodative and vergence movements, saccadic, pursuit, vestibular and optokinetic movements. The course addresses the kinematic, physiological, cybernetic, anatomical and pathophysiological properties of ocular motility.

### 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.

## Myopia Management-Beyond Correction

ELC67401

Instructor of Record: Anita Gulmiri, OD, FAAO and Fuensanta A. Vera-Diaz, OD, PhD

Myopia management goes beyond providing optical correction for Myopia. Given the higher incidence of ocular disease associated with Myopia, it is now of utmost importance to implement strategies in clinical practice to prevent the onset of Myopia and slow Myopia progression. The “Myopia Management - Beyond Correction” elective course provides a comprehensive review of the fundamentals of Myopia as a disease process and as an epidemic, as well as a thorough, systematic evidence-based review of available treatment approaches. Each of these treatments is discussed during the course with a heavy emphasis on clinical applications through interactive discussions geared towards improving patient and provider communications.

## Neural Basis of Vision

VS21207

Instructor of Record: Athanasios Panorgias, MSc, PhD

VS21291

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.

## Neuroanatomy

BSD10009

Instructor of Record: Emily Humphreys, OD, FAAO & Steven B. Koevary, PhD

BSD10011

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.

## Nutrition

ELC61003

Instructor of Record: Steven B. Koevary, PhD

In this course, we will discuss the nutritional pyramid, the roles of carbohydrates, fats, proteins, phytochemicals, zoochemicals, 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 USDA dietary guidelines for Americans. In all of our discussions, implications for ocular health will be highlighted.

## Ocular Biochemistry and Genetics

BSD10340

Instructor of Record: Steven B. Koevary, 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 including proteins, DNA, and RNA. Other topics include the study of carbohydrate and lipid metabolism, the kinetics and catalytic mechanisms of enzymes, as well as the role of various vitamins and minerals in biological pathways.

## Ocular Disease Principles I

BSD10721

Instructor of Record: Maureen Hanley, OD and 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. The course will also include an introductory workshop on ocular surface condition.

## Ocular Disease Principles II

BSD20722

Instructor of Record: Maureen Hanley, OD and 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 dilated eye examination including dilation.

## Ocular Disease Principles III

BSD20723

Instructor of Record: Maureen Hanley, OD

This course provides a comprehensive survey of glaucoma and gonioscopy, 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/surgical treatment will be discussed. Concepts will also be reinforced with interactive workshops. The course will also discuss some of the surgical treatments of retinal disease and also include a unit on neurological fields. A lecture will be given on ocular emergencies.

## Ocular Physiology

BSD10288

Instructor of Record: Ananya Datta, BSOpt, MPhil, PhD

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.

## Ophthalmic Business and Management Policy I

PC32721

## Ophthalmic Business and Management Policy II

PC32722

## Ophthalmic Business and Management Policy III

PC32723

Instructor of Record: Jonathon H. Jimmerson, 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.

## 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/surgical treatment will be discussed. Concepts will also be reinforced with interactive workshops.

## Optics I

VS11001

Instructor of Record: George Asimellis, PhD

VS91001

This course aims to provide the student with education in the basic theory of optics necessary for understanding optometric refraction, ophthalmic corrective lenses, ophthalmic instruments, contact lenses and low-vision devices. In addition, the course will enable the student to understand the optical properties of the eye and the techniques used to assess these properties. The first part of the course (Geometric Optics) covers vergence, refraction and reflection, ray-tracing, the optics of prisms, thin and thick lenses, and mirrors.

The second part of the course (Visual Optics) covers optical models of the eye, refractive errors and optical effects of correcting lenses that are concepts that form the basis of a 'refraction' performed in the clinic. Most of the concepts are critical fundamentals for the clinical examination of optical and visual function and form the basis for ophthalmic optics (Optics II), low vision and contact lens courses later in the curriculum.

Fundamental concepts and equations will be presented, and sample problems will be solved in the lecture sessions. The laboratory sessions support the lecture material with hands-on experiments.

## Optics II

VS11002

Instructor of Record: George Asimellis, PhD

This course emphasizes the application of geometric optics to the properties of ophthalmic lenses, including the imaging properties of spherocylindrical lenses, lens aberrations, base curves, lens thickness,



magnification properties, lens shapes, and prismatic effects of lenses. Specific, image-quality aspects are discussed, including the aperture and field stops, the pupils and ports. The effect on these aspects in depth of field, resolution, blur, and contrast are presented.

Additional material covers principles of ophthalmic optics devices, including the magnification and field of view in telescopes and magnifiers, and effects associated with lens decentration and tilting as they are fitted on spectacle frames.

### 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.

### Optics Prep MS/OD

VS11003

Instructor of Record: George Asimellis, PhD

This course builds the foundation of geometric optics such as prism, lens focal properties, imaging properties of spherocylindrical lenses, thick lenses and cardinal points and establishes the connection with visual optics, such as the optical system of the eye, the optics of ametropia (myopia, hyperopia, astigmatism) and the properties of corrective ophthalmic lenses, including vertex distance, lens aberrations, base curves, lens thickness, magnification properties, lens shapes, and prismatic effects of lenses.

### Patient Care Ia

PC12125

### Patient Care Ib

PC12126

### Patient Care Ib AODP

PC12127

Instructor of Record: Hilary Gaiser, OD, MS

The series of Patient Care I courses serve as the first introduction to patient care as a student clinician. The course consists of pediatric vision screenings and clinical observations. Student clinicians will perform vision screenings, a tailored set of tests performed to determine if an individual should be referred for a complete eye exam, in local schools under the oversight of a preceptor. Students will be evaluated by the preceptor on examination techniques, record keeping and attitude/professionalism. Additionally, students will be required to maintain up to date patient logs, immunization requirements and required forms.

During clinical observations, students will observe optometrists providing clinical care and will complete an assignment on Dr/Pt. communication. Additionally, students will be required to complete an observation attendance form as part of the clinical observation. The observation program places students in different health care settings to critically observe how communication techniques are utilized. Students will also be required to network and book their own self-scheduled observation.

The Advanced Optometric Degree Program (AODP) program follows the same fall curriculum as the regular OD program but then transitions to a hybrid observation and intern program in the spring semester.

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.

<b>Patient Care IIa</b>	PC22125
<b>Patient Care IIb</b>	PC22126
<b>Patient Care II AODP</b>	PC22127

Instructor of Record: Jennifer Reilly, OD, MSc, FAAO

Patient Care II is the primary clinical component of the second-year curriculum. Through assignments to practices in the NECO Clinical Network, 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 diagnostic equipment. As skills are developed during the year, preceptors are encouraged to incorporate those techniques into patient care responsibilities. 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 course requirements and on clinical performance. The course requirements include fulfilling immunizations, CPR training, HIPAA training, and submitting clinical observation forms, log forms, and preceptor evaluations.

<b>Patient Care IIIa</b>	PC32125
<b>Patient Care IIIb</b>	PC32126
<b>Patient Care IIIc</b>	PC32127

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

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.

## 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.

## Pharmacology I

BSD20813

Instructor of Record: Lance McNaughton, OD, PhD

This is the first installment of a two-part course that examines drugs and nutraceuticals used in optometry and medicine for diagnostic, nutritional, and/or therapeutic purposes. Initially, a review of the basic principles of pharmacology and drug development will establish a foundation for the subsequent examination of pharmaceuticals used for a wide range of medical purposes. Prescription writing practices and clinical decision-making are also reviewed. A whole-body approach is adopted to examine drugs used to treat diseases affecting a broad spectrum of organ systems including the nervous, immune, cardiovascular, reproductive, endocrine, hemostatic, genitourinary, metabolic, gastrointestinal, respiratory, and visual systems. Pathologies of these various systems and methods of pharmacological intervention will be covered. Diagnostic and therapeutic indications will also be examined for each drug along with off-label considerations. Mechanisms of action, side effects, drug interactions, and contraindications of pharmaceuticals are also reviewed; in consideration of adverse drug effects, a particular emphasis is placed on those known to affect the eyes or the visual system. Pros and cons of using one drug or another will be discussed to aid the clinical decision-making process.

## Pharmacology II

BSD20814

Instructor of Record: Lance McNaughton, OD, PhD

This is the second and final semester of this course that covers drugs and nutraceuticals used in optometry and medicine for diagnostic, nutritional, and/or therapeutic purposes. Throughout this semester, application of basic principles covered in *Pharmacology I* will be emphasized. Furthermore, a whole-body approach will continue to be followed to examine drugs used to treat diseases affecting a broad spectrum of organ systems including the nervous, immune, cardiovascular, reproductive, endocrine, hemostatic, genitourinary, metabolic, gastrointestinal, and visual systems. Pathologies of these various systems and methods of pharmacological intervention will be covered. Diagnostic and therapeutic indications will also be examined for each drug along with off-label considerations. Mechanisms of action, adverse effects, drug interactions, and contraindications of pharmaceuticals are also reviewed. In consideration of adverse drug effects, a particular emphasis is placed on those known to affect the eyes or the visual system. Pros and cons of using one drug or another will be discussed to aid the clinical decision-

making process. This course concludes with a look at innovations and advancements in the development of emerging drugs and medical devices used for a wide range of health-related purposes.

## Primary Care Rotation

Instructor of Record: Jonathon H. Jimmerson, OD

ECP4916 | ECP4917

ECP4918 | ECP4919

Final-year 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.

## Principles and Practice of Ocular Imaging

Instructor of Record: Robert W. Dunphy, OD

ELC67003

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.

## Principles and Practice of Optometry I

Instructor of Record: Benjamin Young, OD, FAAO

PC12021

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, 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.

## Principles and Practice of Optometry II

PC12022

Instructor of Record: Hilary Gaiser, OD, MS

Principles and Practice of Optometry (PPO) II is the second part of the three-part PPO course series (PPO I, II and III). The course helps lay the foundation for primary care clinical skills and for more advanced clinical courses in the NECO curriculum through lectures and laboratory sessions. Students will also acquire the knowledge, technical skills, professional attitudes and ethics needed to participate in patient care.

## Principles and Practice of Optometry III

PC22023

Instructor of Record: Jennifer Reilly, OD, MSc, FAAO

Principles and Practice of Optometry (PPO) III is the third of three courses (PPO-I, II and III) that prepare second year students to participate in Patient Care II 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.

## Principles of Anterior Segment Disease

BSD10720

Instructor of Record: Maureen Hanley, OD and Bina Patel, OD, FAAO

This course will emphasize anterior segment ocular diseases at an intermediate level of knowledge that will include variations from the normal and common pathological presentations. This course will be complemented with diagnostic laboratory procedures.

## Public Health and Clinical Practice

PC32400

Instructor of Record: Diane Russo, OD, MPH, MBA, 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, cultural competency, medical ethics, and evidence-based medicine will be discussed and analyzed through the use of case discussions, journal articles, and active learning strategies.

## Research Colloquia "Research Lecture Series"

GRS97010 | GRS97011

Instructor of Record: Christopher Taylor P., PhD

GRS97012 | GRS97013

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.

## Special Populations Experience Course: Advanced Contact Lenses

ELC63012

<b>Special Populations Experience Course: Individuals with Disabilities</b>	ELC63013
<b>Special Populations Experience Course: Low Vision</b>	ELC63011
<b>Special Populations Experience Course: Pediatrics</b>	ELC63010
<b>Special Populations Experience Course: Vision Therapy</b>	ELC63014

Instructor of Record: Alexis G. 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. The application evaluates interest, academic standing, and potential extra-curricular scheduling conflicts (e.g. VOSH, etc.).

### **Special Topics: Ocular Disease and Advanced Clinical Care** BSD30710

Instructor of Record: Daniel Bastian, 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.)

### **Specialty Care Rotation** ACC4961 | ACC4962

Instructor of Record: Jonathon H. Jimmerson, OD ACC4963 | ACC4964

Final-year 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.

### **Strabismus and Amblyopia** SAC33483

Instructor of Record: Sarah Williams, OD, FAAO

This course 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 seminar component, setting the stage for discussion and hands-on experience with relevant diagnostic and treatment procedures.

## Systems Physiology

BSD10286

Instructor of Record: Steven B. 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 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.

## Thesis Preparation I

GRS97050

Instructor of Record: Athanasios Panorgias, MSc, PhD

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 of Record: Athanasios Panorgias, MSc, 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 of Record: Athanasios Panorgias, MSc, 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 of Record: Athanasios Panorgias, MSc, 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.

## 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.



# COLLEGE POLICIES AND INFORMATION

## Academic Policies and Procedures

For information regarding academic policies and procedures, please consult the Student Handbook found on the NECO website at <https://www.neco.edu/consumer-information/>.

## Academic Calendar

The Office of Academic Affairs is responsible for annually coordinating and publishing the academic year calendar. The calendar can be found at [www.neco.edu/academics/current-calendar](http://www.neco.edu/academics/current-calendar). All students are responsible for familiarizing themselves with important academic dates. It is important for students to check the academic calendar periodically as some dates may change. Final year students taking clinical rotations follow the calendar at their clinical site.

## Accreditation

The New England College of Optometry is accredited by the Accreditation Council on Optometric Education (ACOE) of the American Optometric Association and by the Commission on Institutions of Higher Education (CIHE) of the New England Commission of Higher Education (NECHE). 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.

For further information: <https://www.neco.edu/consumer-information/accreditation/>

## Consumer Information

For more information on accreditation, policies, and procedures, please visit the Consumer Information page on the NECO website at <https://www.neco.edu/consumer-information/>.

## Notice Regarding College Catalog

New England College of Optometry (NECO) makes every effort to be certain that the catalog is substantively true and correct in content and policy as of the date of publication. It should not, however, be construed as the basis of an offer or contract between NECO and any present or prospective student. While to NECO's knowledge, the catalog contains no erroneous, deceptive, or misleading statements or omissions, NECO retains the right to amend, add or delete any information in the catalog, including any course of study, program or regulation, subsequent to publication thereof. Changes are made on a periodic basis utilizing NECO's website or printed material.