Vision Science

Vision is one of the most valuable sensory modalities. It is also the source of a rich array of research questions relating to how we see, how and why vision fails, and what can be done about it. Investigators in Vision Science conduct human and animal research and modeling, yielding cutting-edge discoveries and applications in disciplines that include molecular genetics, clinical care, adaptive optics, neurobiology, cell biology, infectious disease, bioengineering, perception, and public health.

This Ph.D. program (http://vision.berkeley.edu/) emphasizes the interdisciplinary nature of vision science research through broad exposure to the basic concepts and techniques used in specialized fields. Engaged in laboratory-based and clinical research, our students (http://vision.berkeley.edu/?page_id=37) work with faculty (http://vision.berkeley.edu/?cat=2) advisers whose research matches their interests. Current research topics include biomedical optics, perception and visual cognition, molecular and cell biology, neuroscience, computational vision, genetics, immunology, microbiology, and clinical science.

To complete our Ph.D. program, students must complete a minimum of 120 units. These units can be earned by taking VISCI 260A, VISCI 260B, VISCI 260C, VISCI 260D, VISCI 298, VISCI 201A, VISCI 201B, and VISCI 300. Students in our program are also allowed to take course across campus as it fits into their research and progress towards their thesis.

Vision Science alumni (http://vision.berkeley.edu/?page_id=2019) are represented on the faculty of world-class universities — in medical schools, schools of optometry, and a wide range of other disciplines spanning psychology, physiology, bioengineering, and ophthalmology. Many others hold research positions in private institutes and federally sponsored agencies, including NASA and the NIH. Still, others can be found in the research and development divisions of the industry. Ophthalmic and biotechnology companies are among the major recruiters of our graduates.

Due to the program's interdisciplinary nature, we accept students with various backgrounds, including psychology, optometry, engineering, computer science, physics, chemistry, biophysics, neuroscience, mathematics, molecular and cell biology, and integrative biology.

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Admission to the University
Applying for Graduate Admission

Thank you for considering UC Berkeley for graduate study! UC Berkeley offers more than 120 graduate programs representing the breadth and depth of interdisciplinary scholarship. A complete list of graduate academic departments, degrees offered, and application deadlines can be found on the Graduate Division website (http://grad.berkeley.edu/programs/list/).

Prospective students must submit an online application to be considered for admission, in addition to any supplemental materials specific to the program for which they are applying. The online application can be found on the Graduate Division website (http://grad.berkeley.edu/admissions/).

Admission Requirements

The minimum graduate admission requirements are:

1. A bachelor's degree or recognized equivalent from an accredited institution;
2. A satisfactory scholastic average, usually a minimum grade-point average (GPA) of 3.0 (B) on a 4.0 scale; and
3. Enough undergraduate training to do graduate work in your chosen field.

For a list of requirements to complete your graduate application, please see the Graduate Division's Admissions Requirements page (https://grad.berkeley.edu/admissions/steps-to-apply/requirements/). It is also important to check with the program or department of interest, as they may have additional requirements specific to their program of study and degree. Department contact information can be found here (http://guide.berkeley.edu/graduate/degree-programs/).

Where to apply?

Visit the Berkeley Graduate Division application page (http://grad.berkeley.edu/admissions/apply/).

Coursework

As a Ph.D. student, you are eligible to take any course on campus during the academic year. This is a great perk and should be taken advantage of, but please be aware that your tuition and fees do not extend into the summer, so any summer courses will be paid out of pocket.

Core Curriculum

The Core Curriculum comprises a series of four courses split between the Fall and Spring semester of your first year. The series is intended to provide a general overview of the main topic areas in Vision Science for students of widely varying backgrounds. The Core Curriculum requirement must be fulfilled by the end of their first year. Each course must be passed with a B or better. Failure to achieve a B or better will require the course to be retaken the following year for a letter grade.

VIS SCI 201A: SURVEY OF LABORATORIES

The goal of this course is to introduce first-year students to the faculty and labs in the Vision Science program. During the first year of the graduate program, students are presented with an overview of the various research opportunities represented in the Vision Science group. Weekly one-hour lectures and/or lab tours are presented by the Vision Science faculty.

VIS SCI 201B: sTUDENT eVENING RESEARCH SEMINAR (sers)

The goal of the Student Evening Research Seminar (SERS) is to provide a forum for VS graduate students to discuss and develop strategies for giving effective presentations and to have an opportunity to practice giving scientific presentations in an informal setting. SERS is a required course for all first-year and second-year students although all graduate students, faculty, and postdocs are welcome and encouraged to attend.
**VIS SCI 206A: OPTICAL AND NEURAL LIMITS TO VISION**
This course will provide an overview of the early stage limits to human vision, from the eye’s optics to sampling and processing in the retina. Students will learn basic optical properties of the eye as well as objective and subjective techniques on how to measure the limits of human vision. The class will comprise a combination of lectures and active learning by the students in the form of a project, to be presented at the end of the semester.

**VIS SCI 206B: INTRODUCTION TO OCULAR BIOLOGY**
This course will provide an overview of eye development, anterior eye ocular anatomy and physiology, and ocular disease. The course will be a combination of didactic lectures and problem-based learning.

**VIS SCI 206C: INTRODUCTION TO VISUAL NEUROSCIENCE**
This course will provide an overview of the neuroscience of vision, spanning the entire neural pathway from retinal neurobiology to cortical processing of visual signals. The class will comprise a combination of lectures and active learning by the students in the form of a project, to be presented at the end of the semester.

**VIS SCI 206D: SEEING IN TIME, SPACE, AND COLOR**
This course will provide an overview of how we see in time (temporal signal processing, eye motion, motion detection), space (stereo vision, depth perception), and color as well as the anatomical and physiological factors that facilitate these capabilities. The course will be a series of didactic lectures.

**VIS SCI 230: ETHICS**
In preparation for participation in research, each student is required to take the Ethics in Scientific Research course for a letter grade within the first 2 years of enrollment. Training in the responsible conduct of research is required for all students. This course examines a range of ethical issues that arise in the process of doing science.

**VIS SCI 298: OXYOPIA SEMINAR**
Oxyopia seminars are presented to the Vision Science and campus community on a weekly basis during the academic year. These seminars are given by local and visiting researchers and are an excellent way for students to become more familiar with the most recent developments in vision research. All graduate students, faculty, and postdocs are welcomed and encouraged to attend. All first-year and second-year students must take Oxyopia for a letter grade. Starting in their 3rd year, all VS students are required to make an annual presentation on a current research project at the Oxyopia lecture series.

**VIS SCI 300: TEACHING METHODS**
As Graduate Student Instructors in the School of Optometry, all first-year students are required to enroll in a teaching methods course. This course provides instruction in teaching methods and materials and opportunities to practice teaching in classrooms and laboratories.

**Additional Coursework**
The following represent fields of study that may be beneficial for student success but are not required courses.

**Statistics**
Strongly recommended for most areas of Vision Science. Meet with your Graduate Advisor to discuss your statistics background and appropriate courses for your intended area of research.

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**Vision Science**
Expand all course descriptions [+]Collapse all course descriptions [-]

**VIS SCI 201A Seminar in Vision Science 2**
Terms offered: Fall 2023, Fall 2021, Fall 2020
Graduate seminar in vision science.
Seminar in Vision Science: Read More [+]
VIS SCI 201B Seminar in Vision Science 2 Units
Terms offered: Spring 2023, Spring 2022, Spring 2021
Graduate seminar in vision science.
Seminar in Vision Science: Read More [+]
Rules & Requirements
Prerequisites: Consent of instructor
Repeat rules: Course may be repeated for credit without restriction.
Hours & Format
Fall and/or spring: 15 weeks - 2 hours of seminar per week
Additional Details
Subject/Course Level: Vision Science/Graduate
Grading: Offered for satisfactory/unsatisfactory grade only.
Instructor: Gronert
Seminar in Vision Science: Read Less [-]

VIS SCI 203A Geometric Optics 4 Units
Terms offered: Fall 2016, Fall 2015, Fall 2014
Geometrical methods applied to the optics of lenses, mirrors, and prisms.
Thin lens eye models, magnification, astigmatism, prism properties of lenses, thick lenses.
Geometric Optics: Read More [+]
Hours & Format
Fall and/or spring: 15 weeks - 3 hours of lecture, 1 hour of discussion, and 2 hours of laboratory per week
Additional Details
Subject/Course Level: Vision Science/Graduate
Grading: Letter grade.
Formerly known as: 101
Geometric Optics: Read Less [-]

VIS SCI 203B Optical System and Physical Optics 4 Units
Terms offered: Spring 2016, Spring 2015, Spring 2014
Principles of optical systems, principles and clinical applications of apertures and stops, aberrations and optical instruments. Optics of the eye. Selected topics in physical optics, diffraction, interference, polarization.
Optical System and Physical Optics: Read More [+]
Rules & Requirements
Prerequisites: 203A
Hours & Format
Fall and/or spring: 15 weeks - 3 hours of lecture, 1 hour of discussion, and 2 hours of laboratory per week
Additional Details
Subject/Course Level: Vision Science/Graduate
Grading: Letter grade.
Formerly known as: 102
Optical System and Physical Optics: Read Less [-]

VIS SCI 205 Visual Perception Sensitivity 4.5 Units
Terms offered: Fall 2016, Fall 2015, Fall 2014
Psychophysical basis for clinical tests in acuity, perimetry, and color vision. The visual stimulus and photometry. Visual receptors.
Visual Perception Sensitivity: Read More [+]
Hours & Format
Fall and/or spring: 15 weeks - 3.5 hours of lecture and 2 hours of laboratory per week
Additional Details
Subject/Course Level: Vision Science/Graduate
Grading: Letter grade.
Formerly known as: 104
Visual Perception Sensitivity: Read Less [-]
VIS SCI 206A Anatomy and Physiology of the Eye 2 Units
Terms offered: Fall 2015, Fall 2014, Fall 2013
This course focuses on the anatomy and physiology of the eyeball. Overview of the gross anatomy of the eye followed by eye-relevant cellular and molecular biology. Cellular and molecular details of structure and function of each of the various non-neural components. Anatomy and Physiology of the Eye: Read More [+]

Hours & Format
Fall and/or spring: 7.5 weeks - 4 hours of lecture per week

Additional Details
Subject/Course Level: Vision Science/Graduate
Grading: Letter grade.
Instructors: Gong, Fleiszig

Anatomy and Physiology of the Eye: Read Less [-]

VIS SCI 206B Anatomy and Physiology of the Eye and Visual System 3 Units
Terms offered: Spring 2021, Spring 2020, Spring 2019
Structure and function of the tissues of the eye, ocular appendages, and the central visual pathways. Basic concepts of physiological, neurological, embryological, and immunological processes as they relate to the eye and vision. Foster an appreciation of the pathophysiology of various disease processes. Convey the importance of anatomy and physiology in the medical approach to ocular disease processes. Anatomy and Physiology of the Eye and Visual System: Read More [+]

Rules & Requirements
Prerequisites: ViS Sci 206A
Repeat rules: Course may be repeated for credit without restriction.

Hours & Format
Fall and/or spring: 15 weeks - 2.5 hours of lecture and 0.5 hours of laboratory per week

Additional Details
Subject/Course Level: Vision Science/Graduate
Grading: Letter grade.

Anatomy and Physiology of the Eye and Visual System: Read Less [-]

VIS SCI 206C Anatomy and Physiology of the Eye and Visual System 2 Units
Terms offered: Spring 2021, Spring 2020, Spring 2019
Problem-based learning approach using clinical case examples. Continuation of 206A-206B. Anatomy and Physiology of the Eye and Visual System: Read More [+]

Rules & Requirements
Prerequisites: 206A-206B
Repeat rules: Course may be repeated for credit without restriction.

Hours & Format
Fall and/or spring: 7.5 weeks - 4 hours of seminar per week

Additional Details
Subject/Course Level: Vision Science/Graduate
Grading: Letter grade.
Formerly known as: 106C

Anatomy and Physiology of the Eye and Visual System: Read Less [-]

VIS SCI 206D Neuroanatomy and Neurophysiology of the Eye and Visual System 2 Units
Terms offered: Fall 2015, Fall 2014, Fall 2013
Structure and function of the neurosensory retina, photoreceptors, RPE including blood supply. Current concepts of etiology and management of major retinal conditions. Overview of diagnostic techniques in retinal imaging, electrophysiologic testing and new genetic approaches. Structure and function of the early visual pathway including retinal ganglion cells, optic nerves, lateral geniculate nucleus and visual cortex. Pupillary responses. Specialization in the visual cortex. Neuroanatomy and Neurophysiology of the Eye and Visual System: Read More [+]

Rules & Requirements
Prerequisites: 206A (must be taken concurrently)

Hours & Format
Fall and/or spring: 7.5 weeks - 4 hours of lecture per week

Additional Details
Subject/Course Level: Vision Science/Graduate
Grading: Letter grade.
Instructors: Flannery, Freeman
Formerly known as: half of 206A

Neuroanatomy and Neurophysiology of the Eye and Visual System: Read Less [-]
VIS SCI 215 Visual System Development 2 Units
Terms offered: Fall 2015, Fall 2014, Fall 2013
Visual System Development: Read More [+]
Rules & Requirements
Prerequisites: 206B

Hours & Format
Fall and/or spring: 15 weeks - 2 hours of lecture per week

Additional Details
Subject/Course Level: Vision Science/Graduate
Grading: Letter grade.
Formerly known as: 115

VIS SCI 217 Oculomotor Functions and Neurology 2 Units
Terms offered: Spring 2016, Spring 2015, Spring 2014
Neuro-anatomical pathways for the control of eye position and movement; gaze holding, image stabilization and tracking eye movement systems; oculomotor signs of disorders of the central nervous system (palsies, nystagmus, ophthalmoplegia, cog-wheel pursuits, saccadic dysmetria); the near visual-motor response and the synergistic coupling of accommodation and convergence; binocular misalignment (heterophoria and fixation disparity); and presbyopia.
Oculomotor Functions and Neurology: Read More [+]
Rules & Requirements
Prerequisites: 203B or consent of instructor

Hours & Format
Fall and/or spring: 15 weeks - 1.5 hours of lecture and 10 hours of laboratory per week

Additional Details
Subject/Course Level: Vision Science/Graduate
Grading: Letter grade.
Formerly known as: 117

VIS SCI 219 Binocular Vision and Space Perception 2 Units
Terms offered: Spring 2016, Spring 2015, Spring 2014
Perception of space, direction, and distance. Binocular retinal correspondence, horopters, differential magnification effects and anomalies of binocular vision development. Sensory vision, local stereopsis, static and dynamic stereopsis, binocular depth cues.
Binocular Vision and Space Perception: Read More [+]
Rules & Requirements
Prerequisites: 203A-203B

Hours & Format
Fall and/or spring: 15 weeks - 1.5 hours of lecture and 10 hours of laboratory per week

Additional Details
Subject/Course Level: Vision Science/Graduate
Grading: Letter grade.
Formerly known as: 118

VIS SCI 230 Ethics in Scientific Research 2 Units
Terms offered: Spring 2023, Spring 2022, Spring 2021
This seminar will examine a range of ethical issues that arise in the process of doing science. Beginning with the philosophical and social foundations, we will consider the pathogenesis of fraud, statistics and deception, the ethics of authorship and publication, research with human subjects, the use of animals, the definition(s) of misconduct and the difference between misconduct and questionable research practices, the relationship between industry and science, and finally, the responsibilities and obligations of the scientist in society.
Ethics in Scientific Research: Read More [+]
Hours & Format
Fall and/or spring: 15 weeks - 30 hours of seminar per week

Additional Details
Subject/Course Level: Vision Science/Graduate
Grading: Letter grade.
Ethics in Scientific Research: Read Less [-]
VIS SCI 260A Optical and Neural Limits to Vision 3 Units
Terms offered: Fall 2023, Fall 2022, Fall 2021
The course will provide an overview of the early stage limits to human vision, from the eye’s optics to sampling and processing in the retina. Students will learn basic optical properties of the eye as well as objective and subjective techniques on how to measure limits of human vision. The class will comprise a combination of lectures and active learning by the students in the form of a project, to be presented at the end of the semester. This is one of the four courses that form the Vision Science core curriculum.

Rules & Requirements
Repeat rules: Course may be repeated for credit with instructor consent.

Hours & Format
Fall and/or spring: 15 weeks - 2 hours of lecture and 1 hour of discussion per week

Additional Details
Subject/Course Level: Vision Science/Graduate
Grading: Letter grade.
Instructor: Austin Roorda

Optical and Neural Limits to Vision: Read Less [-]

VIS SCI 260B Introduction to Ocular Biology 3 Units
Terms offered: Fall 2023, Fall 2020, Fall 2019
The course will provide an overview of eye development, anterior eye ocular anatomy and physiology and ocular disease. The course will be a combination of didactic lectures and problem-based learning. This is one of the four courses that form the Vision Science core curriculum.

Rules & Requirements
Repeat rules: Course may be repeated for credit with instructor consent.

Hours & Format
Fall and/or spring: 15 weeks - 2 hours of lecture and 1 hour of discussion per week

Additional Details
Subject/Course Level: Vision Science/Graduate
Grading: Letter grade.
Instructor: Suzanne Fleiszig

Introduction to Ocular Biology: Read Less [-]

VIS SCI 260C Introduction to Visual Neuroscience 3 Units
Terms offered: Spring 2023, Spring 2022, Spring 2021
The course will provide an overview of the neuroscience of vision, spanning the entire neural pathway from retinal neurobiology to cortical processing of visual signals. The class will comprise a combination of lectures and active learning by the students in the form of a project, to be presented at the end of the semester. This is one of the four courses that form the Vision Science core curriculum.

Rules & Requirements
Repeat rules: Course may be repeated for credit with instructor consent.

Hours & Format
Fall and/or spring: 15 weeks - 2 hours of lecture and 1 hour of discussion per week

Additional Details
Subject/Course Level: Vision Science/Graduate
Grading: Letter grade.
Instructor: Michael Silver

Introduction to Visual Neuroscience: Read Less [-]

VIS SCI 260D Seeing in Time, Space and Color 3 Units
Terms offered: Spring 2023, Spring 2022, Spring 2021
The course will provide an overview of how we see in time (temporal signal processing, eye motion, motion detection), space (stereo vision, depth perception), and color as well as the anatomical and physiological factors that facilitate these capabilities. The course will be series of didactic lectures. This is one of the four courses that form the Vision Science core curriculum.

Rules & Requirements
Repeat rules: Course may be repeated for credit with instructor consent.

Hours & Format
Fall and/or spring: 15 weeks - 2 hours of lecture and 1 hour of discussion per week

Additional Details
Subject/Course Level: Vision Science/Graduate
Grading: Letter grade.
Instructor: Martin Banks

Seeing in Time, Space and Color: Read Less [-]
VIS SCI 262 Visual Cognitive Neuroscience 3 Units
Terms offered: Fall 2021, Fall 2018, Spring 2016
The course will provide an overview of visual cognitive neuroscience, drawing from neuroanatomy, neurophysiology in humans and animal models, psychophysics, neuroimaging, neuropharmacology, neuropsychology, and computational models of vision and cognition. Topics will include basic anatomy and physiology of the mammalian visual system, motion perception and processing, depth perception and representation of visual space, brightness and color, object and face recognition, visual attention, developmental and adult plasticity, perceptual learning, multisensory integration, and visual awareness.

VIS SCI C265 Neural Computation 3 Units
Terms offered: Prior to 2007
This course provides an introduction to the theory of neural computation. The goal is to familiarize students with the major theoretical frameworks and models used in neuroscience and psychology, and to provide hands-on experience in using these models. Topics include neural network models, supervised and unsupervised learning rules, associative memory models, probabilistic/graphical models, and models of neural coding in the brain.

VIS SCI C265 Neural Computation 3 Units
Terms offered: Spring 2023, Spring 2022, Spring 2021

VIS SCI 280 Computer Vision 3 Units
Terms offered: Spring 2023, Spring 2022, Spring 2021
VIS SCI 298 Group Studies, Seminars, or
Group Research 1 - 6 Units
Terms offered: Fall 2023, Spring 2023, Fall 2022
Group studies of selected topics. Advanced studies in various subjects
through special seminars on topics to be selected each year, informal
groups studying special problems, group participation in experimental
problems and analysis.
Group Studies, Seminars, or Group Research: Read More [+]
Rules & Requirements
Repeat rules: Course may be repeated for credit without restriction.

Hours & Format
Fall and/or spring: 15 weeks - 2-6 hours of lecture per week
Additional Details
Subject/Course Level: Vision Science/Graduate
Grading: Letter grade.
Group Studies, Seminars, or Group Research: Read Less [-]

VIS SCI 299 Research in Vision Science 1 - 12 Units
Terms offered: Fall 2023, Summer 2023 Second 6 Week Session, Spring
2023
Research.
Research in Vision Science: Read More [+]
Rules & Requirements
Prerequisites: Consent of instructor

Hours & Format
Fall and/or spring: 15 weeks - 0 hours of independent study per week
Summer:
6 weeks - 1-16 hours of independent study per week
8 weeks - 1-12 hours of independent study per week
Additional Details
Subject/Course Level: Vision Science/Graduate
Grading: Letter grade.
Research in Vision Science: Read Less [-]

VIS SCI 300 Teaching Methods in Vision
Science 1 Unit
Terms offered: Spring 2023, Fall 2022, Fall 2021
Instruction in teaching methods and materials, in vision science and
optometry; practice teaching in classrooms and laboratory.
Teaching Methods in Vision Science: Read More [+]
Rules & Requirements
Prerequisites: Graduate standing in vision science
Repeat rules: Course may be repeated for credit without restriction.

Hours & Format
Fall and/or spring: 15 weeks - 1 hour of lecture per week
Additional Details
Subject/Course Level: Vision Science/Professional course for teachers
or prospective teachers
Grading: Offered for satisfactory/unsatisfactory grade only.
Instructor: Silver
Teaching Methods in Vision Science: Read Less [-]

VIS SCI 375A Teaching Methods in Vision
Science, I 1 Unit
Terms offered: Fall 2023
Instruction in teaching methods and materials in vision science and
optometry; practice teaching in classroom and laboratory. Lectures,
discussion and outside work related to learning effective teaching
styles, developing optimal teaching environments, accessing teaching
resources, and fostering professional development.
Teaching Methods in Vision Science, I: Read More [+]
Rules & Requirements
Prerequisites: This course is restricted to student in the Vision Science
graduate program
Repeat rules: Course may be repeated for credit without restriction.

Hours & Format
Fall and/or spring: 15 weeks - 1 hour of lecture and 1 hour of discussion
per week
Additional Details
Subject/Course Level: Vision Science/Professional course for teachers
or prospective teachers
Grading: Offered for satisfactory/unsatisfactory grade only.
Teaching Methods in Vision Science, I: Read Less [-]
VIS SCI 375B Teaching Methods in Vision Science, II 1 Unit
Terms offered: Not yet offered
Instruction in teaching methods and materials in vision science and optometry; practice and reflect on teaching in the classroom and laboratory. Lectures, discussion and outside work related to teaching methods and assessment of student learning, including lecture-based, problem-based, active, and inquiry-based learning. Instruction on student engagement and effective communication.
Teaching Methods in Vision Science, II: Read More [+]  
Rules & Requirements
Prerequisites: This course is restricted to students in the Vision Science graduate program
Repeat rules: Course may be repeated for credit without restriction.
Hours & Format
Fall and/or spring: 15 weeks - 1 hour of lecture and 1 hour of discussion per week
Additional Details
Subject/Course Level: Vision Science/Professional course for teachers or prospective teachers
Grading: Offered for satisfactory/unsatisfactory grade only.
Teaching Methods in Vision Science, II: Read Less [-]

VIS SCI 601 Individual Study for Master's Students 1 - 6 Units
Terms offered: Spring 2021, Spring 2020, Spring 2019
Individual study for the comprehensive requirements in consultation with the adviser in vision science.
Individual Study for Master's Students: Read More [+]  
Rules & Requirements
Prerequisites: Consent of instructor
Credit Restrictions: Course does not satisfy unit or residence requirements for master's degree.
Hours & Format
Fall and/or spring: 15 weeks - 0 hours of independent study per week
Additional Details
Subject/Course Level: Vision Science/Graduate examination preparation
Grading: Offered for satisfactory/unsatisfactory grade only.
Individual Study for Master's Students: Read Less [-]

VIS SCI 602 Individual Study for Doctoral Students 1 - 6 Units
Terms offered: Fall 2023, Fall 2022, Fall 2021
Individual study in consultation with the adviser in vision science, intended to provide an opportunity for qualified students to prepare themselves for the various examinations required for the Ph. D.
Individual Study for Doctoral Students: Read More [+]  
Rules & Requirements
Prerequisites: Consent of instructor
Credit Restrictions: Course does not satisfy unit or residence requirements.
Hours & Format
Fall and/or spring: 15 weeks - 0 hours of independent study per week
Additional Details
Subject/Course Level: Vision Science/Graduate examination preparation
Grading: Offered for satisfactory/unsatisfactory grade only.
Individual Study for Doctoral Students: Read Less [-]