Beachwood Diagnostic Medical Sonography

DMS101B - Introduction to Sonography & Patient Care ***Clock Hours: 32***

This course introduces the student to the world of diagnostic medical sonography and patient care. Topics will include the history and development of ultrasound, professional ethics specific to ultrasound, legal considerations, industry standards and OSHA guidelines, HIPPA, medical records, methods of infection control, proper scanning techniques, and ergonomics including sonographer best practices to reduce injury. In addition, it will cover patient assessment including age-related care and cultural competency, proper transport and transfer of patients with and without support equipment, taking vital signs, patient comfort and modesty, professional roles both in and out of the sonography department, and how to appropriately communicate with patients and department staff. There will be discussion of proper sterile techniques and procedures, personal protective equipment (PPE), and reporting and documenting incidents and/or adverse medication reactions, as well as discussion on hospital and departmental organization, and hospital and program affiliation.

Co-requisites: *DMS101B, DMS111B, DMSL111, DPHY100*

Pre-requisite: Admission to Beachwood Diagnostic Medical Sonography Program

DMS111B – Diagnostic Medical Sonography – Abdomen I ***Clock Hours: 72***

This course will introduce the internal organs to the student. Topics such as anatomy, physiology, embryology, pathology, pharmacology, pathophysiology, and anatomical variants of the lymphatic system, liver, gallbladder, pancreas, adrenal glands, kidneys, urinary bladder, spleen, aorta, inferior vena cava, thyroid, and neck are covered. Introduction to sonographic terminology, cross-sectional imaging, and the importance of sonographic image acquisition of normal and abnormal findings in conjunction with correlating between other modalities to confirm findings will also be discussed.

*There is a corresponding sonography scan lab with this course.

Co-requisites: *DMS101B, DPHY100*

Pre-requisite: Admission to Beachwood Diagnostic Medical Sonography Program

DMSL111 - Introduction to Sonography Scanning Lab ***Clock Hours: 64***

Selected exercises designed to reinforce concepts covered in DMS111.

This course will introduce the internal organs to the student. Topics such as anatomy, physiology, embryology, pathology, pharmacology, pathophysiology, and anatomical variants of the lymphatic system, liver, gallbladder, pancreas, adrenal glands, kidneys, urinary bladder, spleen, aorta, inferior vena cava, thyroid, and neck are covered. Introduction to sonographic terminology, cross-sectional imaging, and the importance of sonographic image acquisition of normal and abnormal findings in conjunction with correlating between other modalities to confirm findings will also be discussed.

Co-requisites: *DMS101B, DPHY100*

Pre-requisite: Admission to Beachwood Diagnostic Medical Sonography Program

DPHY100 - Ultrasound Physics & Instrumentation ***Clock Hours: 64***

This course is designed to present the physical and mathematical principles of diagnostic medical sonography to the students. Topics will include understanding the physical attributes of sound waves and

how images are generated, attenuation, transducer construction and function, ultrasound instrumentation, multi-hertz frequency capabilities, dynamic range, signal processing, bioeffects, display modes, resolution, artifacts, hemodynamics, harmonics and contrast agents, emerging technology, research design, statistics, quality assurance, and Doppler principles.

Co-requisites: *DMS101B, DMS111B, DMSL111*

Pre-requisite: Admission to Beachwood Diagnostic Medical Sonography Program

DMS112B – Diagnostic Medical Sonography - Abdomen II ***Clock Hours: 64***

This course details the anatomy, physiology, embryology, pathophysiology, pathology, pharmacology, and anatomical variants of the male reproductive system, adrenal glands, peritoneal/retroperitoneal, pleural spaces, breast, musculoskeletal, sonographic procedures, and neonatal sonography to include the hips, spine, and head. Discussion of the sonographer's role in procedures, including documentation and sterile setup, contrast imaging, elastography (ARFI), shear wave imaging, and the importance of correlation between modalities will be included.

*There is a corresponding sonography scanning lab with this course.

Co-requisites: DMS102, DMSL102, DCL102

Pre-requisite: DMS111/DMSL 11

DMSL112 - Sonography Scanning Lab II ***Clock Hours: 48***

Selected exercises designed to reinforce concepts covered in DMS112.

This course details the anatomy, physiology, embryology, pathophysiology, pathology, pharmacology, and anatomical variants of the male reproductive system, adrenal glands, peritoneal/retroperitoneal, pleural spaces, breast, musculoskeletal, sonographic procedures, and neonatal sonography to include the hips, spine, and head. Discussion of the sonographer's role in procedures, including documentation and sterile setup, contrast imaging, elastography (ARFI), shear wave imaging, and the importance of correlation between modalities will be included.

*There is a corresponding sonography scanning lab with this course.

Co-requisites: DMS102B, DMSL102, DCL102

Pre-requisite: DMS111B/DMSL111

DMS102B - Gynecology & 1st Trimester ***Clock Hours: 72***

The course details the anatomy, physiology, embryology, pathophysiology, pathology, pharmacology, and anatomical variants during all stages of the female reproductive system, including gynecological disease processes, infertility monitoring, and the developing fetus throughout the first trimester of pregnancy. Medical and surgical interventions, procedures, and the importance of comparative imaging with other modalities will all so be considered. This course will explain the technique of transabdominal versus transvaginal imaging and discuss the ethical standards of practice of when to perform an internal ultrasound.

*There is a corresponding scanning lab with this course.

Co-requisites: DMS112B, DMSL112, DCL102

Pre-requisite: Admission to Beachwood Diagnostic Medical Sonography Program & DMSL111

DMSL102 - Sonography Scanning Lab III ***Clock Hours: 72***

Selected exercises designed to reinforce concepts covered in DMS102.

The course details the anatomy, physiology, embryology, pathophysiology, pathology, pharmacology, and anatomical variants during all stages of the female reproductive system, including gynecological disease processes, infertility monitoring, and the developing fetus throughout the first trimester of pregnancy. Medical and surgical interventions, procedures, and the importance of comparative imaging with other modalities will all so be considered. This course will explain the technique of transabdominal versus transvaginal imaging and discuss the ethical standards of practice of when to perform an internal ultrasound.

Co-requisites: DMS112B, DMSL112, DCL102

Pre-requisite: Admission to Beachwood Diagnostic Medical Sonography Program & DMSL111

DCL102 - Clinical Experience I ***Clock Hours: 304***

Direct, supervised sessions in the clinical setting that will emphasize development of the practical application of direct and indirect patient care, department workflow and sonographic scanning, as taught in the scanning lab. These applications will have emphasis on knobology, equipment orientation, proper scanning positions and planes, and general patient care. Introductory scanning on patients will include the liver, gallbladder, pancreas, kidneys, urinary bladder, adrenal glands, spleen, aorta, inferior vena cava, thyroid, and neck. Students will need to successfully complete all the assigned clinical competency examinations while supervised by a registered diagnostic medical sonographer at the assigned clinical site.

Co-requisites: DMS112B, DMSL112. DMS102B, DMSL102

Pre-requisite: Successful completion of Beachwood Diagnostic Medical Sonography Program Term 1

ETH101 - Healthcare Ethics and Law ***Clock Hours: 24***

This course is designed to provide the student with a fundamental background in healthcare ethics and law. The historical and philosophical basis of ethics as well as the elements of ethical behavior are also discussed. The student will examine a variety of ethical issues and dilemmas that may occur in clinical practice. An introduction to legal terminology, concepts and principles of law will also be presented. Topics include misconduct, malpractice, unintentional and intentional torts, HIPPA standards and compliance, legal and professional standards, the ASRT/ARDMS scope of practice. The importance of proper documentation and informed consent will be emphasized.

Co-requisites: DMS103B, DMSL103, DMS200, DCL103

Pre-requisite: Successful completion of Beachwood Diagnostic Medical Sonography Program Term 2

DMS103B – 2nd & 3rd Trimester ***Clock Hours: 54***

This course details the anatomy, physiology, embryology, pathophysiology, pharmacology, and anatomical variants of normal and common pathologic conditions of the second and third trimesters of pregnancy. Topics will include fetal development and biometry, fetal weight and age assessment, fetal abnormalities, multiple gestations, and maternal disease processes and how they can affect pregnancy.

Correlation with ultrasound guided perinatal procedures, genetic testing, and medical and surgical interventions are also included.

*There is a corresponding sonography scan lab with this course.

Co-requisites: ETH101, DMS200, DCL103

Pre-requisite: DMS102B/DMSL102

DMSL103 - Sonography Scanning Lab IV ***Clock Hours: 36***

Selected exercises designed to reinforce concepts covered in DMS103.

This course details the anatomy, physiology, embryology, pathophysiology, pharmacology, and anatomical variants of normal and common pathologic conditions of the second and third trimesters of pregnancy. Topics will include fetal development and biometry, fetal weight and age assessment, fetal abnormalities, multiple gestations, and maternal disease processes and how they can affect pregnancy. Correlation with ultrasound guided perinatal procedures, genetic testing, and medical and surgical interventions are also included.

Co-requisites: ETH101, DMS200, DCL103

Pre-requisite: DMS102B/DMSL102

DCL103 - Clinical Experience II ***Clock Hours: 288***

Direct, supervised sessions of sonographic scanning with emphasis on the development of the practical application and scanning techniques of obtaining sonographic images of the organs of the male and female reproductive systems, gastrointestinal tract, peritoneal/retroperitoneal and pleural spaces with continued proficiency on the liver, gallbladder, pancreas, kidneys, urinary bladder, adrenal glands, spleen, aorta, inferior vena cava, thyroid, and neck. Students will need to successfully complete all the assigned clinical competency examinations while supervised by a registered diagnostic medical sonographer.

Co-requisites: DMS103B, DMSL103, ETH101, DMS200

Pre-requisite: DCL101

DMS200 - Registry Review - SPI ***Clock Hours: 24***

This course will prepare the students for the Sonographic Principles & Instrumentation (SPI) examination. The course material will follow the current ARDMS Exam Content Outline. The course will review the physical and mathematical principles of diagnostic medical sonography. Knowledge of the physical attributes of sound waves and how images are generated, attenuation, transducer construction and function, ultrasound instrumentation, multi-hertz frequency capabilities, dynamic range, signal processing, bioeffects, display modes, resolution, artifacts, hemodynamics, harmonics and contrast agents, statistics, emerging technology, quality assurance, and Doppler principles will be tested.

Co-requisites: DMS103B, DMSL103, ETH101

Pre-requisite: DPHY100

DMS223 - Introduction to Vascular ***Clock Hours: 16***

This eight-week course involves a specialized study of the anatomy, physiology, hemodynamics, pharmacology, clinical signs and symptoms, and pathologies of the cerebrovascular, peripheral arterial, and deep venous systems. Correlation with other modalities, medical and surgical procedures, scanning techniques, direct/indirect testing methods, gold-standards regarding testing and statistics will also be included.

*There is a corresponding sonography scanning lab with this course.

Pre-requisite: Successful completion of Beachwood Diagnostic Medical Sonography Program Term 3

DMSL 223 - Sonography Scanning Lab V ***Clock Hours: 24***

Selected exercises designed to reinforce concepts covered in DMS223.
This eight-week course involves a specialized study of the anatomy, physiology, hemodynamics, pharmacology, clinical signs and symptoms, and pathologies of the cerebrovascular, peripheral arterial, and deep venous systems. Correlation with other modalities, medical and surgical procedures, scanning techniques, direct/indirect testing methods, gold-standards regarding testing and statistics will also be included.

Pre-requisite: Successful completion of Beachwood Diagnostic Medical Sonography Program Term 3

DCL201 - Clinical Experience III ***Clock Hours: 512***

Indirect, supervised clinical time that continues to emphasize the development of critical thinking skills and exam knowledge on a more independent level. Development of imaging skills in obstetrics and gynecology, male reproductive system, and continued proficiency in sonographic scanning techniques of the aorta, inferior vena cava, pleural space, gastrointestinal tract, thyroid, and the organs of the abdomen to include the liver, gallbladder, bile ducts, pancreas, spleen, and the urinary system as taught in the scanning lab. Students need to complete all the assigned clinical competency examinations while supervised by a registered diagnostic medical sonographer.

Pre-requisite: DCL102

Clinicals: 16 weeks, 4 days/week (8 hours daily)

DMS226 - Registry Review - Abdomen ***Clock Hours: 16***

This eight-week course will prepare the students for their final clinical rotation and the abdominal registry examination. The course material will follow the current ARDMS Exam Content Outline. The review will include the abdomen with emphasis on sonographic abnormalities of the liver, gallbladder, pancreas, kidney, spleen, and aorta. The course will also review sonographic abnormalities of the abdominal wall, breast, pleural space, structures of the neck, peritoneum, retroperitoneum, prostate, scrotum, and superficial structures. Image identification, mock exams, and procedural scenarios will be covered to evaluate knowledge from previous courses.

Pre-requisite: DMS111B/DMSL111

DCL202 - Clinical Experience IV ***Clock Hours: 512***

Indirect, supervised clinical time that continues to emphasize the development of critical thinking skills and exam knowledge on a more independent level. Continued proficiency in sonographic scanning techniques of the liver, gallbladder, bile ducts, pancreas, spleen, urinary tract, aorta, inferior vena cava, non-cardiac chest, gastrointestinal tract, male reproductive, thyroid, gynecology, and obstetrics will be evaluated and tested. Students need to complete all the assigned clinical competency examinations while supervised by a registered diagnostic medical sonographer.

Pre-requisite: DCL201

Clinicals: 16 weeks, 4 days/week (8 hours daily)

DMS230 - Capstone ***Clock Hours: 16***

This eight-week course will be utilized for the student to demonstrate the skills and knowledge mastered during the Diagnostic Medical Sonography Program (Beachwood) both in lecture and at clinicals. Preparation for the employment interview process and presentation of qualifications through a resume and cover letter will be included. Importance of credentialing, professional involvement, career advancement, and continuing education will be stressed. Students will present one interesting case that they performed in the clinical setting to a community of their peers in a formal presentation.

Pre-requisite: Successful completion of Beachwood Diagnostic Medical Sonography Program Term 4

DMS227 - Registry Review – Ob/Gyn ***Clock Hours: 16***

This eight-week course will help challenge the students for their final clinical rotation and prepare them for the obstetrics/gynecology specialty registry examination. The course material will follow the current ARDMS Exam Content Outline. The course will review the female reproductive system with emphasis on the sonographic appearance of normal and abnormal appearances of the uterus and ovaries and will include obstetrics with the emphasis on fetal biometric measurements and developmental abnormalities, genetic testing, and maternal abnormalities.

Pre-requisite: DMS102B/DMSL102