

2014

# Cardiovascular Sonography Course Entering Class 2014-Tampa Regional Campus

Nova Southeastern University

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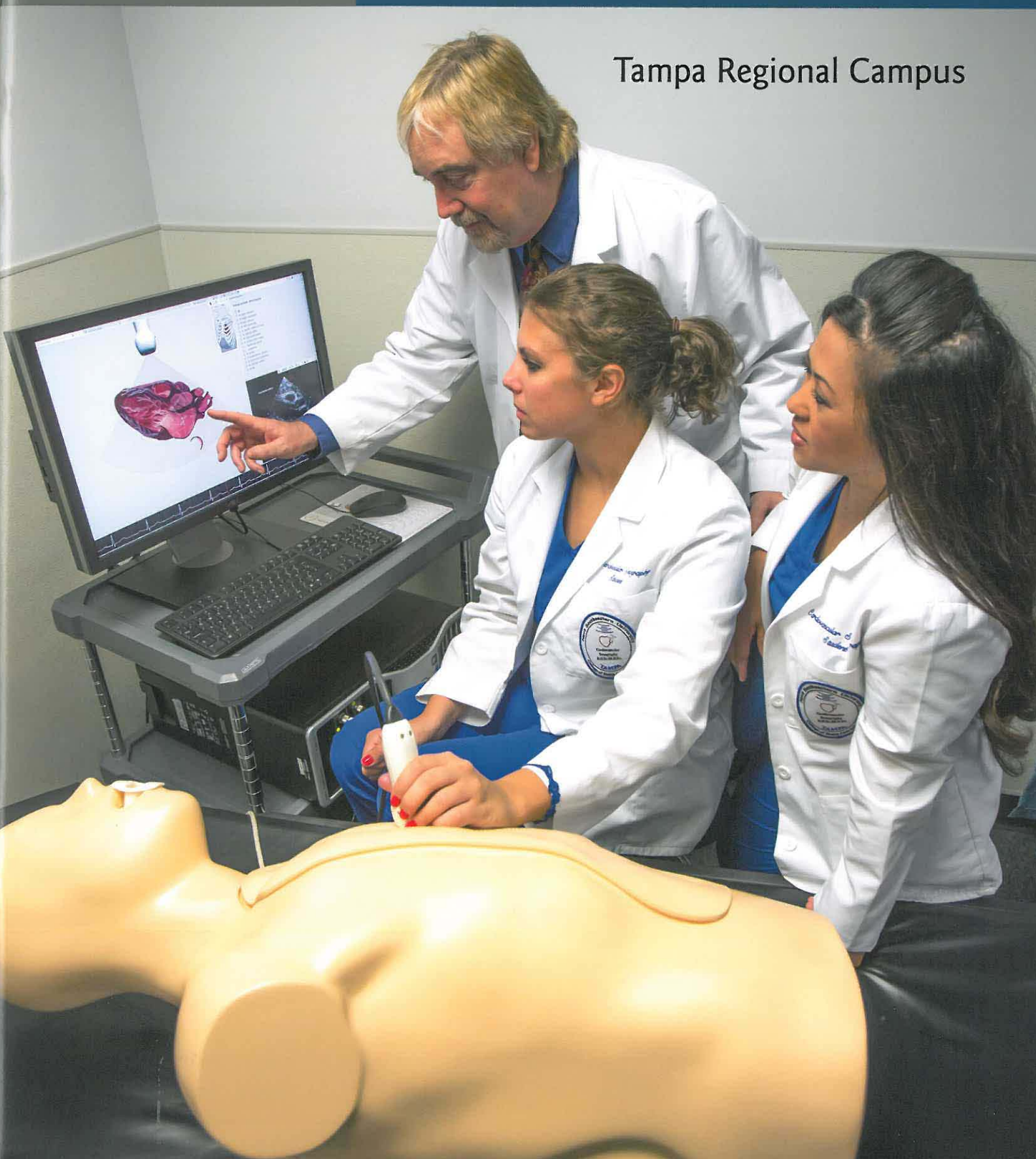
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Tampa Regional Campus



## NOVA SOUTHEASTERN UNIVERSITY

Nova Southeastern University, synonymous with dynamic innovation and intellectual challenge, is the largest independent not-for-profit university in the Southeast, and with an enrollment of nearly **27,000** students, is the **ninth largest** in the United States. Situated on a beautiful, 314-acre campus in Fort Lauderdale, Florida, the university is experiencing a sustained period of academic growth, fiscal strength, and commitment to the challenges of the 21st century.

In this environment of expansion and stability, the university is capitalizing on its strengths in such areas as academic innovation, comprehensive clinical training, and flexible educational delivery systems.

Founded in 1964 as Nova University, the institution merged with Southeastern University of the Health Sciences in 1994, creating Nova Southeastern University. To date, the institution has more than **150,000** alumni. Fully accredited by the Commission on Colleges of the Southern Association of Colleges and Schools, the university awards associate's, bachelor's, master's, educational specialist, and doctoral degrees in a wide range of fields including the health professions, law, business, marine sciences, psychology, social sciences, computer and information sciences, and education.

The university's degree programs are administered through **16 academic centers** that offer courses at the main campus and at field-based locations throughout Florida; across the nation; and at selected international sites in Europe, Mexico, the Pacific Rim, Central and South America, and the Caribbean.

With a budget of more than \$220 million per year and an upward trend in enrollment, the university will continue to maintain a solid record of academic and fiscal strength and excellence in teaching and community service, while expanding its mission in research and scholarship.

### NSU MISSION STATEMENT

The mission of Nova Southeastern University, a private, not-for-profit institution, is to offer a diverse array of innovative academic programs that complement on-campus educational opportunities and resources with accessible, distance-learning programs to foster academic excellence, intellectual inquiry, leadership, research, and commitment to community through engagement of students and faculty members in a dynamic, lifelong learning environment.





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## LETTER FROM THE HPD CHANCELLOR

If you wish to be a leader in the health professions, Nova Southeastern University can help you reach your potential.

In less than two decades, NSU's Health Professions Division has developed into a multidisciplinary academic health center of international stature. Composed of the Colleges of Osteopathic Medicine, Pharmacy, Dental Medicine, Optometry, Health Care Sciences, Medical Sciences, and Nursing, the Health Professions Division has redoubled its commitment to academic excellence, innovation, and community service, while expanding its mission in research and scholarship. Working together, our distinguished faculty members prepare students for an exciting career on tomorrow's dynamic health care team.

Fred Lippman, R.Ph., Ed.D.

Health Professions Division Chancellor



# HEALTH PROFESSIONS DIVISION

As a student in the Health Professions Division of Nova Southeastern University, you can anticipate a remarkable experience. You will train, study, interact, and share faculty and resources (either campus-based or online) with students from various backgrounds and disciplines. This interdisciplinary approach distinguishes the Health Professions Division as unique and will better prepare you to master your discipline with a sensitivity and understanding of the entire health care system.

The Health Professions Division occupies a \$70 million complex, covering 21 acres of the university campus. The division includes eight buildings totaling more than 900,000 square feet of space for classrooms, laboratories, offices, the Health Professions Division Library, an outpatient health center, and a pharmaceutical care center. The adjacent 1,800-vehicle parking garage overlooks the Miami Dolphins Training Camp.

The Health Professions Division, with a student body of more than 5,800, is home to seven colleges.



## College of Osteopathic Medicine

- Doctor of Osteopathic Medicine (D.O.)
- Master of Public Health (M.P.H.)
- Master of Science in Biomedical Informatics (M.S.)
- Master of Science in Disaster and Emergency Preparedness (M.S.)
- Graduate Certificate in Health Education
- Graduate Certificate in Medical Informatics
- Graduate Certificate in Public Health
- Graduate Certificate in Public Health Informatics

## College of Pharmacy

- Doctor of Pharmacy (Pharm.D.)
- Doctor of Philosophy in Pharmacy (Ph.D.)—Molecular Medicine and Pharmacogenomics
- Doctor of Philosophy in Pharmacy (Ph.D.)—Pharmaceutics
- Doctor of Philosophy in Pharmacy (Ph.D.)—Social and Administrative Pharmacy

## College of Optometry

- Doctor of Optometry (O.D.)
- Master of Science in Clinical Vision Research (M.S.)

## College of Health Care Sciences

- Bachelor of Health Science (B.H.Sc.)
- Bachelor of Science—Cardiovascular Sonography (B.S.—CVS)
- Bachelor of Science in Medical Sonography (B.S.—MS)
- Bachelor of Science in Respiratory Therapy (B.S.R.T.)
- Master of Health Science (M.H.Sc.)
- Master of Health Science (M.H.Sc.)/Doctor of Health Science (D.H.Sc.)
- Master of Science in Anesthesia (M.S.)
- Doctor of Health Science (D.H.Sc.)
- Doctor of Philosophy in Health Science (Ph.D.)
- Master of Medical Science in Physician Assistant (M.M.S.)
- Master of Occupational Therapy (M.O.T.)
- Entry-Level Doctor of Occupational Therapy (O.T.D.)
- Doctor of Occupational Therapy (Dr.OT)
- Doctor of Philosophy in Occupational Therapy (Ph.D./OT)
- Entry-Level Doctor of Physical Therapy (D.P.T.)
- Hybrid Entry-Level Doctor of Physical Therapy (D.P.T.)

## College of Health Care Sciences (continued)

- Transition Doctor of Physical Therapy (D.P.T.)
- Doctor of Philosophy in Physical Therapy (Ph.D.)
- Doctor of Audiology (Au.D.)

## College of Medical Sciences

- Master of Biomedical Sciences (M.B.S.)
- Certificate in Anatomical Studies

## College of Dental Medicine

- Doctor of Dental Medicine (D.M.D.)
- Master of Science in Dentistry (M.S.)
- Postgraduate Certificate in Advanced Education in General Dentistry
- Postgraduate Certificate in Endodontics
- Postgraduate Certificate in Operative Dentistry
- Postgraduate Certificate in Oral and Maxillofacial Surgery
- Postgraduate Certificate in Orthodontics and Dentofacial Orthopedics
- Postgraduate Certificate in Pediatric Dentistry
- Postgraduate Certificate in Periodontics
- Postgraduate Certificate in Prosthodontics

## College of Nursing

- Entry-Level Bachelor of Science in Nursing (B.S.N.)
- R.N. to B.S.N.
- R.N. to M.S.N.
- Master of Science in Nursing (M.S.N.)—Advanced Practice Registered Nurse, FNP
- Master of Science in Nursing (M.S.N.)—Health Systems Leadership
- Master of Science in Nursing (M.S.N.)—Nursing Education
- Master of Science in Nursing (M.S.N.)—Nursing Informatics
- Doctor of Nursing Practice (D.N.P.)
- Doctor of Philosophy in Nursing (Ph.D.)

This brochure is for information purposes only and does not represent a contract. Information contained herein is subject to change at any time by administrative decision on the direction of the board of trustees. Updated information can be found on our Web site ([www.nova.edu/chcs/healthsciences/cardiovascular/index.html](http://www.nova.edu/chcs/healthsciences/cardiovascular/index.html)).

**DIAGNOSTIC MEDICAL SONOGRAPHY**

Diagnostic medical sonography includes four primary areas of specialization: general, cardiac, musculoskeletal, and vascular. General sonography includes subspecialties for obstetrics and gynecology exams; abdominal, neurological, and breast exams; and exams of structures such as joints and tendons. Cardiac sonography examines the anatomical structure and function of the heart. Vascular sonography studies the anatomical and physiological characteristics of all arteries and veins in the body. All diagnostic medical sonography uses ultrasound to obtain images and is, therefore, considered noninvasive, having no known risks or side effects in comparison to other widely used medical imaging methods.

**CARDIAC SONOGRAPHY (ECHOCARDIOGRAPHY)**

Cardiac sonographers are more commonly called echocardiographers or echo-techs. Echocardiography obtains images of the heart via ultrasound. It is one of the most widely used imaging examinations for assistance in the diagnosis of heart disease. Echocardiography is especially useful for assessing diseases that affect the heart valves and for detecting abnormalities in the motion and appearance of the heart wall.

**VASCULAR SONOGRAPHY**

Vascular sonographers use ultrasound imaging and other types of exams to detect anatomical and physiological changes caused by diseases of the arteries and veins and the resulting effects on organs and other tissues. Vascular disorders include carotid artery disease, which may lead to stroke; abdominal vascular diseases, such as aneurysms; peripheral arterial disease, which can result in chronic pain and may progress to loss of limbs; and venous conditions that can cause blood clots (thromboses), which can travel to the lungs (pulmonary embolism).

**CARDIOVASCULAR SONOGRAPHY PROGRAM**

The NSU Cardiovascular Sonography Program in Tampa offers didactic and clinical training in two of these specialties, cardiac sonography (adult) and vascular sonography, as an integrated curriculum. Additional course content introduces the student to pediatric cardiac sonography and basic concepts in electrophysiological cardiology. Because of strong interrelationships between cardiac and vascular diseases, the need was seen for a

comprehensive program covering both specialties. Also, some cardiology departments and other imaging providers may prefer that sonographers obtain training and professional registry in both cardiac sonography and vascular sonography for purposes of diagnostic expediency and professional flexibility.

**BACHELOR OF SCIENCE—CARDIOVASCULAR SONOGRAPHY (B.S.—CVS)**

This specialty program is designed to prepare students for entry-level positions in the field of cardiovascular technology. Students take online courses at the undergraduate level, as well as attend on-campus lectures integrated with hands-on training in the ultrasound lab. This prepares them for the 12-month clinical externship during their second year. Upon graduation, the B.S.—CVS student will be eligible to apply for admission to the online Master of Health Science (M.H.Sc.) program.

**CONCURRENT MASTER OF HEALTH SCIENCE OPTION**

Students who already hold a bachelor's degree from an accredited institution with a minimum GPA of 3.0 are eligible to apply for the concurrent Master of Health Science (M.H.Sc.) option. Students who enroll in this concurrent M.H.Sc. program will graduate with a Bachelor of Science—Cardiovascular Sonography and a Master of Health Science. Both programs will be completed in 27 months.

Upon application, a review of the bachelor's degree transcript will be conducted and all general education requirements will need to be satisfied. In addition, up to 27 credits of open electives will be transferred. Upon transfer credit evaluation, completion of any additional credit to meet or fulfill the 57 credits for general education and open elective requirements will be required.

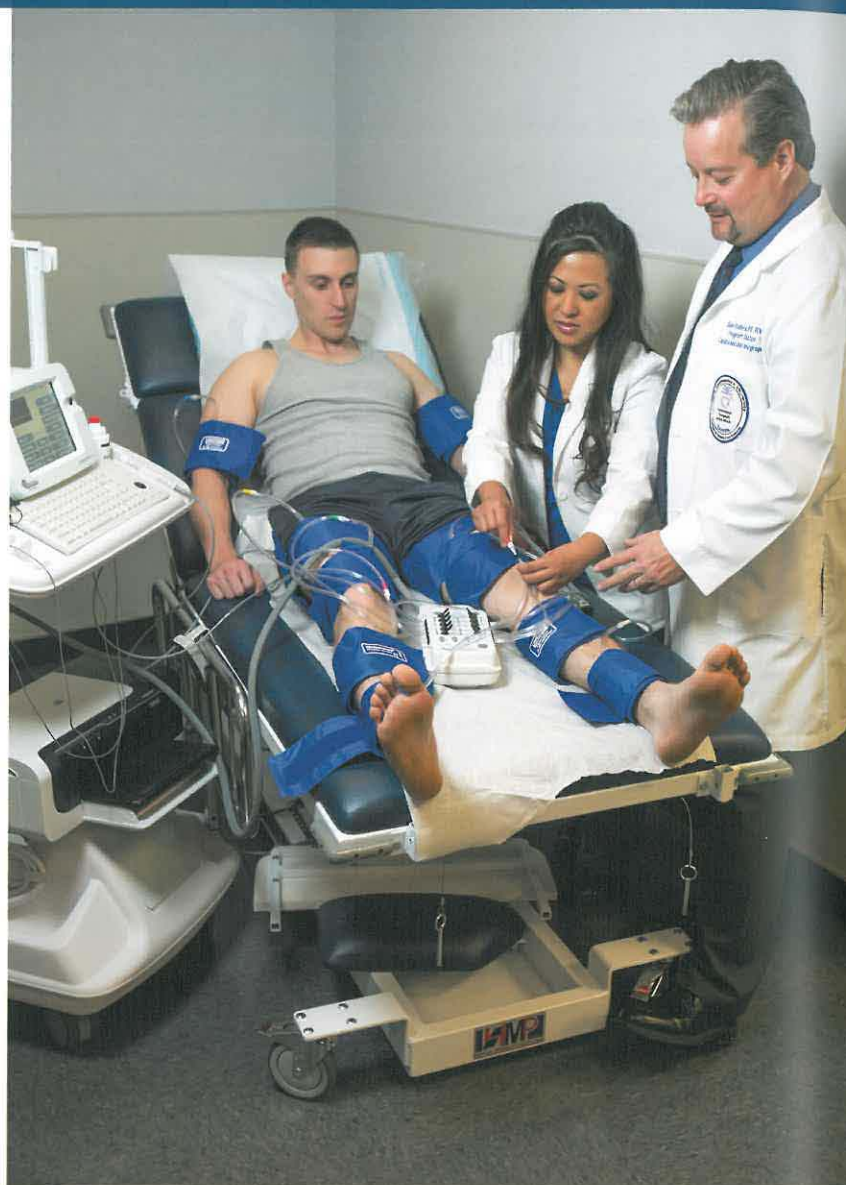
Courses in the M.H.Sc. program online include Writing for Medical Publication, Research Methods, Epidemiology and Biostatistics, and Management in Health Care. During the clinical year, students will work with a faculty member to design and implement capstone projects such as case studies, presentations, or clinical research.

If interested in the concurrent Master of Health Science option, please contact an admissions counselor or the program office for further details.

The cardiovascular sonography program includes on-campus lectures; extensive, hands-on training in our ultrasound laboratory; online courses; and a 12-month focused or combined externship in a clinical laboratory setting. The graduating student will earn a bachelor's degree in cardiovascular sonography. Students will take a combination of general courses in the health science field and focused core courses in the cardiovascular technology field. Examples of general courses include subjects such as Writing for Medical Publication, Epidemiology, Biostatistics, and Principles and Practice of Management in Health Care. Examples of cardiovascular sonography courses include Ultrasound Physics, Echocardiography, and Cerebrovascular Testing. While on campus, the student will spend more than 500 hours in the training laboratory learning imaging skills and techniques and physiologic testing methods prior to the clinical externship experience.

In the second year, the student will complete a more than 1,600-hour clinical training program while continuing to take online courses. The student may have the option to perform his or her clinical externship in a vascular, adult echo, or combined vascular/echo clinical experience, based upon his or her interests and demonstrated competencies. Upon graduation, the student will be eligible to sit for professional registry exams based upon completion of program and clinical requirements.

Prospective cardiovascular sonography students are selected by the Committee on Admissions (COA), which considers the overall qualities of



the candidate. Areas of consideration include interpersonal skills, personal motivation, knowledge and understanding of the cardiovascular profession, academic performance and level of achievement, life experiences, and recommendations. Knowledge of the profession is essential. Personal interviews are offered to the most-qualified applicants to assess interpersonal and communication skills, altruistic attitude, maturity, and commitment to the cardiovascular profession. Phone interviews will not be provided.

## BACHELOR OF SCIENCE—CARDIOVASCULAR SONOGRAPHY

### Required Courses

#### REQUIRED CREDIT HOURS

BHS 3110	Health Care Ethics	3
BHS 3120	Introduction to Epidemiology	3
BHS 3130	Research and Design for Health Care	3
BHS 3150	Principles in Leadership	3
BHS 3155	Conflict Resolution in Health Care	3
BHS 3160	Health Policy	3
BHS 4000	Cultural Competency in Health Care	3
BHS 4100	Academic and Professional Writing	3
BHS 4110	Health Care and Aging	3
CVS 3001	Correlative Imaging and Anatomy	4
CVS 3000	Introduction to Cardiovascular Instruments	3
CVS 3010	Echocardiography I/Lab	3
CVS 3020	Echocardiography II/Lab	3
CVS 3030	Echocardiography III/Lab	4
CVS 3040	Ultrasound Physics I	4
CVS 3050	Ultrasound Physics Review	2
CVS 3060	Cerebrovascular Testing/Lab	3
CVS 3070	Peripheral Arterial Testing/Lab	3
CVS 3080	Venous Testing/Lab	3
CVS 3090	Abdominal Vascular Testing/Lab	3
CVS 4000	Clinical Prep and Review/ Basic Life Support	3
CVS 4500	Clinical Externship I (16 weeks)	9
CVS 4600	Clinical Externship II (16 weeks)	9
CVS 4700	Clinical Externship III (16 weeks)	9
Subtotal Required Courses		92
Prerequisite Courses		30

**Minimum Total Degree Semester  
Hours Required**

**122**

## CONCURRENT MASTER OF HEALTH SCIENCE OPTION

### Required Courses

#### REQUIRED CREDIT HOURS

MHS 5107	Master's Degree Internship	5
MHS 5205	Writing for Medical Publication	3
MHS 5207	Practicum	5
MHS 5406	Directed Studies I/Elective	3
MHS 5407	Directed Studies II/Elective	3
MHS 5408	Directed Studies III/Elective	3
MHS 5501	Epidemiology and Biostatistics	3
MHS 5507	Ethical, Legal, and Cultural Trends in Today's Health Care Environment	4
MHS 5510	Research Methods	3
MHS 5530	Principles of Management in Health Care	3

If interested in the concurrent Master of Health Science option, please contact an admissions counselor or the program office for further details. Course requirements and availability are subject to change without notice.

Curriculum is subject to change without notice.

## SELECTION

Upon receipt of a completed application, either for the bachelor's or master's degree track; fees; credentials; and transcripts, the admissions officer for the cardiovascular sonography program in the College of Health Care Sciences will review all material for evidence of the proper education, training, and background to enter the cardiovascular sonography concentration. The university reserves the right to modify any requirement on an individual basis as deemed necessary by the dean of the College of Health Care Sciences and the program director.

Areas of consideration include application content, academic record, letters of evaluation, and personal motivation. Upon receipt of the completed application, the COA will select applicants for interview. Applicants must be present for the interview (phone interviews are not acceptable). Expenses for the interview are the responsibility of the applicant.

The applicant who has graduated from a college or university of a country for which English is not the primary language, regardless of United States residency status, must obtain a minimum score of 550 on the written or 213 on the computerized Test of English as a Foreign Language (TOEFL). An official set of scores must be sent directly from the Educational Testing Services in Princeton, New Jersey, to NSU's EPS. Equivalent scores from the International English Language Testing System (IELTS) or the Pearson Test of English-Academic (PTE-A) are acceptable.

It is highly recommended that cardiovascular sonography applicants have or obtain meaningful and significant scientific, health care, or elder care work or volunteer experience.





## BACHELOR OF SCIENCE—CARDIOVASCULAR SONOGRAPHY

### PREREQUISITES FOR THE BACHELOR OF SCIENCE

In order to be eligible for admission to the Bachelor of Science—Cardiovascular Sonography, a student must have completed 30 credit hours of prerequisite education coursework with a minimum GPA of 2.75 on a 4.0 grading scale.

### REQUIRED GENERAL EDUCATION COURSES

	REQUIRED CREDIT HOURS
Composition (above Comp 1000)	3
Social and Behavioral Sciences	9
Humanities*	6
Anatomy and Physiology I	3
Physical/Human/Biological Science	3
Physics	3
Math** (above Math 1000)	3
Subtotal General Education Courses	30

Note: Required general education courses cannot be survey courses.

\* recommend 3 semester hours in foreign language

\*\*strongly recommend 3 semester hours in college algebra

### PREFERRED BUT NOT REQUIRED COURSE

Anatomy and Physiology II

## ACCREDITATIONS

The Master of Health Science is an established program within Nova Southeastern University's College of Health Care Sciences. This program was officially approved by the NSU board of trustees in 2009.

Nova Southeastern University is accredited by the Southern Association of Colleges and Schools Commission on Colleges to award associate's, baccalaureate, master's, educational specialist, doctorate, and professional degrees. Contact the Commission on Colleges at 1866 Southern Lane, Decatur, Georgia 30033-4097 or call 404-679-4500 for questions about the accreditation of Nova Southeastern University.

## NONDISCRIMINATION

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, and Title IX), 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, unfavorable discharge from the military, 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.

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, nondisqualifying disability, age, ancestry, marital status, sexual orientation, unfavorable discharge from the military, 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.

## THE APPLICATION DEADLINE IS APRIL 1.

Applicants for admission must submit or be responsible for submission of

1. a completed application form along with a \$50, nonrefundable application fee (Applications can be downloaded by visiting [www.nova.edu/cardiovascular](http://www.nova.edu/cardiovascular).)
2. two letters of evaluation from individuals (other than relatives) such as academic advisors, professors, clinical or non-clinical supervisors, or community associates
3. official college-, certificate-, and/or diploma-based transcripts from all undergraduate and graduate institutions attended, sent directly from the institution to the Enrollment Processing Services (EPS)
4. copies of national and/or state professional certification, licensure, or registration, if applicable
5. evaluation of coursework taken at a foreign institution for U.S. institutional equivalence (if applicable)  
  
Foreign coursework must be evaluated by one of the following services:

### **World Education Services, Inc.**

Bowling Green Station  
P.O. Box 5087  
New York, New York 10274-5087  
(212) 966-6311 • [www.wes.org](http://www.wes.org)

### **Josef Silny & Associates**

7101 SW 102nd Avenue  
Miami, Florida 33173  
Phone: (305) 273-1616 • Fax: (305) 273-1338  
[www.jsilny.com](http://www.jsilny.com)

### **Educational Credential Evaluators**

P.O. Box 514070  
Milwaukee, Wisconsin 53203-3470  
(414) 289-3400 • [www.ece.org](http://www.ece.org)

5. a current curriculum vitae

7. TOEFL scores, or equivalent IELTS or PTE-A scores, (if applicable), sent directly to NSU'S EPS
8. a student-prepared learning portfolio requesting assessment of prior experiences for academic credit (only for graduates from programs other than those from regionally accredited colleges or universities)

All admissions information should be sent to

NOVA SOUTHEASTERN UNIVERSITY  
Enrollment Processing Services  
College of Health Care Sciences  
Cardiovascular Sonography Admissions  
3301 College Avenue, P.O. Box 299000  
Fort Lauderdale, Florida 33329-9905

Phone: (954) 262-1101 • Fax: (954) 262-2282

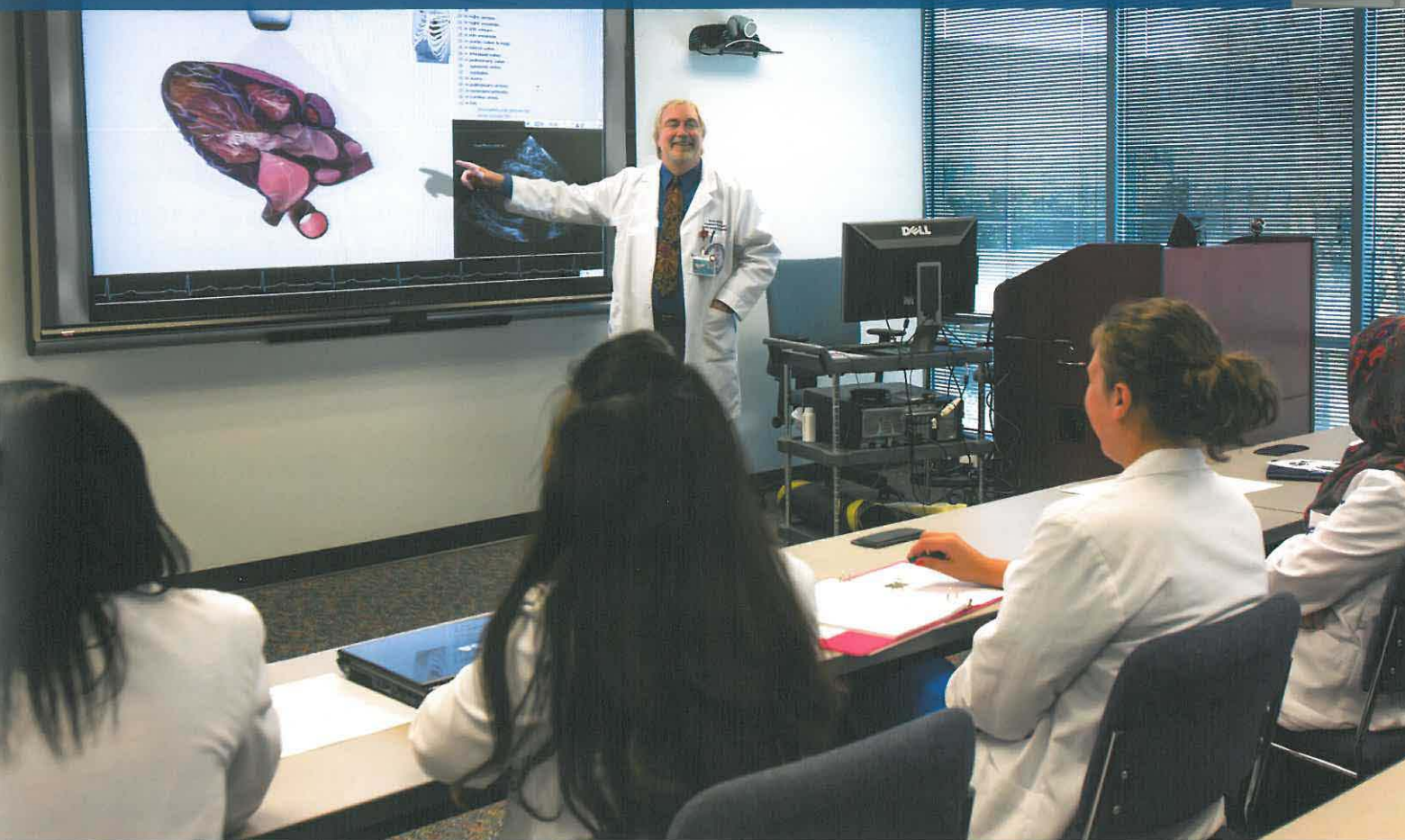
The Office of Admissions works on a rolling admissions basis. Applications are accepted year round. To ensure that your application receives prompt consideration, you should apply early.

The Committee on Admissions will not consider an application until all required fees, credentials, transcripts, and test scores have been received by the EPS.

The university reserves the right to modify any requirements on an individual basis as deemed necessary by the dean of the College of Health Care Sciences.

The college reserves the right, and the student (by his or her act of matriculation) concedes to the college the right, to require his or her withdrawal any time the college deems it necessary to safeguard its standards of scholarship, conduct, and compliance with regulations, or for such other reasons as are deemed appropriate.

The dean and cardiovascular sonography program director reserve the right to require the student's withdrawal at any time for the above-mentioned reasons.



### **B.S.—CVS**

An evaluation of transfer credit will be completed prior to the first semester of enrollment, and applicable credit will be transferred based on all final official transcripts received. Students will be advised to take courses based on the official evaluation in their file.

Transfer students must provide final official transcripts from all their previous colleges. Their previous academic work will then be evaluated. The B.S.—Cardiovascular Sonography program will transfer a maximum of 30 prerequisite semester hours (grades of C or better).

### **CONCURRENT M.H.Sc. OPTION**

Students matriculated into the concurrent M.H.Sc. option may petition for transfer of credits to the program. Up to, but not exceeding, 6 semester hours of graduate work may be considered for transfer from a regionally accredited institution. The courses considered for transfer must meet the goals and objectives of the M.H.Sc. course in question, have a grade of B or better, and cannot be previously applied toward another awarded degree in or outside of NSU.

## CORE COURSES

Credit Hours

**CVS 3000 Introduction to Cardiovascular Sonography Instruments . . . . . 3**

This course is designed to introduce the students to the equipment used in cardiovascular ultrasound. The course will, therefore, be primarily taught in the ultrasound training laboratory in small groups, with supplemental online content and challenge-based learning assignments. The focus of the course will be to lead the students toward proficiency and competency in using all the tools available on the ultrasound equipment for the production of quality images, as well as proper ergonomics, patient handling, and care of the equipment. This course is the foundation for all the following core courses.

**CVS 3001 Correlative Imaging and Anatomy . . . 4**

For this course, emphasis will be placed on teaching the students to identify normal cross-sectional anatomy based on the characteristics of each imaging modality, the position of other relative anatomy (anatomical landmarks), proportionality of size, and correlation with other imaging modalities. As such, this course will serve as the foundation for knowledge and understanding of both fundamental imaging analysis and anatomical identification, which will be required for successful completion of the core courses in the balance of the program curriculum.

**CVS 3010 Echocardiography I . . . . . 3**

This course will provide an introduction to techniques, measurements, and normal function of the adult heart as evaluated with ultrasound. It will have a strong hands-on component and students will spend several hours per week in the ultrasound training laboratory acquiring skills in basic imaging, patient positioning, and ergonomics to form a solid foundation for later, more-advanced courses. Lectures will include, but not be limited to, a review of the normal anatomy and physiological function of the heart, commonly encountered pathology, pathophysiology, basic treatment options, and beginning analysis of data obtained by ultrasound, as well as introduction to other cardio-focused techniques.

Credit Hours

**CVS 3020 Echocardiography II . . . . . 3**

This is an intermediate course on the use of ultrasound for the evaluation of the adult heart and heart function. It will have a strong hands-on component and students will spend several hours per week in the ultrasound training laboratory acquiring advanced imaging skills to begin mastery of the adult echocardiography examination. Lectures will continue with advanced subjects including, but not limited to, acquired and congenital pathologies, pathophysiology, and treatment options. In-depth analysis of echocardiographic findings and presentation of same in preliminary reporting will also be covered in detail.

**CVS 3030 Echocardiography III . . . . . 4**

This is an advanced course on the use of specialized ultrasound techniques for the evaluation of the adult heart, with additional content for pediatric echocardiography and other advanced imaging techniques and considerations. It will have a strong hands-on component and students will spend several hours per week in the ultrasound training laboratory acquiring advanced imaging skills. Lectures will cover special considerations for advanced imaging, specific pathologies and anatomical considerations for pediatric imaging, pediatric congenital pathologies, pathophysiology, treatment options, and analysis of data obtained by ultrasound, as well as other cardio-focused techniques. Additional topics will cover procedures and other considerations surrounding the performance of the echocardiography exam that will be encountered in a clinical setting, preparing the student for clinical externships in year two of the program.

**CVS 3040 Ultrasound Physics I . . . . . 4**

This course helps the student acquire knowledge of all the fundamental principles and concepts necessary to understand the properties of sound and ultrasound as used in diagnostic imaging. These principles and concepts will span from basic properties of sound in soft tissue to advanced techniques, such as Doppler, spectral analysis, and M-mode, as they pertain to evaluation for vascular and cardiac ultrasound imaging. Students will also learn about artifacts, safety, and the concepts of bio-effects. Key physics principles will be illustrated with hands-on exercises and activities in the classroom and lab, utilizing both the imaging equipment and more everyday materials. Challenge-based learning physics assignments will also be given to further the learning process.

Credit Hours

**CVS 3050 Ultrasound Physics Review . . . . . 2**

This course reviews the principles and concepts learned in CVS 3040 through quizzes and exams to help the student prepare for the Sonography Principles and Instrumentation (SPI) exam administered by the ARDMS. The students will take the exam after completion of the course.

**CVS 3060 Cerebrovascular Testing . . . . . 3**

This course will focus on the use of ultrasound for the evaluation of the extracranial and intracranial cerebrovascular circulation. It will have a strong hands-on component with students spending several hours per week in the ultrasound training laboratory. Lectures will focus on anatomy, pathologies, treatment options, and analysis of data obtained by ultrasound and other diagnostic techniques.

**CVS 3070 Peripheral Arterial Testing . . . . . 3**

This course will focus on the use of ultrasound for the evaluation of the arterial circulation of the upper and lower extremities. It will have a strong hands-on component with students spending several hours per week in the ultrasound training laboratory. Lectures will focus on anatomy, pathologies, treatment options, and analysis of data obtained by ultrasound and other technologies specific to vascular laboratories.

**CVS 3080 Venous Testing. . . . . 3**

This course will focus on the use of ultrasound for the evaluation of the venous circulation of the upper and lower extremities. It will have a strong hands-on component with students spending several hours per week in the ultrasound training laboratory. Lectures will focus on anatomy, pathologies, treatment options, and analysis of data obtained by ultrasound and other techniques.

**CVS 3090 Abdominal Vascular Testing . . . . . 3**

This course will focus on the use of ultrasound for the evaluation of the arterial and venous circulation of organs of the abdomen. It will have a strong hands-on component with students spending several hours per week in the ultrasound training laboratory. Lectures will focus on anatomy, pathologies, treatment options, and analysis of data obtained by ultrasound and other diagnostic imaging techniques.

Credit Hours

**CVS 4000 Clinical Preparation . . . . . 3**

This course helps students learn the nontechnical aspects of the profession of diagnostic medical sonographers including, but not limited to, professionalism, billing, quality assurance, image storage, and reporting. It will prepare students for the clinical experience that follows in the second year. Embedded in this course will also be a certification training seminar for Basic Life Saving (BLS) for Health Care Providers.

**CVS 4500 Clinical Externship I. . . . . 9**

In the second year of the program, students may have the option of performing their clinical externships in a vascular, adult echo, or combined vascular/echo clinical experience, depending on their interests and demonstrated competencies. This course will be mainly provided in a clinical setting assigned at the end of the first year. Students will be a daily integral part of the operations of the vascular laboratory and/or echocardiography imaging department they have been assigned to. They will report to the clinical coordinator or an assigned professor of the program.

**CVS 4600 Clinical Externship II. . . . . 9**

This course is a continuation of CVS 4500.

**CVS 4700 Clinical Externship III . . . . . 9**

This course is a continuation of CVS 4500 and CVS 4600.

## ONLINE COURSES

	Credit Hours		Credit Hours
<b>BHS 3110 Health Care Ethics . . . . .</b>	<b>3</b>	<b>BHS 3160 Health Care Policy . . . . .</b>	<b>3</b>
This course is designed to introduce ethical thinking and concepts regarding health care to prepare the student with the essential vocabulary and thought processes to understand, evaluate, and participate in ethical decision making.		This course provides the student with a broad understanding of policy, how health care is organized and dispensed, and how the practitioner can better work in the system. Topics of discussion include cost control, long term care, quality control, ethical issues, and insurance.	
<b>BHS 3120 Introduction to Epidemiology . . . . .</b>	<b>3</b>	<b>BHS 4000 Cultural Competency . . . . .</b>	<b>3</b>
The purpose of this course is to introduce the history and development of epidemiology in relation to public health and disease. Communicable, epidemic, and endemic, as well as social diseases, will be discussed.		The purpose of this course is to develop competency and better understanding when confronted with the practitioner's delivery of health care and issues related to diversity; ethnically based customs, rituals, and alternative health care choices; folk medicine; and cultural structure and viewpoints.	
<b>BHS 3130 Research Design in Health Care . . . . .</b>	<b>3</b>	<b>BHS 4100 Academic and Professional Writing . . . . .</b>	<b>3</b>
This course is designed as an introduction to critical analysis of research and medical literature as well as basic research methods. The course includes an introduction to descriptive and inferential statistics and research design. Statistical and research concepts and procedures are combined with an emphasis on practical health care applications.		The purpose of this course is to introduce students to the format, content, and thought processes needed for successful academic and professional writing. This is accomplished through the use of the <i>NSU B.H.Sc. Form and Style Manual</i> as well as an introduction to APA and AMA manuals. An overview of proper sentence and paragraph structure, grammar, punctuation usage, formatting, and bibliographic referencing will be discussed.	
<b>BHS 3150 Principles of Leadership . . . . .</b>	<b>3</b>	<b>BHS 4110 Health Care and Aging . . . . .</b>	<b>3</b>
This course will provide an overview of numerous leadership theories to prepare the student for a leadership role in health care. The course will critically analyze the differences between leadership and management.		This course examines the psychosocial and cultural variations associated with maturing and aging. Topics covered will be an overview of life choices, living wills, and treatment, as well as cultural implications of senior care.	
<b>BHS 3155 Conflict Resolution . . . . .</b>	<b>3</b>		
The purpose of this course is to develop an understanding of, and effective methods and strategies for reducing, the incidences of workplace conflict, including employee-employee, supervisor-subordinate, patient-patient, and patient/client-provider conflict.			

**Credit Hours**

**MHS 5107 Internship ..... 5**

Students will complete 80 hours of internship in an area of interest within a health care organization outside of their regular places of employment. The final product of this internship is an in-depth SWOT analysis of the unit or health care organization. The internship site requires prior M.H.Sc.-faculty member approval.

**MHS 5205 Writing for Medical Publication . . . . 3**

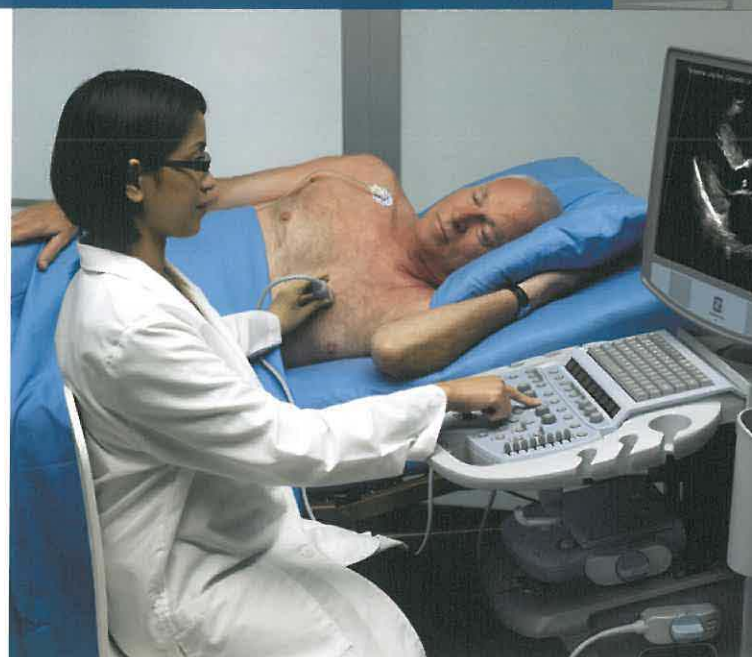
This course is a study and review of quality medical writing techniques, issues, and procedures with an emphasis on cultivating personal style and content. Focus will be on writing for peer and evidence-based publications.

**MHS 5207 Practicum ..... 5**

The practicum is a culminating experience for M.H.Sc. students. Under supervision of an M.H.Sc. faculty adviser, students will develop community-based health promotion and disease prevention interventions with underserved and/or nontraditional populations.

**MHS 5406 Directed Studies I ..... 3**

This course is the foundation for MHS 5407 Directed Studies II. This two-tiered course structure will culminate in a scientific paper or research poster presentation based on extensive research on a particular topic in cardiovascular sonography or ultrasound technology. In MHS 5406, the student will select an appropriate topic, obtain approval by the program director, and explore the foundation of that topic including issues and questions. Work product for this course will include, but is not limited to, the first half of a scientific paper or research poster—introduction, needs assessment, identification of resources, literature review, methodologies and procedures section, and anticipated results.



**Credit Hours**

**MHS 5407 Directed Studies II. .... 3**

This course concludes the series on Directed Studies by the completion of the scientific paper or research poster presentation on the topic chosen in MHS 5406. The final paper is to be suitable for publication in professional journals. The poster presentation is to be suitable for presentation at a local, regional, or national professional event. Work product for this course will include, but is not limited to, the remaining content necessary to complete a scientific paper or research poster—discussion, conclusions, implications, and recommendations.

**MHS Elective Courses ..... 3**

Master of Health Science elective courses may be taken in addition to, or in lieu of, Directed Studies I, II, and/or III, based upon faculty adviser approval and course availability. Available course listings will be provided as needed.

## Credit Hours

### MHS 5501 Epidemiology and Biostatistics . . . . . 3

The ability to understand the conceptual and practical aspects of biostatistics and epidemiology in health care is critical to understanding research and analyzing population data about disease. This survey course will improve the ability of students to understand and apply these concepts.

### MHS 5510 Research Methods . . . . . 14

This course is designed to enable participants to develop skills in reading and critically evaluating published research using the scientific model. The advantages and disadvantages of quantitative and qualitative research methods will be compared and contrasted. Research articles will be collaboratively analyzed to develop an appreciation of potential methodological problems and their implications for evidence-based professional practice.

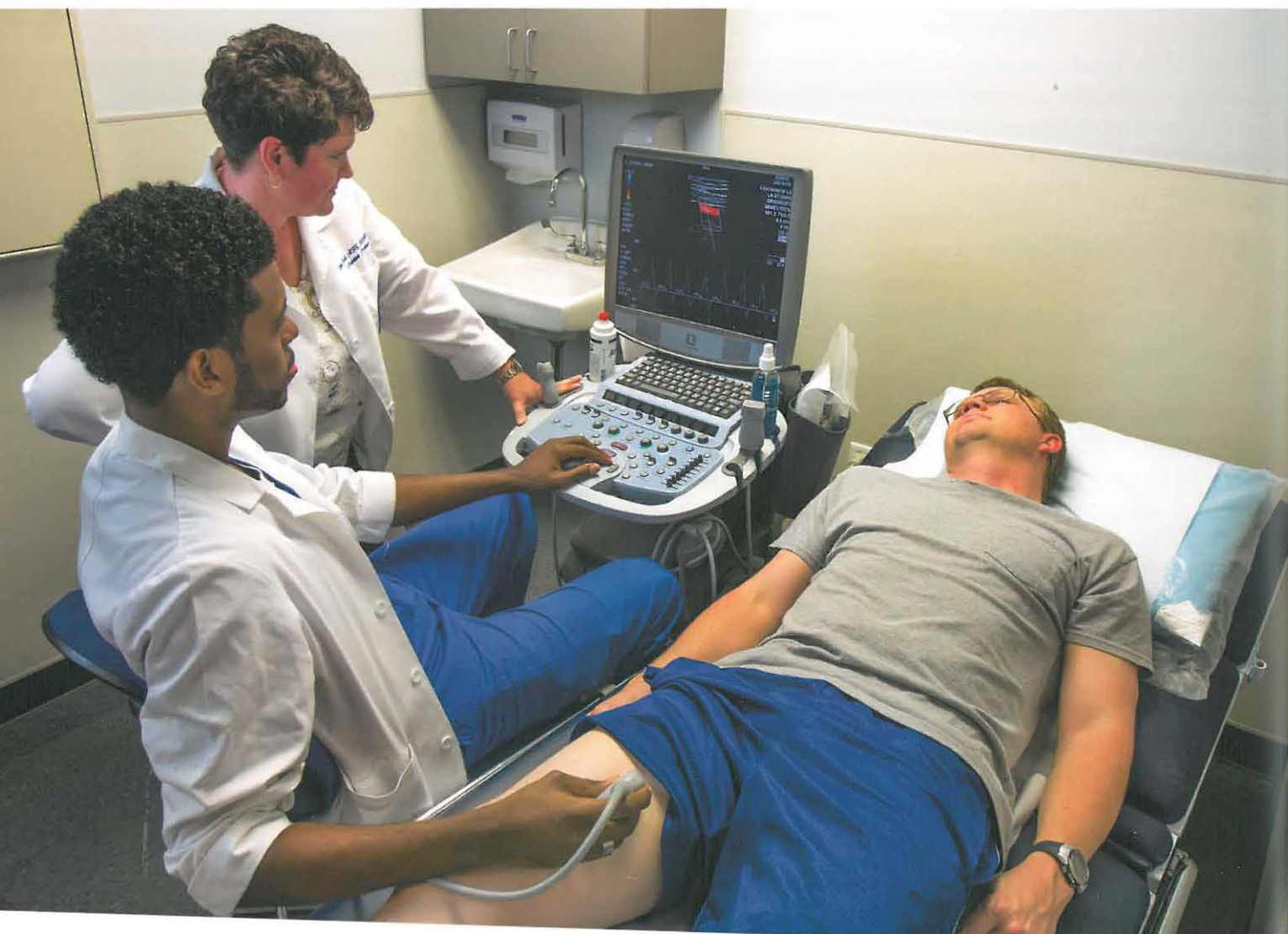
## Credit Hours

### MHS 5507 Ethical, Legal, and Cultural Trends in Today's Health Care Environment . . . . . 4

This course will examine ethical principles, cultural issues, and legal trends in today's health care environment. Discussion, analysis, and application of cultural issues and ethical principles that guide decision making as related to current health care reform will be explored.

### MHS 5530 Principles of Management . . . . . 3

This course will discuss the various principles of management and its associated issues as they relate to the modern health care professional. It will explore topics such as concepts of organizational management; decision making; strategic planning; resource management; and allocation, conflict, and the concept of power.



The BHS and MHS prefix courses are designed to be completed in a distance learning format. The online courses are offered via Nova Southeastern University College of Health Care Sciences' state-of-the-art, Web-based distance learning technologies.

Students in the B.S.—Cardiovascular Sonography program are provided with NSU computer accounts including email. Students must obtain their own Internet service providers (ISP) and use their own computer systems (IBM-compatible PC or Apple, and a high-speed Internet connection). New students receive an orientation and extensive online technical support dealing with online access, online tools and methods, and library resources.

Online interactive learning methods involve Web pages to access course materials, announcements, the electronic library, and other information, plus a range of online activities that facilitate frequent student-professor interaction. Faculty members and students interact via online forums using threaded bulletin boards, chatrooms, and email. Students are able to submit assignments as email attachments, through the use of online forms sent directly to program instructors, fax-to-fax, fax-to-email, and through Blackboard. Some online courses may include electronic classroom sessions.

Online students have online access to books, journal articles, microfiche, dissertations, index searches, catalog searches, and reference librarians. The online medical database collection at NSU is extensive and includes access to quality subscription services free of charge to the student.

The bachelor's degree and concurrent master's degree option curricula for the cardiovascular sonography program follow a lock-step model. This means that all courses (both online and on campus) have to be taken and passed in sequence for students to progress in the program. Each term will have a blend of both online and on-campus courses for a full-time curriculum of study. The specific sequence of courses will be announced during orientation for each new entering class and is subject to change if necessary.



## COMPUTER REQUIREMENTS

All students are required to have access to a computer (PC or Apple equivalent) with the following minimum specifications:

- AMD or Intel dual-core processor
- Windows 7 or better
- 4 GB RAM
- 250 GB hard-drive
- CD-ROM drive (read-write)
- USB port
- high-speed Internet connection (cable, DSL, etc. 100 Mb/second or better)
- graphics printing capability
- video Webcam with microphone capability

## PROGRAM CONTACT INFORMATION

### ONLINE

- Web site:  
[www.nova.edu/chcs/healthsciences/cardiovascular/index.html](http://www.nova.edu/chcs/healthsciences/cardiovascular/index.html)
- Online application:  
[www.nova.edu/chcs/healthsciences/cardiovascular/index.html](http://www.nova.edu/chcs/healthsciences/cardiovascular/index.html)  
Click on "Request/Apply Now" at the top of the page

### PHONE

- Cardiovascular Sonography program office:  
(813) 574-5370
- Undergraduate Admissions: (954) 262-8000
- HPD Admissions: 877-640-0218

## STUDENT HOUSING

Numerous apartments, condominiums, and other rental facilities are located near campus. Information concerning off-campus housing may be obtained by contacting

### NOVA SOUTHEASTERN UNIVERSITY

Office of Student Affairs

3632 Queen Palm Drive

Tampa, Florida 33619-1311

Sheena Zawacki: (813) 574-5298



Students are provisionally admitted to a degree-seeking program based on a review of unofficial transcripts or other specific program admission requirements. However, this admission includes a condition that final and official transcripts, documents, and requirements must be received within 90 calendar days from matriculation. If these final and official transcripts, documents, and/or requirements are not received by that time, the student will not be allowed to continue class attendance. Financial aid will not be disbursed to a provisional/conditional student until he or she has been fully admitted as a regular student (all admissions requirements have been approved by the college/program admissions office). Students who have an unpaid balance 30 days from the start of the term will be assessed a \$100 fee.

## TUITION AND FEES

Tuition for 2013–2014 is \$19,500 for the B.S.—Cardiovascular Sonography Program and \$20,710 for the concurrent M.H.Sc. option. Tuition for 2014–2015 will subsequently be posted on our Web site ([www.nova.edu/chcs/healthsciences/cardiovascular/index.html](http://www.nova.edu/chcs/healthsciences/cardiovascular/index.html)). In addition, there will be a \$200 fee for the Sonography Physics and Instrumentation (SPI) examination. A Health Professions Division general access fee of \$145 is required each year. An NSU student services fee of \$900 is also required annually. All tuition and fees are subject to change by the board of trustees without notice.

**Acceptance Fee—\$500.** This fee is required to reserve the accepted applicant's place in the entering first-year class, but is not refundable in the event of a withdrawal. It is payable within two weeks of an applicant's acceptance.

**Deposit—\$250.** This is due May 1, under the same terms as the Acceptance Fee.

**Preregistration Fee—\$250.** This is due June 1 for master's degree applicants and July 15 for bachelor's degree applicants, both under the same terms as the Acceptance Fee.

**University Technology Fee.** This fee is not to exceed \$100 when implemented.

The first semester's tuition and fees, less the \$1,000 previously paid, are due on or before registration day. Tuition for each subsequent semester is due on or before the appropriate registration day. Students will not be admitted until their financial obligations have been met.

Each student is required to carry adequate personal medical and hospital insurance. Students may avail themselves of the hospitalization insurance plan obtainable through the university.

## FINANCIAL AID

The primary financial responsibility for a student's education rests with the student and his or her family, but economic circumstances for some may make it necessary for the student to obtain assistance from other sources.

The Office of Student Financial Assistance at Nova Southeastern University is there to help as many qualified students as possible to complete their health professions education. Various loans, scholarships, and grants are available to qualified students to help ease the high cost of a health professions education. These financial assistance programs are described on our Web site ([www.nova.edu/financialaid](http://www.nova.edu/financialaid)).

For information on financial assistance, contact

NOVA SOUTHEASTERN UNIVERSITY  
Office of Student Financial Assistance  
3301 College Avenue  
Fort Lauderdale, Florida 33314-7796  
(954) 262-3380 • 800-806-3680

## NSU COLLEGE OF HEALTH CARE SCIENCES

### VISION STATEMENT

The College of Health Care Sciences will be recognized as a local, national, and international leader in health-care education through excellence and innovation in teaching, scholarship, and service.

### MISSION STATEMENT

The College of Health Care Sciences strives to provide professionals with the skills necessary for the diagnosis, treatment, and prevention of disease and disability in order to assure optimum health conditions in the community and beyond. With an unwavering commitment to ethical practice and in support of the Nova Southeastern University Core Values, the college endeavors to advance research, scholarship, and the development of leadership skills utilizing traditional educational methods, distance learning, and innovative combinations of both to achieve its educational goals.



Welcome to Tampa Bay. Situated along Florida's Gulf Coast, this region boasts an enviable quality of life with year-round sunshine, a unique cultural heritage, and a diverse business climate. For individuals and companies alike, Tampa offers accessibility, affordability, and opportunity.

Tampa is the hub of Hillsborough County and one of the largest metropolitan areas in the Southeast. The four-county metropolitan statistical area (MSA) of Hillsborough, Pinellas, Pasco, and Hernando counties has a population of 2.7 million, making it the 19th largest MSA in the United States. We boast a diverse and expanding mix of businesses, from financial services and bioscience to technology and international trade. As the economy begins to kick back into gear, the Tampa Bay region is looking to a bright future of continued job creation. This will be particularly true of the industry clusters that make Tampa the gateway to Florida's High Tech Corridor (including life sciences, nanotechnology, aviation/aerospace, and homeland security/defense).

Newcomers to the region will be delighted to discover a vibrant arts community alive with contemporary art and a deep respect for our unique cultural heritage. In February 2010, Tampa celebrated the opening of the Tampa Museum of Art's new facility along the Hillsborough River in downtown Tampa. The museum is located in the brand new Curtis Hixon Downtown Waterfront Park, which will also soon be home to the Glazer Children's Museum,

currently under construction. Besides enjoying Tampa Bay's beautiful beaches, millions of people experience Busch Gardens annually, and the Lowry Park Zoo is ranked as the number one Family Friendly Zoo in the country. Other major attractions include the outstanding Florida Aquarium, the Museum of Science and Industry, and the Big Cat Rescue.

Sports and Tampa Bay are an unbeatable combination. Professional sports teams keep spectators on their feet with championship runs, while perfect weather and a pristine physical environment make Tampa Bay an outdoor enthusiast's paradise. Tampa has very active professional sports teams, including the NFL's Tampa Bay Buccaneers, MLB's Tampa Bay Rays, and the NHL Tampa Bay Lightning. The New York Yankees call Tampa their home for spring training, while the University of South Florida Bulls and University of Tampa Spartans provide multiple NCAA sports for the area.

Tampa Bay enjoys an average temperature of 73 degrees Fahrenheit and holds the record for the most consecutive days of sunshine—768 to be exact. This tropical climate makes Tampa a great place to play. From canoeing the scenic Hillsborough River to biking or jogging alongside the bay, Tampa has something for everyone. Fish from a pier or charter a deep-sea fishing boat. Play at one of Tampa's dozens of beautiful golf courses year-round. Enjoy a walk on the beach at sunset. The opportunities for physical activity are endless.



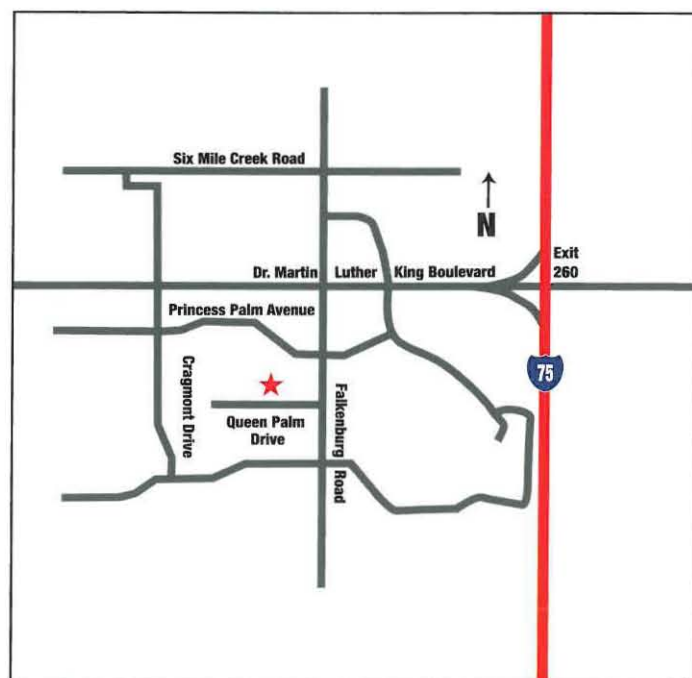
**NOVA SOUTHEASTERN UNIVERSITY**  
**Tampa Regional Campus**  
 3632 Queen Palm Drive  
 Tampa, Florida 33619-1311

**From Cities North of Tampa**

- Take I-75 South to Mango exit, exit 260 (Martin Luther King Boulevard)
- Exit onto Martin Luther King Boulevard (west)
- Turn left onto Falkenburg Road
- Turn right onto Queen Palm Drive (2nd right)
- The educational center will be on your right-hand side.

**From Cities South of Tampa**

- Take I-75 North to Mango exit, exit 260B (Martin Luther King Boulevard)
- Exit onto Martin Luther King Boulevard (west)
- Turn left onto Falkenburg Road
- Turn right onto Queen Palm Drive (2nd right)
- The educational center will be on your right-hand side.





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UNIVERSITY

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Phone: (813) 574-5200

Cardiovascular Sonography Program: (813) 574-5370

Health Professions Division  
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Office of Admissions  
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[www.nova.edu](http://www.nova.edu)