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2019

## Graduate Program Catalog 2019-2020

Nova Southeastern University

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# **NSU**

## Florida

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Halmos College of Natural  
Sciences and Oceanography

**NOVA SOUTHEASTERN  
UNIVERSITY**

### **Graduate Program Catalog**

### **2019-2020**

**NSU**

Florida

Halmos College of Natural  
Sciences and Oceanography  
**NOVA SOUTHEASTERN  
UNIVERSITY**

**GRADUATE PROGRAM  
CATALOG  
2019-2020**

The Halmos College of Natural Sciences and Oceanography Graduate Program Catalog is a resource for information about academic program and curriculum requirements, academic policies, procedures for resolving academic and administrative grievances, course descriptions, and other information relevant to the graduate degree programs at NSU's Halmos College of Natural Sciences and Oceanography (HCNSO).

The HCNSO Graduate Program Catalog is published once a year. This catalog is comprised of information for all graduate students at HCNSO. In terms of curricula, students are bound by the curricula published in the catalog in effect the semester they enter Nova Southeastern University (NSU). In terms of various academic and administrative policies, students are bound by those described in the most recently published catalog. If there is an interruption in studies of more than one calendar year from the end of the last semester enrolled, the student must abide by the HCNSO Graduate Catalog in effect upon return, or to requirements approved by the student's department chair.

This catalog provides guidelines and rules to assist the student in fulfilling the academic requirements of the M.S. and Ph.D. degrees. For graduation, students must fulfill the curriculum and course-load requirements of the catalog in effect at their initial registration or that of any later-edition catalog. Updates may be issued at the HCNSO between catalog publications. Copies of the catalog and updates are located on the college website (<https://cnso.nova.edu/academics/course-catalog/>). The failure to read and/or understand this catalog does not excuse students from the rules, policies, and procedures contained in it.

## NSU NONDISCRIMINATION STATEMENT

Consistent with all federal and state laws, rules, regulations, and/or local ordinances (e.g., Title VII, Title VI, Title III, Title II, Rehab Act, ADA, Title IX, and the Florida Civil Rights Act), it is the policy of Nova Southeastern University not to engage in any discrimination or harassment against any individuals because of race, color, religion or creed, sex, pregnancy status, national or ethnic origin, non-disqualifying disability, age, ancestry, marital status, sexual orientation, gender, gender identity, military service, veteran status, or political beliefs or affiliations, and to comply with all federal and state nondiscrimination, equal opportunity, and affirmative action laws, orders, and regulations. Any such acts are unacceptable and strictly prohibited by the university. In addition, the law prohibits retaliation against an individual for opposing any practices forbidden under this policy, for bringing a complaint of discrimination or harassment, for assisting someone with such a complaint, for attempting to stop such discrimination or harassment, or for participating in any manner in any investigation or resolution of a complaint of discrimination or harassment. This nondiscrimination policy applies to admissions; enrollment; scholarships; loan programs; athletics; employment; and access to, participation in, and treatment in all university centers, programs, and activities. NSU admits students of any race, color, religion or creed, sex, pregnancy status, national or ethnic origin, non-disqualifying disability, age, ancestry, marital status, sexual orientation, gender, gender identity, military service, veteran status, or political beliefs or affiliations, to all the rights, privileges, programs, and activities generally accorded or made available to students at NSU, and does not discriminate in the administration of its educational policies, admission policies, scholarship and loan programs, and athletic and other school-administered programs.

## NSU ACCREDITATION

Nova Southeastern University (NSU) is accredited by the Southern Association of Colleges and Schools Commission on Colleges (SACSCOC) to award associate's, baccalaureate, master's, educational specialist, doctoral, and professional degrees.

**FOR QUESTIONS ABOUT THE ACCREDITATION OF NOVA SOUTHEASTERN UNIVERSITY, CONTACT THE COMMISSION ON COLLEGES AT 1866 SOUTHERN LANE, DECATUR, GEORGIA 30033-4097; TELEPHONE: (404) 679-4500.**

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## HALMOS COLLEGE OF NATURAL SCIENCES AND OCEANOGRAPHY OVERVIEW

### MISSION STATEMENT

The Halmos College of Natural Sciences and Oceanography (HCNSO) offers degree and certificate programs in biology, ocean science, marine biology, mathematics, chemistry, physics, and environmental science within Nova Southeastern University (NSU). The mission of the HCNSO is to carry out innovative, basic, and applied research and to provide high quality graduate and undergraduate education in a broad range of disciplines including natural, ocean, environmental, and biological sciences (including pre-medical and pre-health professions), mathematics, chemistry, and physics. The college houses three graduate majors (M.S. and Ph.D.), five undergraduate majors, eight undergraduate minors, and one graduate certificate programs. The college comprises of four departments: Biological Sciences; Chemistry and Physics; Marine and Environmental Sciences; and Mathematics.

### VISION 2020

By 2020, through excellence and innovations in teaching, research, service, and learning, Nova Southeastern University will be recognized by accrediting agencies, the academic community, and the general public as a premier, private, not for-profit university of quality and distinction that engages all students and produces alumni who serve with integrity in their lives, fields of study, and resulting careers.

### NSU CORE VALUES

Academic Excellence  
Student Centered  
Integrity  
Innovation  
Opportunity  
Scholarship/Research  
Diversity  
Community

### UNIVERSITY HISTORY

In 1964, Nova University of Advanced Technology was chartered as a graduate institution specializing in the physical and social sciences. In 1972, Nova introduced its first off-campus course of study, a major in education. Soon, Nova became nationally recognized for its innovative distance learning programs.

The board of trustees changed the university's name to Nova University in 1974. Over time, Nova added programs in law, education, business, psychology, computer science, oceanography, social and systemic studies, and hospitality.

While Nova continued to expand its educational reach, Southeastern University of the Health Sciences also took an expansion course. Southeastern was created by osteopathic physicians committed to establishing a college of osteopathic medicine in the Southeast. As a result, Southeastern College of Osteopathic Medicine opened in 1981. From 1987 to 1997, the institution added Colleges of Pharmacy, Optometry, Allied Health, Medical Sciences, and the College of Dental Medicine, which admitted 88 students in 1997.

The merger of Nova University and Southeastern University of the Health Sciences in 1994 increased available resources and gave students the opportunity for a multi-disciplinary education and a better understanding of how their future professions related to society as a whole.

Today, Nova Southeastern University (NSU) is an accredited, coeducational institution providing educational programs from preschool through the professional and doctoral levels. The institution awards associate, bachelor, master, specialist, and first-professional degrees in a wide range of fields. Those include the arts, business, counseling, conflict resolution, criminal justice, cross-disciplinary studies, engineering, computer and information sciences, education, humanities, medicine (D.O. program), optometry, pharmacy, dental medicine, nursing, various health professions, law, marine sciences, early childhood, psychology, and other social sciences.

The university's educational programs are conducted at the Fort Lauderdale/Davie Campus locations throughout Florida, Puerto Rico, across the nation, and in several countries. NSU is accredited by the Southern Association of Colleges and Schools Commission on Colleges.

NSU is classified as a research university with "high research activity" by the Carnegie Foundation for the Advancement of Teaching. It is one of only 50 universities nationwide also awarded Carnegie's Community Engagement Classification. NSU is the largest private, not-for-profit university in Florida with almost 21,000 students. It is the largest university in the U.S. that meets U.S. Department of Education criteria as a Hispanic serving Institution.

## **CAMPUS FACILITIES**

Nova Southeastern University operates four campuses in the Miami to Fort Lauderdale area—the Fort Lauderdale/Davie Campus, the East Campus in Fort Lauderdale, the North Miami Beach Campus, and the Oceanographic Campus in Hollywood. The university also has campuses in the Florida cities of Miami (Kendall), Jacksonville, Orlando, Tampa, Fort Myers, Miramar, and Palm

Beach, and its newest campus in San Juan, Puerto Rico. The Campus in Fort Lauderdale/Davie is located on a lush 314-acre site 10 miles inland from the Atlantic Ocean and readily accessible via several highways and Florida's Turnpike. The Fort Lauderdale/Davie Campus is the central location for most of NSU's colleges with state-of-the-art classrooms, laboratories, patient simulation facilities, auditoriums, and computer centers. NSU's campus expansion added, new educational facilities, athletic venues, residence halls, and performing arts theatres.

In 2003, the university dedicated the 110,000-square-foot Jim & Jan Moran Family Center Village, a model for early education programs across the country. It also dedicated the Carl DeSantis Building, the 261,000-square-foot home of the H. Wayne Huizenga College of Business and Entrepreneurship, the Huizenga Sales Institute, and the College of Engineering and Computing. NSU's Guy Harvey Oceanographic Center building opened in 2012 as, one of the largest facilities in the U.S. dedicated to research and the conservation of marine life.

Westside Regional Medical Center emergency center opened on NSU's Fort Lauderdale/Davie Campus in summer 2015. The NSU Art Museum Fort Lauderdale Boasts a permanent collection of more than 6,000 works, visual arts exhibits, arts curriculum, and educational programs in South Florida.

NSU's Fort Lauderdale/Davie Campus is home to the Rose and Alfred Miniaci Performing Arts Center, and the Alvin Sherman Library Research and information Technology Center, which serves the university and the residents of Broward County in a unique private-public partnership.

NSU's library system, composed of the Alvin Sherman library, Health Professions Division Library, Panza Maurer Law Library, the William S. Richardson Ocean Sciences Library, and four junior K- 12 school libraries contribute to NSU's strong academic research environment.

In 2006, the university opened the Don Taft University Center, a 366,000-square-foot recreation, athletic, and arts complex at the Fort Lauderdale/Davie Campus. The center is home to a multipurpose 4,500-seat arena and, studios, the Flight Deck Pub, a state-of-the-art gym, food court, and a performing and visual arts wing. The wing houses the Department of Performing and Visual Arts at the College of Arts, Humanities, and Social Sciences. It includes the intimate Black Box Theatre, art gallery, performance theatre, and additional rooms supporting theatre, music, art, dance, and other creative activities.

Opened in September 2016, NSU's Center for Collaborative Research (CCR) is one of the largest and most advanced research facilities in Florida. The CCR provides wet and dry labs for NSU's innovative researchers, a General Clinical Research Center, an outpatient facility, a technology incubator offering partnerships with innovative companies, and the NSU Cell Therapy Institute.



The CCR also houses NSU's Institute for Neuro-Immune Medicine; NSU's Rumbaugh-Goodwin Institute for Cancer Research; the Emil Buehler Research Center for Engineering, Science and Mathematics; the U.S. Geological Survey (USGS), which partners with NSU on collaborative research. The Noel P. Brown Sports Center has a state-of-the-art fitness center, two full-sized basketball courts, a volleyball court, and areas for physical fitness activities and programming.

For a full overview of NSU's campuses and facilities, refer to the Fact Book at <https://www.nova.edu/publications/factbook/2018>

## NSU CAMPUS LOCATIONS

### **Fort Lauderdale/Davie Campus**

3301 College Avenue  
Fort Lauderdale, Florida 33314-7796  
Phone: 800-541-NOVA (6682)  
Email: nsuinfo@nova.edu

### **Oceanographic Campus**

8000 North Ocean Drive  
Dania Beach, Florida 33004-3078  
Phone: 800-39-OCEAN  
Email: imcs@nova.edu

### **East Campus**

3100 SW 9th Avenue  
Fort Lauderdale, Florida 33315-3025  
Facilities at the Oceanographic Campus

## HALMOS COLLEGE FACILITIES

Halmos college facilities are divided between two campuses: The Fort Lauderdale/Davie campus and the Oceanographic Campus.

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### FORT LAUDERDALE/DAVIE CAMPUS

Housed primarily in the **Parker Building**, Biological Sciences graduate students work on both this campus and the Oceanographic Campus.

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### OCEANOGRAPHIC CAMPUS

The Oceanographic Campus (OC) is only 12 miles from the Fort Lauderdale/Davie Campus and is nestled at the end of Von D. Mizell and Eula Johnson State Park directly on the entrance

channel of Port Everglades and within one hundred meters hundred feet of the open Atlantic Ocean.

The OC campus includes five buildings:

1. The **Dr. Charles and Hamilton Forman** building, completed in 1970, contain offices as well as classrooms for onsite classes for lecture, computing and GIS, and laboratory teaching. Classrooms are outfitted with large monitors and telecommunication equipment. There is a large warehouse for equipment storage. There are several laboratories including for scanning and transmission electron microscopy, The Forman building contains a recently completed Student Center which comprises a study area and lounge. There is a SGA (Student Government Association) office, as well as offices for potential employers to meet to discuss job placement. NOAA NMFS employees occupy several offices in Forman.
2. The **Mellon building**, constructed shortly after Forman, contains a teaching laboratory and maintenance facilities.
3. The **Alexander and Dorothy Shure building** was completed in 1976 and renovated in 1995. It contains academic program offices, faculty offices, a classroom and teaching lab, as well as research laboratories
4. The most recent building was completed in 2012. It is designated as the **Guy Harvey Oceanographic Center (GHOC)** building. It is environmentally friendly and state of the art with 86,000 square feet of usable space. The building is silver LEED certified. The activities in this research building are multi-disciplinary to address national and international priorities in coral reef research in five thematic areas:
  - Impacts of global and local stressors;
  - geospatial analysis and mapping;
  - deep sea coral reefs and organisms;
  - genetic and genomic connectivity; and
  - hydrodynamics.

The GHOC building includes space for offices, research laboratories, collaboration, research training, and fieldwork staging. Laboratories include for mapping and geospatial analysis, microbiology, genetics and genomics, histology, geology, ecological modeling, deep sea optical and vision, ichthyology, coral reef assessment, monitoring, and restoration, and wet laboratories for seawater usage and organism maintenance. The GHOC building houses a research library for the many disciplines of marine science, an auditorium, seminar rooms, seawater purification and delivery system, and outside experimentation facility. The facilities also include a SCUBA gear storage area and tank fill station for regular air and nitrox.

The biology laboratories in HCNSO contain state of the art equipment facilitating the study of some of the most pertinent questions in biology. Students have the opportunity to work directly with equipment including an Illumina MiSeq DNA sequencer, fully automated microplate readers, qPCR machines, and a host of microscopes including fluorescent, electron, and high-resolution/magnification light. These pieces of major equipment are complemented with well-stocked laboratories that contain supporting equipment including biological hoods, PCR machines, nucleic acid spectrophotometer and fluorometer, -80C freezers, cold rooms, gel electrophoresis and other instruments. Faculty actively collaborate with additional diverse NSU investigators and laboratories, allowing us access to other instruments, including computational clusters, automated nucleic acid extraction platforms, cell sorters and flow cytometers.

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## LIBRARY RESOURCES

The Nova Southeastern University Oceanographic Campus Library is located on the 4<sup>th</sup> Floor of the Guy Harvey Oceanographic Center building at the Halmos College of Natural Sciences and Oceanography (HCNSO) in Dania Beach, FL. This marine, aquatic, and environmental sciences library serves the research needs of NSU faculty, staff, researchers, and students. The library is open 59 hours a week (Monday-Saturday) and provides a myriad of print and online resources, guides, tutorials, collections, and materials. The library also provides technology onsite, including 10 computers with various software (i.e. ArcGIS, Photoshop, statistical software, etc.), a KIC Scanner, a color LaserJet printer, and tablets available for checkout. Within the library, there are numerous study spaces, including tables for groups or projects, study carrels, reading chairs, and a quiet study area.

The Oceanographic Campus Library print collection (including monographs, periodicals, reference, and theses/dissertations) contains over 17,000 volumes. The online collection currently contains over 3,600 e-journal subscriptions to marine/ocean specific titles and provides access to over 148,000 academic ebooks and 500 research databases through the NSU Libraries. Additionally, faculty and student scholarship is available online via NSU's institutional repository, NSUWorks, and the HCNSO collections can be accessed at: <http://nsuworks.nova.edu/cnso/>. This includes digital collections, faculty publications, conferences, student work (such as theses and dissertations), and HCNSO publications and journals.

As a part of the NSU Libraries, Oceanographic Campus patrons may request items to be sent from the Ft. Lauderdale/Davie campus libraries for their use as well as submit requests via the Interlibrary loan (ILL) service that is available for receiving books and/or copies of journal articles from other libraries around the country that are not available from the NSU Libraries. In

In addition to the ILL services, the librarians are members of the International Association of Aquatic and Marine Science Libraries and Information Centers (IAMSLIC), and SAIL, its regional branch, which provides access to additional marine and aquatic library collections and resources from around the world.

Link to Oceanographic Campus Library resources: [nova.campusguides.com/oclibrary/home](http://nova.campusguides.com/oclibrary/home)

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#### FORT LAUDERDALE/DAVIE CAMPUS LIBRARY SERVICES: ALVIN SHERMAN LIBRARY

Located on the Ft. Lauderdale/Davie campus, the 325,000-squarefoot Alvin Sherman Library, Research, and Information Technology Center is a joint-use facility with the Broward County Board of County Commissioners. It serves students and faculty and staff members of NSU, as well as residents of Broward County. The five-story structure contains electronic classrooms, group-study rooms, a cafe, and service desks with staff trained and ready to serve library users. Collections of library resources support the research of students and faculty and staff members. A large, spacious atrium houses educational art pieces. The reference desk is located on the second floor, clearly visible to students. It is enhanced by the NSU Glass Garden, created by glass artist Dale Chihuly for the Sherman Library.

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#### TECHNOLOGY FACILITIES

The university maintains an extensive information technology network for teaching and learning, research, and administrative computing. Comprehensive fiber-optic and wireless networks provide high-speed Internet access to all campus sites. The NSU wireless network provides students with mobile and wireless network connectivity. The wireless network covers the university's campuses throughout Florida and Puerto Rico.

NSU is an equity member of the Florida LambdaRail (FLR), a not-for-profit, limited liability corporation composed of public and private, not-for-profit Florida universities. The FLR operates a statewide, high performance, fiber-optic network infrastructure that utilizes next-generation network technologies, protocols, and services. The FLR provides NSU with high-speed commercial Internet services and connectivity to advanced regional and national networks, such as the National LambdaRail (NLR) and the Abilene Internet2 backbone. The FLR has significantly enhanced university research and distance-education capabilities and allows NSU faculty and staff members, researchers, and students to collaborate with colleagues round the world on leading-edge research projects and social science areas.

Students, faculty, and staff have access to university computing resources including desktop and laptop computers and document printers and copiers. Numerous computer labs are conveniently located throughout the university's facilities for student use. Administrative

computing resources consist of multiple servers and numerous other application specific Linux and Microsoft Systems. The university's administrative operations are supported by the Ellucian Banner Application.

Additional administrative systems include imaging systems; campus card systems; facilities systems; procurement systems; time/effort; and medical, dental, optometry, and mental health clinic systems. Multiple Oracle servers support academic applications and World Wide Web-based tools. Microsoft Exchange email systems support all faculty and staff email services, while Microsoft Office 365 provides email services to NSU students. Faculty and staff are migrating to Office 365 in the near term to better enable collaboration. Synchronous and asynchronous web tools are used for the delivery of distance education.

Electronic classrooms and microcomputer labs provide hands-on technology support for students and faculty. Multimedia technology training labs support technology-training opportunities for faculty and staff. Internet Protocol (IP)-based videoconferencing is provided for distance education. IP conferencing is based both on a videoconferencing bridge located on campus and on cloud-based conference services. Campus sites can be linked to form a global classroom. Students can connect from their own devices to cloud services to form virtual classrooms. There are videoconferencing rooms located at NSU's regional campuses and other sites throughout Florida. Also, videoconferencing rooms are located in Puerto Rico. Desktop and mobile device videoconferencing units are located at clinical and internship sites and in the homes of students enrolled in the speech-language pathology and audiology doctoral programs.

To further augment the libraries' print materials and online databases, the Office of Educational Technologies and Media Services has an extensive collection of videotapes and DVDs. A digital media production studio houses tools for the creation of instructional, informational, and marketing videos, CDs, and DVDs.

## ACADEMIC DEPARTMENTS

The graduate academic programs are part of two different Halmos College departments. The M.S. in Biological Sciences with Biology and Health Studies concentrations and the graduate certificate in Computational Molecular Biology are part of the Department of Biological Sciences. The M.S. degree in Marine Science with concentrations in Marine Biology, Marine Environmental Sciences, or Coastal Zone Management and the Ph.D. in Oceanography/Marine Biology are part of the Department of Marine and Environmental Sciences.

## **DEPARTMENT OF BIOLOGICAL SCIENCES**

### **MISSION STATEMENT**

The Mission of the Department of Biological Sciences is to provide students with a strong foundation in biology at the undergraduate and graduate levels. The Department is committed to excellence in teaching, research and service, providing opportunities and connections for current students and graduates to achieve success in their careers.

## **DEPARTMENT OF MARINE AND ENVIRONMENTAL SCIENCES**

### **MISSION STATEMENT**

The Mission of the Department of Marine and Environmental Sciences is to carry out innovative, basic and applied research and to provide high-quality graduate and undergraduate education in a broad range of marine and environmental sciences and related disciplines. The Department also serves as a community resource for information, research and education on oceanographic and environmental issues.

## **RESEARCH ACTIVITIES**

Since its inception in 1966, Nova Southeastern University's Halmos College of Natural Sciences and Oceanography has a long history of conducting high quality ocean research in a variety of topics and disciplines. Initially concentrating primarily on physical oceanography, today the Halmos College of Natural Sciences and Oceanography faculty, researchers, staff, and students pursue studies and investigations in a variety of natural scientific fields. Research remains at the forefront of the College's many initiatives. Specific research topics, and past publications for all of Halmos College of Natural Sciences and Oceanography can be found at <https://nsuworks.nova.edu/cnso/>.

## **DEPARTMENT OF BIOLOGICAL SCIENCES RESEARCH**

In the Department of Biological Sciences, areas of research include animal behavior; synthetic biology; systems biology; genomics; microbiology/microbiome; parasitology; physiology, zoology and invertebrate zoology. Furthermore, the program offers opportunities to interact and collaborate with researchers throughout NSU including those in the Cell Therapy Institute and the Institute for Neuro-Immune Medicine, as well as the College of Pharmacy, and College of Dental Medicine, among others. Research in these Institutes and collaborative colleges requires a multidisciplinary approach to study diverse organismal systems, the results of which could advance both human biomedical and environmental research priorities.

## **DEPARTMENT OF MARINE AND ENVIRONMENTAL SCIENCES RESEARCH**

Faculty and students at the Departments of Marine and Environmental Sciences pursue studies and investigations in experimental, observational, and theoretical oceanography, environmental science, geology and biology. Research interests include biological and chemical oceanography; coral reef ecology, deep sea biology, assessment, restoration, and monitoring of marine and terrestrial systems; sea level change; benthic ecology; marine plankton; invertebrate systematics and phylogeny; calcification of invertebrates; cell ultrastructure; marine fisheries; anatomy and physiology of marine vertebrates; molecular ecology and evolution; wetlands ecology; marine mammals; modeling of large-scale ocean circulation; coastal dynamics; ocean-atmosphere coupling, and surface gravity waves. Research on land regards landscape evolution, sedimentary depositional patterns, and the study of population biology of endangered vertebrates. Regions of interest include not only Florida's coastal waters and the continental shelf/slope waters of the southeastern United States, but also the waters of the Caribbean Sea, the Gulf of Mexico, and the Atlantic, Indian, and Pacific Oceans. In particular, the Environmental Sciences focusses heavily on Florida ecosystems, such as the Everglades.

## **RESEARCH INSTITUTES**

Halmos College of Natural Sciences and Oceanography is home to several institutes. These are primarily located at the Oceanographic Campus.

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### **NATIONAL CORAL REEF INSTITUTE**

The National Coral Reef Institute (NCRI) was established by Congressional mandate in 1998. The Institute's primary objective is the assessment, monitoring, and restoration of coral reefs through basic and applied research and through training and education. NCRI operates at Nova Southeastern University's Oceanographic Campus in Hollywood, FL. NCRI's mission is to identify gaps and constraints in scientific knowledge of reef structure and function as it relates to issues of assessment, monitoring, and restoration. Through active research and collaborative funding, NCRI undertakes and facilitates hypothesis-based scientific research in emerging reef issues and technologies. NCRI provides scientific synthesis and evaluation criteria of existing programs for use by the research and management community. These include the study of minimally impacted, stressed, and imminently threatened and endangered reefs. Assessing and monitoring biodiversity is a priority, especially as it affects and interacts with ecological processes, overall reef function, reef recovery, and restoration. NCRI's primary capability is that of offering a strong scientific focus as well as innovative approaches to relevant scientific issues

in all aspects of coral reef biology. More information about NCRI can be found at <https://cnso.nova.edu/ncri/index.html>.

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#### GUY HARVEY RESEARCH INSTITUTE

The NSU Guy Harvey Research Institute (GHRI) is a scientific research organization based at the Oceanographic Campus. GHRI was established in 1999 through collaboration with renowned marine artist Dr. Guy Harvey. The Institute is one of only a handful of private organizations dedicated exclusively to expanding the scientific knowledge base for effective conservation of fish populations and maintenance of fish biodiversity. The NSU Guy Harvey Research Institute (GHRI) conducts high quality, solution-oriented, basic and applied scientific research needed for effective conservation, biodiversity maintenance, restoration, and understanding of the world's wild fishes. The GHRI also provides advanced scientific training to U.S. and international students who will serve as future stewards of the health of our oceans. More information about GHRI can be found at <https://cnso.nova.edu/ghri/index.html>.

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#### BROWARD COUNTY SEA TURTLE CONSERVATION PROGRAM

NSU Halmos College of Natural Sciences and Oceanography operates the [Broward County Sea Turtle Conservation Program](#) in partnership with Broward County government. The program provides for the conservation of endangered and threatened sea turtle species within Broward County. While 70% of the nation's sea turtle nesting occurs in Florida, Broward County serves as a normal nesting area of three specific species of sea turtles: the loggerhead sea turtle is listed as threatened; and the green and leatherback sea turtle, which are listed as endangered and critically endangered, respectively. By monitoring nests and creating public awareness, the Broward County Sea Turtle Conservation Program helps protect these fragile creatures.

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#### MARINE ENVIRONMENTAL EDUCATION CENTER (MEEC)

An associated part of this effort is the Carpenter House: [Marine Environmental Education Center \(MEEC\)](#), which the Halmos College of Natural Sciences and Oceanography manages on behalf of Broward County to expand education and outreach about its sea turtles and other valuable marine resources.

### FACULTY AND STAFF

The dean of the College is Richard E. Dodge, Ph.D.

Information about the faculty including their background, the courses they teach, and their research interests, as well as links to their specific web sites, can be found at <https://cnso.nova.edu/overview/faculty-staff-profiles/index.html>.



Information about staff and their positions is also located at the website listed above.

## ACADEMIC CALENDAR

The 2019-2020 [academic calendar](#) is also available online. HCNSO follows the 16-week trimester system of the university. The fall and winter is also divided into two 8-week terms. The summer term is 14 weeks.

<b>Fall 2019</b>		<b>August 19 – December 8, 2019</b>
<b>Registration</b>		
<b>Fall Term I and Semester Classes</b>		May 6 – August 8, 2019
<b>Fall Term II Classes</b>		May 6 – October 13, 2019
<b>Drop/Withdraw Policy</b>		
<b>Fall Term I and Semester Classes</b>		Term I: August 19-October 13, 2019
<b>Drop/Add Period</b>		August 19 – August 25, 2019
<b>Drop during 1st week of term (100% refund)</b>		August 19 – August 25, 2019
<b>Drop during 2nd week of term (75% refund)</b>		August 26 – September 1, 2019
<b>Drop during 3rd week of term (50% refund)</b>		September 2 – September 8, 2019
<b>Last Day to withdraw from Term I (no refund)</b>		September 22, 2019
<b>Last Day to withdraw from Semester (no refund)</b>		November 17, 2019
<b>Fall Term II</b>		Term II: October 14-December 8, 2019
<b>Drop/Add Period</b>		October 14 – October 20, 2019
<b>Drop during 1st week of term (100% refund)</b>		October 14 – October 20, 2019
<b>Drop during 2nd week of term (75% refund)</b>		October 21 – October 27, 2019
<b>Drop during 3rd week of term (50% refund)</b>		October 28 – November 3, 2019
<b>Last Day to withdraw from Term I (no refund)</b>		November 17, 2019

<b>Winter 2020</b>		<b>January 6 – May 3, 2020</b>
<b>Registration</b>		
<i>Winter Term I and Semester Classes</i>	November 4, 2019 – January 5, 2020	
<i>Winter Term II Classes</i>	November 4, 2019 – March 8, 2020	
<b>Drop/Withdraw Policy</b>		
<i>Winter Term I and Semester Classes</i>	Term I: January 6 - March 1, 2020	
<b>Drop/Add Period</b>	January 6 – January 12, 2020	
<b>Drop during 1st week of term (100% refund)</b>	January 6 – January 12, 2020	
<b>Drop during 2nd week of term (75% refund)</b>	January 13 – January 19, 2020	
<b>Drop during 3rd week of term (50% refund)</b>	January 20 – January 26, 2020	
<b>Last Day to withdraw from Term I (no refund)</b>	February 9, 2020	
<b>Last Day to withdraw from Semester (no refund)</b>	April 12, 2020	
<i>Winter Term II</i>	Term II: March 9 - May 3, 2020	
<b>Drop/Add Period</b>	January 6 – March 15, 2020	
<b>Drop during 1st week of term (100% refund)</b>	March 9 – March 15, 2020	
<b>Drop during 2nd week of term (75% refund)</b>	March 16 – March 22, 2020	
<b>Drop during 3rd week of term (50% refund)</b>	March 23 – March 29, 2020	
<b>Last Day to withdraw from Term I (no refund)</b>	April 12, 2020	

<b>Summer 2020</b>		<b>May 4 – July 26, 2020</b>
<b>Registration</b>		
<i>Semester Classes</i>	March 3 – May 4, 2020	
<b>Drop/Withdraw Policy</b>		
<b>Drop/Add Period</b>	May 4 – May 10, 2020	
<b>Drop during 1st week of term (100% refund)</b>	May 10, 2020	
<b>Drop during 2nd week of term (75% refund)</b>	May 17, 2020	
<b>Drop during 3rd week of term (50% refund)</b>	May 24, 2020	
<b>Last Day to withdraw from Semester (no refund)</b>	July 17, 2020	

## UNIVERSITY CLOSURES

The following table is a list of dates where the university is closed. The full holiday schedule is available [online](#).

<b>Event</b>	<b>Date</b>
<b>Labor Day</b>	Monday, September 2, 2019
<b>Thanksgiving Day</b>	Thursday, November 28, 2019
<b>Day after Thanksgiving Day</b>	Friday, November 29, 2019
<b>Winter Break (No Classes)</b>	Monday, December 9, 2019 – Sunday, January 5, 2020
<b>Christmas Day</b>	December 25, 2019
<b>Martin Luther King Jr. Day</b>	Monday, January 20, 2020
<b>Memorial Day</b>	Monday, May 25, 2020
<b>Independence Day (Observed)</b>	Friday, July 3, 2020

## ACADEMIC PROGRAMS

The academic arms of the Department of Biological Sciences and the Department of Marine and Environmental Sciences are headed by the respective Department Chairs who are responsible for the academic programs. All certificate and degree programs offered by the Departments are detailed in this catalog.

### PROGRAMS AND MAJORS

The Halmos College of Natural Sciences and Oceanography (HCNSO) offers a doctorate degree (Ph.D.), two Master of Science (M.S.) degrees, and a graduate certificate in Computational Molecular Biology. HCNSO operates on a trimester system.

#### DEPARTMENT LOCATION OF DEGREES

Degree	Department of Biological Sciences	Department of Marine and Environmental Sciences
Ph.D. Oceanography/Marine Biology		X
M.S. Biological Sciences	X	
M.S. Marine Science		X
Graduate Certificate in Computational Molecular Biology	X	

### PH.D. IN OCEANOGRAPHY/MARINE BIOLOGY

The Ph.D. degree consists of upper-level course work and original research on a selected topic of importance in the ocean sciences. Courses consist of required general core courses (which can be transferred in from qualified M.S. courses) elective courses, as well as tutorial studies with the major professor. Ph.D. programs are informally divided into physical oceanography and marine biology.

#### A SUCCESSFUL RECIPIENT OF THE PH.D. IS EXPECTED TO:

- Understand basic marine biological, chemical, geological, and physical processes to a level sufficient to communicate and collaborate with experts in those sub-disciplines; and to be able to apply this knowledge to issues in research and resource management
- Apply the scientific method to define, investigate, and evaluate hypotheses in at least one of these sub-disciplines

- Conduct (as guided by, and to the satisfaction of, the doctoral committee and HCNSO faculty) advanced, original, and independent research that adds to the body of oceanographic knowledge in one or more of the sub-discipline areas
- Communicate scientific results and conclusions clearly and logically in a written dissertation and in scientific presentations and publications

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#### PH.D. COURSE AND TIME REQUIREMENTS

The Ph.D. degree requires a minimum of 90 credits beyond the baccalaureate. At least 42 credits must consist of upper-level course work. At least 24 credits must consist of dissertation research. The student may not register for research credits until after successfully defending the dissertation proposal. After faculty acceptance of the dissertation proposal, the student must register for a minimum of three research credits per term until completion of the degree.

As part of the core curriculum, Ph.D. students must also complete a 0-credit/0-cost seminar series to graduate and are required to attend a minimum of eight seminars. Students can also fulfill this requirement online using Canvas and SharkMedia if they are unable to attend in person.

Students are expected to complete degrees within 5 years of full-time study, and within 9 years in the case of part-time students. A minimum of 3 years enrollment in the Ph.D. program is required.

#### MASTER OF SCIENCE DEGREES

The goal of the Halmos College of Natural Sciences and Oceanography's Master of Science Degree Programs is to provide graduates with credible, holistic and timely scientific skills, and knowledge with regards to key environmental, ecological and socio-environmental issues.

On campus graduate classes are held in both morning and evening format and typically meet one to two times per week, with some meeting three times per week (MWF format) in the Health Studies Concentration. Exceptions are field courses which may entail several days of intensive study or weekend field trips.

There are two M.S. degree programs offered with a variety of concentrations:

M.S. Biological Sciences	M.S. Marine Science*
<b>Concentrations in</b>	<b>Concentrations in</b>
<ul style="list-style-type: none"> <li>• <i>Capstone/Thesis</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Marine Biology</i></li> </ul>
<ul style="list-style-type: none"> <li>• <i>Health Studies</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Coastal Zone Management</i></li> </ul>
	<ul style="list-style-type: none"> <li>• <i>Marine Environmental Sciences</i></li> </ul>

\* *Joint concentrations in the M.S. degree in Marine Science can be obtained by taking an additional three concentration-specific elective courses in the second area.*

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**A SUCCESSFUL RECIPIENT OF THE M.S. DEGREE IS EXPECTED TO DEMONSTRATE:**

- Effective communication skills,
- A full understanding of the scientific method,
- Advanced knowledge of ecological, geological, chemical and biological concepts as they relate to the environment or study system (organism).
- Advanced knowledge of the natural and human-driven problems currently, and anticipated to, impact the marine environment.
- In-depth knowledge of a specific aspect of their major

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**M.S. DEGREE TIME REQUIREMENTS**

The maximum time limit for the completion of the M.S. programs is nine years. M.S. students must petition the program office in writing for an extension of the time limit, which may be granted only under extenuating circumstances.

**M.S. IN BIOLOGICAL SCIENCES**

The M.S. in Biological Sciences provides a varied curriculum necessary for the diverse interests of today’s students. This rigorous program is designed to provide a foundation that can be applied toward entry into a Ph.D. program, professional school or as an entry point for professional careers in biology and the healthcare field.

Students in the M.S. in Biological Sciences will benefit from small class sizes, courses taught by faculty that are experts in their field, and a sound academic foundation resulting in increased analytical skills.

The M.S. in Biological Sciences offers two paths of study: a health studies concentration (12-month; 3 semester program) and a biology concentration (capstone/thesis) (24-month; 5 semester program).

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### HEALTH STUDIES CONCENTRATION

This concentration is a 12-month (3 semester), 30-credit program designed to better prepare graduates of undergraduate science programs for entrance into health-related professional schools. Courses for this concentration begin in summer of each year. It offers the opportunity for students to enhance their academic records, to improve graduate entrance test scores, and to obtain a graduate degree.

The concentration is geared toward the student who has completed an undergraduate science degree and is desirous of working towards a graduate degree in Health Studies. The student will obtain a Master of Science degree at the end of the program that will prepare them for future careers in any health-care profession, other graduate science programs or employment. They will be exposed to rigorous course work that is indicative of graduate health programs.

A comprehensive examination is a requirement for graduation and is given at the conclusion of all successfully completed course work and is scheduled for the week after the winter semester final exam week. To be eligible to take this exam, a student must have a minimum GPA of 3.0 with no more than 9 credits of "C grades". A passing grade must be achieved, and a second opportunity will be provided two weeks after the first attempt. The student may only attempt this exam twice.

A Kaplan Prep course will be offered to assist students in achieving an acceptable exam score and will be available in the summer semester to students who have been accepted into the program and registered for classes in the fall semester of the same year. Students will choose the test prep course appropriate to their career goals as Kaplan offers test preparation for various standardized tests e.g., MCAT, DAT, and PCAT.

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### HEALTH STUDIES CONCENTRATION LEARNING OUTCOMES

- Demonstrate an in-depth knowledge of science as it relates to the normal and abnormal processes of the human body.
- Demonstrate knowledge of current advances in medical research and the relationship to clinical practice.
- Demonstrate ability in problem solving and analytical thinking.
- Demonstrate both effective oral and written skills necessary to a professional setting.

### CAPSTONE/THESIS CONCENTRATION

The M.S. Biological Sciences capstone/thesis concentration is designed to enhance the education of students for jobs and careers in all fields of biology, including Ph.D. programs and professional medical programs. Reflecting the hands on and critical thinking skills that are required for careers in biology, our thesis and capstone programs place increased emphasis on research. In both the thesis and capstone paths, students will have ample course credit time dedicated to performing research in various capacities. This ensures that students can develop critical thinking skills focused on applications, while tackling significant questions in biology. Both the thesis and capstone path of this Biological Sciences concentration culminate in the creation of a novel and significant piece of writing, ensuring that graduates can effectively communicate their scientific findings to the community at large. All entering M.S. students are accepted into the capstone path. Additional research proposal development is required to enter the thesis path. A minimum of 36 credits is required to complete this concentration.

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### CAPSTONE/THESIS CONCENTRATION LEARNING OUTCOMES

- Students will be highly knowledgeable in a broad area of interest within the field of Biology. The area of knowledge will differ according to individual interest.
- Students will be highly knowledgeable in a specific topic of biology (e.g. ecology, taxonomy, zoology, physiology, reproduction, and growth).
- Students will demonstrate proficient communication skills in a) writing, and b) oral presentation.
- Students will have a superior understanding of the scientific method. The student will be able to formulate hypotheses, generate research questions and be able to apply the scientific method toward specific research goals and projects.

### M.S. IN MARINE SCIENCE

The M.S. in Marine Science degree requires a minimum of 36 credits. A student in the Department of Marine and Environmental Sciences (DoMES) will be exposed to a wide variety of special topics with experienced and highly skilled faculty members in our high-end facilities that allow the conduct of advanced research in the area of interest. DoMES provides a balance between field, laboratory, classroom and online experiences that allow convenient customizing of the curriculum. There are three concentrations: Marine Biology, Marine Environmental Sciences and Coastal Zone Management. Joint concentrations in the M.S. degree in Marine Science can be obtained by taking an additional three concentration-specific elective courses in the second area.



The M.S. Marine Science degree is completed by writing a capstone or thesis. All entering M.S. students are accepted in the capstone. Students are expected to complete the degree within 2 years of full-time study, and within 5 years of part-time study.

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### MARINE BIOLOGY CONCENTRATION

This course of study is designed to equip students with a substantial understanding of the nature and ecology of marine life and a solid grounding in the other overlapping areas of marine science. Program flexibility provides preparation for further graduate study, secondary education career enhancement, or employment in technical research institutions, government agencies, or environmental consulting firms. Applicants should hold a bachelor's degree in biology, oceanography, or a closely related field, including science education.

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### MARINE BIOLOGY LEARNING OUTCOMES

Expected outcomes of the Marine Biology concentration are:

- Effective communication skills
- A full understanding of the scientific method
- Competency in scientific concepts as they relate to marine biota
- Competency in research methods (quantitative, lab, field) as related to marine science
- An understanding of the taxonomy, natural history, and ecology of marine organisms
- In-depth knowledge of a specific aspect of marine biology

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### COASTAL ZONE MANAGEMENT CONCENTRATION

This course of study focuses on contemporary problems and conflicts arising from increased use of coastal areas and emphasizes the evaluation of alternative policy management solutions. It is intended for employees of government and industry seeking career enhancement, as well as for recent college graduates seeking careers in planning and management with government agencies, industries, and other activities depending on or affecting the coastal zone or its resources. The program can also be of value for enhancement of careers in education.

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### COASTAL ZONE MANAGEMENT LEARNING OUTCOMES

Expected outcomes of the Coastal Zone Management concentration are:

- Effective communication skills
- A full understanding of the scientific method
- Competency in ecological, geological, chemical and biological concepts, as they relate to resource management in the coastal zone

- An understanding of coastal zone processes
- Familiarity with current management problems and approaches to their solution
- In-depth knowledge of a specific aspect of coastal zone management

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### MARINE ENVIRONMENTAL SCIENCES CONCENTRATION

Graduates can find employment in environmentally oriented agencies/organizations and the program is of value for prospective or actual employees of government, industry, or academia seeking to advance careers in marine-related areas. Applicants are required to have a B.S. degree in the natural sciences.

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### MARINE ENVIRONMENTAL SCIENCES LEARNING OUTCOMES

Expected outcomes of the Marine Environmental Sciences concentration are:

- Effective communication skills
- A full understanding of the scientific method
- A generalized knowledge in scientific concepts as they relate to the marine environment
- Competency in research methods (quantitative, lab, field) as related to marine science
- A generalized knowledge of the natural and human-driven problems currently impacting, and anticipated to impact, the marine environment
- In-depth knowledge of a specific aspect of marine environmental sciences

### GRADUATE CERTIFICATE IN COMPUTATIONAL MOLECULAR BIOLOGY

The Department of Biological Sciences offers a Graduate Certificate program in Computational Molecular Biology. It is awarded upon successful completion (defined as a course grade of C or better) of four courses at the graduate level. Courses do not have to be taken within any one term, or consecutively, but the Certificate must be completed within 5 years of admission. Successful completion of the Graduate Certificate will award the equivalent of 12 graduate credits.

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### GRADUATE CERTIFICATE IN COMPUTATIONAL MOLECULAR BIOLOGY LEARNING OUTCOMES:

- A scientifically based, credible, holistic and timely introduction and knowledge of key ecological and socio-environmental issues related to the oceans and coastal zone.
- A forum for sharing national and international perspectives, information and case studies concerning the coastal and marine environment.

## TIME LIMIT FOR GRADUATE CERTIFICATES

The maximum time limit for completed of the graduate certificate is five years. Certificate students must petition the program office in writing for an extension of the time limit, which may be granted only under extenuating circumstances. There is no minimum time limit for completion of the certificate.

## NON-DEGREE SEEKING STUDENTS

Non-degree seeking students are accepted for no more than two courses and do not qualify for federal financial aid.

## ADMISSIONS

### ENTRY TERMS

Prospective students in the Ph.D., M.S. in Marine Science, M.S. in Biological Sciences capstone/thesis concentration, and the graduate certificate may apply for any start term (fall, winter, and summer). The M.S. in Biological Sciences concentration in Health Studies only starts in the summer term.

### APPLICATIONS

All applications to the graduate programs are submitted online at <https://www.nova.edu/info-apply/index.html>. Prospective graduate students must select Halmos College of Natural Sciences to apply for any of the programs listed below. The fee for each graduate application is \$50.

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## GRADUATE RECORD EXAMINATION (GRE)

The Halmos College of Natural Sciences and Oceanography requires all applicants to take the general GRE. Advanced aptitude test scores from the Graduate Record Examination (GRE) must be sent to the Halmos College directly from Educational Testing Service, PO Box 995, Princeton, NJ 07540. Our Institution Code for Nova Southeastern University is 5514. The Institution code for the Halmos College of Natural Sciences and Oceanography is 3236. The GRE requirement is waived under extreme special circumstances. More information about the GRE may be found at [www.gre.org](http://www.gre.org).

Students with lower GRE scores may be accepted if there is evidence, they may be able to successfully complete the program (GPA, letters of recommendation, etc.). GRE scores older than five years will not be accepted.

Other standardized test scores (MCAT, DAT, OAT and PCAT) may be submitted in lieu of the GRE.

Applicants to the graduate certificate are not required to take the GRE.

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## TRANSCRIPTS

All applicants must submit official transcripts from any educational institution attended since high school graduation. All applicants must provide an official undergraduate transcript showing bachelor's degree conferral.

Ph.D. applicants must also provide an official graduate transcript showing master's degree conferral.

Prospective students applying for graduate admission and who have completed coursework outside the United States at a non-American institution must have their foreign transcript go through a process called "Credential Evaluation". This Credential Evaluation is completed by organizations accredited by the National Association of Credential Evaluation Services (NACES).

This Credential Evaluation is conducted by organizations that are accredited by the National Association of Credential Evaluation Services (NACES). A list of these organizations can be found at [www.naces.org](http://www.naces.org). The evaluation will determine if the student's foreign degree is equivalent to the degree that the program of choice requires. The evaluation must list the degree equivalency and include a GPA (grade point average) calculation as well as a course-by-course credit evaluation.

The prospective student is responsible for requesting this Credential Evaluation.

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## LETTERS OF RECOMMENDATION

Applicants to the Ph.D. program are required a minimum of three letters of recommendation. The master's degree programs' applicants are required to produce a minimum of two letters of recommendation. Within the online application, letters of recommendation are listed as supplemental items. Please fill out the letters of recommendation section of your application.

Letters must come from professors or class instructors. An exception can be made if the applicant has been out of school for a long period of time, in which case, an employment supervisor's letter will be adequate.

## TRANSFER CREDIT POLICY

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### PH.D. CREDIT TRANSFER

Ph.D. students may transfer up to 30 graduate course credits from prior graduate programs in the same discipline as the Ph.D. degree aspired to. Transfer courses must be either reasonable duplicates of courses offered at NSU or clearly in the applicable Ph.D. field of interest. Students should submit requests for transfer credits in writing to the Program Office with documentation indicating the subject matter and that the transfer credits were of graduate level from accredited institutions. This must consist of the student's transcript, course syllabus and/or the course description from the professor.

### MASTER'S DEGREE TRANSFER

M.S. students may transfer up to six credits of previous graduate course work. Course work must replicate HCNSO offerings in the major field of interest or must be clearly closely related. Students should submit requests for transfer credits in writing to the Program Office with documentation indicating the subject matter and that the transfer credits were of graduate level from accredited institutions. This must consist of the student's transcript, course syllabus and/or the course description from the professor.

Transfer acceptability for both the M.S. and Ph.D. programs will be decided by the appropriate department chair at the HCNSO.

### TRANSFER CREDITS FROM HALMOS COLLEGE OF NATURAL SCIENCES AND OCEANOGRAPHY

Nova Southeastern University has no control over acceptance of course credits at other institutions. Credits earned at HCNSO are transferable to other institutions at the discretion of the receiving school.

## PH.D. ADMISSIONS

For Ph.D. applicants, previous degree(s) should be in the area of mathematics (for Physical Oceanography) or an appropriate area of the natural sciences (for Marine Biology). A Master's degree in Biological oceanography, Biology, Marine Biology, or a related science is preferred. Acceptance into the program is effectively provisional for all. The accepted student is a "pre-candidate" until later defense of proposal and successful passing of comprehensive exams.

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### PH.D. ADMISSIONS REQUIREMENTS

The prospective Ph.D. student must complete the following items to be considered for the program:

<b>Ph.D. Admissions Requirements</b>
<b>Online Application and Application fee</b>
<b>General Graduate Record Examination (GRE)</b>
<b>Official transcripts for all undergraduate and graduate education</b>
<b>Three letters of recommendation</b>
<b>Curriculum Vitae (CV)</b>
<b>Pre-Proposal of Research</b>
<b>Candidate Acceptance Letter from Potential Dissertation Advisor at Halmos College</b>

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### QUALIFIED APPLICANTS FOR PH.D.

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#### GPA REQUIREMENT

To qualify for acceptance, applicants must submit a transcript for a master's degree with a cumulative GPA of at least 3.0, and bachelor's degree with a major GPA of at least 3.0 and a cumulative GPA of 2.9.

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#### GRE SCORE REQUIREMENT

The Graduate Record Examination (GRE) requirements are scores of 55% on the verbal portion, 55% on the quantitative portion, and 4.0 on the analytical writing portion for acceptance.

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#### CURRICULUM VITAE (CV)

An updated curriculum vitae (CV) is required for all doctoral applicants. The CV should elaborate on the applicant's education to a greater degree than a resume and is expected to

include a comprehensive listing of professional history including every term of employment, academic credential, publication, contribution, or significant achievement.

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#### PRE-PROPOSAL OF RESEARCH

Ph.D. applicants should have completed a dissertation pre-proposal that must be submitted with the application. The pre-proposal will be included as a supplemental item for the application that can be uploaded as a word document. The proposal will be a major factor in acceptance.

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#### CANDIDATE ACCEPTANCE LETTER FROM POTENTIAL DISSERTATION ADVISOR

Ph.D. Applicants must have obtained agreement from a faculty member to serve as the major professor. Furthermore, the Major Professor will need to state in writing that she/he has or will be able to acquire sufficient funds to cover the Ph.D. candidate's research expenses, and salary for a minimum of 3 years. The Halmos College of Natural Sciences and Oceanography will not be responsible for covering research expenses in the event of funding loss by the Major Professor. This letter can be uploaded as an attachment in the application under supplemental items.

## M.S. ADMISSIONS

The Halmos College of Natural Sciences and Oceanography offers two Master's of Science (M.S.) degrees: M.S. in Biological Sciences and M.S. in Marine Science.

Applicants to the M.S. degree programs are accepted into one of two classifications: Full Acceptance or Acceptance with Academic Requirements.

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### FULL ACCEPTANCE

To qualify for Full Acceptance, applicants must submit a transcript of their bachelor's degree with a major GPA of at least 3.0 and a cumulative GPA of 3.0. The applicant must have a minimum GRE score of 55% on the verbal portion, 55% on the quantitative portion, and 4.0 on the analytical writing portion. See further explanations of requirements below.

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### ACCEPTANCE WITH ACADEMIC REQUIREMENTS

Students who have not satisfied all the above criteria, but who have given evidence that they may succeed in the degree program will be considered for provisional acceptance. A 'B' grade or better in the first four courses is required before a student can be converted to Full Acceptance status. The applicant must have a minimum GRE score of 40% on the verbal portion, 40% on the quantitative portion, and 3.5 on the analytical writing portion.

## M.S. REQUIREMENTS

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### PREREQUISITES

All admitted students must have a strong science background prior to acceptance into the M.S. programs, although a B.S. degree in a related field is preferred. Along with a strong science background, the following courses are required:

<b>Prerequisites for the HCNSO M.S. Degree</b>
<b>Applied Statistics or Biostatistics</b>
<b>Biology I with Lab</b>
<b>Biology II with Lab</b>
<b>General Chemistry with Lab</b>
<b>Calculus I or higher</b>
<b>One or more of the following: Anatomy, Ecology, Geology, Physiology (general or basic level)</b>



## QUALIFICATIONS

The following are the entrance requirements in the M.S. degree programs for Halmos College:

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### GPA REQUIREMENT

To qualify for acceptance, applicants must submit a transcript for a bachelor's degree with a cumulative GPA of at least 3.0, and a major GPA of at least 3.0.

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### GRE SCORE REQUIREMENT

To qualify for full acceptance, the Graduate Record Examination (GRE) requirements are scores of 55% on the verbal portion, 55% on the quantitative portion, and 4.0 on the analytical writing portion for acceptance.

To qualify for acceptance with academic requirement, the Graduate Record Examination (GRE) requirements are scores of 40% on the verbal portion, 40% on the quantitative portion, and 3.5 on the analytical writing portion for acceptance.

Applicants with lower GRE scores may be accepted if there is evidence, they may be able to successfully complete the program (GPA, letters of recommendation, etc.). GRE scores older than five years will not be accepted.

Other standardized test scores (MCAT, DAT, OAT and PCAT) may be submitted in lieu of the GRE.

## GRADUATE CERTIFICATE ADMISSIONS

Applicants for the Graduate Certificate are required to have a baccalaureate (four-year degree). They must apply for the certificate at <http://apply.nova.edu> and must submit an official undergraduate transcript as part of the application process.

## INTERNATIONAL STUDENT ADMISSIONS

Nova Southeastern University's programs are administered through its 18 colleges and schools at locations throughout Florida, across the nation, and at select international sites.

U.S. Citizenship and Immigration Services (USCIS) has approved NSU to accept and enroll international students who will be attending classes at campuses in the South Florida area (Dade, Broward, and Palm Beach counties), as well as regional campuses throughout the state.

Complete information for international students is available in the [Office of International Students and Scholars](#).

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## OFFICE OF INTERNATIONAL STUDENTS AND SCHOLARS

The Office of International Students and Scholars (OISS) provides complete support and advisory services. THEY are here to answer questions and help with any immigration-related problems. OISS offers immigration assistance for the NSU community and serves as a liaison between our office and U.S. Citizenship and Immigration Services (USCIS) in matters related to international students and scholars studying and working here.

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## LANGUAGE PROFICIENCY INFORMATION

Applicants whose native or official language is not English are required to demonstrate English proficiency in order to be admitted into a degree program. Each program may have additional requirements. Please check with the admissions department of your program for its English proficiency requirements.

The following standardized tests currently satisfy the English language proficiency requirements for the majority of NSU's colleges, schools and centers:

<b>English Language Proficiency Exams Accepted by NSU</b>
<b>Test of English as a Foreign Language (TOEFL)</b>
<b>International English Language Testing System (IELTS)</b>
<b>Pearson Test of English—Academic (PTE)</b>
<b>iTEP Academic (undergraduate admissions only)</b>
<b>GMAT</b>
<b>GRE</b>
<b>Scholastic Assessment Test (SAT)</b>
<b>American College Test (ACT)</b>
<b>Cambridge Certificate in Advanced English (CAE)</b>

Proof of English language competency can also be in the form of successful completion of a degree at an approved U.S. institution of higher education or passing Level 9 at Talk International Language School.

## POLICIES AND PROCEDURES

The following information is for students enrolled in the HCNSO graduate programs. The failure to read this catalog does not excuse students from the rules, policies, and procedures contained in it.

### ATTENDANCE POLICY

The educational process at NSU depends on a close working relationship between students and faculty members. Students are expected to attend class regularly, from beginning to end. Students who miss a class must inform the instructor before the class meeting.

University policy requires each faculty member to confirm his or her class roster during the second week of each semester. Any student deemed as a non-attender will be dropped from the class by the Office of the University Registrar. Students who believe they were reported in error as non-attenders must communicate with the instructor who is the only one to determine whether the student may remain in the class. Faculty members must email [rostrec@nova.edu](mailto:rostrec@nova.edu) to request a student remain in the class.

Students are responsible for the academic consequences resulting from class absences. Students who miss class because of an illness or other emergency should contact the instructor as soon as possible to arrange for make-up work. Missed assignments/tests can be made up solely at the discretion of the course faculty.

### COURSE DELIVERY

Students should review the following course delivery options with their academic advisors, based on courses required in their majors and their registration choices.

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#### FACE-TO-FACE

Face-to-face classes are scheduled at a variety of times and locations, to best meet students' schedules and demands. Face-to-face classes may also include some online instruction in addition to regular classroom instruction, although most instructions will take place on campus or in-site classrooms. Some assignments may be administered through internet-based sites associated with class textbooks or through the university's online course management system. Instructors will explain specific requirements for participation in online components.

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#### ONLINE

Students who participate in online classes are supported through a variety of technologies and teaching methods: email, bulletin boards, chat rooms, electronic journals, synchronous

conferencing tools, content sharing tools, video lectures, and other digital and web-based tools and resources. Each student must obtain an NSU account to access email, course materials, and library resources. Students may be required to participate in an online orientation before the start of each class.

## AUDIT

Master's degree candidates and special students may audit courses (non-credit) for one-half the normal tuition rate (plus fees). These students may withdraw from audited courses and receive full or partial tuition reimbursement according to the Withdrawal and Refund Policy listed in the handbook and bulletin. Ph.D. candidates may register to audit courses at no additional charge beyond their regular tuition.

Audit students are expected to attend classes and participate in the courses as regular students. If this is not the case, the students will be administratively dropped from the class roster. Audit students may take course exams and complete term papers at their option. An audit does not count towards degree or certificate requirements.

## COURSE EVALUATIONS

Course evaluations facilitate the collection of feedback from students about their classes—how they feel about course content, appropriateness of textbook selection, and other aspects. All evaluations are confidential and anonymous. Students are urged to be honest and constructive in their remarks. The course evaluation process is either conducted in the classroom or online. Evaluations are usually handed out or opened prior to the Exam Week. It is important to complete the course evaluations when you are sent the link for your courses. Administration uses student feedback to evaluate the course, and the text book.

## GRADING SYSTEM

The following grading system exists across all Doctoral, Masters, and Graduate Certificates at HCNSO.

Grade	Quality Points
<b>A</b>	4.00
<b>A-</b>	3.75
<b>B+</b>	3.50
<b>B</b>	3.00
<b>B-</b>	2.75
<b>C+</b>	2.50
<b>C</b>	2.00
<b>C-</b>	1.75
<b>F</b>	0.00
<b>NPR</b>	0.00
<b>P</b>	0.0
<b>TR</b>	0.0

All programs may use the grades: **P** (Pass), **I** (Incomplete), **W** (Withdrawn), **AU** (Audit), **NPR** (No Progress), and **TR** (Transfer). The grade of **PR** (Progress) may be used for programs with a thesis or dissertation in which the student continues to demonstrate progress towards the completion of said requirement.

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## GRADE POINT AVERAGE AND QUALITY POINTS

A student's academic standing for a specific semester or term is indicated by the grade point average (GPA). The GPA is calculated based on earned credits and letter grades (including Fs, for which students receive 0 credits). The GPA does not include classes from which the student has successfully withdrawn or received an Incomplete. Overall academic standing is indicated by the cumulative GPA (CGPA).

- GPA calculations include NSU coursework only, based on the following formulas and definitions.
- Quality points = A letter grade's numerical GPA value MULTIPLIED BY the number of credits assigned to the course
- GPA hours = Earned credits, including Fs, excluding withdrawals, and audits, and successfully-completed pass/fail courses

- Current semester or term GPA = The total number of quality points for the semester or term DIVIDED BY the total GPA hours for the semester or term
- Cumulative GPA (CGPA) = Total quality points DIVIDED BY total GPA hours

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## GRADE REPORTS

Student grades are disseminated online via SharkLink at <https://sharklink.nova.edu>. Legal provisions prohibit the release of personally identifiable information to anyone other than legally authorized persons. Students are permitted to inspect, review, and challenge such information as provided by law.

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## INCOMPLETE

A grade of Incomplete (I) is issued in rare cases because of unusual and exceptional circumstances. Students are only eligible for an Incomplete if

- 50% of the coursework has been completed with a C or above average, and
- the remaining coursework can be completed in a timeframe agreed upon by the faculty member and the student, not
- exceeding one semester beyond the final date of the course.

It is the student's responsibility to consult the faculty member regarding an Incomplete request. Based on the unusual and exceptional circumstances surrounding the Incomplete request, documentation may be required to be submitted. Please refer to the Incomplete Grade Agreement Form/Contract for more information. Both the student and faculty member must sign the Incomplete Grade Agreement Form/Contract prior to the end of the course and agree upon its conditions via email.

If the student does not complete the coursework within the agreed upon time period, the Incomplete grade will be changed to the grade earned based on the work accepted by the instructor to date as stipulated in the contract or agreement (not to exceed 16 weeks); the student only gains points for assignments completed that were included in the incomplete agreement. A student cannot remove an Incomplete by retaking the course in a subsequent semester. A student who is absent at the final examination without prior approval is generally not eligible to receive an Incomplete grade.

Incompletes that have not been addressed by the student and college will ultimately be converted to a Failing grade after 1 year from the end of the term.

## ACADEMIC STANDING

Policies outlined below apply to all graduate programs in the Halmos College of Natural Sciences and Oceanography.

Academic Standing, as defined below, is separate from the standards for Satisfactory Academic Progress (SAP) for financial aid purposes. For detailed information about maintaining SAP for financial aid eligibility, visit [nova.edu/sap](http://nova.edu/sap).

Nova Southeastern University is committed to ensure accurate tracking and review of a student's permanent academic record. Academic transcripts serve as documentation for the student and as a record for other agencies (employers, other academic institutions, etc.). The academic transcript reflects the record of courses in progress and attempted, grades received, degrees sought and/or earned (with award and academic completion dates), and disciplinary actions which result in a student's suspension or expulsion from the institution. Additionally, the student's academic standing is reflected on an academic transcript to provide a more complete depiction of the student's academic history. The following designations provide for a student's status as it relates to her/his end-of term academic standing within the university:

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### GOOD ACADEMIC STANDING

A student is in good academic standing unless he or she is not making sufficient progress toward degree completion and/or is placed on academic probation, academic suspension, or academic dismissal. **Students shall be deemed in good academic standing unless they have a cumulative GPA of less than 3.0, which is required for graduation.**

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### ACADEMIC PROBATION/DISMISSAL

Any student who fails to maintain a cumulative 3.0 GPA will be placed on academic probation for two terms. Students must raise their GPA to at least a 3.0 or above in two subsequent terms. Students will not be permitted to take a term off between terms of academic probation.

*M.S. Biological Sciences Health Studies concentration students who are on academic probation must petition the Biological Sciences Masters Health Studies Concentration Admissions committee via the Department Chair prior to the start of the next semester for the option to allow said students to register for a limited course load and decreased credit hours. Note that this would extend the time for completion of the degree and concentration to more than 12 months.*

If probation is not removed at the end of the two subsequent terms, the student will be dismissed from the program.

## PETITION FOR PERMISSION TO ENROLL AFTER ACADEMIC DISMISSAL

A student may petition for reinstatement after 12 months, explaining the reasons why their academic potential has changed, and re-admission should be considered. Reinstatement is not guaranteed and is only possible if it is probable that the student can raise their cumulative GPA to 3.0 in two terms. Students who are approved to re-enroll after academic suspension may register for classes for the next semester. These students return on academic probation.

## GRADUATION – DEGREES, DIPLOMAS, AND COMMENCEMENT

### APPLICATION FOR DEGREE

Students must complete an online degree application in order to be eligible for degree conferral. Students are eligible for graduation when they meet the requirements listed in the HCNSO Graduate Program Catalog in effect when they entered the university, unless a prior request to follow a more recent catalog has been approved. Degrees are conferred once a month, by the university's Board of Trustees once students have met all the criteria for graduation. The conferral date reflects the last day of the month in which the academic department of the appropriate college approved the degree application. Once degrees have been conferred, transcripts and diplomas showing the awarded degree are sent to students by mail. Students with holds on their student account must satisfy any outstanding balances in order to receive their transcripts and diploma.

### DIPLOMAS

The diploma indicates the degree and major the student has earned. The academic transcript, the official record of work at NSU, indicates degree earned and major field of study.

### COMMENCEMENT

Commencement is a recognition and celebration of academic achievement and the lasting contributions that students have made to the university. Do not confuse the degree/diploma application with commencement and your regalia purchase. These are two separate processes.

Although often used interchangeably, the words Commencement and Graduation are not the same thing. It is important to understand that participating in a commencement ceremony does not mean that you have completed your degree and actually graduated.

Commencement is a formal ceremony for students who have been cleared to walk by their college or academic program.

Ceremony dates can be found [online](#).



## CANDIDATES

Commencement is a recognition and celebration of academic achievement and the lasting contributions that students have made to the university. Commencement is a formal ceremony for candidates who have been cleared to walk by their school or program.

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## ATTENDANCE AND ELIGIBILITY

Candidates who have achieved degree conferral since last year's commencement exercises and prior to this year's ceremony dates, are automatically invited to participate this year (as long as they were not invited to participate in a prior year).

Otherwise, each program/school determines its "participation requirements." When in doubt, check with your college or visit its commencement website for clarification on the requirements that must be met in order to be invited.

## GRADUATE CERTIFICATE CONFERRAL

Students completing the graduate certificate are not eligible to attend commencement. Students who complete the certificate need to submit their information to the program office. Certificates are conferred once a month, by the university's Board of Trustees once students have met all the criteria for conferral. The conferral date reflects the last day of the month in which the academic department of the appropriate college approved the degree application. Once the certificates have been conferred, transcripts and diplomas showing the awarded certificate are sent to students by mail. Students with holds on their student account must satisfy any outstanding balances in order to receive their transcripts and diploma.

## GRADUATION REQUIREMENTS

**Conferrals for all degrees and certificates require a minimum GPA of 3.0.**

### PH.D. MINIMUM GRADUATION REQUIREMENTS

The following items must be successfully completed to achieve the Ph.D. Degree:

- A minimum of 90 credits beyond the baccalaureate. At least 42 credits must consist of upper-level course work. At least 24 credits must consist of dissertation research.
- Successfully defend the dissertation proposal in an oral presentation to faculty.
- Successfully complete a qualifying examination with the candidate's committee.
- Successfully complete comprehensive examinations upon completion of formal coursework.
- Successfully defend the dissertation to the committee and other faculty members.

- Submit the final dissertation copy to the William H. Richardson Library, located on the Oceanographic Campus.

#### M.S. MINIMUM GRADUATION REQUIREMENTS

The following items must be successfully completed to achieve the master's degree at HCNSO.

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#### M.S. DEGREES IN BIOLOGICAL SCIENCES (CAPSTONE/THESIS CONCENTRATION) AND MARINE SCIENCE:

- A minimum of 36 credits beyond the baccalaureate
- A successful completion of a pass/fail test on their program learning outcomes.
- A successful completion of attending a minimum of 8 0-credit/0-cost seminars.
- Successfully defend the capstone/thesis to the committee and other faculty members.
- Submit the final capstone/thesis copy to the William H. Richardson Library, located on the Oceanographic Campus.

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#### M.S. DEGREE IN BIOLOGICAL SCIENCES (HEALTH STUDIES CONCENTRATION)

- A minimum of 30 credits beyond baccalaureate
- Successfully pass a comprehensive examination at the of the winter term.

#### GRADUATE CERTIFICATE MINIMUM GRADUATION REQUIREMENTS

- Successfully complete the 12 credits required by the certificate.
- No grade lower than C and GPA of 3.0 and higher

### ONLINE COURSE ACCESS AND SHARKLINK

#### ONLINE EDUCATION SUPPORT

All NSU students are provided with NSU computer accounts including email. Students, however, must obtain their own Internet Service Providers (ISP) and use their own computer systems (PC or Apple Macintosh and an Internet connection). New students receive an orientation and extensive online technical support online access, online tools and methods, and library resources. Online interactive learning methods involve web-based course materials, the electronic library, and online activities that facilitate frequent student-professor interaction. Faculty members and students interact via online forums using threaded discussion boards, chat rooms, and email. Students submit assignments through a web-based learning environment. Online students have access to books, journal articles, microfiche, dissertations, index searches, catalog searches, and reference librarians. The online database collection at

NSU is extensive and includes access to quality subscription services free of charge to the student.

## SHARKLINK

SharkLink is NSU's online information portal. With a single username and password, it provides students access to their NSU email account, online courses and discussion groups, university announcements and calendar reminders, and student records. SharkLink also enables students to register online, view course availability, and check their grades. All students are assigned a Sharklink ID, which is also their NSU email username, that uniquely identifies them and provides them access to the NSU administrative system. SharkLink can be accessed at <https://sharklink.nova.edu>.

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## ONLINE COURSE ACCESS

The university uses a secure course management platform for developing and delivering interactive courses and their components over the Web. Students are granted access to this platform based on registration for online courses. Students must use their SharkLink login and password in order to access their online courses. All online students must use this platform when communicating with their program. Course communication will be done through the particular course that the student is attending. Online courses can be accessed at SharkLearn (<https://sharklearn.nova.edu>).

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## NSU EMAIL

All official NSU business, such as information on accounts, financial aid, class emails, etc., is done through students' NSU email accounts. Students can access NSU email by logging into [sharkmail.nova.edu](http://sharkmail.nova.edu). Students' SharkLink ID serves as their NSU email username.

## PROBLEM RESOLUTION PROCEDURES

### TYPES OF GRIEVANCES

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#### DISCRIMINATION

Nova Southeastern University is committed to maintaining a safe and healthy educational environment that is free from discrimination, harassment, and misconduct based on race, religion/creed, sex (including sexual orientation), disability, age, or military/veteran status. The university is committed to taking immediate action to eliminate any harassment, prevent its recurrence, and address its effects. Any student or employee found to have engaged in acts of

harassment are subject to the University Disciplinary process, including potential suspension or expulsion for students, and suspension or termination for employees.

**For inquiries or complaints regarding perceived discrimination based on the gender or sex, please contact:**

Laura Bennett  
Title IX Coordinator  
(954) 262-7858  
[laura.bennett@nova.edu](mailto:laura.bennett@nova.edu)

Information about NSU's Title IX/Sexual Misconduct policy, confidential resources, rights of all parties, definitions and examples of prohibited behaviors, and the procedures for investigating and resolving reports of sexual misconduct is available on the Title IX website at [nova.edu/title-ix](http://nova.edu/title-ix). Individuals may report incidents through a secure online form on the Title IX website and/or may contact the Title IX Coordinator directly. The Title IX Coordinator also assists students in learning about their protections under Title IX, such as those for pregnant/parenting students as well as those who may have experienced sexual violence on- or off-campus that affects their ability to participate in an NSU educational program or activity.

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## GRADE/ACADEMIC GRIEVANCES

Faculty members serve as the initial contacts for all grievances involving the fairness of a grade, or any classroom or instructor activity, in their courses. Students unable to resolve a grade/academic grievance with a faculty member should contact the appropriate department chair or program director in the college responsible for the course, who will make a final decision on the fairness of the grade. Grade/academic grievances will not be permitted to proceed any further unless evidence of discrimination or a violation of rights can be demonstrated.

Grade/academic grievances must be initiated in a timely fashion, no later than the end of the semester following the occurrence of the grievance issue. The student may forfeit all rights under the grievance procedure if each step is not followed within the prescribed time limit.

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## ADMINISTRATIVE GRIEVANCES

Administrative grievances are related to academic policies and administrative actions. Grievance procedures must be initiated by submitting a Student Action Request (SAR) no later than 20 days after the end of the semester in which the grievance issue took place. The student may forfeit all rights under the grievance procedure if each step is not followed within the prescribed time limit.

## ADMINISTRATIVE GRIEVANCE PROCESS

All administrative grievances must begin at the first level contact. Grievances brought to higher level contacts without previously going through the appropriate administrative grievance procedure will be referred to the appropriate step in the process, thus delaying problem resolution. Students who are not sure of the appropriate university employee to contact about an administrative issue should communicate with their academic advisor.

### GRADE APPEAL/GRIEVANCE PROCEDURE

Students who have reason to believe that there has been an error in assigning a grade may formally protest and invoke the Grade Appeal Procedure. The grade appeal or other grievance procedure for students is itemized below and should be followed in all instances, making sure that each step is completed before going on to the next step. If resolution is reached at the end of any given step, it is not necessary to continue.

### STEPS FOR SUBMITTING GRADE/GRIEVANCES

Steps	Procedure
<b>Step 1</b>	The professor should be contacted to discuss the grade disparity. The problem should be resolved at this level if at all possible.
<b>Step 2</b>	The student must make an appeal in writing to the professor noting specific objection to the grade received or the problem encountered. The professor must respond in writing giving justification for the grade or action given. <b>Copies of both communications should be forwarded to the program administrator.</b> The program administrator may decide the matter, if that is agreeable to all parties.
<b>Step 3</b>	An appeal committee will review both written and oral arguments in the case. The committee will consist of at least one administrative officer of the program, at least one faculty member who teaches in the program, and others as deemed necessary by the program administrator(s).
<b>Step 4</b>	The student and professor will be informed of the committee's decision and, barring any written objections to the committee by either party within fourteen calendar days, the recommendations of the committee will be accepted.
<b>Step 5</b>	If written objections are received within fourteen days, the matter will be referred to the Department Chair for review and resolution. <i>This step does not apply if the Director served on the appeal committee. In the latter case, the matter will be referred to the Dean of the HCNSO.</i>

## REGISTRATION

As part of the registration process, all students must complete the Nova Southeastern University Student Enrollment Agreement (SEA) each semester or risk being dropped from their courses. A copy of the verbiage in the SEA can be viewed at [nova.edu/registrar/forms/catch-the-sea-wave.pdf](http://nova.edu/registrar/forms/catch-the-sea-wave.pdf). A registration hold on a student's account does not prevent the student from completing the SEA. Students are encouraged to register online via SharkLink. Students who do not know their SharkLink username ID and password should visit [nova.edu/resources/nsuidentity.html](http://nova.edu/resources/nsuidentity.html).

All students must have at least provisional admission status, be officially registered, and pay tuition and fees in order to attend class, receive a grade, and receive academic credit. Students should register via SharkLink for the fall, winter, and summer semester during the open registration period, and take advantage of the university's online degree-evaluation tools for guidance (see "Online Degree Evaluation Tools" section for more details). Students should register for all courses they intend to complete within a semester and not wait until the semester has started to register for part of a term.

Registering early for the entire semester ensures availability of seats in required classes and allows the NSU Office of Student Financial Assistance to properly process and disburse the student's financial aid. An official grade will not be recorded, and credit will not be given for anyone who attends class as an unregistered student.

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### HOLDS

The following holds will prevent students from registering:

**NSU employee hold**—NSU employees must submit a Student Transaction Form (STF) to register. An online STF is available on the registrar's website; paper STF's may be submitted at the One-Stop Shop or the Office of the University Registrar.

**Other holds**—Other holds, such as a bursar or academic hold, may prevent students from registering. Students must contact the respective hold originator to resolve the hold before registering in SharkLink.

### STUDENT CONTACT AND PERSONAL INFORMATION

Students must keep their contact information current in [SharkLink](#), including preferred and permanent mailing addresses and phone numbers, to ensure that they will be able to receive important information sent by mail, such as tax forms from the Office of the University Bursar or notices from the Office of Student Financial Assistance. The Office of the University Bursar

also requires a valid mailing address to issue a financial aid refund. Students may update their address anytime by clicking on the green WebSTAR icon in the [SharkLink](#) application slider bar to access their personal information.

To make a change to other personal information, such as a name, Social Security Number, date of birth, or gender, Nova Southeastern University requires official documentation. Students must submit a completed Data Change Form available at [https://nova.edu/registrar/forms/data\\_change.pdf](https://nova.edu/registrar/forms/data_change.pdf) along with supporting legal documentation. For details on acceptable documentation for each change, visit the Registrar's website at <https://nova.edu/registrar/services.html>.

## ONLINE DEGREE EVALUATION TOOLS

NSU's online degree evaluation tools, Degree Works and Curriculum, Advising and Program Planning (CAPP) allows students to compare their completed coursework against the degree/certificate requirements published in the Graduate Program Catalog for the year in which they matriculated. These useful reference tools help students track their progress toward degree/certificate completion and are available through SharkLink. Degree Works is available for new incoming graduate students. Continuing graduate students will continue to use CAPP.

Degree Works and CAPP help students keep track of their completed coursework by applying it to each specific requirement (e.g., core and elective requirements).

Detailed instructions on how to view a CAPP Online Degree Evaluation are available at <https://nova.edu/capp>. For information on Degree Works, visit the registrar's website at <https://nova.edu/registrar>.

## ENROLLMENT REQUIREMENTS FOR FINANCIAL AID ELIGIBILITY

In order for students to receive any federal Title IV or state financial aid (grants, scholarships, student employment, and loans), they must be enrolled in a minimum number of courses that are required for degree/certificate completion (degree-applicable). Students may only receive financial aid for courses that are required for degree/certificate completion. Financial aid funds will only be disbursed to students who meet the minimum enrollment requirements for financial aid eligibility with degree-applicable courses. A student may maintain maximum financial aid eligibility while enrolled in non-degree-applicable courses if the student meets the enrollment requirements for each respective Title IV program with degree-applicable courses. For instance, in order to be eligible for federal loans, a student must be enrolled at least half time. Half time for HCNSO graduate programs is defined as 3-credits of coursework. Students enrolled in 3-credits of thesis or capstone research are considered full-time students.

## CLOSED CLASSES

Enrollment capacity for each class is carefully determined to reflect the physical limitations of the classroom or lab as well as the subject's most effective learning and teaching environment. Once a class has been filled and closed to further registration, students should meet with their academic advisor for help adjusting schedules and choosing alternative classes that meet degree program requirements.

Students may appeal to register for closed classes under exceptional circumstances. Student appeals must be made in writing by the student's academic advisor to the chair of the department in which the course is offered. **Appeals should not be directed to course instructors.** Department chairs review appeals and may consult instructors when considering such requests. All appeals must explain why no alternative class will support the student's degree requirements, explain why the student was unable to register for the class when space was available. If a student appeal is granted, the department chair will authorize the student's academic advisor in writing (e.g., by email) to register the student. However, the registration must be processed within 24 hours of the department chair's notification. If the registration is not processed within that time period, the authorization is removed, and the student's space in the closed class may be released to another student.

## DROPPING AND ADDING CLASSES

During the drop and add periods (the first week of class), students may modify their schedules by changing classes without any further academic implications. However, even during the drop and add period, dropping a class may result in a tuition charge, affect fees, or impact a student's financial aid. Students may withdraw from a class after the drop period has ended (see "Academic Calendars" section for deadlines). In extenuating circumstances, requests for changes to course registrations will be considered up to 20 days after each semester ends. Dropping a course may result in a refund for tuition paid and will not negatively affect the GPA. However, students need to be cautious because dropping classes may affect the student's enrollment status, eligibility for financial aid, and loan deferment. If a student drops below half-time or full-time status (whichever was the basis for financial aid awarded), the student may become ineligible for grant aid, loans, and scholarships that were awarded prior to the drop. This may cause a reduction in certain types of financial aid and, consequently, may result in a higher balance due.

Students are directed to make their course selection based on their program curriculum requirements and scheduling needs, not based on the instructor. Course instructors may



change without notice before or during the semester. In such instances, student petitions based on instructor preference will not be granted.

### DROP AND ADD PERIODS

The first week of each semester comprises the drop/add period. The drop/add period is the designated time frame in which course schedules may be edited before they become official. Students who add classes after they have started are responsible for all course requirements.

The second and third weeks of each semester are drop periods. Dropped courses are removed from the student's class schedule and will not appear on transcripts. A percentage of the student's tuition will be reversed as applicable. Only subsequent term (Term II) classes may be added during these weeks. See "Academic Calendars" section of this catalog for deadlines.

The withdrawal period starts with the fourth week of each semester and ends three weeks prior to the end of the semester. Students who intend to withdraw from all courses for a semester are encouraged to meet with their academic advisor and must submit a Student Transaction Form for the withdrawal to be processed.

### DROPPING CLASSES

Students who intend to drop all their classes for an upcoming semester may not process the full drop through SharkLink. Students must complete a Student Transaction Form and submit it to their academic advisor to process the full drop.

### WITHDRAWAL FROM CLASSES

Students may withdraw from a class after the drop period has ended up to three weeks prior to the end of the semester. Please refer to "Academic Calendars" section of this catalog for specific dates. Withdrawn courses will remain on student transcripts with a notation of W but will not affect the student's GPA. For information about the drop period, see "Dropping and Adding Classes" section of this catalog. Before withdrawing from classes, students are advised to consult with their academic advisor to discuss academic standing implications. Financial aid recipients are strongly encouraged to also speak with a financial aid counselor to avoid unwelcome that the change in enrollment status may affect their immigration status and eligibility for student visas.

Students may initiate a withdrawal from a course after the first three weeks from the start of the course. Students may withdraw from a course with no financial refund or credit until the third week before the class ends. For example, students may withdraw until the end of the fifth

week of a term for an 8-week course or until the end of the 13th week of a semester for a 16-week course. For exact dates, refer to “Academic Calendars” section of this catalog.

There is no financial refund if a student withdraws from a course. Total credits attempted are not reduced by course withdrawals. Withdrawals may affect a student’s financial aid eligibility; therefore, students should check with a financial aid counselor before making adjustments to their schedule. Not attending classes does not constitute official withdrawal. A student who stops attending classes will receive grades based on course requirements and work completed.

Withdrawals cannot be processed via SharkLink. Students who plan to withdraw from a course must notify their academic advisor. Withdrawal forms must be received and processed by academic departments prior to withdrawal deadlines.

## WITHDRAWAL FROM THE UNIVERSITY AND LEAVES OF ABSENCE

Students who plan to withdraw from all courses during a semester and leave the university must contact their academic advisor before withdrawing. Students who withdraw from the university must formally apply to be considered for readmission at a later date.

Unregistered students lose their online library privileges, including database searches and interlibrary loan. Students not registered for 6 months will automatically lose their email account. A leave of absence can impact student loan disbursement and repayment. See [www.nova.edu/financialaid/](http://www.nova.edu/financialaid/).

## LEAVES OF ABSENCE

A leave of absence may be granted in all HCNSO programs. Students who require a leave of absence for less than one year may return and continue their programs without reapplying to the university. If students have not registered for coursework for more than one year, they must reapply for admission, and their major program’s required curriculum will be reevaluated according to the requirements listed in the most current graduate program catalog.

A leave of absence for one or more terms may be granted under special circumstances if a student must interrupt thesis research or capstone review studies. The leave request must be submitted in writing and approved in writing. It is granted at the discretion of the Department Chair. Re-entry into the master’s program after a leave of absence should be requested in writing and is not guaranteed.

During the leave of absence, it is clearly understood that during a leave no NSU resources are to be used. The student is neither working on a research or review project nor is in communication with their advisor on academic subjects.

## MILITARY LEAVES OF ABSENCE

Students in the military whether active, reserve, or national guard desiring to take a leave of absence because of military deployment or changes in orders may request a leave of absence for the duration of the time indicated in their orders. To request a military leave of absence, students must contact and supply their academic advisor with a copy of the orders and complete a Student Action Request (SAR) form.

## STUDENT CONDUCT – ACADEMIC INTEGRITY

Students should refer to the full Code of Student Conduct and Academic Responsibility in the NSU Student Handbook ([nova.edu/student-handbook](http://nova.edu/student-handbook)). Conduct standards, supplementary standards, and university policies and procedures are handled by NSU's Office of the Vice President of Student Affairs or by the individual colleges as deemed appropriate.

Nova Southeastern University has established clear expectations regarding student conduct and academic responsibility. When these standards are violated, significant disciplinary action can be expected, including expulsion from the university. Students are expected to abide by all university, college, and program rules and regulations as well as all federal, state, and local laws. Students are also expected to comply with the legal and ethical standards of their chosen fields of study. Violations of academic standards are handled by the Office of the Dean of Halmos College of Natural Sciences and Oceanography.

## ACADEMIC INTEGRITY IN THE CLASSROOM

The university is an academic community and expects its students to manifest a commitment to academic integrity through rigid observance of standards for academic honesty. Faculty members are committed to uphold the standards of academic integrity and do their utmost to prevent academic misconduct by being alert to its possibility. If academic misconduct is detected, the faculty member communicates with the student and takes appropriate grade actions within the scope of the course. Faculty members report all violations of academic honesty to their departmental chairs.

Depending on the severity or reoccurrence of the academic misconduct, academic leadership can impose institutional sanctions. Deans, associate deans, or department chairs, at their discretion, may immediately suspend students pending a hearing on charges of violations. Sanctions may include academic misconduct warning, academic misconduct suspension, or academic misconduct dismissal, including notation on the student's academic transcript. Students found responsible for violations of academic integrity have the option of appealing the sanctions.

## ACADEMIC STANDARDS

Excerpt from the NSU Student Handbook ([nova.edu/student-handbook](http://nova.edu/student-handbook)).

The university is an academic community and expects its students to manifest a commitment to academic integrity through rigid observance of standards for academic honesty. The university can function properly only when its members adhere to clearly established goals and values. Accordingly, the academic standards are designed to ensure that the principles of academic honesty are upheld.

The following acts violate the academic honesty standards:

1. **Cheating:** intentionally using or attempting to use unauthorized materials, information, or study aids in any academic exercise
2. **Fabrication:** intentional and unauthorized falsification or invention of any information or citation in an academic exercise
3. **Facilitating Academic Dishonesty:** intentionally or knowingly helping or attempting to help another to violate any provision of this code
4. **Plagiarism:** the adoption or reproduction of ideas, words, or statements of another person as one's own without proper acknowledgment

Students are expected to submit tests and assignments that they have completed without aid or assistance from other sources. Using sources to provide information without giving credit to the original source is dishonest. Students should avoid any impropriety or the appearance thereof in taking examinations or completing work in pursuance of their educational goals.

Students are expected to comply with the following academic standards:

### 1. **Original Work:**

Assignments such as course preparations, exams, texts, projects, term papers, practicum, etc., must be the original work of the student. Original work may include the thoughts and words of another author. Entire thoughts or words of another author should be identified using quotation marks. At all times, students are expected to comply with the university and/or academic program's recognized form and style manual and accepted citation practice and policy.

Work is not original when it has been submitted previously by the author or by anyone else for academic credit. Work is not original when it has been copied or partially copied from any other source, including another student, unless such copying is acknowledged by the person submitting the work for the credit at the time the work is being submitted, or unless copying,

sharing, or joint authorship is an express part of the assignment. Exams and tests are original work when no unauthorized aid is given, received, or used before or during the course of the examination, re-examination, and/or remediation.

## **2. Referencing the Works of Another Author:**

All academic work submitted for credit or as partial fulfillment of course requirements must adhere to each academic program's specific accepted reference manuals and rules of documentation. Standards of scholarship require that the writer give proper acknowledgment when the thoughts and words of another author are used. Students must acquire a style manual approved by their program and become familiar with accepted scholarly and editorial practice. Students' work must comport with the adopted citation manual.

At Nova Southeastern University, it is plagiarism to represent another person's work, words, or ideas as one's own without use of a center-recognized method of citation. Deviating from program standards (see above) are considered plagiarism at Nova Southeastern University.

## **3. Tendering of Information:**

All academic work must be the original work of the student. Knowingly giving or allowing one's work to be copied, giving out exam questions or answers, or releasing or selling term papers is prohibited.

## **4. Acts Prohibited:**

Students should avoid any impropriety or the appearance thereof, in taking examinations or completing work in pursuance of their educational goals. Violations of academic responsibility include, but are not limited to the following:

- Plagiarism Any form of cheating
- Conspiracy to commit academic dishonesty
- Misrepresentation
- Bribery in an attempt to gain an academic advantage
- Forging or altering documents or credentials
- Knowingly furnishing false information to the institution

Students in violation will be subject to disciplinary action.

## ACADEMIC MISCONDUCT REPORTING, SANCTIONS, AND APPEAL

Faculty members are responsible for assessing classroom conduct including academic misconduct. Faculty members are required to report any incident of misconduct to their department chair and the college's Office of the Dean. These reports are reviewed for institutional sanction, which is distinct from a grading consequence administered by the faculty member.

A student may appeal an academic misconduct sanction of suspension or dismissal. This appeal will only address the sanction and not whether academic misconduct took place. If a student wishes to address an academic misconduct report, he/she should follow the "Grade/Academic Grievances" section of this catalog.

## TUITION AND FEES

### PH.D. TUITION AND FEE CHART

EXPENSE TYPE	ESTIMATED EXPENSE
<b>Tuition</b>	\$12,973 per term (\$38,919/year)
<b>Application Fee</b>	\$50 nonrefundable
<b>Seat Deposit</b>	\$100 (nonrefundable; payable after acceptance and credited toward tuition)
<b>Registration Fee</b>	\$30 per-semester nonrefundable
<b>Graduation Fee</b>	\$100 per-term
<b>Deferment Fee for Installment Payment</b>	\$75 per-term
<b>Student Services Fee</b>	\$225 - 0-3 credit hours \$450 - 4 credit hours or more
<b>Application for Degree</b>	\$100

Graduate course laboratory fees are on a class by class basis. These are posted in NSU's [Course Wizard](#) by term.

## M.S. AND GRADUATE CERTIFICATE TUITION AND FEE CHART

EXPENSE TYPE	ESTIMATED EXPENSE
<b>Tuition</b>	\$1,390 per credit hour
<b>Application Fee</b>	\$50 nonrefundable
<b>Seat Deposit</b>	\$100 (nonrefundable; payable after acceptance and credited toward tuition)
<b>Registration Fee</b>	\$30 per-semester nonrefundable
<b>Graduation Fee</b>	\$100
<b>Deferment Fee for Installment Payment</b>	\$75 per-term
<b>Student Services Fee</b>	\$225 - 1-3 credit hours \$450 - 4 credit hours or more
<b>Application for Degree</b>	\$100

Graduate course laboratory fees are on a class by class basis. These are posted in NSU's [Course Wizard](#) by term.

## EXPLANATION OF TUITION RATES

Tuition and fee charges are automatically calculated when students register for classes, and students are expected to pay in full at the time of registration through SharkLink or their NSU eBill account. Detailed payment instructions and additional information on payment options is available on the Bursar's website at [nova.edu/bursar](http://nova.edu/bursar).

## ENROLLMENT REQUIREMENTS

### PH.D. ENROLLMENT

Ph.D. students pay full tuition while in active status; that is, while taking courses, finalizing the proposal, performing research, and writing the dissertation. Once Ph.D. activity has begun, registration is sequential each term. Full tuition must be paid each term. Failure to register for a particular term is not permitted without prior written approval by the Department Chair and may signal the student's resignation from the degree. Minimum registration is 3-credits.

### M.S. ENROLLMENT

#### BIOLOGY CONCENTRATION (CAPSTONE/THESIS)

The M.S. in Marine Science (all concentrations) and the M.S. in Biological Science (Capstone/Thesis concentration) are not lock-step programs. Students in those two programs may go at their own pace, with a minimum of 3-credits per term. Students may not take more than 9 credits per semester. Students may request to take 12 credits in a semester, under special circumstances. Students are cautioned that any courses within a term can affect financial aid and student employment.

#### HEALTH STUDIES CONCENTRATION

The M.S. in Biological Sciences Health Studies concentration is a lock-step program beginning in the summer term. Students must complete the curriculum in the order set out in the curriculum plan.

## FULL TIME STATUS

The following are requirements for full time student status at HCNSO.

### PH.D.

One doctoral level class or enrollment in dissertation/thesis or qualifying exam.

### M.S.

6 credit hours minimum (3 credit hours minimum during capstone/thesis or qualifying exams)



## PAYMENT

### PAYMENT POLICY

By registering for courses at Nova Southeastern University, the student accepts financial responsibility for payment. The student is responsible for the full balance on the account plus any additional costs which may be incurred by the university in the collection of these debts. Payment is due in full at the time of registration. The middle of each month, email notifications are sent stating that NSU eBills are available for review online. However, students should not wait for their billing statement to pay their tuition and fees to avoid late charges.

If a student has a balance at 30 days after the start of the semester, a hold and a \$100 late fee will be placed on the account. The hold stops all student services, including but not limited to access to the university's recreational facility (NSU RecPlex) and transcripts. A student will not be able to register until all outstanding balances from previous semesters have been paid in full. Holds must be cleared before the end of the drop/add period in order for a student to register.

### METHODS OF PAYMENT

NSU accepts Visa, MasterCard, and American Express. Check payments include traveler's checks, cashier's checks, personal checks, and money orders. International checks must be in U.S. funds only and drawn on a U.S. bank. Wire transfers are accepted. Electronic check and credit card payments can also be made through NSU eBill, SharkLink, or WebSTAR. Students can access NSU eBill using their SharkLink ID and password to authorize other individuals (e.g. parent, spouse, or grandparent) to view their bill and make payments to their account. Credit card authorization forms can be downloaded from the Bursar's website at [nova.edu/bursar/forms/cc\\_authorization.pdf](http://nova.edu/bursar/forms/cc_authorization.pdf) and faxed to (954) 262-2473. Students may also mail a payment to the Office of the University Bursar or make payments in person at the One-Stop Shops on the NSU Fort Lauderdale/Davie Campus. For more details, visit [nova.edu/bursar/payment/pay\\_my\\_bill.html](http://nova.edu/bursar/payment/pay_my_bill.html).

### DECLINED PAYMENT POLICY

NSU assesses a \$25 declined payment fee for each declined payment, including payments made by check or credit card.

The Bursar's Office reserves the right to refuse personal checks from students, whose previous check payments have been declined more than once. These students will be required to submit payment by money order, credit card, or certified check.

## NSU PAYMENT PLANS

NSU students (with the exception of international students) who wish to defer payment of their tuition, fees, and other institutional charges, due at the time of registration, may sign up for an NSU payment plan. For detailed information including payment plan application deadlines, visit [nova.edu/bursar/payment/payment\\_plans.html](http://nova.edu/bursar/payment/payment_plans.html).

## TUITION DIRECT BILLING

A student whose employer, sponsor, or guarantor has agreed to be direct-billed by NSU must notify the Office of the University Bursar accordingly. The student must complete the following upon registration:

- provide a voucher, financial guarantee, letter of credit or eligibility from the respective payer with the amount and enrollment period for which funds are to be applied when charges are due at the time of registration.
- pay any amount due not covered in the billed party documentation.

## TUITION REIMBURSEMENT

Some employers/sponsors/guarantors make payments directly to the student. Students must complete the following upon registration:

- Pay charges in full for the semester/term to be reimbursed.
- Send an email to [bursar@nova.edu](mailto:bursar@nova.edu) from their SharkLink (NSU) email account to request a receipt of paid charges.

## CONSEQUENCES OF NONPAYMENT

The student's failure to meet financial obligations at the end of 30 days from the start of the semester, in accordance with university policy, will result in an email notification being sent to the student informing him or her of failure to resolve his or her financial obligation.

The Office of the University Bursar shall:

- notify students who have failed to meet their financial obligation after 30 days from the start of the semester;
- place a financial hold and late fee of \$100 on the student's account. A financial hold prevents a student from obtaining grades, registering for classes, and accessing the university's recreational facility (NSU RecPlex) until all outstanding balances are paid in full.

## REFUND POLICIES

### REFUND OF ADMISSIONS DEPOSITS

A \$100 deposit is paid upon admissions to all HCNSO graduate programs. This is non-refundable.

### REFUNDS OF TUITION AND FEES

Pro-rated tuition refunds are limited to the first three weeks of each semester according to the policies outlined below for each program. All fees will be refunded to student accounts prior to the first day of classes for a semester. Non-attendance does not constitute an official drop. Students must formally drop courses in order to be eligible for a refund. Contact an academic advisor for assistance.

Please note that students must be officially registered prior to the start date of course(s) in order to participate in and receive academic credit for those courses. The “start date” is generally through the first week of the semester. Students are responsible for reviewing their registration and academic records each semester for accuracy. In extenuating circumstances, petitions for changes to course registration may be accepted up to 20 days after each semester ends.

Students will not be charged tuition for each course dropped in SharkLink by the end of the first week of the semester (drop/add period).

In order to drop classes after the official add/drop period, students must submit a Student Transaction Form to the Registrar’s Office, the One-Stop Shops (located in the Horvitz and Terry Administration buildings), or the program office.

The following applies:

- Drops through the seventh day of term in which the class begins: 100 percent
- Drops during the eighth through 14th day of term: 75 percent
- Drops during the 15th through 21st day of term: 50 percent
- Withdrawals after the 21st day of term: no refund

### PROCESSING OF REFUNDS FOR TUITION AND FEES

For tuition refund requests to be considered, students must provide written notification to their academic advisor. Refund amounts are based on the date of written notification, such as the date of sent email (must be from an NSU email account) or postmark for mailed requests. For

general registration, drop/add, and withdrawal policies, refer to “Registration” section of this catalog.

#### REFUNDS FOR DISMISSED STUDENTS

Students who are expelled from NSU will not receive tuition refunds.

#### REFUNDS FOR COURSE CANCELLATIONS

The university reserves the right to cancel any course or section when registered enrollments are low. The university will refund 100 percent of tuition and any associated class fees for courses that are cancelled. If a student registered for only one course, the registration fee and student services fee will also be refunded.

#### EXCEPTIONS TO TUITION AND FEES REFUND POLICIES

Refunds or credits to student accounts may be considered after the drop period if proof of extenuating circumstances exists. Students should contact their academic advisor with questions about extenuating circumstances. Requests for refunds must be made during the same semester in which courses are scheduled.

It is the student’s responsibility to provide all necessary documentation. Academic advisors will forward requests to appropriate directors/chairs for consideration.

#### FINANCIAL AID REFUNDS

Financial aid is intended to cover educational expenses. If the total amount of your financial aid award for the semester exceeds the institutional charges on your NSU student account, (e.g., tuition, fees, campus housing, NSU health insurance, meals), you may receive a financial aid refund. If you are eligible to receive a refund, you will be receiving your refund in form of a check unless you have completed a Direct Deposit Authorization or the account has been paid by credit card or gift card, in which case the excess credit will be returned to your card. Therefore, students are advised to retain any gift cards used to make payments. For detailed information about financial aid refunds, visit [nova.edu/bursar/refunds/financial\\_aid\\_refunds.html](http://nova.edu/bursar/refunds/financial_aid_refunds.html)

#### VETERANS’ EDUCATION BENEFITS

Department of Veterans Affairs (DVA) educational benefits are designated to provide eligible individuals with an opportunity for educational and career growth. Eligible veterans and their dependents should contact the Veterans Benefits Administrator Office at (954) 262-7236, toll free 800-541-6682, ext. 27236, Monday through Friday, between the hours of 8:30 a.m. and

5:00 p.m., or visit the office in the Horvitz Administration Building on the Fort Lauderdale/Davie campus. Detailed information is also available on the veterans education benefits web page at [nova.edu/financialaid/veterans/](http://nova.edu/financialaid/veterans/). If you have any questions concerning eligibility, you may also contact the U.S. Department of Veterans Affairs (DVA) at 888-442-4551 or visit their website at [benefits.va.gov/gibill/](http://benefits.va.gov/gibill/).

#### GRADE/PROGRESS REPORTS FOR STUDENTS RECEIVING VETERANS' BENEFITS

Nova Southeastern University furnishes each student with a Notification of Posting of Grade with instructions on how to view an unofficial transcript that shows current status of grades and earned semester hours for all courses completed and/or attempted, and grades for courses in which the student is currently enrolled. At the end of every evaluation period (e.g., term, semester) each veteran can request an official transcript which shows the current status of grades and earned semester hours for all courses completed and/or attempted. This transcript can be obtained from the One-Stop Shop in the Horvitz Building or online at <https://sharklink.nova.edu/> for a \$10 fee.

## ACADEMIC RESOURCES AND STUDENT SERVICES

### ACADEMIC ADVISING

HCNSO has a centralized group of graduate academic advisors. Academic advisors provide students with confidential academic, social, and developmental advising to ensure they receive the individual attention they need to succeed. Students are required to contact an academic advisor prior to registering for their first semester.

Students should maintain regular contact with their academic advisors throughout their academic careers at NSU. Students are encouraged to consult with an academic advisor if they believe their rights as students are being, or have been, violated. Students are also encouraged to discuss aspects of their education with faculty members, and program administrators.

### CAREER DEVELOPMENT

The Career Development office provides NSU students the individual attention needed to reach their career goals. Students are coached on how to further explore their major while developing a competitive resume and cover letter, refining individual interviewing skills, selecting an internship, applying to graduate school and supporting overall career planning needs. In addition, students have access to Handshake, a cutting-edge career platform that serves as a career one-stop-shop.

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### EMPLOYER RELATIONS

The Employer Relations team provides an array of opportunities that enhances a students' academic experience and cultivates their professional and personal development through employer programming including:

- Career and Internship Fairs
- Case Competitions
- Networking and Industry focused events
- Company Site Visits
- On-campus Interviews
- Resume and Interview Critiques

For more information, contact the Office of Career Development at (954) 262-7201 or [career@nova.edu](mailto:career@nova.edu) or visit [nova.edu/career](http://nova.edu/career).

## DISABILITY SERVICES

The Office of Student Disability Services provides reasonable accommodations for qualified students with documented disabilities enrolled at NSU, regardless of location or instructional delivery format. The Office of Student Disability Services and its designated representatives are available to advise students regarding eligibility for classroom and testing accommodations and other disability related services. The process for obtaining a reasonable accommodation(s) is an interactive one that begins with the student's disclosure of disability and a request for a reasonable accommodation(s). The student has the responsibility to provide Nova Southeastern University with proper documentation of disability from a qualified physician or clinician who diagnoses disabilities and sets forth the recommended accommodation(s). Student requests for accommodation(s) will be considered on an individual basis. Each student with a disability should contact the Office of Student Disability Services prior to the commencement of classes to discuss his or her needs.

To obtain more information from the Office of Student Disability Services, please call (954) 262-7185, email [disabilityservices@nova.edu](mailto:disabilityservices@nova.edu), or visit our website at [nova.edu/disabilityservices](http://nova.edu/disabilityservices).

## STUDENT COUNSELING

### HENDERSON STUDENT COUNSELING CENTER FOR NSU STUDENTS

Services provided at the center include: treatment for anxiety, panic and depression; anger management; financial stress; social struggles; chronic illnesses; abuse; suicidal thoughts; break-ups and divorce; assault; and many other areas affecting a student's quality of life. In addition to the office hours listed below, a crisis hotline is available 24 hours a day, seven days a week to give support and counseling by phone. More information is available on their [website](#).

#### LOCATION AND HOURS OF OPERATION

##### **Location**

3440 S. University Drive, Davie, FL 33328

##### **Phone Numbers**

Office: 954-424-6911 or 954-262-7050

Fax: 954-424-6915

**Hotline:** 954-424-6911 or 954-262-7050 (available 24 hours, 7 days a week)

##### **Hours**

Monday, Thursday: 8:30 a.m. - 6:00 p.m.

Tuesday, Wednesday: 8:30 a.m. - 8:00 p.m.

Friday: 8:30 a.m. - 5:00 p.m.

## SUICIDE AND VIOLENCE PREVENTION

The Suicide and Violence Prevention staff are devoted to creating a safety net at NSU, helping to prevent suicide and violence. The most effective ways to prevent suicide and violence are to know the warning signs, take them seriously, and help the individual access the appropriate resources. The only real risk is in doing nothing. More information is available at their [website](#).

## STUDENT HEALTH INSURANCE REQUIREMENT

NSU requires all students to carry adequate health insurance coverage. Therefore, students will automatically be enrolled in the NSU Student Health Insurance Plan, and their student accounts will be charged when they register for classes. Students who already have health insurance must opt out of the NSU Student Health Insurance Plan each academic year by the given waiver deadline for their program. For detailed information, including waiver deadlines, access to the online waiver, NSU Student Health Insurance Plan features, costs, and more, students should visit the Bursar's website at [nova.edu/studentinsurance](http://nova.edu/studentinsurance).

## ENROLLMENT AND STUDENT SERVICES

Enrollment and Student Services (ESS) is comprised of the Office of Student Financial Assistance (OSFA), the Office of the University Registrar, the Office of the University Bursar, NSU Student Health Insurance, the One-Stop Shops in the Horvitz and Terry Administration Buildings, the University Call Center, Enrollment Processing Services/Admissions Management Services, Transfer Evaluation Services, Health Professions Divisions (HPD) Office of Admissions, and SharkCard Services. Collectively, ESS's ultimate goal is to exceed the information and service needs of all NSU students.

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## MEANS OF COMMUNICATION WITH STUDENTS

ESS' official means of communicating with students is via SharkLink and NSU email. Students are encouraged to access SharkLink at <https://sharklink.nova.edu> to complete the following tasks:

- check their NSU email
- access their financial aid information
- request official transcripts and view unofficial transcripts
- view their student accounts
- make payments
- access their grades
- register for and drop courses



- view their course schedule
- access their online degree evaluation (CAPP)
- obtain enrollment verification
- change their primary and mailing addresses and phone numbers
- apply for student employment jobs
- sign the Student Enrollment Agreement (SEA)

#### OFFICE OF STUDENT FINANCIAL ASSISTANCE

The NSU Office of Student Financial Assistance (OSFA) is dedicated to helping students make educated financial choices while attending college. The OSFA administers federal, state, and institutional aid programs such as grants, scholarships, federal work-study funds, and loans. In order to be eligible for these programs, students must complete the Free Application for federal Student Aid (FAFSA) at [fafsa.gov](https://fafsa.gov). The NSU Federal School Code is 001509. For detailed financial aid information, visit [nova.edu/financialaid](https://nova.edu/financialaid).

#### OFFICE OF THE UNIVERSITY REGISTRAR

The Office of the University Registrar offers a variety of services to the university community. These services include, but are not limited to, course registration, transcript processing, name and address change, loan deferment, enrollment and degree verification, grade processing, commencement, degree conferral, and diploma printing. For more information, visit [nova.edu/registrar](https://nova.edu/registrar).

#### OFFICE OF THE UNIVERSITY BURSAR

The Office of the University Bursar is responsible for billing students, collecting and depositing payments, sending invoices and receipts, distributing student educational tax forms, issuing refunds from excess financial aid funds, and verifying students' eligibility for financial aid funds. NSU Student Health Insurance is also housed within this office. For more information, visit [nova.edu/bursar](https://nova.edu/bursar).

## FINANCIAL ASSISTANCE

### FINANCIAL AID CHECKLIST

#### **1. Complete the FAFSA.**

Students should complete the Free Application for Federal Student Aid (FAFSA) at [fafsa.gov](https://fafsa.gov) annually. It becomes available each October 1 for aid in the following award year. The earlier students apply, the better chance they have of being considered for maximum available funds.

#### **2. Identify and apply for scholarships.**

Institutional and external scholarship opportunities are available to assist students in meeting their educational goals. The best resource for up-to-date information is the NSU scholarship website located at [nova.edu/financialaid/scholarships](https://nova.edu/financialaid/scholarships). Students will find information on how to apply, as well as resources to help them identify scholarships. Students should commit to continuously identifying and applying for scholarships. This type of financial aid does not have to be repaid.

#### **3. Plan for housing and meal expenses.**

The budget includes a housing and meal component. Students should ensure that they budget for these expenses.

#### **4. Check your financial aid account regularly.**

Students should log in to SharkLink at <https://sharklink.nova.edu> and regularly check their financial aid status to ensure that there are no outstanding requirements. Students who must submit additional documents in order to be awarded financial aid will also be notified via NSU email.

#### **5. Students must accept, reduce, or decline loan and federal work-study award(s).**

The financial aid award notice provides students with detailed instructions on how to accept, reduce, or decline their financial aid award. Loan awards are not disbursed and students are not able to apply for student employment jobs in JobX until this step has been completed.

#### **6. Complete Master Promissory Note and Entrance Counseling.**

Students interested in receiving Federal Direct Loans are required to complete a Direct Loan Master Promissory Note (MPN) and entrance counseling at [studentloans.gov](https://studentloans.gov).

## 7. Register for classes (early).

Students are to use NSU's online degree-evaluation systems CAPP and Degree Works to keep track of completed and outstanding degree requirements when registering for courses. For more information, see the Online Degree Evaluation Tools section. In order for students to receive any federal financial aid (grants, scholarships, Federal Work-Study, and loans), they must register for a minimum number of credits that are required for degree/certificate completion (degree-applicable) as published in the catalog from the year the student matriculated. Enrollment requirements for federal and state grants vary. Students awarded federal direct loans must be enrolled at least half time in degree-applicable courses.

## STUDENT EMPLOYMENT

There are four student employment programs:

- Federal Work-Study (FWS)
- Florida Work Experience (FWEPE)
- Nova Southeastern University Student Employment (NSE)
- Job Location and Development (JLD)

The Nova Southeastern University Student Employment and Job Location Development programs provide jobs to students regardless of financial need. FWS and FWEPE are need-based and require the completion of the FAFSA. Students awarded FWS may participate in the America Reads/America Counts Programs through which students serve as reading or math tutors to elementary school children. For more information on NSU student employment, including information on how to apply for jobs and the Student Employment Manual, visit [nova.edu/financialaid/employment/](http://nova.edu/financialaid/employment/). New and exciting on- and off-campus jobs are available throughout the year.

## SCHOLARSHIPS

Each year, HCNSO has a limited number of scholarships available to graduate students. Prospective students should contact the program office for availability.

## LOANS

Graduate students may be eligible to receive aid from the following sources. Please carefully read the process and requirements for each below.

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### FEDERAL LOAN PROGRAMS

- [Federal Direct Unsubsidized Loan](#)

- [GRAD Plus](#)

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#### ADDITIONAL SOURCES

- [Alternative/Private Loans](#)
- [NSU Payment Plan](#)

### SATISFACTORY ACADEMIC PROGRESS (SAP)

In order to receive financial assistance, a student must continually meet Satisfactory Academic Progress (SAP) requirements established by the Department of Education. These progress requirements include the following four criteria: quantitative (annual credits), qualitative (grade point average), maximum time frame (total allowable credits, and pace (overall credits completed). SAP requirements are published at [nova.edu/financialaid/eligibility/sap-standards.html](http://nova.edu/financialaid/eligibility/sap-standards.html).

Students who fail to meet SAP during the 2019–2020 academic year will not be eligible for federal financial aid.

### NSU STUDENT HANDBOOK

The NSU Student Handbook addresses general university policies for NSU students, including student life, student rights and responsibilities, university policies and procedures, and NSU resources. The NSU Student Handbook can be viewed at [nova.edu/student-handbook](http://nova.edu/student-handbook).

### OFFICE OF INTERNATIONAL AFFAIRS (OIA)

The Office of International Affairs (OIA) serves as a base for the university's international initiatives, international student services, education abroad, and international risk management travel registration procedures. The OIA also provides ongoing assistance and support for all members of the university community engaged in campus internationalization, global partnerships and exchanges and other globalization efforts.

- The Office of International Students and Scholars (OISS) provides immigration, orientation, counseling and overall assistance to all new and continuing international students, visiting scholars, and faculty on and off campus.
- The Office of Education Abroad (OEA) provides comprehensive assistance to all students (domestic and international) who wish to travel abroad on any of the many international travel experiences offered at the institution including summer semester, and academic year study abroad programs, faculty-led travel study programs, international internships and international service learning opportunities.

The OIA is committed to welcoming international students, scholars, and their families while facilitating their transition to life at Nova Southeastern University. For further information, contact OIA at (954) 262-7240 or visit the website at [nova.edu/internationalaffairs](http://nova.edu/internationalaffairs).

## ORIENTATION

A mandatory orientation session is held every fall for incoming in-house students and may be held at other times for groups of incoming students to inform them about the facilities, Ph.D. and M.S. program requirements. It is recommended that students not starting in the fall meet with the Assistant Director of Graduate Admissions during their first term. If a student cannot attend the orientation in person, they will be required to view the orientation information posted on NSU's Canvas. The program office must be alerted if a student cannot attend the orientation in person.

## TECHNICAL HELP

The Help Desk is dedicated to serving the NSU community from enrollment to graduation and beyond. Help Desk services include, but are not limited to, computer and browser configuration for NSU online resources; SharkLink account support; academic specified program installations; email configuration; basic network troubleshooting and configuration, and mobile device support. For technical help, call (954) 262-4357; 800-541-6682 ext. 24357; or email [help@nova.edu](mailto:help@nova.edu).

## VETERANS' RESOURCE CENTER

The Mission of the Nova Southeastern University Veterans Resource Center (VRC) is to link veterans with university and community resources. In addition, the VRC provides a welcoming environment for student veterans to study, connect and relax. The VRC is located on the second floor of the Rosenthal Student Center in Room #218. The room is open from 7:00 am to 10:00 pm., seven days a week.

For more information about NSU's Veterans Resource Center, call (954) 262-FLAG (3524) or email [vrcc@nova.edu](mailto:vrcc@nova.edu), or connect with us at [www.facebook.com/NSUVets/](http://www.facebook.com/NSUVets/) or [www.instagram.com/nsuvets/](http://www.instagram.com/nsuvets/).

## WRITE FROM THE START WRITING AND COMMUNICATIONS CENTER

The NSU Write from the Start Writing and Communication Center (WCC) is an innovative workspace where students, consultants, and faculty from all disciplines come together, in person and online, to discuss and develop writing and communication skills.

Located on the 4th floor of Alvin Sherman Library, the WCC offers all NSU students one-on-one assistance at any stage of the process, from brainstorming through final editing. WCC consultants help students develop and strengthen general writing and communication skills during face-to-face or online consultations.

Services include assistance on academic projects (essays, lab reports, theses, dissertations); digital projects (presentations, posters, infographics); professional projects (articles for publication); personal projects (creative writing); oral presentations.

For more information or to make an appointment, students can visit the WCC website at [nova.edu/wcc](http://nova.edu/wcc) or call (954) 262-4644.

## GRADUATE PROGRAM CURRICULA

The following items are required for numerous programs. Information specific to an individual program is found later in this document.

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### SEMINAR REQUIREMENT – DEPARTMENT OF MARINE & ENVIRONMENTAL SCIENCES

As part of the curriculum for the Department of Marine and Environmental Sciences, students in the Ph.D. and M.S. in Marine Science programs are required to attend a minimum of eight seminars for this 0-credit/0-cost seminar series before they graduate. Research and defense seminars count towards this number. Students can also fulfill this requirement online using Canvas and SharkMedia if they are unable to attend in person.

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### REPORT OF PROGRESS – CAPSTONE/THESIS/DISSERTATION

The report of progress is required from each student registered for thesis, capstone, DIS, or dissertation credits by the end of each term of registration before a grade is issued. The completed report is turned into the Program Office by the student's advisor. *Not submitting the Report of Progress prior to the end of term will result in failing the thesis, capstone, or Directed Independent Study (DIS) credits for that term.*

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### REQUIREMENTS FOR REPORT OF PROGRESS

The report of progress is a summary of all the research work completed in the current term. The form can be found online at <http://cnso.nova.edu/forms/report-of-progress.pdf>.

- Only for students currently registered for following courses need to submit the report:
  - Ph.D. Candidates
    - Directed Study
    - Dissertation

- M.S. Students
  - Directed Independent Study
  - Capstone
  - Thesis
- Report of Progress is due at the end of term. Defending students do not need to submit the report.
- The form must be submitted to the student's major professor for signature and comments. The report must include the following:
  - Student's name and date
  - A brief narrative of synopsis of the work completed since the last report (for example, details of experiments conducted, and literature reviewed)
  - Target date for thesis/capstone completion
  - Estimate of time spent on thesis/capstone work for the term
  - A list of problems experienced (if any)
  - Major Professor's comments
  - Major Professor's signature
- **Failure to turn in a report of progress is an automatic F for the term.**

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## DISSERTATION/CAPSTONE/THESIS FINAL PAPER STRUCTURE

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### DISSERTATION STRUCTURE

The dissertation structure is up to the Ph.D. candidate's committee. However, it must contain the following:

<b>Dissertation Style</b>
<b>Title page</b>
<b>Table of Contents (detailed outline, using outline headings in text, same format)</b>
<b>References</b>

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## CAPSTONE STRUCTURE

The capstone should (at minimum) contain the following sections:

Capstone Style
Title page
Table of Contents (detailed outline, using outline headings in text, same format)
Introduction
Statement of Purpose or Objectives
Methods
Results or Review
Summary and Conclusions
References

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## THESIS STRUCTURE

The thesis should (at minimum) contain the following sections:

Thesis Style
Title page
Approval page
Abstract
Acknowledgments
Preface (optional)
Table of Contents - (detailed; this serves as the outline and section headers as well)

The body of the thesis must contain:

Thesis Body Requirements
Introduction
Statement of Purpose or Objectives
Methods and Materials
Results
Discussion Summary and Conclusions
References
Appendices (if applicable)



## COPYRIGHTS

The directions for each track and the Ph.D. programs are found under their specific curriculum. As part of the online submission process, students will be required to upload the paper into NSU's Institutional Repository, [NSUWorks](#). Please review the copyright statements contained therein before submission. While entering text into the appropriate fields, the student must take note that the email address provided will be the only form of contact for your paper in the event that someone needs to ask for your permission to use or view it. Please use a permanent email address. Embargoes will only be approved for works that are being published in a journal or if a grant stipulates an embargo.

## PH.D. CURRICULUM

The Ph.D. degree consists of upper-level course work and original research on a selected topic of importance in the ocean sciences. Courses consist of required general core courses as well as tutorial studies with the major professor. With permission of the Department of Marine and Environmental Sciences chair, students may transfer in core classes.

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### COURSES

Ph.D. candidates must have at least 42-credits of upper level coursework. These can be tutorials with their major professors or from the roster of M.S. in Marine Science classes found in this catalog.

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### ACADEMIC COURSE APPROVALS

Ph.D. candidates may transfer up to 30 graduate course credits from prior graduate programs in the same discipline as their anticipated Ph.D. Transfer courses must be either reasonable duplicates of courses offered at NSU or clearly in an applicable Ph.D. field of interest. Transfer acceptability will be decided by the Department Chair, the student's advisors, and the student's dissertation committee.

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### RESEARCH CREDITS

At least 24 credits of the Ph.D. must consist of Dissertation credits (OCGY-8000). The candidate may not register for dissertation credits until after successfully defending the research proposal. Prior to this defense, the student may register for Directed Study credits (OCGY-0799). After faculty acceptance of the research proposal the student must register for a minimum 3 Dissertation credits (OCGY-8000) per term until completion of the degree.

## M.S. IN BIOLOGICAL SCIENCES CURRICULUM

The M.S. in Biological Sciences consists of two concentrations. Students are either admitted to the health studies concentration or the biology (capstone/thesis) concentration. The health studies concentration requires 10 courses for a total of 30 credits. The capstone/thesis concentration requires a minimum of 36-credits. All students entering the capstone/thesis concentration start on the capstone track and may join the thesis track if all requirements are met.

There are four core courses common to both tracks.

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**CORE COURSES FOR ALL CONCENTRATIONS**

The common core courses are as follows:

Course Number	Course Name	Credit Hours
BCOR 5000	Graduate Seminar	3
BCOR 5150	Immunobiology	3
BCOR 5350	Principles of Epidemiology	3
BCOR 5585	Genomics	3

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**REQUIRED ELECTIVE COURSES FOR CAPSTONE/THESIS CONCENTRATION**

The biology (capstone/thesis) concentration requires an additional two courses:

Course Number	Course Name	Credit Hours
BCOR 5570	Biostatistics	3
BCOR 5580	Scientific Method and Experimental Design	3

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**HEALTH STUDIES CONCENTRATION CURRICULUM**

This is a 12 month, 30-credit program of study which only begins with the summer semester and includes the fall and winter semesters. The following is the breakdown of the number of courses required for this track:

Type of Course	Health Studies
Core Courses	4
Required Electives	6
<b>Total Number of Courses</b>	<b>10</b>

A standardized Test Prep course will be available during the summer for students wishing to avail themselves of this before taking their standardized examinations. The course will be given at a discounted rate to students registered for the Summer and Fall semesters.

Each student will be assigned a faculty mentor upon registration.

**To successfully complete this concentration, the student must pass all courses as well as a standardized-styled comprehensive exam at the end of the Winter semester. There will be two opportunities to take the exam before graduation.**

The following is a sample of the 12-month lockstep curriculum for the Health Studies Concentration:

<b>Summer Term</b>		
<b>Course Number</b>	<b>Course Name</b>	<b>Credit Hours</b>
<b>BCOR 5000</b>	Graduate Seminar	3
<b>BMHS 5105</b>	Physical Diagnostic Skills	3
<b>Fall Term</b>		
<b>BMHS 5200</b>	Pathophysiology	3
<b>BMHS 5300</b>	Pharmacodynamics	3
<b>BMHS 5400</b>	Advanced Regional Anatomy/Lab	3
<b>BMHS 5500</b>	Advanced Biochemistry	3
<b>Winter Term</b>		
<b>BCOR 5585</b>	Genomics	3
<b>BCOR 5150</b>	Immunobiology	3
<b>BMHS 5250</b>	Systems Neuroscience	3
<b>BCOR 5350</b>	Principles of Epidemiology	3

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**M.S. BIOLOGICAL SCIENCES CAPSTONE/THESIS CONCENTRATION CURRICULUM**

The M.S. Biological Sciences capstone/thesis concentration is a 36-credit program to prepare students for advanced study in the biological sciences or in careers. While both require a written paper (capstone or thesis), the thesis requires original data and analysis, thus additional thesis research credits are required.

The following is the breakdown of the number of courses required for each path of study in the M.S. Biological Sciences Capstone/Thesis Concentration. Each course is worth 3-credits.

Type of Course	Capstone	Thesis
<b>Core Courses</b>	4	4
<b>Required Electives</b>	2	2
<b>Free Electives</b>	3	1
<b>Capstone/Thesis</b>	3	5
<b>Total Number of Courses</b>	12	12

## M.S. IN MARINE SCIENCE CURRICULUM

The M.S. in Marine Sciences allows three concentrations. As a joint option, students may combine two concentrations. The M.S. in Marine Science degree requires a minimum of 36 total credits, consisting of 18 credits of core/required courses, 12 credits of electives in the concentration, and a minimum of 6 capstone or thesis credits.

Course requirements are the same for thesis and capstone tracks. Students may switch from the capstone to the thesis track with support of an HCNSO faculty member to advise a specific research project.

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### CORE COURSES FOR ALL CONCENTRATIONS

The following are courses required for all M.S. Marine Science concentrations for a total of 18 credits:

Course Number	Course Name	Credit Hours
<b>MSMS 5010</b>	Biostatistics	3
<b>MSMS 5020</b>	Marine Ecosystems	3
<b>MSMS 5030</b>	Marine Geology	3
<b>MSMS 5040</b>	Marine Chemistry	3
<b>MSMS 5050</b>	Physical Oceanography	3
<b>MSMS 5060</b>	Scientific Communications	3

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### MARINE BIOLOGY CONCENTRATION CURRICULUM

This concentration is designed to equip students with a substantial understanding of the nature and ecology of marine life and grounding in the other overlapping areas of marine science.

Students must choose one course (3 credits) from courses in any of the three concentrations and three courses (9 credits) from the following courses to complete this concentration:

Course Number	Course Name	Credit Hours
<b>MSMS 6001</b>	Marine Physiology	3
<b>MSMS 6002</b>	Coral Reef Ecology	3
<b>MSMS 6003</b>	Deep Sea Biology	3
<b>MSMS 6004</b>	Marine Fisheries	3
<b>MSMS 6005</b>	Invertebrate Zoology	3

<b>MSMS 6006</b>	Taxonomy of Marine Invertebrates	3
<b>MSMS 6007</b>	Marine Mammalogy	3
<b>MSMS 6008</b>	Biology of Sharks & Rays I	3
<b>MSMS 6009</b>	Biology of Sharks & Rays II	3
<b>MSMS 6010</b>	Marine Apex Predators	3
<b>MSMS 6011</b>	Marine Avian Ecology	3
<b>MSMS 6012</b>	Corals from the Inside Out	3
<b>MSMS 6014</b>	Marine Larval Ecology	3
<b>MSMS 6016</b>	Ichthyology	3
<b>MSMS 6017</b>	Tropical Fish Biology	3
<b>MSMS 6021</b>	Histology & Ultrastructure	3

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#### COASTAL ZONE MANAGEMENT CURRICULUM

This concentration focuses on contemporary problems and conflicts arising from increased use of coastal areas and emphasizes the evaluation of alternative policy management solutions. It

Students must choose one course (3 credits) from courses in any of the three concentrations and three courses (9 credits) from the following courses to complete this concentration:

<b>Course Number</b>	<b>Course Name</b>	<b>Credit Hours</b>
<b>MSMS 6101</b>	Coastal Policy	3
<b>MSMS 6102</b>	Ocean and Coastal Law	3
<b>MSMS 6103</b>	Invasive Species	3
<b>MSMS 6104</b>	Communication Dynamics in Dispute Resolution: Human Factor	3
<b>MSMS 6105</b>	Effective Environmental Communication	3
<b>MSMS 6106</b>	Leadership in the Public Sector	3
<b>MSMS 6107</b>	Aspects of Marine Pollution	3
<b>MSMS 6108</b>	Marine Environment: Psychological Dimensions	3

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**MARINE ENVIRONMENTAL SCIENCES CURRICULUM**

The concentration focuses on marine environmental issues using both science and policy.

Students must choose one course (3 credits) from courses in any of the three concentrations and three courses (9 credits) from the following courses to complete this concentration:

<b>Course Number</b>	<b>Course Name</b>	<b>Credit Hours</b>
<b>MSMS 6201</b>	GIS & Environmental Remote Sensing	3
<b>MSMS 6202</b>	Coastal Processes and Hazards	3
<b>MSMS 6203</b>	Climate Change	3
<b>MSMS 6204</b>	Anthropogenic Impacts in Marine Environments	3
<b>MSMS 6205</b>	Toxicology & Laboratory q-PCR	3
<b>MSMS 6208</b>	Aquaculture	3
<b>MSMS 6209</b>	Biodiversity	3
<b>MSMS 6210</b>	Scientific Method & Experimental Design	3
<b>MSMS 6211</b>	Genomics	3
<b>MSMS 6212</b>	Population Ecology	3

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**JOINT CONCENTRATION CURRICULUM**

If students are interested in completing the M.S. in Marine Science with a joint concentration, they will be required to take at least three additional, concentration-specific courses (9-credits) in conjunction with the three concentration-specific electives (9-credits) in their primary concentration plus the one open elective (3 credits). For both the capstone and the thesis degree tracks, once the proposal has been accepted, enrollment in the chosen track must continue until completion of the degree.



## GRADUATE CERTIFICATE CURRICULUM

The graduate certificate in computations molecular biology is awarded upon successful completion of the following four classes (12-credits). Taught in tandem with the College of Engineering and Computing. Course grades received that are lower than C will not count towards the certificate.

Course Number*	Course Name	Credit Hours
<b>BCOR 5585</b>	Genomics	3
<b>BMME 8050</b>	Foundations of Programming*	3
<b>BMME 8051</b>	Database Management & Applications*	3
<b>BMME 8053</b>	Introductions to Bioinformatics	3

\*Courses taught by College of Engineering and Computing

## PH.D. DISSERTATION INFORMATION

### COMMITTEE

The candidate's Ph.D. Committee consists, at a minimum, of four people, at least three of whom must be Halmos College of Natural Sciences and Oceanography (HCNSO) faculty and one of who must be from outside the HCNSO. The committee monitors all phases of the candidate's progress. The committee is formed prior to acceptance or within two terms of admission.

### PROPOSAL DEFENSE

Before research relevant to the Ph.D. can begin, a candidate must produce a detailed research proposal written under guidance of the major professor and members of the supervising committee.

The dissertation proposal should consist of at least the following elements:

- title of the proposed dissertation
- statement of the problem and hypothesis to be tested
- statement of the significance of the work
- detailed description of the methodology with enough detail that the methodology can be understood without having to consult secondary sources
  - literature should be cited where applicable
  - proper experimental design is very important and will be subject to review and comment by the dissertation committee

- expected results of the research should be provided, and any required funding, facilities, and other equipment/resources should be listed
- references/bibliography

A candidate will defend the proposal in an oral presentation to faculty. A written version must be submitted at least one week beforehand and must be uploaded into NSUWorks for inspection by the faculty if desired. At the oral presentation defense, a candidate will be expected to demonstrate sufficient knowledge about the proposed research project, and to justify the chosen research topic. Presentation will be open only to NSU faculty and Halmos students; a closed session with the student will follow, restricted to the committee and interested faculty. If areas of deficiency are highlighted, a candidate will be notified and will have the opportunity to modify the proposal. The committee may require a second presentation.

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### PROPOSAL SUBMISSION DIRECTIONS

The following is the directions to upload the proposal into NSUWorks:

- Create a new account at [NSUWorks.nova.edu](http://nsuworks.nova.edu). The username and password can be unique from the myNSU Identity.
- Once the account is created, log out of the system. Then visit: [http://nsuworks.nova.edu/cgi/ir\\_submit.cgi?context=cns\\_o\\_proposal](http://nsuworks.nova.edu/cgi/ir_submit.cgi?context=cns_o_proposal)
- If a committee member is not a member of NSU, please be sure to include their email address with the proposal submission.
- Inform the program office of having successfully submitted the proposal.
  - Committee members will be sent automated emails to go in and approve the proposal.
  - Once the proposal is approved, the student will be notified that they are eligible to register for dissertation credits.

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### QUALIFYING EXAMINATION

Within 6 months to a year after admission, the candidate will complete a qualifying exam before their committee that will determine basic knowledge and deficits to be corrected by coursework. This test is used to tailor the student's curriculum. It is not graded and does not determine final candidacy. The qualifying examination may be taken directly after the proposal defense.

### COMPREHENSIVE EXAMINATION

The examination consists of written and oral phases. The written exams, taken on completion of formal course work, are administered by the major professor and consist of questions submitted by each committee member. The candidate is allowed a day to answer each member's questions. The entire exam takes at least four days. The candidate is informed of the results of the written examination within one week of completion. At that time, the committee determines if the answers to the written portion warrant further examination, in which case an oral exam is scheduled. The student normally takes the oral examination within two weeks of this notification.

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### DISSERTATION DEFENSE

On completion of the dissertation to the major professor's satisfaction, it is formally submitted to the other committee members. It is the responsibility of the candidate to communicate a defense date with all committee members before a reservation request. Prior to the reservation request, the dissertation must be approved by all committee members and the department chair. **No defenses will be held in between semesters.**

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### SUBMISSION CRITERIA

- The dissertation must be at least 90% complete.
  - The paper must be uploaded at least two weeks prior to your desired defense date.
  - Defense times are between 9:30am - 3:00pm.
- 

### DIRECTIONS FOR SUBMITTING PAPER FOR DEFENSE

- Log into [NSUWorks.nova.edu](https://nsuworks.nova.edu) using the same account as for the proposal submission using this link: [https://nsuworks.nova.edu/cgi/ir\\_submit.cgi?context=cnsso\\_defense](https://nsuworks.nova.edu/cgi/ir_submit.cgi?context=cnsso_defense)
  - If a committee member is not a member of NSU, please be sure to include their email address with the proposal submission.
  - Inform the program office of having successfully submitted the defensible paper. Once approved, the candidate will be notified by email. This email will include the next steps in setting up the defense.
  - The committee members will need to create an account in NSUWorks in order to approve the defense.
- 

### FINAL SUBMISSION OF DISSERTATION

Information for final submission can be found through the Oceanographic Campus Library at <https://nsufl.libguides.com/oclsubmissionguide>.

## DISSERTATION BINDING REQUIREMENTS

*Printed copies are no longer required.*

- **SUBMISSION:** Submit final manuscript for review & approval online via the NSUWorks portal: [https://nsuworks.nova.edu/occ\\_stuetd/](https://nsuworks.nova.edu/occ_stuetd/)
- Please note: All Dissertation signature pages are submitted electronically by committee members in the NSUWorks online ETD submission system, which will create a digital signature page for your work.

Candidates must submit their final dissertation to [ProQuest](#). This service is free to students. Please speak to a librarian if you need assistance with this step.

## FORMATTING OF PAPER

<b>Margins</b>	All margins = 1 inch
<b>Font</b>	Times New Roman
<b>Font Size</b>	12 Point Font
<b>Spacing</b>	1.5 spaced, except for:
	<ul style="list-style-type: none"> <li>• Abstract should be single spaced.</li> </ul>
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<b>Citation and Writing Style</b>	<ul style="list-style-type: none"> <li>• References should be single spaced with a hard enter between each citation or a layout space between each one.</li> </ul>
	<ul style="list-style-type: none"> <li>• Chicago Manual of Style</li> <li>• Another style may be chosen but is at the discretion of your committee.</li> </ul>

## M.S. CAPSTONE/THESIS INFORMATION

### PROPOSAL

Before a thesis or capstone can be accepted, a proposal must be submitted to the chosen committee. The major professor and committee member(s) will review the proposal draft. The student may meet and discuss issues with the professor and committee. The committee members make a final decision as to whether the proposal is defensible.

If the proposal is approved, the student can submit their final proposal online through NSUWorks CNSO Proposal Review. From there, the student's committee members must log in

and approve of the student's proposal. After receiving approval from all committee members in NSUWorks, the Departmental chair will review the proposal for approval. When the chair approves of the proposal, an email will be automatically generated alerting the student that their proposal has been accepted by the program office.

**Students should not register for capstone/thesis credits until they receive full approval from the program office.** The proposal is a demonstration by the student and the involved faculty that the student is indeed ready to produce a capstone/thesis that will allow graduation according to the standards of HCNSO. This forms the basis of an understanding that the faculty involved (including the department chair, who has final signing authority) will allow graduation if the student produces a document with agreed-upon quality and content.

To avoid unpleasant surprises and undue delays to a student's graduation, a proposal is only acceptable once it demonstrates, in all matters, that the student will indeed be able to produce the thesis/capstone and meet the high-quality criteria required by the department. Fairness to student and committee as well as maintenance of academic integrity are the utmost concern here.

A proposal will not be accepted if the style, presentation, and content are not to the quality as would be accepted in the capstone/thesis. This because it may give the student a wrong impression of what is acceptable as a capstone/thesis – leading ultimately to unnecessary delays at submission stage. Therefore, the proposal should be seen as a “minicapstone/thesis” that is at the same stage the blue-print for the work that will be done in the capstone/thesis.

The program chair must approve the proposal at least two weeks prior to the start of each term. Proposal approval to begin research credits in the Winter semester are urged to submit their proposal before Winter closure to ensure timely review of their submitted work.

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## PROPOSAL SUBMISSION DIRECTIONS

The following is the directions to upload the proposal into NSUWorks:

- Create a new account at [NSUWorks.nova.edu](http://nsuworks.nova.edu). The username and password can be unique from the myNSU Identity.
- Once the account is created, log out of the system. Then visit: [http://nsuworks.nova.edu/cgi/ir\\_submit.cgi?context=cnso\\_proposal](http://nsuworks.nova.edu/cgi/ir_submit.cgi?context=cnso_proposal)
- If a committee member is not a member of NSU, please be sure to include their email address with the proposal submission.

- Inform the program office of having successfully submitted the proposal.
  - Committee members will be sent automated emails to go in and approve the proposal.
  - Once the proposal is approved, the student will be notified that they are eligible to register for capstone/thesis credits.

On completion of the capstone/thesis to the major professor's satisfaction, it is formally submitted to the other committee members. It is the responsibility of the candidate to communicate a defense date with all committee members before a reservation request. Prior to the reservation request, the dissertation must be approved by all committee members and the department chair. **No defenses will be held in between semesters.**

---

### SUBMISSION CRITERIA

- The dissertation must be at least 90% complete.
- The paper must be uploaded at least two weeks prior to your desired defense date.
- Defense times are between 9:30am - 3:00pm.

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### DIRECTIONS FOR SUBMITTING PAPER FOR DEFENSE

- Log into [NSUWorks.nova.edu](https://nsuworks.nova.edu) using the same account as for the proposal submission using this link: [https://nsuworks.nova.edu/cgi/ir\\_submit.cgi?context=cnso\\_defense](https://nsuworks.nova.edu/cgi/ir_submit.cgi?context=cnso_defense)
- If a committee member is not a member of NSU, please be sure to include their email address with the proposal submission.
- Inform the program office of having successfully submitted the defensible paper. Once approved, the candidate will be notified by email. This email will include the next steps in setting up the defense.
- The committee members will need to create an account in NSUWorks in order to approve the defense.

## M.S. CAPSTONE TRACK INFORMATION

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### DEFINITION OF A CAPSTONE

A capstone is a scientific manuscript, based upon a comprehensive literature search, review, and synthesis of the chosen topic. It is similar to a thesis, inasmuch as data need to be acquired and analyzed within the framework of a scholarly article with the exception that these data can be acquired from the literature. In certain cases, a study subject may not lend itself to quantification. In such a case, the argument for the chosen approach in the proposal must be as clear and convincing as any quantitative argument.

Carrying out a capstone is possible with agreement from a major professor, typically, capstone students find a major professor on their own by approaching faculty in the student's area of interest. Students will be assigned a capstone advisor if they have difficulty finding one. Prior to beginning a capstone and registering for capstone credits, the student must write a proposal which must be approved by the student's major professor, committee, and the Department Chair. The approval process takes place through submission in NSUworks.nova.edu.

Before starting a capstone, students should read some of the completed capstone projects in the library. After choosing a topic, students must check that the subject area is novel and has not been dealt with by a previous capstone. Once the capstone proposal has been approved, M.S. capstone students sequentially register for and complete a minimum of six capstone credits for Marine Science or nine capstone credits for Biological Sciences in each succeeding term until the capstone is complete and has been successfully defended. Sequential registration continues until the capstone is finished. If a student fails to register for any given term without written approval by the Chair, missed credits must be made up before graduation, usually during the next term of registration. It should be noted that while a minimum of six (Marine Science) or nine (Biological Sciences) capstone research credits is required; more than this may be necessary for the completion of M.S. research.

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#### COMMITTEE COMPOSITION

Each M.S. student will have an advisory committee. To obtain the maximum benefit, it is to the student's advantage to form this committee early in their program.

The capstone committee will consist of at least two members, one of which must be a faculty member of the Halmos College Natural Sciences and Oceanography. The major professor and at least one other committee member must have the terminal degree in a field relevant to the capstone topic. Other members of the committee must ordinarily have the terminal degree.

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#### FINAL SUBMISSION OF CAPSTONE

Information for final submission can be found through the Oceanographic Campus Library at <https://nsufl.libguides.com/oclsubmissionguide>.

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#### CAPSTONE FINAL PAPER FORMATTING REQUIREMENTS

*Printed copies are no longer required.*

- SUBMISSION: Submit final manuscript for review & approval online via the NSUWorks portal: [https://nsuworks.nova.edu/occ\\_stuett/](https://nsuworks.nova.edu/occ_stuett/)

- Please note: All signature pages are submitted electronically by committee members in the NSUWorks online ETD submission system, which will create a digital signature page for your work. Candidates must submit their final thesis to [ProQuest](#). This service is free to students. Please speak to a librarian if you need assistance with this step.

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## PAPER FORMATTING

- Create a title page that follows the format shown in the template available on this page.
- Include keywords - place them after your abstract on the same page (if possible).  
Keywords should be important terms not included in your title.

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## FORMATTING OF PAPER

<b>Margins</b>	All margins = 1 inch
<b>Font</b>	Times New Roman
<b>Font Size</b>	12 Point Font
<b>Spacing</b>	1.5 spaced, except for:
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<b>Length</b>	<ul style="list-style-type: none"> <li>• There are no set guidelines on length, but most capstone review papers are around 50 pages in length (excluding tables and figures).</li> </ul>
<b>Citation and Writing Style</b>	<ul style="list-style-type: none"> <li>• Chicago Manual of Style</li> </ul>

## M.S. THESIS TRACK INFORMATION

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### DEFINITION OF A THESIS

A thesis is an original contribution to knowledge resulting from the systematic study of a significant problem or issue. It requires the student to secure agreement from a faculty member, with adequate funding to carry out the proposed research, to be the student's major professor. **Students are not guaranteed a thesis advisor in the same way as they are guaranteed a capstone advisor.**



Prior to beginning thesis research and registering for thesis credits, the student must write a proposal, which must be approved by the student's major professor, committee, and the Departmental Chair. The approval process takes place through submission in NSUworks.nova.edu. Once the thesis proposal has been approved, M.S. thesis students sequentially register for and complete a minimum of six thesis credits for Marine Science or fifteen thesis credits for Biological Science in each succeeding term until the thesis is complete and has been successfully defended. Sequential registration continues until the thesis is finished. If a student fails to register for any given term without written approval by the Chair, missed credits must be made up before graduation, usually during the next term of registration. It should be noted that while a minimum of six (Marine Science) or fifteen (Biological Science) thesis research credits is required; more than this may be necessary for the completion of M.S. research.

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### COMMITTEE COMPOSITION

Each M.S. student will have an advisory committee. To obtain the maximum benefit, it is to the student's advantage to form this committee early in their program.

The thesis advisory committee will consist of a major professor from the HCNSO faculty and at least two additional members, one of whom must be from another college of Nova Southeastern University or from outside the university. In rare cases, requiring approval by the Department Chair, the major professor may be an adjunct faculty member. The committee participates in topic selection and preparation of the proposal/outline and thesis. Close coordination between student and committee during this process is strongly advised. The major professor must have the terminal degree in a field relevant to the thesis research. Other members of the committee must ordinarily have the terminal degree.

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### FINAL SUBMISSION OF THESIS

Information for final submission can be found through the Oceanographic Campus Library at <https://nsufl.libguides.com/oclsubmissionguide>.

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### THESIS FINAL PAPER FORMATTING REQUIREMENTS

*Printed copies are no longer required.*

- **SUBMISSION:** Submit final manuscript for review & approval online via the NSUWorks portal: [https://nsuworks.nova.edu/occ\\_stueta/](https://nsuworks.nova.edu/occ_stueta/)
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	<ul style="list-style-type: none"> <li>• Chicago Manual of Style</li> <li>• Another style may be chosen but is at the discretion of your committee.</li> </ul>

## M.S. IN BIOLOGICAL SCIENCES (HEALTH STUDIES CONCENTRATION) INFORMATION

All Health Studies Concentration students are assigned a faculty advisor at the start of the program. To successfully complete this concentration, the student must pass all courses as well as a standardized-styled comprehensive exam at the end of the Winter semester. There will be two opportunities to take the exam before graduation.

## COURSE DESCRIPTIONS

(Current term course descriptions are located in [NSU's Course Wizard](#))

### PH.D. COURSE DESCRIPTIONS

Subject & Number	Course Title	Credits
<b>OCGY 0799</b>	<b>Ph.D. Directed Study</b>	<b>3</b>
Advanced tutorial instruction and/or directed independent study in specialized aspects of ocean science.		
<b>OCGY 8000</b>	<b>Ph.D. Dissertation</b>	<b>3-6</b>
Research and progress toward completion of the Ph.D. dissertation in specialized aspects of ocean science.		
<b>OCGY 8811</b>	<b>DIS: Data Analysis Methods in Physical Oceanography</b>	<b>3</b>
The course introduces the principles of data analysis in physical oceanography. Topics include the methods of data acquisition and recording, data processing and presentation, statistical methods and error handling, spatial analysis of data fields, and time series analysis methods.		
<b>OCGY 8812</b>	<b>DIS: Population Ecology</b>	<b>3</b>
<p>Population Ecology reviews key concepts of theoretical ecology concerning population dynamics, as needed by marine biologists to understand the numerical behavior of animal and plant populations to provide a general-knowledge background. Since it is graduate-level, students are required to enhance frontal classroom teaching by the instructor through research papers and their presentation on specialized subjects directly related to the taught material. Course material reviews principals of the mathematical treatment of theoretical ecological programs, the programming background to solve these problems and applied problems of population dynamics. Numerous case-studies are used to illustrate concepts such as stability, bifurcations, basins of attraction etc. Students will have a broad understanding of ecological dynamics and will be literate in present issues in the Life Sciences.</p> <p>Furthermore, since quantitative data analysis is a key skill required on the job-market, students will be introduced to the freeware statistical software R and will be exposed to the analysis of realistic geological datasets.</p>		
<b>OCGY 8813</b>	<b>DIS: Basic R Programming for Ecology</b>	<b>3</b>
Basic R programming reviews key concepts and basic programming skills required for innovative use of theoretical ecology concerning population dynamics, as needed by marine biologists to understand the numerical behavior of animal and plant populations. Since it is graduate-level, students are required to enhance frontal classroom teaching by the instructor through research papers and their presentation on specialized subjects directly related to the taught material. Course material reviews principals of the computational treatment of		

theoretical ecological programs, as well as the mathematical background to solve these problems and applied problems of population dynamics. Numerous case-studies are used to illustrate concepts such as stability, bifurcations, basins of attraction etc. Students will have a broad understanding of ecological dynamics and will be literate in present issues in the Life Sciences.

Furthermore, since quantitative data analysis is a key skill required on the job-market, students will be introduced to the freeware statistical software R and will be exposed to the analysis of realistic geological datasets.

<b>OCGY 8814</b>	<b>DIS: Data Analysis Methods in Physical Oceanography</b>	<b>3</b>
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This course provides a comprehensive account of how the atmosphere and the ocean interact, what physical laws govern this interaction, and what are the important mechanisms. An advanced feature of this course is that it develops its subject from the fundamental physical and thermodynamic principles.

<b>OCGY 8816</b>	<b>DIS: Concepts of Fluid Mechanics</b>	<b>3</b>
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The course introduces the principles of continuity, momentum, and energy applied to fluid motion. Topics include buoyancy, stability, and hydrostatics; ideal-fluid flow; laminar flow; turbulent flow in boundary layer and pipes; dimensional analysis, and flow in pipes and channels; applications to physical oceanography.

<b>OCGY 8817</b>	<b>DIS: Isotopes Ecology Biochemistry</b>	<b>3</b>
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The SPATIAL Short Course represents a bridge between theory and measurement and regional-to-continental scale research. It builds on the skills and knowledge base developed in Course 1 or equivalent stable isotope biogeochemistry coursework to introduce current research themes in large-scale ecology and environmental Earth science, theoretical and technical aspects of assembling and working with large, spatially distributed datasets, and analytical and computational tools available to support such work. The course emphasizes stable isotopes as a research tool, and their unique capacity to address many ecological problems, but also stresses the integration of isotopes with other data types and methods within a geospatial framework.

## M.S. IN BIOLOGICAL SCIENCES COURSE DESCRIPTIONS

## CORE COURSES

Subject & Number	Course Title	Credits
<b>BCOR 5000</b>	<b>Graduate Seminar</b>	<b>3</b>
<p>Conveying and applying effective communication skills will be vital for success in academia, the health professions, scientific research and education. Research seminars represent a useful venue to effectively present the most recent research results to colleagues, faculty, students and the public. This course will provide students opportunities to present current research in the health and biological sciences fields of study for peers and faculty. Students will also gain exposure to scientific presentations by NSU faculty and other researchers. The latest techniques for presenting effective oral presentations, as well as evaluating and critiquing scientific seminars will be discussed.</p>		
<b>BCOR 5150</b>	<b>Immunobiology</b>	<b>3</b>
<p>The goal of this course is to introduce two topics: general immunological concepts and mechanisms of disease. The course will focus on molecular and cellular bases of immune phenomena including: development of the immune system, cellular and molecular mechanisms of immune recognition, host response to foreign agents including bacteria and viruses, nature of antigens and antibodies, antigen antibody interactions, immunity to pathogens, immune diseases, autoimmunity, and hypersensitivity.</p>		
<b>BCOR 5350</b>	<b>Principles of Epidemiology</b>	<b>3</b>
<p>This course will introduce the principles and methods used in epidemiologic investigation of infectious and noninfectious diseases. The course will illustrate how epidemiological studies can contribute to an understanding of the etiological factors, modes of transmission, and pathogenesis of diseases, as well as demonstrate the relationship between epidemiology and the development of policy. Examples used in the course will help illustrate epidemic; the spread of infectious disease in school, home, and community; epidemiological aspects of a noninfectious disease; vaccination; the epidemiological approach to health services evaluation; rates of morbidity and mortality; and sensitivity and specificity of different methods.</p>		
<b>BCOR 5585</b>	<b>Genomics</b>	<b>3</b>
<p>The primary goal of this course is to introduce and describe the latest advances in molecular biology, genomics, computational biotechnology, and their interrelationships to all biology and human society through classroom and computer exercises. We will review milestone discoveries, which led to the rise of genomics science, characteristics of the wide spectrum of different genomes (prokaryotic, eukaryotic and organellar), and innovative molecular techniques and tools (e.g. high throughput DNA sequencing, CRISPRs) used to study and manipulate genomes. We will study genomes including their architecture in different organisms and the gene products that underlie development and basic metabolism.</p>		

Genomics will also be viewed in the context of “Big Data” sets, and its integration with computational methods. The impact of genomics on human health (personalized medicine, diagnostics and new treatments to cure genetic diseases), ecology, ethical issues and problems will be discussed in depth.

#### REQUIRED ELECTIVE COURSES FOR CAPSTONE/THESIS CONCENTRATION

Subject & Number	Course Title	Credits
<b>BCOR 5570</b>	<b>Biostatistics</b>	<b>3</b>
<p>This graduate course will introduce the most commonly used statistical tests and procedures to analyze biological and ecological data. The main objective is to prepare the students to identify the most correct statistics to analyze biological data, perform the statistical analysis in R and correctly interpret the results. Lectures will consist of short theoretical presentations followed by a lab where students will do guided exercises in R. Students will be required to do readings prior to the class on the theoretical basis of the theme of the week and perform unguided exercises (homework) to cement knowledge.</p>		
<b>BCOR 5580</b>	<b>Scientific Method and Experimental Design</b>	<b>3</b>
<p>Scientific Method and Experimental Design This course provides a broad historical overview of biological sciences since Aristotle through Darwin with emphasis on both the experimental design of seminal studies as well as the evolving philosophical approaches to the acquisition of knowledge from methodological naturalism to critical rationalism, Karl Popper and the hypothetico-deductive model for scientific method.</p>		

#### HEALTH STUDIES CONCENTRATION COURSES

Subject & Number	Course Title	Credits
<b>BMHS 5105</b>	<b>Physical Diagnostic Skills</b>	<b>3</b>
<p>This lab-based course will introduce students to the clinical aspect of health studies. Its primary objective is to assist students in learning and developing the knowledge and practical skills essential in performing a medical history and physical examination. In doing so they will develop vital communication, reasoning and problem-solving skills. The course is designed to be ‘hands-on’, offering students the opportunity to develop these practical skills with direct faculty observation and feedback.</p>		
<b>BMHS 5200</b>	<b>Pathophysiology</b>	<b>3</b>
<p>This course will focus on the pathological basis of disease and its effect on the physiological systems and homeostasis of the human body. It consists of the comprehensive study of basic pathological processes including inflammation, dysplasia and neoplasia, along with specific acquired and congenital diseases of the various body systems. Additionally, students will gain an understanding of the diagnosis and prognosis of diseases.</p>		

<b>BMHS 5300</b>	<b>Pharmacodynamics</b>	<b>3</b>
<p>This course provides students a detailed understanding of basic pharmacology. It introduces the basic principles of drug absorption, distribution, metabolism, and elimination, as it pertains to pharmacology. Special emphasis is placed on determinants of therapeutic window, factors that affect the mechanism of action and side effects of the most common drugs. The course will provide a detail explanation about receptor theory including types of receptors, agonists, antagonists, receptor modulation and intracellular signaling pathways. The students will also be introduced to selected drugs commonly used in the United States.</p>		
<b>BMHS 5400</b>	<b>Advanced Regional Anatomy/Lab</b>	<b>3</b>
<p>This course is designed to serve as a transition between systems-based undergraduate anatomy and regionally based medical professional anatomy. Anatomical organization will be presented in a regional format so that students can assimilate the bones, muscles, vasculature, innervations, and lymphatic pattern for each region of the body, similar to the pedagogical approach used in medical professional programs.</p>		
<b>BMHS 5500</b>	<b>Advanced Biochemistry</b>	<b>3</b>
<p>Structures and functions of the four major biological molecules (amino acids, lipids, carbohydrates, and nucleotides) and their metabolism will be discussed. Students will learn the structural-functional relationship of proteins, lipids, carbohydrate macromolecules. Fundamental biochemical processes related to metabolism including energetics, signal transduction, regulation and enzyme kinetics will be presented. Students will also learn the biochemical roles of vitamins, enzyme cofactors, hormones, drugs, antibiotics, and toxins. An emphasis will be placed on understanding the clinical applications of biochemistry. Experimental techniques used to study biochemistry will be illustrated.</p>		
<b>BMHS 5250</b>	<b>Systems Neurosciences</b>	<b>3</b>
<p>The aim of this course is to provide students with a better understanding of the structural and functional components of nervous system at different levels of analysis in sufficient depth to form the basis for further clinical or research studies. The course is comprised of topics related to the molecular and cellular physiology of neurons, development of nervous system, sensory and motor systems, and complex brain functions (learning, memory, emotions, motivation, and language). It also familiarizes students with the range of PBL style cases in neuroscience, and topics related to neuropathology and neuroimaging are discussed in each chapter.</p>		

#### CAPSTONE/THESIS CONCENTRATION COURSES

<b>Subject &amp; Number</b>	<b>Course Title</b>	<b>Credits</b>
<b>BCOR 5560</b>	<b>Biodiversity/Biogeography</b>	<b>3</b>
<p>Globally, biodiversity is being dramatically altered by human activities. Because many species remain undiscovered and ecological roles of existing species are poorly understood, the magnitude of these changes is difficult to evaluate. This course will discuss multiple aspects</p>		

of biodiversity including: definition and importance of biodiversity to conservation issues; threats to biodiversity including introductions of non-indigenous species; impediments to conservation; scientific constraints; developing tools and forums for conserving biodiversity, and evaluating existing biodiversity initiatives currently in place and planned. Management approaches such as parks, protected areas, no-take or completely protected reserves, and special management areas will be discussed and evaluated.		
<b>BMME 4002</b>	<b>DIS: Research Methods</b>	<b>3</b>
Translating scientific results into published manuscripts is key to a successful career in science. This course will guide you through analyzing, interpreting and visualizing quantitative data, reviewing and understanding relevant literature, and construction and editing of a manuscript. The end goal of the class is to create a published manuscript in a peer-reviewed journal, with all member of the class as co-authors.		
<b>BMME 4003</b>	<b>DIS: Regulation of Quorum Sensing</b>	<b>3</b>
The student will perform an extensive literature search to determine the quorum-sensing based regulatory pathways evolved in pathogenesis of <i>Pseudomonas aeruginosa</i> . Experimental analysis of final effectors in these regulatory pathways must also be described in detail in terms of approaches. As a culmination of their efforts, the student will produce a literature review document.		
<b>BMME 5600</b>	<b>Training in Standard Molecular Biology Methods</b>	<b>3</b>
Molecular biology has grown as a discipline since the 1970's, and now encompasses a wide variety of methods and theory. In order to perform growing research in genomics and bioinformatics, basic training in fundamental molecular methods are necessary. This course will train an upper level undergraduate or entry level graduate student in the basic techniques, such as DNA extractions from diverse organisms, gel electrophoresis, polymerase chain reaction, DNA sequencing reaction and analysis, restriction enzyme digests, and molecular cloning among others.		
<b>BMME 5750</b>	<b>Stable Isotopes</b>	<b>3</b>
The course centers on the systematics, ecology, behavior, and resource management of marine fishes with emphasis on the inshore fishes of the tropical Atlantic. A self-paced laboratory and some field work are integral to the course.		
<b>BMME 6000</b>	<b>Geographic Information Systems (GIS) &amp; Remote Sensing</b>	<b>3</b>
This course assumes that you have an interest in Geographic Information Systems (GIS) and Remote Sensing. It is not intended to matter whether you consider yourself a chemist, physicist, biologist, geologist or geographer. The intention is to deliver practical experience in Geographic Information System (GIS) through analysis and visualization of spatial data gathered from tools to study the Earth, its processes, and its inhabitants. The course is designed to be accessible to anyone with a reasonable grounding in the Earth and Biological Sciences with basic computer skills and is tailored to give a general induction to a wide scope of relevant topics and spatial data. The syllabus introduces basic Earth observation principles		



<p>and image classification is dealt with by providing a grounding in the basic theory underlying image processing. Analyses of commonly collected spatio-temporal biological data will be emphasized. Processing, visualization, and presentation of spatial data, generated from field studies and theoretical models, will be stressed for the purposes of analysis and publication in print and on the internet. This practical and real-world experience founded in RS and GIS theory can be brought forward to each student's individual thesis topic.</p>		
<b>BMME 7020</b>	<b>DIS: Biological Sciences</b>	<b>3</b>
<p>Directed Independent Study courses are offered each term on an elective basis. Directed study in aspects of biological sciences. May be used for the completion of capstone or thesis proposal.</p>		
<b>BMME 7030</b>	<b>Thesis: Biological Sciences</b>	<b>3</b>
<p>Research and thesis preparation. Requires prior consultation with major professor and submission of an approved biological sciences thesis proposal.</p>		
<b>BMME 7040</b>	<b>Capstone: Biological Sciences</b>	<b>3</b>
<p>An extended literature review of a biological science subject approved by the student's advisory committee. The paper should demonstrate proficiency in library research, organization, and writing. Requires prior consultation with major professor and submission of an approved capstone proposal.</p>		
<b>BMME 8050</b>	<b>Foundations of Programming, Data Structures, &amp; Algorithms</b>	<b>3</b>
<p>Concepts and foundations of computer science, including procedural and object-oriented programming, data structures, algorithms, and algorithm design, are introduced through programming in Python.</p>		
<b>BMME 8051</b>	<b>Database Management &amp; Applications</b>	<b>3</b>
<p>The application of database concepts to management information systems. Design objectives, methods, costs, and benefits associated with the use of a database management system. Tools and techniques for the management of large amounts of data. Database design, performance, and administration. File organization and access methods. The architectures of database systems, data models for database systems (network, hierarchical, relational, and object-oriented model), client-server database applications, distributed databases, and object-oriented databases.</p>		
<b>BMME 8053</b>	<b>Introduction to Bioinformatics</b>	<b>3</b>
<p>The primary goal of this course is to introduce the field of bioinformatics and to familiarize yourself with working in the UNIX/LINUX environment, standard DNA sequence analyses, and online database resources. There will be an emphasis on hands on practice and use of computer and online resources through the guidance of the instructor.</p>		

## M.S. IN MARINE SCIENCE COURSE DESCRIPTIONS

## CORE COURSES

Subject & Number	Course Title	Credits
<b>MSMS 5010</b>	<b>Biostatistics</b>	<b>3</b>
<p>This graduate course will introduce the most commonly used statistical tests and procedures to analyze biological and ecological data. The main objective is to prepare the students to identify the most correct statistics to analyze biological data, perform the statistical analysis in R and correctly interpret the results. Lectures will consist of short theoretical presentations followed by a lab where students will do guided exercises in R. Students will be required to do readings prior to the class on the theoretical basis of the theme of the week, and perform unguided exercises (homework) to cement knowledge.</p>		
<b>MSMS 5020</b>	<b>Marine Ecosystems</b>	<b>3</b>
<p>This class focuses on marine ecological and functions. It presents an overview of the basic concepts of marine ecology along with more detailed elements of the discipline including the diversity of marine ecosystems, trophic relationships, ecological roles, and nutrient cycling and biogeochemistry.</p>		
<b>MSMS 5030</b>	<b>Marine Geology</b>	<b>3</b>
<p>Marine Geology reviews key concepts of marine geology, as needed by marine biologists to understand the geomorphic setting they are working in and to provide a general-knowledge background. Since it is graduate-level, students are required to enhance frontal classroom teaching by the instructor through research papers and their presentation on specialized subjects directly related to the taught material. Course material reviews planetary evolution, types of sediments and rocks, the reason for the existence of oceans and continents and the spatio-temporal dynamics of marine sedimentary and igneous processes. Numerous case-studies are used to illustrate concepts such a plate tectonics via island formation, and sedimentology via discussion of attractive sedimentary systems, such as coral reefs. Students will have a broad understanding of geological ocean dynamics and will be literate in present issues in the Earth Sciences.</p> <p>Furthermore, since quantitative data analysis is a key skill required on the job-market, students will be introduced to the freeware statistical software R and will be exposed to the analysis of realistic geological datasets.</p>		
<b>MSMS 5040</b>	<b>Marine Chemistry</b>	<b>3</b>
<p>This course is an introduction to marine chemistry. It describes the properties, composition, and origin of seawater; the importance, distribution, relationships, and biogeochemical cycling of the major inorganic nutrients, dissolved gases, trace metals, and organic compounds. Salinity, temperature and density distributions will be explained. Carbonate parameters (pH, Alkalinity, TCO<sub>2</sub> and pCO<sub>2</sub>) and how these are influenced by uptake of anthropogenic carbon dioxide by the ocean will be a key topic. Material is presented through</p>		

lectures and four laboratory sessions which cover the principles and application of selected analytical techniques.		
<b>MSMS 5050</b>	<b>Physical Oceanography</b>	<b>3</b>
This course is intended to give students a view to how wind, radiation, gravity, friction, and the Earth's rotation determine the ocean's temperature and salinity patterns and currents. Some important process we will study include heat budget of the oceans, exchange of heat with the atmosphere and the role of the ocean in climate, surface mixed layer, waves in the ocean, geostrophy, Ekman transport, upwelling, Rossby waves, subtropical gyres, western and eastern boundary currents. Students will learn how to explain physical features of the ocean ranging from microscopic turbulence to global circulation.		
<b>MSMS 5060</b>	<b>Scientific Communications</b>	<b>3</b>
This professional development class is designed to broaden the graduate student's career prospective and develop competencies in communication (written and oral), leadership/management abilities, and skills related to job acquisition. This class will benefit students at any stage of their graduate career or pursuing any degree type (capstone, thesis, dissertation).		

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#### MARINE BIOLOGY CONCENTRATION COURSES

<b>Subject &amp; Number</b>	<b>Course Title</b>	<b>Credits</b>
<b>MSMS 6001</b>	<b>Marine Physiology</b>	<b>3</b>
This course examines various aspects of the functional biology of marine animals, including physiology, feeding, locomotion, morphology and sensory biology. Basic functional biology and physiological concepts will be taught, and then expanded upon to identify how animals have adapted to deal with major biological challenges found in the marine environment, such as pressure and temperature extremes, large salinity fluctuations, extremely low light levels, etc.		
<b>MSMS 6002</b>	<b>Coral Reef Ecology</b>	<b>3</b>
The decline of coral reefs worldwide is a pressing concern for scientists and managers. Thus, it is important to understand the complex ecological relationships of coral reefs in order to determine how this diverse ecosystem will respond to current and future threats. This course will introduce students to the general biology, geology, and ecology of scleractinian corals and coral-associated organisms and examine the importance of seagrass and mangrove communities. Material will be presented from a global perspective, with focus on the South Florida and Caribbean marine environment. Following the presentation of material by the professor, active classroom discussion is required.		
<b>MSMS 6003</b>	<b>Deep Sea Biology</b>	<b>3</b>
The deep sea is the largest living space on the planet, with some of the most diverse, complex and extreme environments on the planet. This course will cover major topics in deep-sea biology, including depth zonation, energetics, adaptations, extreme environments,		

sensory biology, and anthropogenic threats. This course will provide you with a basic understanding of what we know (and don't know) about deep-sea ecosystems, the methods used to study this environment and inhabitants, and it will create an opportunity to discuss major current questions and exciting new discoveries.		
<b>MSMS 6004</b>	<b>Marine Fisheries</b>	<b>3</b>
This course will explain the main theories and methods used in marine fisheries science, as well as providing a basic understanding of management in the United States (including the federal fisheries management council and international regional fisheries management organization processes). Ultimately, the student will better understand the historical development of the structure and goals for U.S. domestic fisheries policies. In addition, this new course adds many of the laboratory exercises and guest lectures formerly in the Intermediate Marine Fisheries Science course, including fishing gear modifications, fish specimen preparation, and basic population modeling.		
<b>MSMS 6005</b>	<b>Invertebrate Zoology</b>	<b>3</b>
Invertebrate zoology including introductory anatomy, physiology, phylogeny, and ecology of major animal phyla through non-vertebrate chordates and including heterotrophic protists, with emphasis on marine organisms. Prerequisites: Undergraduate Biology.		
<b>MSMS 6006</b>	<b>Taxonomy of Marine Invertebrates</b>	<b>3</b>
Identification and ecology of marine invertebrates with an emphasis on shallow-water species of the tropical Western Atlantic. Field work and a self-paced laboratory are integral to the course.		
<b>MSMS 6007</b>	<b>Marine Mammalogy</b>	<b>3</b>
This course provides an overview of the evolution, natural history, anatomy, physiology, biomedicine, husbandry, pathology, and conservation of cetaceans, pinnipeds, sirenians, and their allies. Graduate students are required to contribute to classroom lectures through a review of primary literature and presentation on specialized subjects directly related to the taught material. Numerous case-studies are used to illustrate concepts such as aquatic mammal diseases, direct and indirect anthropogenic impacts, and translation from terrestrial to marine ecosystems. Students will have a broad understanding of marine mammals, their role in a variety of ecosystems, and the environmental issues related to their need for conservation.		
<b>MSMS 6008</b>	<b>Biology of Sharks &amp; Rays I</b>	<b>3</b>
Although the study of sharks generally lags behind studies on bony fishes and many other animals, our understanding of the biology of sharks and rays has improved tremendously over the past several decades. Despite much of the interest in sharks stemming from the fact that they occasionally bite humans, sharks are fascinating animals in many respects. They are highly specialized inhabitants of the sea and possess a variety of unique characteristics that are integral to their having been around for the past 400 million years. In this course, we will explore the general biology of sharks and rays by examining topics concentrating on their		

anatomy, physiology and biochemistry with the goal of understanding how exquisitely adapted these animals are to their environment.		
<b>MSMS 6009</b>	<b>Biology of Sharks &amp; Rays II</b>	<b>3</b>
<p>Although the study of sharks generally lags behind studies on bony fishes and many other animals, our understanding of the biology of sharks and rays has improved tremendously over the past several decades. There is tremendous diversity within sharks and rays and this diversity reflects the evolutionary history and range of lifestyles of these animals. A combination of heavy fishing pressure on shark populations and their general vulnerability to overexploitation has led to serious declines in shark populations throughout the world. We will survey the evolution and diversity of past and present sharks and rays and also examine distributions, environments inhabited, ecological roles, interactions within and among species, and review the life history characteristics of sharks and rays in relation to their occurrence and sustainability in fisheries with the overall goal of understanding the diversity of sharks and rays, their role in marine ecosystems and their interactions with humans (other than in terms of shark attack).</p>		
<b>MSMS 6010</b>	<b>Marine Apex Predators</b>	<b>3</b>
<p>Apex predators like sharks, crocodiles, bears, eagles, and dolphins all play important ecological roles in coastal and marine environments, and many are unfortunately endangered by human activities. The material covers aspects of the life histories, ecology, and conservation biology of this diverse group. This hands-on course will also provide in-depth experience with the apex predators of marine ecosystems across multiple taxa, including sharks, seabirds, teleost fishes, and marine mammals. Students will participate in shark tagging excursions, dissections of various predator taxa, and conduct field testing of several scientific methods of studying predators in natural environments.</p>		
<b>MSMS 6011</b>	<b>Marine Avian Ecology</b>	<b>3</b>
<p>This course will cover the main biological and ecology aspects of avian species within the marine ecology, with a particular emphasis on coastal ecosystems. Particular emphasis is also placed on the policy and management aspects of water-associated bird species during the final third section of the course, including state and U.S. federal regulations. Students will be provided with several seminal, peer-reviewed articles and other supporting materials regarding the topic of the week and expected to read and comment to the class about their content. In addition, students will be required to develop a field observation notebook of water-associated bird species in South Florida.</p>		
<b>MSMS 6012</b>	<b>Corals from the Inside Out</b>	<b>3</b>
<p>This course presents the microscopic anatomy of scleractinian corals and gorgonians (Phylum Cnidaria, Class Anthozoa) to support studies on their ecology, physiology, reproduction, biochemistry, systematics, molecular biology/genetics, immunology, embryology, and pathology. Topics covered include histology; coral diseases; sample collection, preservation, processing, and histoslide preparation (lecture and discussion only, no laboratory); and slide reading of healthy and diseased specimens using light microscopy and virtual microscopy.</p>		

<p>The course begins with online readings and research, and then students will meet at NSUOC for one week of full-time lecture and laboratory sessions. This summer only: Students may attend either the one week of full-day laboratory sessions OR attend two weeks of afternoon laboratory sessions. Participants may bring histoslides from their own research to share with the group and discuss with Dr. Peters.</p>		
<b>MSMS 6014</b>	<b>Marine Larval Ecology</b>	<b>3</b>
<p>Most marine animals have a complex life cycle with a sessile or sedentary adult stage and a dispersive larval stage. This course will expose the students to the diversity of marine larval forms and increase their understanding of the environmental factors affecting larval survival, development, dispersal, settlement, recruitment and connectivity. We will study the implications of having a larval stage for the persistence and management of marine ecosystems, and how climate change and other human-induced disturbances on larvae may affect species persistence.</p>		
<b>MSMS 6016</b>	<b>Ichthyology</b>	<b>3</b>
<p>This course will provide a thorough coverage of ichthyology, the study of fishes. The focus will be on the systematics of bony, cartilaginous and jawless fishes, both living and extinct. The anatomy of fishes will be detailed, followed by a multi-lecture series treating the major lineages of fishes. Lab exercises will involve anatomical study and taxonomy of extant fishes. Following systematic lectures key ecological aspects of fishes will be examined, including trophic ecology, growth and reproduction, and community structure. These ecological elements will be traced back to the evolution of major lineages to allow student understanding of why certain fish groups occur (or do not occur) where they do. In addition to in-lab work, students will gain experience in field sampling techniques around the Oceanographic Center in order to acquire fresh material for laboratory exercises.</p>		
<b>MSMS 6017</b>	<b>Tropical Fish Biology</b>	<b>3</b>
<p>This lecture/field/laboratory course emphasizes the ecology and identification of Caribbean inshore and coral reef fishes. Lectures concentrate on general ecology (e.g., planktonic existence, reproductive strategies, feeding methods, distributional determinants) and species-specific ecology (e.g., diel and seasonal rhythms, food, reproduction) as well as the identification and taxonomy of approximately 200 species. Field and laboratory periods emphasize collecting and museum techniques as well as the use of dichotomous identification keys.</p>		
<b>MSMS 6021</b>	<b>Histology and Ultrastructure</b>	<b>3</b>
<p>This intensive course will examine the fine and ultrastructure of marine organisms and range in focus from bacterial cells to fish tissue. Lectures and labs will be conducted to examine structure and function of tissue and cells of several marine groups. Light and electron microscopy in conjunction with molecular methods for study of bacterial cells such as FISH (Fluorescence In-situ hybridization) will be discussed. Additionally, the complementary nature of cell and tissue imaging using light and electron microscopy will be examined. Fixed and embedded blocks of student research specimens will be supplied and students will</p>		

section and stain their samples for examination in the light and/or electron microscope. Imaging and image capture methods including quantification of structural features using ImageJ will be conducted. Students will prepare their results for presentation and submit a term paper at the end of the semester.

#### COASTAL ZONE MANAGEMENT CONCENTRATION COURSES

Subject & Number	Course Title	Credits
<b>MSMS 6101</b>	<b>Coastal Policy</b>	<b>3</b>
<p>This seminar-style discussion course will explain the main federal legislation governing the domestic and international management and policies surrounding marine mammals, seabirds, sea turtles, and marine fishes. This course also provides an overview of approaches and governance tools used in coastal policy and management, with specific emphasis on living marine resources, such as coral reef ecosystems. Students will be exposed to basic precepts of public policy analysis. The course will examine relevant international, federal, and state marine and coastal policy programs and issues, incorporating current events for weekly discussions.</p>		
<b>MSMS 6102</b>	<b>Ocean and Coastal Law</b>	<b>3</b>
<p>A hodgepodge of laws and policies apply to the oceans and coasts. These govern private landowners, extractors of living and nonliving resources like fish and energy, shipping interests, conservation groups, reef and sanctuary managers, polluters, researchers, and many more. Layers of local, national, and international authorities create regulations and enforce rights and duties. Many living systems are in collapse, with social and economic consequences. Much ocean and coastal law is already a story of failure followed by restructuring. Our course describes legal mechanisms and underlying policies behind them. We look over examples of success and of failure to evaluate the approaches. From this we experience how these laws are created and revised, administered, interpreted, shaped by science, enforced, and how to locate and differentiate the legal provisions. Our task is to survey the six decades or so of law in this area. We look more closely at the main categories as they each develop thru time. Climate change law is evaluated from its origins in air pollution control law development. Fisheries are depicted by major legal controversies and revisions to law. Coastal use conflicts are examined for land and marine areas. Pollution of the oceans and coasts is evaluated for law concerning liability for spills and control of land-based sources. Topics of individual interest to students are emphasized.</p>		
<b>MSMS 6103</b>	<b>Invasive Species</b>	<b>3</b>
<p>This course will cover the main biological and historical aspects of invasive species ecology, with a particular emphasis on aquatic systems. Particular emphasis is placed on the development of government policies regarding invasive species and the state, U.S. federal, and international management measures intended to control the effects of current invasive species and to minimize the risk of future introductions. Students will be provided with</p>		

several seminal, peer-reviewed articles and other supporting materials regarding the topic of the week and expected to read and comment to the class about their content.		
<b>MSMS 6104</b>	<b>Communication Dynamics in Dispute Resolution: Human Factor</b>	<b>3</b>
This course presents the human and emotional aspects of conflict, and includes such topics as the influence of anger, gender, culture, forgiveness, and linguistics as well as important conflict analysis/resolution models. It focuses on the body of work that studies essential factors and the dimensions of the intrapersonal and interpersonal dynamics that influence communication in dispute resolution, and enhance understanding, analyzing, and managing conflict. This course is pragmatic as well as theoretical, and presents communication and conflict resolution skills and models in a practice based approach.		
<b>MSMS 6105</b>	<b>Effective Environmental Communication</b>	<b>3</b>
The course will cover the spectrum of media available for communicating environmental and scientific information on various communication channels. It is an interactive and applied on-line course for learning how to communicate effectively in a variety of sectors with diverse audiences, including academia, media, government, NGO's, general public, etc. This course will provide the students with the speaking and presentation skills to effectively and credibly communicate science and environmental issues in terms that can be clearly understood, through the professional experience of several successful public speakers with a wide range of professional disciplines (TV journalists, meteorologists, environmental activists, IPCC author, neuro-marketing professional, etc.). This course will give the student the confidence to become a successful speaker.		
<b>MSMS 6106</b>	<b>Leadership in the Public Sector</b>	<b>3</b>
This course will explore the dimensions of leadership and decision making within the public sector. Students will explore the major theoretical frameworks of leadership as well as the relationship of leadership to organizational change and effective management strategies. Utilizing in-depth reflection for self-development in such areas as ethical decision-making, students will combine theoretical and practical applications to create and present a unique leadership model.		
<b>MSMS 6107</b>	<b>Aspects of Marine Pollution</b>	<b>3</b>
The course deals with various forms of environmental pollution as they affect both the land and maritime environment. Sources, measurement and control of pollution in marine and coastal environments are discussed. It examines the fate of chemicals and their biological effects on marine organisms. It also examines environmental toxicology and the general mechanisms of transport and transformation of chemicals in water/sediment systems and within marine organisms. Laboratory training will include basic laboratory techniques necessary for biological and chemical research projects. These techniques include those applicable to coral reef, ecological, toxicological and marine studies.		



<b>MSMS 6108</b>	<b>Marine Environment: Psychological Dimensions</b>	<b>3</b>
<p>Psychology is the scientific study of behavior and mental processes. Environmental psychology examines the interrelationship between various environments and human behavior. In this graduate course, students will explore the relevance of concepts and viewpoints from environmental psychology to understanding phenomena in marine environments. They will consider how methods and procedures developed in the field of environmental psychology might be useful in solving problems and issues occurring within ocean and coastal environmental settings.</p>		

## MARINE ENVIRONMENTAL SCIENCES CONCENTRATION COURSES

<b>Subject &amp; Number</b>	<b>Course Title</b>	<b>Credits</b>
<b>MSMS 6201</b>	<b>GIS &amp; Environmental Remote Sensing</b>	<b>3</b>
<p>This course assumes that you have an interest in Geographic Information Systems (GIS) and Remote Sensing. It is not intended to matter whether you consider yourself a chemist, physicist, biologist, geologist or geographer. The intention is to deliver practical experience in Geographic Information System (GIS) through analysis and visualization of spatial data gathered from tools to study the Earth, its processes, and its inhabitants. The course is designed to be accessible to anyone with a reasonable grounding in the Earth and Biological Sciences with basic computer skills and is tailored to give a general induction to a wide scope of relevant topics and spatial data. The syllabus introduces basic Earth observation principles and image classification is dealt with by providing a grounding in the basic theory underlying image processing. Analyses of commonly collected spatio-temporal biological data will be emphasized. Processing, visualization, and presentation of spatial data, generated from field studies and theoretical models, will be stressed for the purposes of analysis and publication in print and on the internet. This practical and real-world experience founded in RS and GIS theory can be brought forward to each student's individual thesis topic.</p>		
<b>MSMS 6202</b>	<b>Coastal Processes &amp; Hazards</b>	<b>3</b>
<p>This course provides a broad overview of marine and coastal processes, with special emphasis on coastal dynamics. It explores basic concepts of nearshore ocean and climate dynamics. Basic principles of physical oceanography and marine geology with respect to the coastal zone are introduced. This course provide a deep understanding of physical forces (wind, waves, tides, currents, tsunamis, hurricanes, human-made structures, etc.) which are the drivers of coastal processes, eroding, transporting and depositing sediments in the coastal zone modifying the geomorphology of coastal environments.</p>		
<b>MSMS 6203</b>	<b>Climate Change</b>	<b>3</b>
<p>The purpose of this class is to provide students with an overview of climate change and how it is impacting the marine environment. Students will be introduced to concepts such as the modern climate system, what climate change is, as well as evidence for it. Students will be able to place recent climate change within the context of historical records. Topics such as</p>		

ocean acidification, sea level rise, coral bleaching, hurricanes, marine ecosystems and ocean circulation patterns will allow students to explore the role that climate change is having on the the oceans and coasts. Discussion will include perspectives from the scientific and social side of this issue.		
<b>MSMS 6204</b>	<b>Anthropogenic Impacts in Marine Environments</b>	<b>3</b>
<p>Humankind has always tended to settle around the coastal zone, and the world's oceans have long been a source of transport and natural resources, from fisheries to minerals. However, the oceans and their currents are giant interconnected conveyors of all nations' anthropogenic marine impacts. This course will focus upon the historical patterns and influences associated with anthropogenic activities in the marine and coastal environment as well as examining anthropogenic marine impacts with policies, critical resource limitations and related slowing global economic growth. To do so, the course will examine present day major anthropogenic marine impacts, mitigation efforts, and the economic trends and future trajectories associated with human development, critical resource limitation, and related impacts on the marine environment while considering the resulting net economics resources for forecasting, ameliorating and mitigating them.</p>		
<b>MSMS 6205</b>	<b>Toxicology &amp; Laboratory q-PCR</b>	<b>3</b>
<p>The course will be training in the classical culture techniques for determination of fecal pollution in surface waters as is used in all water quality laboratories. This will involve membrane filtration for bacterial indicators and plaque formation for viral indicators. Newly developed real time PCR methods will be performed and evaluated.</p> <p>The use of q-PCR has been implemented in microbiology studies to quantify abundance and expression of taxonomic and functional gene markers that pose contamination threats to drinking, recreational, marine, and fresh waters. Its use allows viable results for the indication of microbial presence associated with human pollution that supersedes the abilities of culture based fecal coliform and enterococci studies. The use of PCR chemistries is a more advanced, precise and sensitive method for estimating microbial species in environments. Within PCR chemistries, q-PCR allows for expedient results coupled with greater accuracy to determine if human pollution is contaminating a water source and in what amounts quantitatively.</p> <p>Lectures will discuss environmental toxicology and the general mechanisms of transport and transformation of chemicals in water/sediment systems and within marine organisms. Laboratory training will include basic laboratory techniques necessary for biological and chemical research projects. These techniques include those applicable to coral reef, ecological, toxicological and marine studies.</p>		
<b>MSMS 6208</b>	<b>Aquaculture</b>	<b>3</b>
<p>This course will give the student an understanding of the basic principles of aquaculture, including production systems, water quality, nutrition, spawning, larval culture and grow-out, and culture methodologies of fish, reptiles, invertebrates (zooplankton, mollusks, crustaceans, corals) and algae. The course will consist on a series of lectures followed by</p>		

readings for each learning topic and paper discussions. The students will have the opportunity to conduct hands-on activities associated with the culture and husbandry of animals.		
<b>MSMS 6209</b>	<b>Biodiversity</b>	<b>3</b>
Globally, biodiversity is being dramatically altered by human activities. While many species remain undiscovered, and ecological roles of existing species poorly understood, the magnitude of the changes is difficult to evaluate. This course will discuss multiple aspects of biodiversity including: the definition of biodiversity, threats to biodiversity, the role of biodiversity, and methods to study biodiversity, with an emphasis on marine conservation issues. Management approaches such as marine protected areas, no take areas, and special management areas will be studied.		
<b>MSMS 6210</b>	<b>Scientific Method &amp; Experimental Design</b>	<b>3</b>
This course provides a broad historical overview of biological sciences since Aristotle through Darwin with emphasis on both the experimental design of seminal studies as well as the evolving philosophical approaches to the acquisition of knowledge from methodological naturalism to critical rationalism, Karl Popper and the hypothetico-deductive model for scientific method.		
<b>MSMS 6211</b>	<b>Genomics</b>	<b>3</b>
The primary goal of this course is to introduce and describe the latest advances in molecular biology, genomics computational biotechnology, and their interrelationships through classroom and computer laboratory exercises. Discussions will also place these topics in a marine and evolutionary context. We will study the milestone discoveries, which led to the rise of genomics, characteristics of the wide spectrum of different genomes (prokaryotic, eukaryotic and organellar), innovative molecular techniques and computational tools used to study these genomes, and the impact of genomics on current biological issues and problems.		
<b>MSMS 6212</b>	<b>Population Ecology</b>	<b>3</b>
Population Ecology reviews key concepts of theoretical ecology concerning population dynamics, as needed by marine biologists to understand the numerical behavior of animal and plant populations to provide a general-knowledge background. Since it is graduate-level, students are required to enhance frontal classroom teaching by the instructor through research papers and their presentation on specialized subjects directly related to the taught material. Course material reviews principals of the mathematical treatment of theoretical ecological programs, the programming background to solve these problems and applied problems of population dynamics.. Numerous case-studies are used to illustrate concepts such as stability, bifurcations, basins of attraction etc. Students will have a broad understanding of ecological dynamics and will be literate in present issues in the Life Sciences.		
Furthermore, since quantitative data analysis is a key skill required on the job-market, students will be introduced to the freeware statistical software R and will be exposed to the analysis of realistic geological datasets.		

## CAPSTONE/THESIS COURSES FOR ALL CONCENTRATIONS

Subject & Number	Course Title	Credits
<b>MSMS 6300</b>	<b>Directed Independent Study</b>	<b>3</b>
Directed Independent Study courses are offered each term on an optional basis. Directed study in aspects of marine science. May be used for the completion of capstone or thesis proposal.		
<b>MSMS 6400</b>	<b>Thesis</b>	<b>3</b>
Research and thesis preparation. Requires prior consultation with major professor and submission of an approved thesis proposal.		
<b>MSMS 6450</b>	<b>Capstone</b>	<b>3</b>
An extended literature review of a subject approved by the student's advisory committee. The paper should demonstrate proficiency in library research, organization, data analysis, and writing. Requires prior consultation with major professor and submission of an approved capstone proposal.		