

# Master of Science in Vision Science and Investigative Ophthalmology

# MVSIO



**U** Bascom Palmer  
Eye Institute  
UNIVERSITY OF MIAMI HEALTH SYSTEM

# Become a World-Class Leader in Vision Science and Ophthalmology

Bascom Palmer Eye Institute  
presents the Master of Science  
Degree in Vision Science and  
Investigative Ophthalmology



## Global Leadership in Eye Care, Vision Research and Ophthalmology Education

Bascom Palmer Eye Institute is pleased to introduce you to a unique graduate degree, the **Master of Science in Vision Science and Investigative Ophthalmology** (MVSIO).

This innovative program, established in 2016, was the first of its kind in the world. It offers comprehensive training in ophthalmic translational research, problem-based learning, management and a skill set available only at Bascom Palmer Eye Institute.



For six decades, many of the most important innovations that have revolutionized global ophthalmology have come from Bascom Palmer Eye Institute. Bascom Palmer is recognized as one of ophthalmology's foremost resources providing advanced patient care, vision research and education. As the Department of Ophthalmology at the University of Miami Leonard M. Miller School of Medicine, it is committed to the protection and preservation of the treasured gift of sight.

“ MVSIO uses problem-based learning to create a fusion of clinical ophthalmology and basic science; this truly unique program also incorporates the entrepreneurship roundtable. The program has built-in networking with leaders in both academia and industry. I highly recommend the MVSIO program to students considering going on to medical school or pursuing an ophthalmology residency.”

– Erika M. Ellis

*Student, M.S. in Vision Science and  
Investigative Ophthalmology*



## A Unique Master of Science Program

The MVSIO program focuses on science and laboratory research, including the disciplines of electrophysiology, biochemistry and molecular biology, as well as exposure to ocular clinical details and ocular pathology. It will prepare students with furtherance of their careers in vision science and investigative ophthalmology.

In addition, the multidisciplinary program builds management, administrative and entrepreneurial skills for professionals desiring a vision science-oriented career in medical practice, startup companies, management of non-profit organizations, academic practices, government regulatory agencies, and medical device and pharmaceutical companies.

Led by Bascom Palmer Eye Institute's world-class faculty and supported by leading-edge technology, the MVSIO program opens the door to new career opportunities for medical school graduates, clinicians and other professionals.

**BASCOM PALMER EYE INSTITUTE has earned international recognition as an outstanding teaching, research and patient care facility, and its training programs are among the best in the world.**

## Vibrant and Diverse Students

By training graduate students in research, research management skills and enterprise management, the goal of the MVSIO degree is to educate the next generation of leaders in vision science, including:

- Medical school graduates interested in joining an ophthalmology residency program
- Clinician and non-clinician graduates with medical degrees from foreign countries
- Science graduates who want to extend their intellectual horizons
- College graduates who intend to improve their medical education prior to entering medical school
- Professionals in industry, academic research settings, regulatory bodies and philanthropic organizations
- Prospective entrepreneurs in the growing field of vision care

“ Since the program began in 2016, each MVSIO graduate has achieved success in their desired career goal.”

– Sanjoy Bhattacharya, M.Tech, Ph.D., MVSIO Director



## Program Overview

Bascom Palmer Eye Institute's MVSIO program offers extensive training in vision research, management and related topics.

**Program goal:** To train graduate students in vision research and research management skills, and educate the next generation of leaders in vision science.

**Start date:** August

**Duration of program:** 2 years

**Enrollment:** Up to 10 students per year

**Multidisciplinary approach:** Courses are taught by faculty members from the University of Miami, including the Miller School of Medicine, School of Business Administration, and College of Arts and Sciences.

**Core science disciplines:** Electrophysiology, biochemistry, molecular biology, ocular clinical details, ocular anatomy and pathology.

**Related disciplines:** Research management, administrative skills, grant writing for funding applications and business plan formulation.

**Types of classes:** The degree includes 8 courses, 3 laboratory modules, 3 problem-based learning (PBL) activities, 1 elective and a thesis.

**Degree requirements:** 30 credits

**Tuition:** Tuition rates are subject to change annually according to the University of Miami, Board of Trustees. For current rates, please contact the MVSIO office.

**Location:** Courses will take place in the MVSIO education center and laboratories located in the Evelyn F. and William L. McKnight Vision Research Center located adjacent to the Bascom Palmer Eye Institute on the University of Miami Miller School of Medicine campus in Miami, Florida.

## Program Prerequisites

The Ophthalmology Program Committee (OPC) will oversee the application process to ensure the selection of exceptional students.

### BACKGROUND COURSES AND ACADEMIC EXCELLENCE

Candidates should have some education in biology, biochemical or biological sciences. Having taken courses in anatomy and physiology will be advantageous.

Candidates with medical degrees (M.D.) from U.S. or foreign institutions will be eligible for admission. A candidate who has a bachelor's degree in experimental sciences encompassing any area of biological or biochemical sciences will also be eligible for admission provided they have the equivalent of a 3.5 or higher grade point average.

Students with a cumulative grade point average of 3.5 and above (or U.S. equivalent) in their undergraduate degree will be eligible for admission provided they have relevant work experience. For medical degree students, a Step 1 United States Medical Licensing Examination (USMLE) score greater than 245 will be preferred.

### ENGLISH PROFICIENCY

Applicants considered for admission must demonstrate proficiency in the English language. This will be assessed using the Test of English as a Foreign Language (TOEFL), the International English Language Testing System (IELTS) or through written and oral communication.



## About the Curriculum

The curriculum for the MVSIO degree has been designed to facilitate graduate student learning through several related components.

### CORE COURSES

Students will gain an understanding of the anatomy and physiology of the eye, cellular mechanisms and ophthalmic genetics, vision, optics and molecular ophthalmology.

### LABORATORY COURSES

Laboratory courses will include biochemistry, microbiology and pathology as applicable to ophthalmology.

### PROBLEM-BASED LEARNING

A unique feature of the MVSIO program is the problem-based learning courses. Three PBL modules will be offered in topics such as new approaches in genomics, genetics, lipidomics, regenerative medicine and proteomics. These multidisciplinary PBL modules will be taught primarily by faculty members from Bascom Palmer Eye Institute.

At least one course will describe historic accounts of successes and failures in drug or device discovery. Instructors will include guest lecturers with academic and industry experience as well as clinicians with substantial work in multidisciplinary translational research.

Students will be required to take a course in responsible conduct of research and research ethics. In addition, students will also learn about issues pertaining to animal use in research, including regulatory requirements through a PBL module with faculty from the Departments of Ophthalmology and Veterinary Resources and the Neuroscience Program.

The curriculum includes a PBL module focused on management tools for academic and commercial research, including grant writing, business plans, mergers and acquisitions.

### THESIS

A 7-credit thesis course will be required in the second year. Students will choose a mentor in the first year with whom they will work towards a thesis project (research project) in the second year. They will select a thesis proposal after rotation through the prospective mentor's laboratory.



## Coursework and Credits

OPH610	<b>Anatomy and physiology of the eye</b>	1
OPH615	<b>Pathology of eye diseases</b>	1
OPH620	<b>Ocular Pharmacology, Epidemiology, and Biostatistics</b>	1
OPH625	<b>Microbiology and Immunology of the eye</b>	1
OPH691	<b>Societal relevance to Science, Medicine, and Translational Science</b>	2
OPH630	<b>Ophthalmic Genetics</b>	1
OPH635	<b>Electrophysiology of the eye</b>	1
OPH640	<b>Vision and Optics</b>	2
OPH645	<b>Biochemistry, Cellular and Molecular Ophthalmology</b>	2
OPH661	<b>Basic Biochemistry, Microbiology and Pathology</b>	3
OPH662	<b>Basic and Applied Optics</b>	1
OPH663	<b>Electrophysiology, Clinical Testing, and Applications</b>	1
OPH771	<b>Advanced and high throughput approaches in Science</b>	2
OPH772	<b>Management skills and Tools for Academia and Enterprises</b>	2
OPH773	<b>Animal models, Regulatory issues, and Research methods</b>	2
OPH810	<b>Thesis</b>	7
<b>Total Credits</b>		<b>30</b>

## Selection Criteria

MVSIO candidates will be selected by the Ophthalmology Program Committee, led by Graduate Program Director Sanjoy K. Bhattacharya, M. Tech., Ph.D. The admissions committee is comprised of clinicians and basic sciences faculty members of the Bascom Palmer Eye Institute.



Candidates will be judged on their core competency, prior course work, leadership abilities, accomplishments, professional and personal experience, and academic excellence.

Applicant selection will be based upon past performance, letters of recommendation from former teachers, supporting material and

interviews by faculty and student mentors. Some candidates will be interviewed using web-based programs.

To matriculate from the first year to the second year of the MVSIO program, the student must successfully complete all courses in the first year with a grade B or better.

## Financing Your Degree

Some MVSIO students may receive full or partial tuition reimbursement through their companies or sponsors. Other students may obtain loans to finance their graduate education. Please visit [www.miami.edu/grad](http://www.miami.edu/grad) for more information.

For information on financial aid for U.S. citizens and international students, please visit [www.fafsa.ed.gov](http://www.fafsa.ed.gov), or call the University of Miami's Office of Financial Services at 305-284-5212.

## Application Information

Candidates are invited to apply for the 2018-19 session and must submit the following:

### • TRANSCRIPTS

Candidates are required to hold a baccalaureate degree from an accredited college or university. Official transcripts for all undergraduate coursework, as well as any post-graduate coursework from each college or university attended, must be sent directly to the MVSIO office.

Applicants who received a degree from an international university must also provide a photocopy of the diploma and an official certified English translation of both the transcripts and the diploma, along with an original transcript in a sealed envelope from the attended university. An applicant whose native language is not English may be required to submit a TOEFL or IELTS score with the application. The TOEFL or IELTS requirement can be waived based upon a video interview for people proving their proficiency in English.

### • USMLE SCORE

Medical degree holders should submit a step 1 score of USMLE at the time of application. This may be waived by the admission committee on a case-by-case basis.

### • PERSONAL STATEMENT

A personal statement is required as part of the application.

### • LETTERS OF RECOMMENDATION

Three letters of recommendations are required. These should be from former teachers evaluating a candidate's knowledge of science and/or medicine, analytical skills and other qualities.

### • APPLICATION

The application for admission is submitted electronically through the online application at [www.biomed.med.miami.edu](http://www.biomed.med.miami.edu)



**Eduardo C. Alfonso, M.D.**  
Chair, Bascom Palmer  
Eye Institute



**Felipe A. Medeiros,  
M.D., Ph.D.**  
Vice Chair of Research



**David T. Tse, M.D.**  
Vice Chair of  
Administration and  
Strategic Planning  
Chief Mentor, MVSIO



**Sanjoy K. Bhattacharya,  
M. Tech., Ph.D.**  
Graduate Program  
Director MVSIO

### FOR FURTHER INFORMATION, CONTACT:

**Sanjoy K. Bhattacharya, M. Tech., Ph.D.**  
Graduate Program Director  
*Master of Science in Vision Science  
and Investigative Ophthalmology*  
[sbhattacharya@med.miami.edu](mailto:sbhattacharya@med.miami.edu)

# MVSIO

## Learning at Bascom Palmer

Add research training to your clinical skills

Build credentials for medical school or  
doctoral studies

Broaden your skill set in academic medicine

Develop the perspective of a research manager

Gain a better understanding of  
grant applications and business plans



900 Northwest 17th Street  
Miami, Florida 33136

305-326-6000

[bascompalmer.org](http://bascompalmer.org)

2/2026