



Wheaton Franciscan Healthcare
St. Francis School of Diagnostic Medical Sonography

Bulletin
Cardiac/Vascular

The St. Francis School of Diagnostic Medical Sonography operates on the semester system, with Three 16 week semesters a year. The final semester is shortened to 8 weeks.

Clinical Practicum for Cardiac/Vascular ultrasound is done at one of several clinical sites. During the first 3 months all students are at Wheaton Franciscan- St. Francis. Thereafter students rotate to the other clinical sites on an 8 week basis.

Clinical courses and experiences at each campus are tailored to reflect the unique patient population base of that location. This program is intended to be taken in sequence after prerequisite courses are met. Students cannot transfer into the program nor take courses out of sequence. The general sequence of the program is as follows:

Course #	Course Name	Credit Hours	Didactic Clock Hours	Lab Clock Hours	Hospital Clinical Clock Hours
DMS S1-0	Foundations of Ultrasound	1	32		
DMS S1-1	Ultrasound Physics & Instrumentation 1	3	48	4	
DMS S1-2	Vascular Sonography 1	3	40	12	
DCS S1-1	Cardiac Sonography 1	3	40	8	
DCS S1-2	Echo/Vascular Case Review	2	36		
DCS S1-3	Clinical Practicum 1	4			350
DMS S2-1	Ultrasound Physics & Instrumentation 2	3	48		
DMS S2-2	Vascular Sonography 2	4	48	16	
DCS S2-1	Cardiac Sonography 2	4	52	12	
DCS S2-2	Echo/Vascular Case Review	4	48		
DCS S2-2	Clinical Practicum 2	5			380
DMS S3-1	Ultrasound Physics & Instrumentation 3	3	48	4	
DMS S3-2	Vascular Sonography 3	4	52	12	
DCS S3-1	Cardiac Sonography 3	4	48	16	
DCS S3-2	Echo/Vascular case Review	3	48		
DCS S3-3	Clinical Practicum 3	5			380
DCS S4-1	Cardiac Sonography 4	4	56	8	
DCS S4-2	Echo/Vascular Case Review	3	48		
DCS S4-3	Clinical Practicum 2	6			500
DCS S5-1	Cardiac Sonography 5	2	32		
DCS S5-2	Echo/Vascular case Review	2	32		
DCS S5-3	Clinical Practicum 5				250
Program Hour Totals		72	756	92	1780

COURSE DESCRIPTIONS

Semester 1 (16 weeks)

Foundations of Ultrasound

This course helps the students adapt to the demands of a hospital based educational program. Course content includes hospital and department orientation, healthcare law and ethics, disease and medical terminology. A primer on patient care including infection control, vitals, restraints, transfers, pharmacology, and emergencies is taught. The history of ultrasound and the function of imaging in medicine are reviewed.

Prerequisites: none

Book required: none

DMS S1-3 Ultrasound Physics & Instrumentation 1

This course focuses on basic mathematical principles and ultrasound physics. The relationships between period, frequency, and wavelength are explored. A description of amplitude, power and intensity is given for both continuous wave and pulsed ultrasound. The student is taught the concepts of attenuation, reflection and refraction. It discusses the various types of transducers and mechanisms for emitting and receiving sound waves. The schema of an ultrasound unit is discussed.

Prerequisites: DMS S1-0

Book required: Understanding Ultrasound Physics (3rd edition) by Sidney Edelman ISBN 0-9626444-4-7

DCS S1-1 Cardiac Sonography 1

This course introduces the student to the basics of echocardiography. Course content includes hospital and departmental orientation, terminology, basic technique (knobology) cardiac anatomy and physiology, introduction to ECG, and the 2-dimensional echocardiographic examination.

Prerequisites: none

Books required: The Echo Manual (3rd edition,) Jae K. Oh et al, ISBN 0-7817-4853-4

The Echocardiographer's Pocket Reference (3rd edition,) Terry Reynolds, ISBN 0-9635767-9-8

DCS S1-2 Echo/Vascular Case Review

This course serves as an in-depth look at normal and abnormal cardiac and vascular sonographic anatomy and interpretive and technical considerations. The student will be required to present at least one case per session using prescribed methodology. The cases are designed to parallel the progression of lecture material.

Prerequisites: none

Books required: none

DCS S1-3 Clinical Practicum 1

The students will receive clinical instruction at WFH-St. Francis. The instruction will concentrate on transthoracic echocardiography and peripheral arterial vascular sonography, but the student will be exposed to all aspects of cardiology and cardiovascular imaging. Under direct supervision of the clinical instructors and sonographers, students will perform the portion of the echocardiogram that they have attained proficiency in (see proficiency/competency system.) They will also observe exam

Prerequisites: DMS S1-1 Foundations of Ultrasound

Books required: none

Semester 2 (16 weeks)

DCS S2-1 Cardiac Sonography 2

This course continues to build on the basics taught in Cardiac Sonography 1. Topics include Doppler, ventricular systolic and diastolic function, coronary artery disease, stress testing, contrast agents and invasive cardiology (cardiac catheterization.)

Prerequisites: DCS S1-1

Books required: The Echo Manual (3rd edition,) Jae K. Oh et al, ISBN 0-7817-4853-4
The Echocardiographer's Pocket Reference (3rd edition,) Terry Reynolds, ISBN 0-9635767-9-8

DMS S2-2 Ultrasound Physics & Instrumentation 2

This course focuses on the physics and instrumentation used in general ultrasound. The construction and function of transducers are discussed. The functional parts of an ultrasound machine are described. Display and storage of ultrasound images are covered.

Prerequisites: DMS S1-3

Book required: Understanding Ultrasound Physics (3rd edition) by Sidney Edelman ISBN 0-9626444-4-7

DCS S2-2 Echo/Vascular Case Review

This course serves as an in-depth look at normal and abnormal cardiac and vascular sonographic anatomy and interpretive and technical considerations. The student will be required to present at least one case per session using prescribed methodology. The cases are designed to parallel the progression of lecture material.

Prerequisites: DCS S1-2

DCS S2-3 Clinical Practicum 2

Students receive continued instruction by clinical instructors and sonographers in the performance of echocardiography and vascular sonography at WFH-St. Francis and through clinical rotations to other sites. Students will perform the portion of the exam for which they have completed proficiency. Students will be evaluated monthly on their scanning abilities and patient care skills

Semester 3 (16 weeks)

DCS S3-1 Cardiac Sonography 3

This course provides instruction on pericardial disease, cardiac transplants, and valvular stenosis and regurgitation. More detailed instruction on Doppler findings specific to each valvular lesion is emphasized.

Prerequisites: DCS S2-1

Books Required: The Echo Manual (3rd edition,) Jae K. Oh et al, ISBN 0-7817-4853-4
The Echocardiographer's Pocket Reference (3rd edition,) Terry Reynolds, ISBN 0-9635767-9-8

DMS S3-2 Ultrasound Physics & Instrumentation 3

This course focuses on the physics and instrumentation used in vascular physics. The hemodynamics, Doppler instrumentation, and bioeffects of ultrasound are discussed and the safe use of the technology is emphasized. Students are required to explore recent advances in ultrasound and make presentations. This course will prepare the student to take the Physics and Instrumentation Board.

Prerequisites: DMS S2-1

Book required: Understanding Ultrasound Physics (3rd edition) by Sidney Edelman ISBN 0-9626444-4-7

DMS S3-2 Vascular Sonography 3

This class is intended to teach the student to perform cerebrovascular and abdominal vascular exams. The student will become acquainted with other modalities that perform peripheral arterial tests and the relative strengths and weaknesses will be explored. The student will also become familiar with pre and post testing for dialysis grafts and shunts. The concepts of cerebrovascular hemodynamics will be taught. The anatomy, physiology and pathology of the cerebrovascular and visceral systems will be addressed. The ultrasound tests used to diagnose cerebrovascular and visceral pathology will be described and the student will be taught to perform each of these tests. Scan labs will be integrated into the curriculum to provide hands-on skills. The student will become acquainted with other modalities that perform vascular tests and the relative strengths and weaknesses will be explored. Finally the quality control and statistical analysis of vascular ultrasound will be taught.

Prerequisites: DMS S2-2

Book required: Vascular Technology: an Illustrated Review (4th edition) by Rummwell & McPharlin ISBN 0-941022-73-0

DCS S3-2 Echocardiography/Vascular Case Review

This Cardiac Sonography 3 course serves as an in-depth look at normal and abnormal cardiac and vascular sonographic anatomy and interpretive and technical considerations. The student will be required to present at least one case per session using prescribed methodology. The cases are designed to parallel the progression of lecture material.

Prerequisites: DCS S2-2

DCS S3-3 Clinical Practicum 3

Students receive continued instruction by clinical instructors and sonographers in the performance of echocardiography and vascular sonography at WFH-St. Francis and through clinical rotations to other sites. Students will perform the portion of the exam for which they have completed proficiency. Students will be evaluated monthly on their scanning abilities and patient care skills.

Semester 4 (16 weeks)

DCS S4-1 Cardiac Sonography 4

Students will receive instruction on transesophageal echocardiography, endocarditis, Cardiomyopathies, embryology and congenital heart disease.

Prerequisites: DCS S3-; Books required: Textbook of Clinical Echocardiography (4th edition) by Catherine Otto and The Echocardiographer's Pocket Reference (3rd edition) by Terry Reynolds

DCS S4-2 Echocardiography/Vascular Case Review

This course serves as an in-depth look at normal and abnormal cardiac and vascular sonographic anatomy and interpretive and technical considerations. The student will be required to present at least one case per session using prescribed methodology. The cases are designed to parallel the progression of lecture material.

Prerequisites: DCS S3-2

DCS S4-3 Clinical Practicum 4

Students receive continued instruction by clinical instructors and sonographers in the performance of echocardiography and vascular ultrasound at WFH-St. Francis and through clinical rotations to other sites. Students will perform the portion of the exam for which they have completed proficiency. Students will be evaluated monthly on their scanning abilities and patient care skills.

Semester 5 (16 weeks)

DCS S5-1 Cardiac Sonography 5

This course focuses on new technologies and applications, 3D/4D imaging, systemic diseases and preparation for the American Registry of Diagnostic Medical Sonography RDCS exam.

Prerequisites: DCS S4-1;

Books required: Textbook of Clinical Echocardiography (4th edition) by Catherine Otto and The Echocardiographer's Pocket Reference (3rd edition) by Terry Reynolds

DMS S5-1 Registry Review

Classroom involvement during the last semester of the program is dedicated to reviewing for the ARDMS exam. This course provides students with the opportunity to improve test-taking skills.

Prerequisites: DMS S4-1

Book required: Lange Q&A Ultrasonography Examination (4th edition) Herzog, Odwin & Fleischer

DCS S5-2 Echocardiography/Vascular Case Review

This course serves as an in-depth look at normal and abnormal cardiac and vascular sonographic anatomy and interpretive and technical considerations. The student will be required to present at least one case per session using prescribed methodology. The cases are designed to parallel the progression of lecture material.

Prerequisites: DCS S5-2

DCS- S5-3 Clinical Practicum 5

Students will continue clinical rotations at various sites. They will be independently performing echocardiograms and vascular testing under supervision. Students will be evaluated monthly on their scanning abilities and patient care skills.

Grading and Evaluation

Didactic grading is achieved by written tests and completion of proficiencies. Written tests are used to compute a course grade. Proficiencies are required elements that if not completed will effect the course grade.

Written Tests and Course grading

The student will receive a percentile score for every test taken. These tests are weighted as to their importance for the course grade. A weighted averaging is then computed and converted to a letter grade for the course according to the following table.

Weighted Test Score Average	Letter grade	Grade points
100% - 93%	A	4.0 x credit hours
92% - 85%	B	3.0 x credit hours
84% - 77%	C	2.0 x credit hours
70% - 76%	D	1.0 x credit hours
<70%	F	0

Grade Point Average (GPA)

Grade points are awarded for each course based upon the letter grade earned times the course credits. The grade point average is computed by dividing the earned grade points by the total possible grade points.

Students are required to maintain a B average (or 3.0 GPA) in every semester. Failure to maintain this standard may lead to probationary action. If uncorrected, expulsion from the program will occur.

Proficiency grading

Students are expected to complete a series of proficiencies within a specified period for many courses. Failure to complete the proficiency on time will result in a 10 percentage point deduction on the corresponding test.

Semester Grades

Students will receive a semester grade that will contain the letter grade for every course, a semester GPA and an accumulative GPA. A clinical assessment will also be given based upon the clinical performance evaluations completed by Clinical Instructors and the Program Director.

Curriculum Enhancements

St. Francis School of Diagnostic Medical Sonography is committed to developing and maintaining the very best education programs. Changes may be made to the curriculum and other aspects of this program as necessary to assure the highest-quality training.

Graduation requirements

Satisfaction of Monetary Obligations — Full payment of tuition, textbooks, and any other related fees is required before graduation

Satisfactory completion of all courses - Students are expected to maintain a B average in all semesters. Any student that does not may be dismissed or prevented from school authorized participation in the ARDMS registry exam.

Clinical Competence — Students must pass a clinical Competency in the following areas: Parasternal, Apical, Subcostal and Other Views, Routine Complete Exam, Transesophageal Exam, and Timed Routine Cardiac Exam.

Clinical Experience- Students are required to perform clinical work for a minimum of 1,700 hours within an 18 month period. In addition, the student will be involved (observed, partially scanned, and fully scanned) at least 1,000 cases. This total must include at least 400 echocardiography cases, and 300 vascular cases.

Satisfactory Attendance- Students cannot graduate if they have exceeded their allotted personal time off (PTO). Students who have exceeded their allotted PTO will have to make up their time before graduation.

Clinical Grade- students are evaluated by the clinical instructors on a monthly basis (see clinical evaluations) and will progress through the clinical levels. To graduate, the student must attain an average “advanced student” level (performance score of 3.0 or above). Failure to attain this score will result in delay of graduation.

Upon fulfillment of all these criteria, the student will be awarded a certificate, final grade and transcript indicating that they are graduates of the program.