# Suggested Course Sequence for the Advanced Certificate

## DMIS Program (Subject to Change)

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**Total: 47 Semester Hours**

**NOTE:** *The DMIS Program may be undergoing a curriculum revision. Admission requirements and the program of study are subject to change. Please monitor the program web-site for program updates, curriculum modifications or changes in admission packet.*
INTRODUCTION TO DIAGNOSTIC MEDICAL IMAGING SONOGRAPHY (DMIS 1100)
3 Credit Hours (2 lecture/2 lab)
History of Ultrasound, including medical applications. Description of the roles, responsibilities and the rules of the Diagnostic Medical Imaging Sonographer. Introduction to the fundamental principles of the use and maintenance of Ultrasound equipment, indications and applications of diagnostic and therapeutic sonography procedures, imaging procedures, safety, protection, and image processing. Legal and ethical issues in an Ultrasound department are reviewed.

SONOGRAPHIC PHYSICS AND INSTRUMENTATION I (DMIS 1101)
3 Credit Hours (2 lecture/2 lab)
Introduction to the physics of acoustics and sonographic instrumentation, including the nature and types of sound waves, propagation of Ultrasound through tissues, Ultrasound transducers and pulse-echo instruments.

CROSS-SECTIONAL ANATOMY (DMIS 1120)
3 Credit Hours (2 lecture/2 lab)
Introduction to cross-sectional anatomy as interpreted on diagnostic sonographic images. Sectional human anatomy in the transverse and coronal plane.

CLINICAL EDUCATION I (DMIS 1111)
1 Credit Hours (8 clinical hours)
Clinical experience of the technical and professional aspects of diagnostic medical imaging sonography in a hospital or clinical setting. Students observe, assist and perform various patient care and sonographic duties under direct supervision in the patient care setting. Students learn correct hospital procedures and policies in the clinical setting.

SONOGRAPHIC PHYSICS AND INSTRUMENTATION II (DMIS 1102)
3 Credit Hours (2 lecture/2 lab)
Continuation of pulse-echo instrumentation, including pulse-echo display methods, static scanners, real-time scanners, echo data imaging storage and display, spatial resolution and field of view, image artifacts, and Doppler instrumentation. Quality management applied to Diagnostic Medical Imaging Sonography, including equipment and imaging parameters to be evaluated, methods for evaluating each parameter, topics of bioeffects, and safety in Ultrasound imaging.

FUNDAMENTALS OF OB/GYN I (DMIS 1121)
3 Credit Hours (2 lecture/2 lab)
Ultrasound evaluation of the female pelvis and reproductive system. Introduction to imaging in the first trimester of pregnancy, imaging normal pathology, and pathologic ultrasonic appearance of the cervix, uterus, fallopian tubes, ovaries, placenta and fetus.

ABDOMEN/SMALL PARTS I (DMIS 1131)
3 Credit Hours (2 lecture/2 lab)
Introduction to abdominal cross-sectional anatomy, including vascular, muscular systems and pathological appearances of the abdomen. Ultrasound evaluation of upper abdominal organs to include the normal Ultrasound appearance of the liver, gallbladder, pancreas, biliary tree, spleen and urinary tract. Introduction to pathologic appearances of the abdomen.

CLINICAL EDUCATION II (DMIS 1112)
3 Credit Hours (24 clinical hours)
Correlation and application of Diagnostic Medical Imaging Sonography 1102, 1121 and 1131. Technical and professional aspects of Diagnostic Medical Imaging Sonography in a clinical setting. Clinical experience concurrent with didactic training in some of the following: obstetrics, pelvic, abdominal and small parts scanning.
FUNDAMENTALS OF OB/GYN II (DMIS 1122)
2 Credit Hours (2 lecture/2 lab)
Ultrasonic utilization in the evaluation of fetal anatomy, including detection of fetal anomalies and intrauterine growth retardation and their management. Includes techniques involving transabdominal and transvaginal procedures to assess early intrauterine and ectopic pregnancies, as well as advanced fetal and pelvic Ultrasound techniques. Demonstrations of multiple gestations; antenatal syndromes; fetal disorders; placental, umbilical cord and membrane techniques and management; gynecologic infertility studies; and pathologic processes in the non-gravid pelvis.

ABDOMEN/SMALL PARTS II (DMIS 1132)
2 Credit Hours (2 lecture)
Continuation of abdominal anatomy and pathology, including the gastrointestinal tract, adrenal glands, abdominal wall, peritoneum and diaphragm. Pathological patterns and physiological changes of the abdomen as they appear on Ultrasound. The introduction of color-flow Doppler techniques used for vascular anatomy. Anatomy and pathology of superficial structures and small parts, including but not limited to, thyroid, parathyroid, breast, prostate, scrotum, penis, tendons, rotator cuff, extracranial vessels and neonatal brain. Continuation of the anatomic appearance and specific pathological patterns of abdomen and thorax.

CLINICAL EDUCATION III (DMIS 1113)
3 Credit Hours (24 clinical hours)
Continuation of Diagnostic Medical Imaging Sonography clinical experience. Reinforcement and broadening of knowledge gained in Clinical Education courses. Correlation and application of Diagnostic Medical Imaging Sonography technical and professional aspects in a clinical setting. Concurrent with didactic training in obstetrics, pelvic, abdominal and/or small parts scanning.

FUNDAMENTALS OF BREAST SONOGRAPHY (DMIS 1140)
2 Credit Hours (2 lecture hours)
Principles and fundamentals of breast sonography. Exploration of physics of sonography as it relates to normal and abnormal breast tissue and anatomy. Correlation with other imaging modalities and surgical techniques in breast pathology.

CASE STUDY CRITIQUE I (DMIS 1141)
1 Credit Hour (1 lecture hour)
Critical analysis of anatomical variants and normal and pathological sonographic findings in diagnostic Ultrasound case presentations with reference to imaging techniques, positioning and patient care. Sonographic cases presented concurrent with procedures described and demonstrated in Fundamentals of OB/GYN I & II and Fundamentals of Abdomen/Small Parts I & II.

CASE STUDY CRITIQUE II (DMIS 1142)
1 Credit Hour (1 lecture hour)
Part II of Clinical Case Study Critique, critical analysis of anatomical variants and normal and pathological sonographic findings in diagnostic Ultrasound case presentations with reference to imaging techniques, positioning and patient care. Sonographic cases presented concurrent with procedures described and demonstrated in Fundamentals of OB/GYN III and Fundamentals of Abdomen/Small Parts III.

CLINICAL EDUCATION IV (DMIS 1114)
3 Credit Hours (24 clinical hours)
Continuation of Diagnostic Medical Imaging Sonography clinical experience, and reinforcement and broadening of knowledge gained in Clinical Education III. Correlation and application of Diagnostic Medical Imaging Sonography technical and professional aspects in a clinical setting. Concurrent with didactic training in obstetrics, pelvic, abdominal and/or small parts scanning.
SONOGRAPHIC PHYSICS AND INSTRUMENTATION REGISTRY REVIEW (DMIS 2280)
1 Credit Hour (1 lecture hour)
Intensive review of major content measured in the American Registry of Diagnostic Medical Imaging Sonography certification exam. This course will review the physical principles of acoustics and sonographic instrumentation including elementary principles, propagation of ultrasound through tissues, ultrasound transducers, pulse-echo instruments, principles of pulse-echo imaging, image storage and display, Doppler ultrasound and image features and artifacts.

SONOGRAPHIC ANATOMY AND PROCEDURES REGISTRY REVIEW (DMIS 2285)
1 Credit Hour (1 lecture hour)
Intensive review of major content measured in the American Registry of Diagnostic Medical Imaging Sonography certification examination. This course reviews the diagnostic medical sonography applications in the specialties of abdominal, OB/GYN, superficial organ and cranial Ultrasound.

HANDS-ON SCANNING LAB – 1 (DMIS 1151)
1 Credit Hour (2 lab hours)
Overview and emphasis of principles taught in DMIS 1100 in Abdominal/Superficial Structures and Obstetrics/Gynecology. Students perform hands-on scanning techniques in the scanning lab. Various scanning techniques are demonstrated on fellow students under the guidance of the instructor and senior students from the prior class. Proper techniques in manipulating the transducer probe are demonstrated. Identification of organ systems and corresponding Ultrasound images.

HANDS-ON SCANNING LAB – 2 (DMIS 1152)
1 Credit Hours (2 lab hours)
Continuation of principles taught in DMIS 1151 in Abdominal/Superficial Structures and Obstetrics/Gynecology. Students perform advanced hands-on scanning techniques in the scanning lab. Techniques are demonstrated on fellow students and volunteer patients under the guidance of the instructor. Proper techniques in manipulating transducer probe are demonstrated. Identification of organ systems and corresponding Ultrasound images.

HANDS-ON SCANNING LAB – 3 (DMIS 1153)
1 Credit Hours (2 lab hours)
Continuation of principles taught in DMIS 1152 in Abdominal/Superficial Structures and Obstetrics/Gynecology. Emphasis placed on advanced skills in obstetrical scanning. Students perform hands-on scanning techniques on volunteer patients under the guidance of the instructor. Proper techniques in manipulating the transducer probe are demonstrated. Identification of organ systems and corresponding Ultrasound images.

HANDS-ON SCANNING LAB – 4 (DMIS 1154)
1 Credit Hour (2 lab hours)
Continuation of principles taught in DMIS 1151 – 1152 – 1153 in Abdominal/Superficial Structures and Obstetrics/Gynecology. Emphasis will be placed on the senior students giving guidance to the first-year sonography students in scanning as well as demonstrating their expertise in various scanning protocols to the instructors.

LEGAL ASPECTS OF HEALTH CARE IN SONOGRAPHY (DMIS 1160)
2 Credit Hours (2 lecture hour)
Legal principles of health care in sonography. Exploration of medical law cases reviewing standard of care, negligence, liability, malpractice insurance, depositions, trials and verdicts. Individual occurrences will be highlighted to avoid and protect from future lawsuits.

ADVANCED HANDS-ON SCANNING (DMIS 1823)
2 Credit Hours (4 lab hours)
Review and emphasis of Sonography hands-on scanning techniques taught in DMIS 1100 and DMIS 1151. Advanced scanning skills with identification of organ systems in abdominal, superficial structures, and OB/GYN will be emphasized. Scanning protocols will be reviewed with a comprehensive examination.