AURORA ST. LUKE’S MEDICAL CENTER
SCHOOL OF DIAGNOSTIC MEDICAL SONOGRAPHY
COURSE OVERVIEW

The core curriculum defines several major modules of ultrasound education. All lectures are correlated with scan lab demonstration and practice for each organ system. Each module of instruction includes the following components:

- Terminology
- Gross and sectional anatomy
- Physiology and pathophysiology
- Clinical medicine
- Sonographic pathology
- Sonographic technique

Students will formally present case studies during semesters two – five. Detailed information is provided in the Case Study Policy.

Clinical Education

The clinical component of our program allows students to rotate through all aspects of sonography specific to their chosen learning track. Students progress in competence and ability on an individual basis and within the guidelines set forth by program faculty. A predetermined number of competencies specific to each learning concentration must be achieved during the duration of the program.

In addition, specialty rotations have been designed in order to broaden the scope of the student’s clinical experiences.

ABDOMINAL SONOGRAPHY
EXTENDED / OBSTETRICS & GYNECOLOGY / VASCULAR TECHNOLOGY
COURSE OUTLINE

Semester I
Introduction to Sonography
Abdominal Sonography I
OB/Gyn Sonography I
Vascular Sonography I
Clinical Education I

Semester II
Abdominal Sonography II
OB/GYN Sonography II
Vascular Sonography II
Sonography Principles & Instrumentation
Clinical Education II

Semester III
OB/GYN Sonography III
Abdominal Sonography III
Clinical Education III

Semester IV
Abdominal Sonography IV
Seminar in OB/GYN
Vascular III
Introduction to Breast Imaging
Clinical Education IV

Semester V
Introduction to MSK
Seminar in Professional Development
Seminar in Management & Education
Clinical Education V
ABDOMINAL SONOGRAPHY
EXTENDED / OBSTETRICS &
GYNECOLOGY / VASCULAR
TECHNOLOGY
COURSE DESCRIPTIONS

INTRODUCTION TO SONOGRAPHY
Credits: 3
The focus of this course includes content
that emphasizes personal adaptation
skills, nursing skills and staff
development issues. An introduction to
basic sonographic terminology,
techniques, ultrasound physics, and
scanning techniques form the framework
for future study. Lectures are correlated
with scan lab demonstration and
practice. The student handbook policies
and procedures are emphasized.

ABDOMINAL SONOGRAPHY I
Credits: 3
This course focuses on the normal gross,
cross-sectional, relational and
sonographic anatomy of the upper
abdomen to include the liver and the biliary
tree. Physiology, pathology and related
laboratory values are emphasized and
correlated with sonographic findings.
Lectures are correlated with scan lab
demonstration and practice for each
organ system.

ABDOMINAL SONOGRAPHY II
Credits: 3
This course focuses on the normal gross,
cross-sectional, relational and
sonographic anatomy of the upper
abdomen to include the pancreas,
kidneys, spleen, adrenal glands and
retroperitoneum. Physiology, pathology
and related laboratory values are
emphasized and correlated with
sonographic findings. The use and
importance of color and spectral Doppler
will be emphasized. Lectures are
correlated with scan lab demonstration
and practice for each organ system.

ABDOMINAL SONOGRAPHY III
Credits: 3
This course focuses on the normal gross,
cross-sectional, relational, and
sonographic anatomy of superficial
structures, to include the male pelvis
(bladder, prostate, and scrotum), the
thyroid and parathyroid glands.
Pathologic findings encountered during
these exams will be correlated with
possible causative etiologies.
Physiology, pathology, and related
laboratory values are emphasized and
correlated with sonographic findings.
Lectures are correlated with scan lab
demonstration as well as practical
clinical experience.

ABDOMINAL SONOGRAPHY IV
Credits: 3
This course focuses on the normal gross,
cross-sectional, relational, and
sonographic anatomy of each organ
system of the abdomen, pelvis and other
structures typically seen in the pediatric
and adolescent patient. Normal anatomy
and disease processes within the
gastrointestinal system of the pediatric
and adult patient will also be discussed.
Students will become familiar with the
clinical symptoms, lab values and
specific ultrasound protocols for normal
and abnormal cases. Physiology,
pathology and related laboratory values
are emphasized and correlated with
sonographic findings. Lectures are
correlated with practical clinical
experience.
CLINICAL EDUCATION I - V

Students are scheduled for clinical practicum at participating clinical education centers. Students progress in competence and ability on an individual basis and within the guidelines set forth by program faculty. Students are routinely evaluated on professional growth, personal interactions, and technical ability. A predetermined number of competencies specific to each learning concentration must be achieved during the duration of the program. Clinical experience rotations include abdominal imaging, OB/GYN, transthoracic cardiac imaging and vascular technology. Sonographic technique is also practiced during routinely scheduled scan lab sessions, which are conducted by the program faculty.

Clinical Education I – V 3 credits each

INTRODUCTION TO BREAST IMAGING
Credits: 3
This course focuses on the normal gross, cross-sectional, relational and sonographic anatomy of the breast and associated structures, as well as practical clinical experience for proper patient positioning, documentation of sonographic findings with those of mammography. Findings will be correlated with an overview of both benign and malignant pathologies, their incidence, characteristics and specific sonographic appearances for both the female and male patient. Interventional procedures of the breast, an overview of advanced ultrasound imaging techniques and complimentary breast imaging studies will complete this module.

INTRODUCTION TO MSK IMAGING
Credits: 3
This course focuses on the introduction of normal gross, cross-sectional, relational, and sonographic anatomy of the musculoskeletal system. Pathologic findings encountered during these exams will be correlated with possible causative etiologies. Physiology and pathology are emphasized and correlated with sonographic findings. Lectures are correlated with scan lab demonstration and practice.

OB/GYN SONOGRAPHY I
Credits: 3
This course focuses on the normal gross, cross-sectional, relational and sonographic anatomy of the non-gravid female pelvis and embryology of the developing human. Physiology, pathology and related laboratory values are emphasized and correlated with sonographic findings. Lectures are correlated with scan lab demonstration and practice as well as practical clinical experience.

OB/GYN SONOGRAPHY II
Credits: 3
This course focuses on the 1st, 2nd and 3rd trimester gravid uterus and developing fetus. Normal gross, cross-sectional, relational and sonographic anatomy will be discussed. Gestational dating methods and measurements will be presented. Clinical presentation, sonographic signs and associations found in the abnormal 1st trimester and failed pregnancy will be presented. The sonographic presentations of fetal abnormalities found in the 2nd and 3rd trimester is considered. Students will focus on the more common anomalies of the gastrointestinal system, musculoskeletal system, and
genitourinary system. Physiology, pathology and related laboratory values are emphasized and correlated with sonographic findings. Lectures are correlated with practical clinical experience.

**OB/GYN SONOGRAPHY III**
Credits: 3
This course focuses on the sonographic presentations of fetal abnormalities found in the 2nd and 3rd trimester with a focus on the more common anomalies of the central nervous system, the fetal face and neck and the thorax. The normal and abnormal placenta will be presented. At risk and multiple gestation pregnancies will be presented. An introduction to fetal echocardiology will be provided including normal anatomy, fetal circulation, embryology and common congenital heart defects. Physiology, pathology and related laboratory values are emphasized and correlated with sonographic findings. Lectures are correlated with practical clinical experience.

**SEMINAR IN OB/GYN**
Credits: 3
This course focuses on congenital anomalies, syndromes and fetal and maternal factors related to high risk pregnancy. The genetic transmission of anomalies will be discussed. The prevalence, prognosis and sonographic appearance of the most common chromosomal anomalies will be considered. The role of sonography in interventional procedures will be discussed. Physiology, pathology and related laboratory values are emphasized and correlated with sonographic findings.

**SEMINAR IN PROFESSIONAL DEVELOPMENT**
Credits: 3
Senior Project: The main objective is for the student to apply the academic and clinical knowledge used in this program to develop a senior project. This course is designed to showcase the students’ ever evolving knowledge in sonography. The senior project consists of two parts; an in-depth written paper and oral presentation to your peers.

Preparation for the sonography boards and professionalism review: The main objective is to provide the student with the opportunity to improve test-taking skills in preparation for the examination of the American Registry for Diagnostic Medical Sonography. Job-hunting, interview skills and resume writing will provide the student with skills needed when seeking employment. An overview of professional behavior and standards will be reviewed at this time.

**SEMINAR IN MANAGEMENT & EDUCATION**
Credits: 3
This course will discuss theories and techniques of research, management, education and applications and sales sonography. Students will learn possible career paths available and understand what that career path job description would entail. Students will choose between management, education, research and applications for their final project and develop a proposal/solution for that career pathway. Students will participate in weekly online discussions regarding the pathways.
SONOGRAPHY PRINCIPLES & INSTRUMENTATION
Credits: 3
Course Description:
This course focuses on mathematical principals, the characteristics of sound and the mechanism of sonographic image production and display. Potential biological effects and safety are discussed together with the practical application of physical concepts.

VASCULAR SONOGRAPHY I
Credits: 3
This course focuses on the physical principles relating to the vascular system, normal gross, relational, cross-sectional and sonographic anatomy of the peripheral arterial, venous and the abdominal visceral vessels. Mechanisms of disease, unique to the vascular system, as well as the relationship between cardiovascular disease and the health of other organ systems will be discussed. Correlation of laboratory findings and etiologies of disease will be covered. Doppler principles and vascular hemodynamics are presented. Lectures are correlated with scan lab demonstration as well as practical clinical experience.

VASCULAR SONOGRAPHY II
Credits: 3
This course focuses on the physical principles relating to the vascular system, normal gross, relational, cross-sectional and sonographic anatomy of the cerebrovascular, intracranial, peripheral arterial and venous systems. Mechanisms of disease, unique to the vascular system, as well as the relationship between cardiovascular disease and the health of other organ systems will be discussed. Correlation of laboratory findings and etiologies of disease will be covered. Advanced scanning techniques will be discussed. A short correlation of statistical data and vascular testing will be covered. Lectures are correlated with scan lab demonstration and practice for each system.

VASCULAR SONOGRAPHY III
Credits: 3
This course focuses on the normal and abnormal gross, relational, cross-sectional and sonographic anatomy of the abdominal vascular system to include the penile Doppler. In addition, liver, pancreas and renal transplants will be discussed. Treatment options for renal hypertension, liver disease and arterial and venous pathology will be discussed. Also discussed will be correlative imaging modalities, including angiography, CT scan, MRI and Nuclear Medicine. Mechanisms of disease, unique to the vascular system, as well as the relationship between cardiovascular disease and the health of other organ systems will be discussed. Correlation of laboratory findings and etiologies of disease will be covered. Advanced scanning techniques will be discussed. A short correlation of statistical data and vascular testing will be covered. Lectures are correlated with scan lab demonstration and practice for each system.