School of Diagnostic Medical Sonography

Course Curriculum Description

Semester 1

- **Orientation - 101 -**
  This class is an introduction to sonography which includes a basic anatomy review, introduction to sonographic scanning techniques and physical principles. This curriculum includes, but is not limited to, Introduction to Sonographic Terminology, Abdomen, OB-GYN, Vascular, Nursing Care, the Role of the Sonographer and Medical/Legal Issues. Scan Labs provided to develop a comfort level with the transducer are held in coordination with the didactic classes.

- **Ultrasound Physics and Instrumentation I - 102 -**
  This course will cover the physics parameters of ultrasound. It will prepare the student for the taking of the Ultrasound Physics Boards and give understanding of general physics that is required for taking the Ultrasound Physics/Vascular Physics Boards.

- **Obstetrical Sonography - 103 -**
  This course covers the physiology of pregnancy, embryology and the development of the fetus as visualized on ultrasound during the first trimester to include: normal, abnormal and ectopic pregnancy. This course also covers the protocol for a first trimester exam and it will familiarize the student with the anatomy demonstrated by ultrasound during the first trimester.

- **Gynecological Sonography I - 104 -**
  This course includes a presentation of gynecological terminology, normal female anatomy and physiology. The course will cover the bony pelvis, vascular anatomy, muscles, and ligaments.

- **Vascular Sonography I - 105 -**
  This course includes a presentation of vascular terminology, normal carotid anatomy, normal and abnormal lower extremity venous anatomy, characteristics of pathology, and Introduction to Doppler and duplex examination, both normal and abnormal. The course also includes an introduction to Lower Arterial Imaging Lab as well as a presentation of lower venous normal anatomy, characteristic pathology and the study of Doppler and duplex imaging of the lower extremity, both normal and abnormal.

- **Abdominal Sonography I - 106 -**
  This course introduces anatomy, physiology, pathology and scanning techniques of the biliary system, liver, pancreas, thyroid and abdominal vascular system, both normal and abnormal.

- **Clinical Education I - 107 -**
  The student receives clinical education and hands on experience. They begin clinical competencies and to produce images with instruction, guidance and supervision.
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Semester 2

- **Physics and Instrumentation II - 202 -**
  This course will cover instruction of different transducers, instrumentation, display, artifacts, Doppler principles and noted bio-effects of diagnostic ultrasound. This course will continue to prepare the student for taking the Ultrasound Physics Boards and give understanding of general physics that is required for taking the Ultrasound Physics/Vascular Physics Boards. (PI)

- **Obstetrical Sonography II - 203 -**
  This course will cover the normal anatomy of the fetus as visualized on ultrasound during the second and third trimesters, along with the fetal presentation. The course also shows the protocol for a second and third trimester complete ultrasound exam, and will familiarize the student with the second and third trimester anatomy as demonstrated on ultrasound.

- **Gynecological Sonography II - 204 -**
  This course will cover the reproductive menstrual cycle, normal anatomy and pathology of the post menstrual pelvis, GYN ultrasound exams and patient care.

- **Vascular Sonography II - 205 -**
  This course will cover the anatomy, physiology and pathology of the upper extremity venous system, both normal and abnormal. This course will also cover the vascular principles of Hemodynamics and Trans-cranial Doppler.

- **Abdominal Sonography II - 206 -**
  This course introduces the anatomy, physiology, pathology and scanning techniques of the renal/adrenal organs, spleen, scrotum, prostate, retroperitoneum, GI tract, peritoneal cavity, abdominal wall as well as miscellaneous imaging, both normal and abnormal. The course also includes Emergency Ultrasound medicine along with non-vascular Imaging to include non-cardiac chest, biopsy and surgery.

- **Clinical Education II - 207 -**
  Students continue to gain experience in observation and hands on experience through the performance of ultrasound procedures with direct patient contact under the supervision of a Register Sonographer. Students continue to complete clinical competencies.

- **Pediatric Sonography 208 -**
  The course is to introduce the role of ultrasound in the pediatric patient to include the anatomy, physiology, and pathology of the abdomen and pelvis, both normal and abnormal. This course also includes the brain and the spinal cord. Interesting cases and a pediatric clinical rotation are included in this class.
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Semester 3

- **Physics and Instrumentation III - 302** -
  This course will cover the physics parameters of ultrasound to include artifacts, quality assurance, bio-effects and AIUM guidelines for ultrasound usage. It will prepare the student for the taking of the Ultrasound Physics/Vascular Physics Boards.

- **Obstetrics III - 303** -
  This course will cover normal anatomy and pathology of the placenta, amniotic fluid, umbilical cord and cervix. Also covered is the ultrasound biophysical profile with a guest lecture speaker on ante partum testing and fetal lung maturity.

- **Gynecology III - 304** -
  This course will cover the benign and malignant uterine and ovarian pathology.

- **Vascular III - 305** -
  This course will cover the anatomy, physiology and pathology of the lower arterial, both normal and abnormal.

- **Abdomen III - 306** -
  This course introduces the student to the anatomy, physiology, pathology and scanning techniques, both normal and abnormal, of the pancreas and renal/adrenal organs, and the musculoskeletal system.

- **Clinical Education III - 307** -
  The students gain continued clinical experience and knowledge in the performance of ultrasound procedures. They have both direct and indirect supervision as they perform ultrasound procedures and complete competencies. Sonographers review sonographic exams performed by students prior to submission to Radiologists for interpretation.

**Breast - 308**
This course will cover both normal and abnormal anatomy of the breast.

- **Neurosonography - 308** -
  This course is to inform the students of the normal anatomy of the neonatal brain, to discuss anomalies as associated with the central nervous system, to discuss neonatal acquired pathology and to discuss the standard views used to access the changes associated with the anomalies.

Semester 4

- **Physics and Instrumentation Registry Review V - 402** -
  This class is to review the physical principle and instrumentation; it is also to prepare the class for National Registry Board testing. This course will also cover the physical principle related to 3D ultrasonography.
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- **Obstetrical IV - 403 -**
  This class will cover biophysical profile, macrosonmia, multiple gestations, normal and abnormal, GU Tract, normal and abnormal, musculoskeletal, normal and abnormal, face and neck chromosome abnormalities and syndromes.

- **Gynecology VI - 404 -**
  This course will cover pelvic masses in pregnancy, gestational trophoblastic disease and infertility.

- **Vascular IV - 405 -**
  This course covers the anatomy, physiology, pathology and scanning techniques of the upper arterial extremities.

- **Abdomen IV - 406 -**
  This class is to review the abdomen and superficial small parts ultrasound imaging, along with preparing the student for the National Registry Board Examination in Abdomen to include anatomy, physiology, pathology and technical scanning skills.

- **Clinical Education IV - 407 -**
  The students continue to gain clinical experience and knowledge in the performance of ultrasound procedures in a variety of settings under the supervision of registered sonographers.

**Introduction to Echocardiography 408**
This course will offer an introduction to the anatomy, physiology, pathology and scanning techniques of adult echocardiography. This course will also offer an echocardiography scan lab.

**Semester 5**

- **Physics and Instrumentation Registry Review V - 502 -**
  This class is to review the physical principle and instrumentation; it is also to prepare the class for National Registry Board testing.

- **Obstetrics V & Review - 503 -**
  This class informs the students of the normal anatomy of the fetal neural axis, gastrointestinal tract, thorax and heart. The class also discusses the anomalies associated with the central nervous system, GI system, respiratory system and cardiovascular system to enable the student to recognize the changes, both normal and abnormal.

- **Gynecology V & Review - 504 -**
  This course covers puerperium as well as an OB/GYN review to prepare the students for the National Board Examination for OB/GYN.
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- **Vascular V & Registry Review - 505 -**
  This class is a review of Vascular Technology principles, along with preparing the students for the National Registry Board Exams in Vascular Technology to include anatomy, physiology, pathology and scanning techniques, both normal and abnormal.

- **Abdomen V - 506 -**
  This class is to review the abdomen and superficial small parts ultrasound imaging, along with preparing the student for the National Registry Board Examination in Abdomen to include anatomy, physiology, pathology and technical scanning skills.

- **Clinical Education V - 507 -**
  This class covers technical and professional scanning in obstetrics, gynecology, abdominal imaging and superficial structures. The course also includes overview of all competencies and completion of all required advance-imaging procedures. Reinforcement and correlation of previous clinical skills are emphasized.

**Special Classes Includes but are not limited to:**

- Interesting Case Studies I - IV
- TIPS Procedures
- Biopsy's – A Radiologist's perspective
- CT/US Correlation
- Nuclear Med/US Correlation
- MRI/US Correlation
- Fetal Board Review
- HIPPA/Privacy Issues
- Medical/Legal Issues
- Nursing Care Procedures Review
- Incomplete Cervix
- Fetal Growth
- Genetics