

## **ASSOCIATE OF APPLIED SCIENCE IN DIAGNOSTIC MEDICAL SONOGRAPHY (DMS AAS)**

2,160 clock hours / 84 weeks (Total time to complete the program may vary based on school holidays and breaks)  
60 weeks Theory/Lab (20 hours per week) + 24 weeks externship (40 hours per week)

### **Program Objective:**

The Associate of Applied Science in Diagnostic Medical Sonography (DMS AAS) Program is designed to prepare competent entry-level general sonographers in the cognitive (knowledge), psychomotor (skills), and effective (behavior) learning domains. This preparation is accomplished through didactic, laboratory, and clinical instruction in the theoretical knowledge, skills, and responsibilities of a diagnostic medical sonographer. The successful program graduate will be able to perform appropriate ultrasound scanning examinations and procedures, and record anatomic, pathologic, and/or physiologic data for interpretation by a physician. The graduate will also be able to obtain, review, and integrate pertinent patient history and supporting clinical data to facilitate optimum diagnostic results. In addition, the graduate will be prepared to exercise discretion and judgment in the performance of sonographic diagnostic services, provide appropriate and compassionate patient care for patients undergoing ultrasound examinations, demonstrate excellent communication skills with patients and other health care professionals, and act in an ethical and professional manner.

Completion of the General Education requirements for the AAS Degree program may be transferable if the student wishes to pursue a Bachelor's Degree in Diagnostic Medical Sonography. The award of transfer credit is at the discretion of other institutions and is not guaranteed.

A graduate of the DMS Program will be qualified to work as an entry-level sonographer in a hospital or medical center, a medical clinic, a radiology imaging center, a physician's office, or a mobile ultrasound service; as a free lance sonographer; or as a traveling sonographer.

It is not currently mandatory that graduates take any licensing or credentialing examination upon successful program completion. However, many employers prefer or require that DMS graduates be credentialed by the American Registry of Diagnostic Medical Sonographers (ARDMS) or Cardio Vascular Credentialing (CCI). Depending upon the graduate's prior education, he or she may be eligible to sit for EITHER the CCI examination OR the ARDMS examination upon graduation, as prerequisites for these examinations are currently written.

The graduate of the DMS AAS must pass all General Education courses, core theory and laboratory courses, and clinical externship courses with a grade of 70% or better to complete the program.

### **Program Admissions Requirements:**

1. High School Diploma or equivalent
2. Must be at least 17 years of age
3. WONDERLIC SLE admissions score of 15 or higher (please see admissions process above)
4. Criminal history background check - Note: If you have been convicted, found guilty of, or pled nolo contendere to any crime (felony or misdemeanor), other than a speeding or parking violation, you **MUST** seek clarification from the ARDMS at [www.ardms.org](http://www.ardms.org), as to your eligibility to apply for ARDMS examination. Students who wish to sit for the CCI examination must seek clarification from CCI at [www.cci-online.org](http://www.cci-online.org).
5. Health screenings and immunizations (prior to program admission). Note: TB testing is required just prior to placement into clinical externship.
6. Drug and alcohol testing (required by some clinical externship sites prior to placement)
7. Current BLS CPR certification (prior to placement in clinical externship)

Upon successful completion of the program, graduates may obtain employment as:

- Diagnostic Medical Sonographer/Ultrasound Technician  
(CIP # 51.0910; O-NET # 29-2032.00)

Term #	Course Title	Week #	Clock Hours
GE	Mathematics 101 - College Math.	01-12	45
	English 102 - Oral Communication		45
	Physics 101 - General Physics		45
	Biology 101 - Human Anatomy		45
	Biology 102 - Human Physiology		45
	Orientation to Ultrasound Imaging		15
I	Physical Principles & Instrumentation of Ultrasound	13-24	192
	Professional Aspects of Sonography		48
II	Abdominal & Small Parts Ultrasound Imaging	25-36	192
	Fundamentals of Sonography		48
III	Obstetrics & Gynecology Ultrasound Imaging	37-48	192
	Patient Care for Sonographers		48
IV	Vascular Ultrasound Imaging	49-60	192
	Patient/Sonographer Interaction		48
V	Clinical Practicum I	61-72	480
VI	Clinical Practicum II	73-84	480
<b>Total:</b>			<b>2160</b>

Note: one clock hour is defined as a 60-minute span of time in which 50 minutes is devoted to actual class instruction, with the remaining portion designated as a break.

**Program Syllabus:**

<b>Course Number</b>	<b>Course Title</b>	<b>Lecture Hours</b>	<b>Lab Hours</b>	<b>Clinical Hours</b>	<b>Total Clock Hours</b>
MTH 101	College Math	45	0	0	45
ENG 102	Oral Communication Skills	45	0	0	45
PHY 101	General Physics	45	0	0	45
BIO 101	Human Anatomy	45	0	0	45
BIO 102	Human Physiology	45	0	0	45
DMS 200	Orientation to Ultrasound Imaging	15	0	0	15
DMS 240	Physical Principles & Instrumentation of Ultrasound	96	96	0	192
DMS 245	Professional Aspects of Sonography	48	0	0	48
DMS 210	Abdominal & Small Parts Ultrasound Imaging	96	96	0	192
DMS 215	Fundamentals of Sonography	48	0	0	48
DMS 220	Obstetrics & Gynecology Ultrasound Imaging	96	96	0	192
DMS 225	Patient Care for Sonographers	48	0	0	48
DMS 230	Vascular Ultrasound Imaging	96	96	0	192
DMS 235	Patient / Sonographer Interaction	48	0	0	48
DMS 250	Clinical Practicum I	0	0	480	480
DMS 260	Clinical Practicum II	0	0	480	480
<b>TOTAL</b>		<b>816</b>	<b>384</b>	<b>960</b>	<b>2160</b>

For information on graduation rates, median debt of graduates completing this program or other important information, visit: <http://www.cbd.edu/programs/diagnostic-medical-sonography-ultrasound/>

## **DMS AAS Program Descriptions:**

### MATHEMATICS 101 – COLLEGE MATH

**Prerequisites:** Admission to the DMS Program.

*Total clock hours: 45*

This course is designed primarily for students who know the fundamentals of arithmetic, and have had little or no background in algebra. The course strengthens the student's arithmetic and informal geometry skills, provides an introduction to the abstractions of algebra using fundamental principles of rational numbers, order of operations, and solution of linear equations. Upon course completion, the student will be able to solve mathematical problems applicable to theory and practice of diagnostic medical sonography.

### ENGLISH 102 – ORAL COMMUNICATION

**Prerequisites:** Admission to the DMS Program.

*Total clock hours: 45*

This introductory course is designed to provide students with greater skills in all aspects of oral presentation. The course enables students to prepare effective speeches, emphasizing the relevant elements of public speaking. The process of preparing a presentation is covered, including topic selection, development, research, organization, language, and delivery of speeches for many types of audiences and occasions. The course will focus on building self-confidence of the students by presenting the appropriate techniques to deliver informative and persuasive oral presentations. Upon course completion, the student will be able to prepare and deliver job related oral communications.

### PHYSICS 101 – GENERAL PHYSICS

**Prerequisites:** Admission to the DMS Program.

*Total clock hours: 45*

This is an introductory course in physics that surveys basic concepts, principles and laws of physics including the topics of mechanics, thermodynamics, heat, fluids, sound, waves and vibrations, electricity, magnetism, optics and radioactivity. It is specifically designed for students with no previous experience with physics.

### BIOLOGY 101 – HUMAN ANATOMY

**Prerequisites:** Admission to the DMS Program.

*Total clock hours: 45*

This course emphasizes the principles of human anatomy and includes an overview of all body systems, organs, tissues, and cells with focus on major biochemical, mechanical and cellular biology theories. Topics dealing with the nature of science, human genetics and development are included.

### BIOLOGY 102 – HUMAN PHYSIOLOGY

**Prerequisites:** Admission to the DMS Program.

*Total clock hours: 45*

The course offers a comprehensive study of human physiology. Included is an overview of structure and functions of all body systems, organs, tissues, and cells. This course focuses on the

function of the integumentary, skeletal, muscular, respiratory, cardio-vascular, immune systems, as well as endocrine, nervous, urinary, digestive, and reproductive systems.

#### DMS 200 – ORIENTATION TO ULTRASOUND IMAGING

**Prerequisites:** Admission to the DMS Program. All GE courses. *Total clock hours: 15*

This course is a prerequisite to the core courses of the DMS program. It provides an overview of the scope and content of the DMS program. It focuses on the elementary operational principles of diagnostic medical ultrasound, basic ultrasound terminology specific to the profession, anatomic imaging planes and body directions used in ultrasound imaging, and the image orientation on the ultrasound display.

#### DMS 240 – PHYSICAL PRINCIPLES AND INSTRUMENTATION OF ULTRASOUND

**Prerequisites:** All GE courses, DMS 200, **Co-requisite:** DMS 245 *Total clock hours: 192*

This course covers the basic physical principles of ultrasound and the instrumentation relating to the ultrasound unit. The information covered in the course will include the basic acoustic principles of ultrasound, the physics of pulsed ultrasound, Doppler principles, transducer operating principles and composition, the components of the ultrasound imaging unit, common artifacts in imaging, and safety in operation of the ultrasound imaging system. In the laboratory component, emphasis will be placed upon the instrumentation controls required for optimum operation of the ultrasound machine.

#### DMS 245 – PROFESSIONAL ASPECTS OF SONOGRAPHY

**Prerequisites:** All GE courses, DMS 200, **Co-requisite:** DMS 240 *Total clock hours: 48*

The aspects of sonography as a career will be examined in this course. Topics of discussion include sonography career ladder opportunities, benefits of professional organizations, certification and registration advantages, sonographer safety, medical ethics and legal aspects of sonography, professional behavior, sonography employment venues, resume writing, and interview techniques.

#### DMS 210 – ABDOMINAL AND SMALL PARTS ULTRASOUND IMAGING

**Prerequisites:** All GE courses, DMS 200, **Co-requisite:** DMS 215 *Total clock hours: 192*

This course covers the aspects of abdominal and small parts ultrasound scanning required for employment as an entry-level sonographer. This course will include both lecture and laboratory components. The lecture component will focus on normal ultrasound appearances of the organs of the abdominal cavity, breast, thyroid, prostate, and testes, and on the pathological conditions that may affect these organs. In the laboratory portion of the course the student will learn proper ultrasound scanning techniques for imaging the organs of the abdomen and small parts, and preparation of the necessary information for an initial written or oral presentation to the radiologist.

### DMS 215 – FUNDAMENTALS OF SONOGRAPHY

*Prerequisites:* All GE courses, DMS 200, *Co-requisite:* DMS 210

*Total clock hours:* 48

This course provides a broad overview of the field of diagnostic medical sonography. It covers the history and evolution of ultrasound as an imaging modality, the sonographer's role, required skills and abilities, and effective learning techniques.

### DMS 220 – OBSTETRICS AND GYNECOLOGY ULTRASOUND IMAGING

*Prerequisites:* All GE courses, DMS 200, *Co-requisite:* DMS 225

*Total clock hours:* 192

This course provides a basic understanding to the student of the normal and abnormal conditions that affect the organs of the female pelvic cavity and the developing fetus. The lecture portion will center on the normal and pathological conditions of the uterus, ovaries, and fetus. During the laboratory component the student will learn proper scanning techniques and protocols used in ultrasound imaging of the gynecologic and obstetric patient. Emphasis is placed on recognition of normal anatomy, ultrasound documentation, biometry measurements, and preparation of initial preliminary reports to the reading radiologist.

### DMS 225 – PATIENT CARE FOR SONOGRAPHERS

*Prerequisites:* All GE courses, DMS 200, *Co-requisite:* DMS 220

*Total clock hours:* 48

This course presents the student with different aspects of patient care that are relevant to the sonographer. Focus is placed on patient/sonographer interaction, and patient confidentiality and HIPAA compliance. Students will learn patient care skills that apply to Diagnostic Medical Sonography. Emphasis is placed on vital signs, body mechanics for patient transfer, and care techniques for patients with tubing, standard precautions for infection control, aseptic/sterile technique, isolation techniques, and emergency medical situations.

### DMS 230 – VASCULAR ULTRASOUND IMAGING

*Prerequisites:* All GE courses, DMS 200, *Co-requisite:* DMS 235

*Total clock hours:* 192

This course in vascular ultrasound will introduce the student to the hemodynamic considerations of the arterial and venous vascular systems. The lecture portion of this course will cover the anatomy of the arterial and venous systems of the body, and the pathologies commonly encountered in those systems. During the laboratory sessions, the student will receive instruction in scanning techniques for the carotid arteries, upper and lower extremity arteries, upper and lower extremity veins, and abdominal vessels. This course is designed to instruct the student in procedures performed in the practice of vascular ultrasound imaging.

### DMS 235 – PATIENT / SONOGRAPHER INTERACTION

**Prerequisites:** All GE courses, DMS 200, **Co-requisite:** DMS 230

*Total clock hours: 48*

Students will learn how to communicate with patients and other health care professionals, care for those with special needs, prepare the patient for different types of ultrasound examinations, recognize laboratory values that pertain to specific ultrasound examinations, and examine the role of different imaging modalities in patient diagnosis.

### DMS 250 – CLINICAL PRACTICUM I

**Prerequisites:** All GE courses, DMS 200 – 245

*Total clock hours: 480*

During this course the student will be assigned, and directly supervised in a Diagnostic Medical Ultrasound imaging facility such as a hospital, clinic or imaging center. The student will be introduced to the clinical setting and departmental organization. Under direct supervision by a supervising sonographer or supervising physician, and the school's Clinical Coordinator, the student will begin to acquire the hands-on skills necessary for the sonographer in a clinical site. This is accomplished through observation and participation in clinical case studies of patients undergoing ultrasound examinations.

### DMS 260 – CLINICAL PRACTICUM II

**Prerequisites:** All GE courses, DMS 200 – 250

*Total clock hours: 480*

This course is designed as a more advanced continuation of Clinical Practicum I. The student will continue to perfect his/her skills in the clinical environment and learn more advanced imaging techniques required of the sonographer. The student will gain more experience in performing ultrasound imaging of the patient undergoing abdominal, small parts, gynecologic, obstetric, or vascular ultrasound examinations.