

# DIAGNOSTIC MEDICAL SONOGRAPHY

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## ACCREDITATION

The Diagnostic Medical Sonography program is accredited by the Commission on Accreditation of Allied Health Education Programs (CAAHEP) ([www.caahep.org](http://www.caahep.org); 1361 Park St., Clearwater, FL 33756; 727-210-2350) upon the recommendation of the Joint Review Committee on Education in Diagnostic Medical Sonography (JRC-DMS).

## ASSOCIATE DEGREE PROGRAM

The associate degree program in Diagnostic Medical Sonography (DMS) is a sequence of courses that provides educational opportunities to individuals in didactic and clinical environments that will enable them to gain the skills, knowledge, and attitudes necessary to graduate and become successful entry-level employees in the field of diagnostic medical sonography. The profession requires critical thinking skills, judgment, and the ability to provide appropriate health care services. Sonographers use high frequency sound waves to produce dynamic visual pictures of internal body structures. Physicians then evaluate these images in order to make a medical diagnosis. Coursework includes sonographic physics; sonographic identification of normal and abnormal anatomy; physiology, pathology, and pathophysiology of the abdomen, pelvis, and small parts of the adult, pediatric, and fetal patient; clinical application courses; interventional sonography; journal and case study review; and comprehensive registry reviews. Program graduates receive an associate of applied science degree in Diagnostic Medical Sonography. They are eligible to sit for the American Registry of Diagnostic Medical Sonographers (ARDMS) registry examinations in Sonographic Physics and Instrumentation (SPI), Abdomen (AB), Obstetrics/Gynecology (OB/GYN).

## PROGRAM MISSION

The program offers enthusiastic, dedicated students a well-rounded education in the General Learning Concentration of Diagnostic Medical Sonography (physics and instrumentation, abdominal, and OB/GYN). The DMS program includes an education that provides the information, resources, and environment necessary to become compassionate, responsible, and technically competent sonographers ready for employment in the field of sonography. The program's mission is in concert with the college's mission of service to all Georgians.

The program's mission is supported by an experienced, creative team of education staff, college administration, and student development services staff, ARDMS sonographers, and medical personnel with expertise in various aspects of sonography. The faculty is committed to assisting the DMS student toward the greatest academic, personal, and professional potential through quality courses and clinical opportunities. The program includes

an extensive array of didactic resources, up-to-date textbooks, and course requirements. Courses offer a variety of teaching methods for creative learning to address the various educational needs of the students. Didactic education is concurrent with clinical education experience, providing graduates with the skills and versatility needed to function in a variety of health care facilities that service diverse populations.

## ESSENTIAL FUNCTIONS

The following technical standards and essential functions outline reasonable expectations of a student in the Diagnostic Medical Sonography program for the performance of common sonographic imaging functions. The DMS student must be able to apply the knowledge and skills necessary to function in a variety of classroom, lab, and/or clinical situations while performing the essential competencies of sonographic imaging. These requirements apply for the purpose of admission and continuation in the program.

- **Essential Function: Observation**

The ability to participate actively in all demonstrations, laboratory exercises, and clinical experiences in the professional program component and to assess and comprehend the condition of all clients assigned to him/her for examination, diagnosis, and treatment. Such observation and information usually requires functional use of visual, auditory, and somatic sensations.

*Examples*

- Adequately view sonograms, including color distinctions
- Recognize and interpret facial expressions and body language
- Distinguish audible sounds from both the patient and the ultrasound equipment (Doppler)
- Recognize and respond to soft voices or voices under protective garb

- **Essential Function: Communication**

The ability to communicate effectively in English using verbal, non-verbal, and written formats with faculty, other students, clients, families, and all members of the healthcare team.

*Examples*

- Able to elicit information and assess non-verbal information
- Transmit information to patients, staff, fellow students, and other members of the healthcare team
- Receive and comprehend, write, and interpret verbal and written communication in both the academic and clinical settings

- **Essential Function: Motor**

Sufficient motor ability to execute the movement and skills required for safe and effective care and emergency treatment.

*Examples*

- Lift more than 50 pounds routinely
- Push and pull, bend, and stoop routinely
- Move, adjust, and position patients and equipment
- Have full use of both hands, wrists, and shoulders
- Have the dexterity to manipulate transducer and control panel simultaneously
- Work while standing 80 percent of the time

- **Essential Function: Intellectual**

The ability to collect, interpret, and integrate information and make decisions.

*Examples*

- Read and comprehend relevant information in textbooks, medical records, and professional literature
- Retain and apply information
- Measure, calculate, reason, analyze, and synthesize
- Organize and accurately perform the individual steps in a sonographic procedure in the proper sequence and within the required time frame
- Apply knowledge and learning to new situations and problem solving scenarios

- **Essential Function: Behavioral and Social Attributes**

Possess the emotional health and stability required for full utilization of the student's intellectual abilities, the exercise of good judgment, the prompt completion of all academic and patient care responsibilities and the development of mature, sensitive, and effective relationships with clients and other members of the healthcare team. Posses the ability to tolerate taxing workloads, function effectively under stress, adapt to changing environments, display flexibility, and learn to function in the face of uncertainties inherent in clinical settings with patients. Possess compassion, integrity, concern for others, and motivation. Possess the ability to demonstrate professional behaviors and a strong work ethic.

*Examples*

- Manage heavy academic schedules and deadlines
- Perform in fast-paced clinical situations
- Remain calm and focused during instruction for and performance of sonographic exams
- Display flexibility and adaptability
- Demonstrate integrity, concern for others, compassion, appropriate interpersonal skills, interest, and motivation
- Comply with the Sonographer Code of Ethics, Clinical Practice Standards, and Scope of Practice as identified by the Society of Diagnostic Medical Sonography ([www.sdms.org](http://www.sdms.org))

## CAREER OPPORTUNITIES

The U.S. Department of Labor's Occupational Outlook for 2008-2009 states that the employment of diagnostic medical sonographers is expected to increase by about 19 percent through 2016, a more rapid increase than the average for all other health occupations. According to the 2008 Society of Diagnostic Medical Sonographer Salary and Benefits Survey, salaries for 75 percent of diagnostic medical sonographers with less than five years of experience were in the range of \$45,000 to \$75,000 annually. Hospitals will remain the principal employer of diagnostic medical sonographers. However, employment is expected to grow more rapidly in offices of physicians and in medical and diagnostic laboratories, including diagnostic imaging centers. Health care facilities such as these are expected to grow very rapidly through 2016 because of the strong shift toward outpatient care.

## PROGRAM EXPENSES

The recent reauthorization of the Higher Education Act requires all colleges and universities to notify students and prospective students of all program costs for which they will be responsible. Students will be responsible for the following expenses:

- Quarterly tuition (\$45 per credit hour)
- Quarterly student activity fees (\$16)
- Quarterly registration fee (\$26)
- Quarterly accident insurance fee (\$4)
- Quarterly instructional and technology supply fee (\$35)
- Background check and drug screening (Approximately \$105 per required check/screening)
- Basic Life Support for Healthcare Providers certification (\$50)
- Examinations
  - ARDMS abdomen examination (\$200)
  - ARDMS OB/GYN examination (\$200)
  - ARDMS Sonographic physics and instrumentation examination (\$200)
- Immunizations
  - Hepatitis B (\$200)
  - Mumps, Measles, Rubella (\$25)
  - Varicella (\$25)
  - Tetanus (\$25)
  - Tuberculosis skin test (\$25)
- Major medical insurance (Approximately \$90 per month)
- Malpractice insurance (\$11 per year)
- Physical examination (Approximately \$100)
- Program supplies (Approximately \$150)
- Textbooks (Approximately \$2,200 for entire program)
- Uniforms (Approximately \$150 for entire program)

The expenses are based on costs in effect at the time this catalog was published. Prices are subject to change.

## ADMISSION REQUIREMENTS

The Diagnostic Medical Sonography program utilizes a competitive admission process to select students. Program faculty and the Admissions Office staff designed the pro-

cess to ensure maximum opportunity for student success in the program and for taking national registry examinations. Prospective students may gain admission to the college initially as Health Science program students/applicants to Diagnostic Medical Sonography in order to complete any learning support courses and required general education and health core courses.

Applicants not selected for the program may reapply during subsequent admission intake periods. There is no waiting list between intake periods; applicants must reapply for admission to the program prior to the file completion date of subsequent intake periods for each attempt at entry into the Diagnostic Medical Sonography program. Applicants who are on academic probation or are academically dismissed from the college as of the application deadline will not be considered for admission. The number of clinical sites and sequence of education limit the number of applicants admitted to the program. Completion of the general education and health core courses does not guarantee acceptance into the program. College policies dictate how course credit is transferred or accepted (see *Credit by Transfer*).

Applicants must attend a mandatory program information session prior to the admissions application deadline. In addition to submitting the documentation outlined in the section on *General Admission Requirements*, DMS applicants must submit the following to the Admissions Office by May 1, 2010, in order to gain consideration for admission to the Fall 2010 class in Diagnostic Medical Sonography:

- a. Documentation of attendance at the mandatory DMS program information session;
- b. Documentation of completion of prerequisite general education courses – college algebra (MAT 1111), physics (PHY 1110), and speech (SPC 1101) – and prerequisite health core courses – anatomy and physiology I and II (BIO 2113 and BIO 2114), introductory health care (AHS 104), and medical terminology (AHS 109) – with a minimum grade of C in each course (applicants transferring from other colleges must confirm the transferability of credit for those courses with the college’s director of registration and records by the application deadline);
- c. Scores from a standardized health program placement examination which will be used as part of the competitive selection process;
- d. Documentation showing the completion of a minimum of two hours as a volunteer model/observer in the sonography lab (applicants must have the documentation forms completed during the volunteer session);
- e. Documentation of 20 hours of observation in an ultrasound department (blank DMS observation forms are available from the Admissions Office, at the mandatory DMS mandatory program information session, and online at [www.athenstech.edu](http://www.athenstech.edu)—Select *Prospective Students* and then *Competitive Health Pgms*);

- f. A completed and signed intent form (blank DMS intent forms are available from the Admissions Office, at the mandatory DMS program information session, and online at [www.athenstech.edu](http://www.athenstech.edu)—Select *Prospective Students* and then *Competitive Health Pgms*).

Although applicants must have a minimum grade of C in all prerequisite courses listed in item B, it should be noted that the prerequisite grade point average is one of the main criteria for selection in life science programs, so grades of C are typically not competitive. The Admissions selection committee will invite a group of the highest applicants to participate in a personal interview process.

BIO 2113, BIO 2114, and MAT 1111 must be taken with the last five years and completed by the application deadline date. Students who document the completion of an accredited two-year allied health program that is patient-care related may exempt AHS 104 and AHS 109 courses. Students who document the completion of a two-year accredited postsecondary program in Radiography may exempt PHY 1110. Contact the program chair for information on the exemption process.

Prior to beginning their DMS courses, students must complete the remaining required general education courses—English (ENG 1101 and ENG 1102) and psychology (PSY 1101)—and health core course—introductory microcomputers (SCT 100) – with a minimum grade of C in each course. Applicants transferring from other colleges must confirm the transferability of credit for these courses with the college’s director of registration and records.

Students admitted to the program must submit the following documents to the program chair prior to beginning the DMS coursework:

- a. Completed Diagnostic Medical Sonography health form, which includes hepatitis screen results and documentation of immunity to rubella, measles, and tetanus (blank forms are available from the program chair following acceptance in the program);
- b. Verification of major medical insurance and malpractice insurance (see *Malpractice Insurance*);
- c. Verification of current Basic Life Support for Healthcare Providers (CPR and AED) certification;
- d. A signed document acknowledging that the commission of a felony before or during their enrollment in this program may prevent graduates from taking the registry exam to become registered diagnostic medical sonographers and that they are required to complete drug testing and/or background checks at their own expense prior to participating in internships, practicums, or clinical activities at certain host sites for these activities (see *Drug Testing/Background Checks*) (blank documents are available from the program chair or the Admissions Office or online at [www.athenstech.edu](http://www.athenstech.edu)—Select *Prospective Students* and then *Competitive Health Pgms*).

**DIAGNOSTIC MEDICAL SONOGRAPHY CURRICULUM OUTLINE**  
*Associate of Applied Science Degree Program (Major Code SNN3)*  
*Credits Required for Graduation: 139 quarter credit hours*

			<b>Credits</b>
<b>Prerequisite General Education</b>			<b>30</b>
* ENG	1101	Composition and Rhetoric	5
* ENG	1102	Literature and Composition	5
* MAT	1111	College Algebra	5
* PHY	1110	Introductory Physics**	5
* PSY	1101	Introduction to Psychology	5
* SPC	1101	Public Speaking	5
 <b>Prerequisite Health Core</b>			 <b>19</b>
* AHS	104	Introduction to Health Care***	3
* AHS	109	Medical Terminology for Allied Health Science***	3
* BIO	2113	Human Anatomy and Physiology I	5
* BIO	2114	Human Anatomy and Physiology II	5
* SCT	100	Introduction to Microcomputers	3
 <b>Diagnostic Medical Sonography Major</b>			 <b>90</b>
* DMS	131	Foundations of Sonography	5
* DMS	132	Sonographic Appearance of Normal Anatomy	4
* DMS	133	Cross Sectional Anatomy	4
* DMS	134	Pelvic Sonography and Pathology	2
* DMS	135	Abdominal Sonography and Pathology	5
* DMS	136	Sonographic Physics I	3
* DMS	137	Clinical Sonography I	8
* DMS	201	Normal Obstetric Sonography	3
* DMS	202	Sonographic Physics II	2
* DMS	203	High Resolution Imaging	2
* DMS	204	Clinical Sonography II	8
* DMS	205	Interventional Sonography	1
* DMS	206	Pediatric Sonography	2
* DMS	207	Abnormal Obstetric Sonography	3
* DMS	208	Introduction to Vascular Sonography	2
* DMS	209	Clinical Sonography III	8
* DMS	210	Comprehensive Physics Registry Review	2
* DMS	211	Clinical Sonography IV	11
* DMS	212	Comprehensive Abdomen Registry Review	2
* DMS	213	Comprehensive OB/GYN Registry Review	2
* DMS	214	Clinical Sonography V	11

\* *Students must pass courses with grades of C or better and maintain a minimum overall grade point average of 2.5 each quarter.*

\*\* *Documentation of completion of an accredited two-year allied health program in Radiography may be acceptable for PHY 1110.*

\*\*\* *Documentation of completion of an accredited two-year allied health program that is patient-care related may be acceptable for AHS 104 and AHS 109.*

*BIO 2113, BIO 2114, and MAT 1111 must have been taken within the last five years and must be completed by the application deadline date. All general education and health core courses must be completed prior to taking the first DMS course.*

## ALLIED HEALTH SCIENCE

Department Code: AHS

### AHS 104

#### Introduction to Health Care (2-3-3)

*Banner Title: Intro to Health Care*

Instructors introduce a grouping of fundamental principles, practices, and issues common to many specializations in the health care profession. In addition to the essential skills, students explore various delivery systems and related issues. Topics include basic life support and cardiopulmonary resuscitation (CPR); basic emergency care, first aid, and triage; vital signs; infection control; and blood and airborne pathogens. Students must pay a \$30 supply fee when registering for this course.

*Prerequisite: ENG 097 with a grade of C\* or better and RDG 097 with a grade of C\* or better or placement by diagnostic testing*

*Offered quarterly*

### AHS 109

#### Medical Terminology for Allied Health Science (3-0-3)

*Banner Title: Medical Terminology for AHS*

This course introduces the elements of medical terminology. Instructors place emphasis on building familiarity with medical words through knowledge of roots, prefixes, and suffixes. Topics include origins (roots, prefixes, and suffixes), word building, abbreviations and symbols, terminology related to the human anatomy, reading medical orders and reports, and terminology specific to the students' programs of study.

*Prerequisite: ENG 097 with a grade of C\* or better and RDG 097 with a grade of C\* or better or placement by diagnostic testing*

*Offered quarterly*

## BIOLOGY

Department Code: BIO

### BIO 2113

#### Human Anatomy and Physiology I (4-3-5)

*Banner Title: Anatomy/Physiology I*

This course introduces the anatomy and physiology of the human body. Instructors place emphasis on the development of a systemic perspective of anatomical structures and physiological processes. Topics include body organization, chemistry, cell structure and functions, tissue classifications, the integumentary system, the skeletal system, the muscular system, and the nervous and sensory systems. Laboratory

experiences support classroom learning. Students must pay a \$20 supply fee when registering for this course.

*Prerequisite: ENG 099 with a grade of C\* or better and RDG 098 with a grade of C\* or better or placement by diagnostic testing*

*Offered quarterly*

### BIO 2114

#### Human Anatomy and Physiology II (4-3-5)

*Banner Title: Anatomy/Physiology II*

This course continues the study of the anatomy and physiology of the human body and builds upon the concepts of chemistry, cytology, and histology. Topics include the endocrine system, the cardiovascular system, the blood and lymphatic system, the immune system, the respiratory system, the digestive system, the urinary system, and the reproductive system. Topics also include fluid dynamics and metabolism. Laboratory experiences support classroom learning. Students must pay a \$20 supply fee when registering for this course.

*Prerequisite: BIO 2113 with a grade of C or better*

*Offered quarterly*

## DIAGNOSTIC MEDICAL SONOGRAPHY

Department Code: DMS

### DMS 131

#### Foundations of Sonography (3-5-5)

*Banner Title: Foundations of*

*Sonography*

This course introduces students to the field of sonography and includes information concerning medical ethics and legal issues affecting the patient, student, school, and clinical site. The course also provides an overview of diagnostic medical sonography, its history and development. Emphasis is placed on learning methods, patient care techniques and issues related to sonography, introduction to ultrasound procedures, sonographic terminology, patient interviews, elementary principles of sound waves, sonographic imaging techniques, communication and cultural diversity skills, ethics and professionalism, development of critical thinking skills, legal issues, and issues concerning the clinical environment. Topics include hospital and departmental organization, proper body mechanics when scanning, safety procedures, and blood-borne pathogens.

*Prerequisite: Program admission*

*Offered Fall 2010*

### DMS 132

#### Sonographic Appearance of Normal Anatomy (3-3-4)

*Banner Title: Normal Anatomy Appearance*

This course introduces students to the normal sonographic appearance of abdominal anatomy, female and male pelvic anatomy, and the vascular system in the abdomen and pelvis. Topics include the normal anatomy of the liver, biliary system, pancreas, urinary tract, spleen, prevertebral vessels, peritoneal cavity, retroperitoneum, gastrointestinal tract, non-cardiac chest, and male and female pelvic anatomy. Students also study patient history and physical examination, related imaging, laboratory results, and functional testing procedures. Topics also cover the role of ultrasound in patient management, as well as sonographic appearance and sonographic patterns of structures in the abdomen, female pelvis, male pelvis, and vascularity related to each area.

*Prerequisite: Program admission*

*Offered Fall 2010*

### DMS 133

#### Cross Sectional Anatomy (3-3-4)

*Banner Title: Cross Sectional Anatomy*

This course introduces detailed normal anatomy in various planes used during sonographic examinations. Information focuses on normal structures that are sonographically visible. Course content describes structures according to relative location and proportionality. Students will identify anatomy in both cadaver and sonographic modes. Structures include the brain, neck, chest, abdomen, pelvis, and extremities. Instruction emphasizes sonographically identifying normal cross sectional anatomy based on echogenicity, the position of other relative anatomy, and proportionality of size. Topics include normal sectional anatomy of the neck (vascular and thyroid); normal sectional anatomy of the adult chest; normal sectional anatomy of the abdomen in adults; normal sectional anatomy of the male and female pelvis; and normal sectional anatomy of the extremities (muscles).

*Prerequisite: Program admission*

*Offered Fall 2010*

### DMS 134

#### Pelvic Sonography and Pathology (1-3-2)

*Banner Title: Pelvic Sonography/Pathology*

This course introduces gynecology physiology, pathology, and procedures for diagnostic medical sonography. Instructors place emphasis on female and male pelvic anat-

omy, physiology and anomalies, pathology complications, gynecology, and patient care and patient preparation. Topics include the physiology of the pelvis; history and physical examinations; contraceptive devices and infertility procedures; sonographic appearance of gynecologic disease processes; pathology, pathophysiology, and abnormal sonographic patterns of iatrogenic, degenerative, inflammatory, traumatic, neoplastic, infectious, obstructive, congenital, metabolic, and immunologic diseases; Doppler applications; differential diagnosis; scanning of the prostate in the male pelvis; and related imaging, laboratory, and functional testing procedures.

*Prerequisites: DMS 131 with a grade of C or better, DMS 132 with a grade of C or better, DMS 133 with a grade of C or better*

*Offered Summer 2009, Winter 2011*

### **DMS 135 Abdominal Sonography and Pathology (4-3-5)**

*Banner Title: Abdominal Sonography/  
Pathology*

This course introduces abdominal anatomy, sonographic appearance and procedures and pathology for diagnostic medical sonography. Topics include the anatomy, pathology, and diagnostic procedures of the liver, gallbladder and biliary tree, pancreas, urinary tract, adrenal glands, spleen, abdominal vasculature, peritoneal cavity, retro-peritoneum, GI tract, and non-cardiac chest. Topics also include scanning protocol based on sonographic findings and differential diagnosis; history and physical examinations; related imaging, laboratory, and functional testing procedures; clinical differential diagnosis; the role of ultrasound in patient management; and sonographic appearance of disease processes, pathology, pathophysiology, and abnormal sonographic patterns of iatrogenic, degenerative, inflammatory, traumatic, neoplastic, infectious, obstructive, congenital, metabolic, and immunologic diseases.

*Prerequisites: DMS 131 with a grade of C or better, DMS 132 with a grade of C or better, DMS 133 with a grade of C or better*

*Offered Summer 2009, Winter 2011*

### **DMS 136 Sonographic Physics I (3-0-3)**

*Banner Title: Sonographic Physics I*

The course introduces concepts for the factors involved with diagnostic ultrasound principles and instruments. Instructors place emphasis on basic ultrasound physics; transducer construction, operation, and characteristics; artifacts; and adjustable physics parameters. Topics include sound properties, sound units, sound

measurements, ultrasound transducers, imaging instruments, ultrasound machine adjustable parameters, and display modes.  
*Prerequisite: Program admission  
Offered Summer 2009, Winter 2011*

### **DMS 137 Clinical Sonography I (0-24-8)**

*Banner Title: Clinical Sonography I*

This course introduces students to the hospital or clinic setting work experience. Students perform procedures introduced in Foundations of Sonography and manipulate equipment based on information from Sonographic Appearance and Normal Anatomy. Instructors emphasize the performance of those procedures presented in Pelvic Sonography and Pathology and Abdominal Sonography and Pathology. Students also learn to identify normal anatomy presented in Cross Sectional Anatomy. This course also covers the control of the physical parameters of the sonography unit and the application of sonographic physics as related to image quality. Topics include equipment manipulation for optimum image resolution; scanning procedures for abdominal sonography; normal anatomy and pathologic conditions of the abdomen; normal female pelvic anatomy; female pelvic pathology, including uterine fibroids and bicornuate uterus; and scanning of the female pelvis trans-abdominally, trans-vaginally, and trans-perineally. This course also covers normal and abnormal prostates in males, ectopic pregnancies, patient care issues, patient preparation, patient history taking fundamentals, confidentiality, pertinent clinical laboratory values, and communication. Topics covered in this course also include pathology versus normal abdominal anatomy. Students conduct sonographic examinations under direct and indirect supervision.

*Prerequisite: DMS 131 with a grade of C or better, DMS 132 with a grade of C or better, DMS 133 with a grade of C or better*

*Offered Summer 2009, Winter 2011*

### **DMS 201 Normal Obstetric Sonography (2-3-3)**

*Banner Title: Normal Obstetrics*

This course introduces normal anatomy and development for obstetric evaluation utilizing diagnostic medical sonography. Instructors emphasize normal embryonic and fetal development throughout all three trimesters. Topics include the role of the sonographer in obstetric imaging, guidelines for antepartum obstetric sonography evaluation, and the safety of ultrasound and Doppler imaging for the obstetric patient. Topics also include significant lab-

oratory values in early pregnancy, embryonic development, sonographic evaluation of the early gestation, obstetrical measurements and gestational age, multiple gestations, role of amniotic fluid, placenta, and umbilical cord, fetal development, and biophysical profile.

*Prerequisite: DMS 134 with a grade of C or better*

*Offered Fall 2009, Spring 2011*

### **DMS 202 Sonographic Physics II (2-0-2)**

*Banner Title: Sonographic Physics II*

This course introduces concepts for the factors involved with diagnostic ultrasound principles and instruments. Topics include Doppler instruments, performance and safety, and artifacts.

*Prerequisite: DMS 136 with a grade of C or better*

*Offered Fall 2009, Spring 2011*

### **DMS 203 High Resolution Imaging (1-3-2)**

*Banner Title: High Resolution Imaging*

This course introduces anatomy, pathology, and procedures for diagnostic medical sonography. Topics include anatomy, thyroid, breast, scrotum, anterior abdominal wall, muscles, and other superficial structures.

*Prerequisite: DMS 131 with a grade of C or better, DMS 132 with a grade of C or better, DMS 133 with a grade of C or better, DMS 135 with a grade of C or better, DMS 136 with a grade of C or better*

*Offered Fall 2009, Spring 2011*

### **DMS 204 Clinical Sonography II (0-24-8)**

*Banner Title: Clinical Sonography II*

This course provides students with continued hospital or clinic setting work experience. Students have the opportunity to improve skills in performing procedures introduced concurrently with didactic and laboratory hours of Normal Obstetric Sonography and High Resolution Imaging. Instructors place emphasis on improving students' scanning abilities as related to competencies in Pelvic Sonography and Pathology and Abdominal Sonography and Pathology. Concurrently, students will competently perform procedures included in Normal Obstetric Sonography. Clinical experiences include equipment manipulation for optimal image resolution; demonstrating advanced techniques being presented in Physics II; the manipulation of equipment to minimize biological effects; conditions of the superficial structures to include differentiation of cystic and solid breast masses; sonographic classification of thyroid masses, scrotal her-

nias, testicular torsion, testicular tumors, epididymal cysts, anterior abdominal wall, muscles, and extremities; normal maternal/fetal development through three trimesters, including placental grading, placental location, and fetal growth with HCG levels; gestational sac size; performance of biophysical profiles; fetal heart rated determination; obtaining measurements of fetal anatomy including crown-rump length, bi-parietal diameter, head circumference; documenting normal fetal anatomy; demonstrating the ability to effectively deal with patient care issues including patient preparation, patient history taking, and patient confidentiality; pertinent clinical laboratory values; and communication. Students conduct sonographic examinations under direct and indirect supervision.

*Prerequisite:* DMS 131 with a grade of C or better, DMS 132 with a grade of C or better, DMS 136 with a grade of C or better, DMS 137 with a grade of C or better

*Offered Fall 2009, Spring 2011*

### **DMS 205 Interventional Sonography (0-2-1)**

*Banner Title: Interventional Sonography*

This course provides instruction in sonographic procedures that are considered invasive and/or require sterile procedures. Course content focuses on opening sterile trays, creating and maintaining a sterile field, and sterilizing ultrasound transducers. Topics include sonography in the operating suite and the performance of sonographic biopsy guidance. Students will also review issues concerning patient consent from the Foundations of Sonography course. Topics also include sterile techniques; amniocentesis; scanning of the uterus via sonohysterography; drainage and fluid recovery procedures, including thoracentesis, paracentesis, and amniocentesis; free-hand and attachment-guided biopsy such as breast biopsy and prostate biopsy; and ultrasound guidance procedures such as nephrostomy/biliary drainage procedures.

*Prerequisite:* DMS 133 with a grade of C or better, DMS 134 with a grade of C or better, DMS 135 with a grade of C or better, DMS 201 with a grade of C or better

*Offered Winter 2010, Summer 2011*

### **DMS 206 Pediatric Sonography (2-0-2)**

*Banner Title: Pediatric Sonography*

This course provides sonography students with specialized imaging procedures for the pediatric patient, including normal anatomy, pathology, and pathophysiol-

ogy. Instructors place emphasis on the pediatric abdomen, surgical abdominal conditions, pediatric hip, and the necessary skills and special considerations of the pediatric patient in terms of patient care, presenting symptoms, pathologic processes, diagnosis, and techniques. This course also covers neonatal neurosonography. Topics include normal anatomy of the abdomen in pediatric patients and associated anomalies; normal anatomy of the neonatal brain and head and associated anomalies; anatomy of pediatric hip joint and imaging techniques and associated anomalies; normal pelvic anatomy in pediatric patients and associated anomalies; procedures, indication, and protocol for pyloric stenosis and associated pathology; normal spine anatomy and associated anomalies; history and physical examinations; related imaging, laboratory, and functional testing procedures; differential diagnosis; and the role of ultrasound in patient management.

*Prerequisite:* DMS 132 with a grade of C or better, DMS 133 with a grade of C or better, DMS 134 with a grade of C or better, DMS 135 with a grade of C or better

*Offered Winter 2010, Summer 2011*

### **DMS 207 Abnormal Obstetric Sonography (3-0-3)**

*Banner Title: Abnormal Obstetric  
Sonography*

This course introduces the knowledge of fetal anatomy, pathology, and procedures for diagnostic medical sonography. Instruction emphasizes fetal anomalies and maternal complications throughout all three trimesters. Topics include first trimester sonographic abnormalities, including the diagnosis of embryonic abnormalities, placental hematomas, associated pelvic masses, and other sonographic findings; second and third trimester sonographic abnormalities, including hydrops, various trisomies, cranial and facial altering abnormalities, vertebral column abnormalities, thoracic cavity abnormalities, abdominal wall abnormalities, urinary tract abnormalities, extremity abnormalities, umbilical cord abnormalities, amniotic fluid volumes, and other miscellaneous congenital abnormalities. Instructors also cover history and physical examinations; related imaging, laboratory, and functional testing procedures; differential diagnosis; the role of ultrasound in patient management; viability; and fetal therapy.

*Prerequisite:* DMS 201 with a grade of C or better

*Offered Winter 2010, Summer 2011*

### **DMS 208 Introduction to Vascular Sonography (1-3-2)**

*Banner Title: Intro to Vascular*

*Sonography*

This course introduces the field of vascular sonography. General practitioners must be able to perform venous examinations of the lower extremity, arterial studies of the neck, and some Doppler studies within the abdomen. For these areas much greater depth will be reached. The field of vascular sonography is much wider and encompassing than these three areas. This course will also introduce the broader field of vascular sonography, but students will not study this field at length or in depth. This course places emphasis on the functional workings and settings associated with Doppler signals and waveforms. Topics include machine/image settings for Doppler imaging; venous imaging of the lower extremities; arterial imaging of the neck; and vascular imaging of the abdomen, including aorta and its primary branches, vena cava, portal and hepatic veins, and renal arteries and veins.

*Prerequisite:* DMS 133 with a grade of C or better, DMS 136 with a grade of C or better, DMS 202 with a grade of C or better, DMS 203 with a grade of C or better

*Offered Winter 2010, Summer 2011*

### **DMS 209 Clinical Sonography III (0-24-8)**

*Banner Title: Clinical Sonography III*

This course provides students with continued work experience in a hospital or clinic setting. Students improve skills in performing procedures introduced during previous didactic and clinical courses. Instructors emphasize the identification of normal and pathologic conditions learned concurrently in didactic and laboratory hours in Interventional Sonography, Pediatric Sonography, Abnormal Obstetric Sonography, and Introduction to Vascular Sonography, as well as refining the scanning ability of students in procedures presented in Pelvic Sonography and Pathology, Abdominal Sonography and Pathology, Normal Obstetric Sonography, and High Resolution Sonography. Topics include equipment manipulation for optimum image resolution; sterile techniques; drainage and fluid recovery procedures, including thoracentesis, paracentesis, and amniocentesis; freehand and attachment-guided biopsy, including breast biopsy and prostate biopsy; pathology and abnormal conditions in obstetrics, including the gamut of pathology in the neonate, such as intra-cranial bleeds, masses, and duodenal atresia; organ malformations; maternal conditions affect-

ing pregnancy; ectopic pregnancies; patient care issues; patient preparation; fundamentals of patient history taking; confidentiality; pertinent clinical laboratory values; and communication. Students conduct sonographic examinations under direct and indirect supervision.

*Prerequisite: DMS 204 with a grade of C or better*

*Offered Winter 2010, Summer 2011*

### **DMS 210**

#### **Comprehensive Physics**

##### **Registry Review (2-0-2)**

*Banner Title: Physics Registry Review*

This course provides a review of basic knowledge from previous courses and helps students prepare for national certification examinations for sonography. Students will also review information concerning test-taking skills. Topics include physics, patient care, equipment/image manipulation, scanning procedures, bioeffects, and safety. Instructors will emphasize those items, issues, and topics that are part of the certification examination. Topics include the propagation of ultrasound through tissues, principles of pulse echo imaging, quality assurance of ultrasound instruments, elementary principles, bioeffects and safety, ultrasound transducers, and pulse echo instruments.

*Prerequisite: DMS 136 with a grade of C or better, DMS 202 with a grade of C or better*

*Offered Fall 2009, Spring 2010*

### **DMS 211**

#### **Clinical Sonography IV (0-33-11)**

*Banner Title: Clinical Sonography IV*

This course provides continued hospital/clinic setting work experience for students. Students will focus on refining their scanning techniques, increasing speed of exam completion, and developing a critical thinking approach to sonographic scanning in performing procedures introduced during previous didactic and clinical courses. The course also emphasizes the identification of normal and pathologic conditions learned during Introduction to Vascular Sonography, and the performance of vascular duplex examinations are emphasized. Instruction will also cover equipment utilization, venous structures of the leg, arterial vessels of the neck, and professional development through the application of case studies reviews. Students conduct sonographic examinations under direct and indirect supervision. Topics include the manipulation of Doppler signals for venous scanning of the extremities and arterial scanning of the carotid vessels; normal anatomy and pathologic conditions of vascular structures, including deep vein

thrombosis and carotid artery occlusion; equipment manipulation for optimum image resolution; and patient care issues, including patient preparation, fundamentals of patient history taking, confidentiality, pertinent clinical laboratory values, and communication.

*Prerequisite: DMS 209 with a grade of C or better*

*Offered Spring 2010, Fall 2011*

### **DMS 212**

#### **Comprehensive Abdomen**

##### **Registry Review (2-0-2)**

*Banner Title: Abdomen Registry Review*

This course provides a review of basic knowledge from previous courses and helps students prepare for national certification examinations in sonography. Instructors will guide students through reviews of physics, equipment/image manipulation, anatomy, pathology, scanning procedures, sterile procedures, sonographic measurements, invasive procedures, and test-taking skills. Topics include patient care preparation/techniques, laboratory values and indications, parenchymal diseases, masses of the abdomen, normal anatomy and physiology of abdominal organs, and pathology of the abdomen. Instructors will emphasize those items, issues, and topics that are part of the certification examination.

*Prerequisite: DMS 135 with a grade of C or better, DMS 202 with a grade of C or better*

*Offered Summer 2010, Winter 2012*

### **DMS 213**

#### **Comprehensive OB/GYN**

##### **Registry Review (2-0-2)**

*Banner Title: OB/GYN Registry Review*

This course provides a review of basic knowledge from previous courses and helps students prepare for national certification examinations in sonography. Students will review physics, equipment/image manipulation, anatomy, pathology, scanning procedures, sterile procedures, sonographic measurements, fetal growth, invasive procedures, and test-taking skills. Topics covered include obstetrics, fetal abnormalities, patient care preparation/techniques, laboratory values and indications, pelvic masses and abnormalities, and gynecologic anatomy and physiology. Instructors place emphasis on those items, issues, and topics that are part of the certification examination.

*Prerequisite: DMS 134 with a grade of C or better, DMS 201 with a grade of C or better, DMS 202 with a grade of C or better, DMS 207 with a grade of C or better*

*Offered Summer 2010, Winter 2012*

### **DMS 214**

#### **Clinical Sonography V (0-33-11)**

*Banner Title: Clinical Sonography V*

This course provides a culminating hospital or clinic setting work experience for students to improve skills in performing procedures introduced during prior clinical and didactic classes. Instructional activities assist students in refining their scanning techniques, increasing speed, developing a critical thinking approach to sonographic scanning, and completing all clinical competencies. This course also includes equipment utilization and professional development through the application of case studies reviews. Students conduct sonographic examinations under direct and indirect supervision. Topics covered in this course include the refinement of equipment manipulation, techniques, the role of the sonographer in performing interventional/invasive procedures, completion of competencies necessary for graduation, and requirements of an entry-level sonographer.

*Prerequisite: DMS 211 with a grade of B or better*

*Offered Summer 2010, Winter 2012*

## **ENGLISH**

*Department Code: ENG*

### **ENG 1101**

#### **Composition and Rhetoric (5-0-5)**

*Banner Title: Composition and Rhetoric*

Students practice various modes of writing ranging from exposition to argumentation and persuasion. The course also explores the analysis of literature and articles about issues in the humanities and in society. The course includes a review of standard grammatical and stylistic usage in proofreading and editing. An introduction to library resources lays the foundation for research. Topics covered in the course include writing analysis and practice, revision, and research. Students write a research paper using library resources and using a formatting and documentation style appropriate to the purpose and audience.

*Prerequisites: ENG 099 with a grade of C\* or better and RDG 098 with a grade of C\* or better or placement by diagnostic testing*

*Offered quarterly*

### **ENG 1102**

#### **Literature and Composition (5-0-5)**

*Banner Title: Literature and*

*Composition*

This course emphasizes the ability of students to read literature analytically and meaningfully and to communicate clearly.

Students analyze the form and content of literature in historical and philosophical contexts. Topics include reading and analysis of fiction, poetry, and drama; research, and writing about literature.

*Prerequisite: ENG 1101 with a grade of C or better*

*Offered quarterly*

## MATHEMATICS

*Department Code: MAT*

### **MAT 1111**

#### **College Algebra (5-0-5)**

*Banner Title: College Algebra*

This course emphasizes techniques of problem solving using algebraic concepts. Topics include fundamental concepts of algebra, equations and inequalities, functions and graphs, systems of equations, analytic geometry, and optional topics, including sequences, series, and probability.

*Prerequisite: MAT 097 with a grade of C\* or better and/or MAT 099 with a grade of C\* or better or placement by diagnostic testing*

*Offered Quarterly*

## PHYSICS

*Department Code: PHY*

### **PHY 1110**

#### **Introductory Physics (4-3-5)**

*Banner Title: Introductory Physics*

This course introduces students to the basic laws of physics. Topics include systems of units and conversion of units; vector algebra; Newtonian mechanics; fluids and thermodynamics; heat; light and optics; mechanical waves; sound; electricity and magnetism; and modern physics. Laboratory experience supports classroom learning. Computer use is an integral part of class and laboratory assignments.

*Prerequisite: MAT 1100 or MAT 1101 or MAT 1111*

*Offered Fall, Winter, and Spring terms*

## PSYCHOLOGY

*Department Code: PSY*

### **PSY 1101**

#### **Introduction to Psychology (5-0-5)**

*Banner Title: Introduction to Psychology*

This course emphasizes the basics of psychology. Topics include the science of psychology; social environments; life stages; physiology and behavior; personality; emotions and motives; conflicts, stress, and anxiety; abnormal behavior; and perception, learning, and intelligence.

*Prerequisites: ENG 099 with a grade of C\* or better and RDG 098 with a grade of C\* or better or placement by diagnostic testing*

*Offered quarterly*

## SCIENCE AND TECHNOLOGY

*Department Code: SCT*

### **SCT 100**

#### **Introduction to Microcomputers (1-4-3)**

*Banner Title: Intro to Microcomputers*

This course introduces the fundamental concepts and operations necessary to use microcomputers. Course content emphasizes basic functions and familiarity with computer use. Topics include computer terminology and an introduction to the Windows environment, networking, word processing, spreadsheets, presentation graphics, and databases.

*Prerequisite: Provisional admission*

*Offered quarterly*

## SPEECH

*Department Code: SPC*

### **SPC 1101**

#### **Public Speaking (5-0-5)**

*Banner Title: Public Speaking*

This course introduces the fundamentals of oral communication. Topics include selection and organization of materials, preparation and delivery of individual and group presentations, and analysis of ideas presented by others, and professionalism.

*Prerequisites: ENG 099 with a grade of C\* or better and RDG 098 with a grade of C\* or better or placement by diagnostic testing*

*Offered quarterly*