



**Wheaton Franciscan Healthcare**  
**St. Francis** School of Diagnostic Medical Sonography

**Bulletin**  
**General/Vascular**

The St. Francis School of Diagnostic Medical Sonography operates on the semester system, with Three 16 week semesters a year.

Clinical Practicum for General/Vascular ultrasound is done at one of several clinical sites. During the first 8 weeks 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              |                               |
| DMS S1-3                   | Abdominal Sonography 1                         | 7            | 88                   | 44              |                               |
| DMS S1-4                   | Clinical Practicum 1                           | 4            |                      |                 | 300                           |
| DMS S2-1                   | Ultrasound Physics & Instrumentation 2         | 3            | 48                   |                 |                               |
| DMS S2-2                   | Vascular Sonography 2                          | 4            | 48                   | 16              |                               |
| DMS S2-3                   | Abdominal Sonography 2                         | 4            | 52                   | 12              |                               |
| DMS S2-4                   | Pelvic Sonography                              | 3            | 39                   | 9               |                               |
| DMS S2-5                   | Clinical Practicum 2                           | 5            |                      |                 | 380                           |
| DMS S3-1                   | Ultrasound Physics & Instrumentation 3         | 3            | 48                   | 4               |                               |
| DMS S3-2                   | Vascular Sonography 3                          | 4            | 52                   | 12              |                               |
| DMS S3-3                   | Obstetrical Sonography 1                       | 3            | 51                   | 8               |                               |
| DMS S3-4                   | Abdominal Sonography 3                         | 4            | 60                   | 8               |                               |
| DMS S3-5                   | Clinical Practicum 3                           | 5            |                      |                 | 400                           |
| DMS S4-1                   | Obstetrical Sonography 2                       | 4            | 40                   | 8               |                               |
| DMS S4-2                   | Superficial Sonography                         | 3            | 36                   | 6               |                               |
| DMS S4-3                   | Clinical Practicum 4                           | 6            |                      |                 | 500                           |
| DMS S5-1                   | Registry Review                                | 3            | 60                   |                 |                               |
| DMS S5-2                   | General and Vascular Case Review/Film Critique | 3            | 48                   |                 |                               |
| DMS S5-3                   | Clinical Practicum 5                           | 6            |                      |                 | 500                           |
| <b>Program Hour Totals</b> |  | <b>81</b>    | <b>798</b>           | <b>143</b>      | <b>2000</b>                   |

## COURSE DESCRIPTIONS

### Semester 1 (16 weeks) September - December

#### **DMS S1-0 Foundations of Ultrasound**

This course is intended for both General/Vascular and Cardiac/Vascular students. It is intended to help the student 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 S1-1 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 (3<sup>rd</sup> edition) by Sidney Edelman ISBN 0-9626444-4-7*

#### **DMS S1-2 Vascular Sonography 1**

The purpose of this course is to prepare the student to perform peripheral arterial vascular ultrasound. It will introduce the student to the ultrasound physics and instrumentation involved performing vascular ultrasound. It then moves to the concepts of peripheral arterial hemodynamics. The anatomy, physiology and pathology of the peripheral arterial vasculature will be addressed. The ultrasound tests used to diagnose peripheral arterial 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 peripheral arterial tests and the relative strengths and weaknesses will be explored.

*Prerequisites: DSMS1-0*

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

### **DMS S1-3 Abdominal Sonography 1**

This course focuses on normal gross anatomy, cross-sectional anatomy, and relational anatomy of the abdominal cavities, abdominal vessels, liver, biliary, and pancreatic systems. Physiology, pathology and pathophysiology are emphasized. Related laboratory values and other imaging modalities are discussed. Lectures are correlated with scanning lab demonstrations.

*Prerequisites: DMS S1-0*

Book required: Textbook of Diagnostic Ultrasonography (6<sup>th</sup> edition) by Sandra Hagen-Ansert  
ISBN 10: 0-323-02803-9

### **DMS S1-4 Clinical Practicum 1**

The students will receive clinical instruction at WFH- St. Francis for the first 8 weeks and continue clinical instruction for the second 8 weeks at assigned clinical sites. This instruction will concentrate on abdominal and peripheral vascular ultrasound but the student will be exposed to all facets of Sonography. Under the direct supervision of the clinical instructors and sonographers, students will perform that portion of the abdominal and vascular exam that they have attained proficiency in. (see proficiency/competency system). They will further observe all exams performed at the clinical site.

*Prerequisites: DMS S1-0*

## **Semester 2 (16 weeks) January - May**

### **DMS S2-1 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 S1-1*

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

### **DMS S2-2 Vascular Sonography 2**

The purpose of this course is to prepare the student to perform Peripheral Venous Testing and Ultrasound. It explores the anatomy, physiology and pathology of peripheral venous system. It teaches the student the imaging and non-imaging exams that can be performed and compares those to the other modalities. Scan labs will be integrated into the curriculum to provide hands-on skills.

*Prerequisites: DMS S1-2*

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

### **DMS S2-3 Abdominal Sonography 2**

This course focuses on normal gross anatomy, cross-sectional anatomy, and relational anatomy of the kidneys, spleen, and adrenal glands. Physiology and pathology are emphasized. Related laboratory values and other imaging modalities are discussed. Lectures are correlated with scanning lab demonstrations.

*Prerequisites: DMS S1-3*

Book required: Textbook of Diagnostic Ultrasonography (6<sup>th</sup> edition) by Sandra Hagen-Ansert  
ISBN 10: 0-323-02803-9

### **DMS S2-4 Pelvic Sonography**

This course focuses on the gross normal anatomy, embryology, disease processes and normal and abnormal scan appearances. Physiology, embryology, and the menstrual cycle are discussed. Congenital and acquired anomalies are also explored. Infectious and inflammatory processes as well as neoplasms of the vagina, uterus, ovaries, and surrounding adnexa are discussed. Lectures are correlated with scanning lab demonstrations.

*Prerequisites: DMS S1-0*

Book required: Textbook of Diagnostic Ultrasonography (6<sup>th</sup> edition) by Sandra Hagen-Ansert  
ISBN 10: 0-323-02803-9

### **DMS S2-5 Clinical Practicum 2**

Students will receive continued instruction by clinical instructors and sonographers in the performance of abdominal and vascular ultrasound at their assigned clinical site. They will begin instruction in scanning gynecologic ultrasound under the direct supervision of sonographers. Again students will independently perform that portion of the abdominal, vascular, or pelvic exam that they have completed proficiency for. Students will also be encouraged to perform other exams under the direct supervision of the clinical instructors and experienced sonographers.

Prerequisites: DMS S1-4

## **Semester 3 (16 weeks) May- August**

### **DMS S3-1 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: DSM S2-1*

Book required: Understanding Ultrasound Physics (3<sup>rd</sup> 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 (4<sup>th</sup> edition) by Rummwell & McPharlin ISBN 0-941022-73-0

### **DMS S3-3 Obstetrical Sonography 1**

This course focuses on the gravid uterus and fetal development. Spontaneous abortion and ectopic pregnancies will be discussed. The function of the placenta, umbilical cord and amnion will be detailed. The normal 2<sup>nd</sup> and 3<sup>rd</sup> trimester fetal anatomy will be explained. The types of fetal ultrasound will be explored.

*Prerequisites: DMS S2-3*

Books required: Textbook of Diagnostic Ultrasonography (6<sup>th</sup> edition) by Sandra Hagen-Ansert  
ISBN 10: 0-323-02803-9

### **DMS S3-4 Abdominal Sonography 3**

This course focuses on normal gross anatomy, cross-sectional anatomy, and relational anatomy of the GI tract and abdominal wall. Pediatric ultrasound, including abdomen, GI, brain, spine and hips are covered. Physiology and pathology are emphasized. Related laboratory values and other imaging modalities are discussed. Lectures are correlated with scanning lab demonstrations.

*Prerequisites: DMS S1-3*

Book required: Textbook of Diagnostic Ultrasonography (6<sup>th</sup> edition) by Sandra Hagen-Ansert  
ISBN 10: 0-323-02803-9

### **DMS S3-5 Clinical Practicum 3**

Students will continue to rotate to various clinical sites. They will complete training in abdominal and vascular ultrasound be expected to independently perform entire abdominal exams, carotid ultrasound, and venous Doppler studies. Student will also complete training in pelvic sonography and be expected to show competency during this semester. They will begin performing obstetric and pediatric exams under direct supervision. They will continue to observe all other exams that the clinical site performs.

*Prerequisites: DMSQ2-3*

## **Semester 4 (16 weeks) September - December**

### **DMS S4-1 Obstetrical Sonography 2**

This course focuses on the 2<sup>nd</sup> and 3<sup>rd</sup> trimester scan. Gestational dating, maternal and fetal complications, fetal anomalies, and pathologies are emphasized. Models are used during the integrated scan labs to give the student proctored, hands-on scanning experience.

*Prerequisites: DMS S3-3*

Book required: Textbook of Diagnostic Ultrasonography (6<sup>th</sup> edition) by Sandra Hagen-Ansert

### **DMS S4-2 Superficial Sonography**

This course focuses on the embryology, normal gross anatomy and cross-sectional anatomy of the breast, thyroid, scrotum, prostate, penis, and musculoskeletal ultrasound. The physiology, pathology, and pathophysiology of these organs will be discussed. The normal and abnormal sonographic appearance of the organs will be demonstrated as well as techniques for obtaining images. Correlation with laboratory values and other modalities will be discussed. *Prerequisites: DMS S2-1*

*Prerequisites: DMS S1-1*

Book required: Textbook of Diagnostic Ultrasonography (6<sup>th</sup> edition) by Sandra Hagen-Ansert

#### **DMS S4-3 Clinical Practicum 4**

Students will continue their clinical rotations at various sites and clinical hours will be increased to 4 days per week. They will begin instruction on superficial ultrasound under the direct supervision of sonographers. They will be expected to gain mastery of abdominal, pelvic and vascular sonography. Training in obstetric exams will continue and the student will be expected to independently perform that portion of the exam they have shown proficiency in.

*Prerequisites: DMS S3-5*

### **Semester 5 (16 weeks) January - May**

#### **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 (4<sup>th</sup> edition) Herzog, Odwin & Fleischer ISBN-10: 0071365168

#### **DMS S5-2 General and Vascular Case Review/Film Critique**

This course serves as an in-depth look at normal and abnormal general 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: DMS S3-3*

#### **DMS S5-3 Clinical Practicum 5**

Students will continue clinical rotations at various sites. They will be independently performing all aspects of abdominal, pelvic, obstetric, superficial and vascular ultrasound. They will be expected to show competency in all exams taught under the General/Vascular program

*Prerequisites: DMS S4-3*

## **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: Abdomen, Pelvis, 1<sup>st</sup> Trimester Obstetric, 2<sup>nd</sup>/3<sup>rd</sup> Trimester Obstetric, Small Parts, Carotid Ultrasound, Extremity Venous Doppler, Extremity Arterial Testing, and Visceral Vascular ultrasound.

**Clinical Experience-** Students are required to perform clinical work for a minimum of 1,900 hours within a 20 month period. In addition, the student will be involved (observed, partially scanned, and fully scanned) at least 1,200 cases. This total must include at least 300 abdominal cases, 300 OB/GYN 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.