

# DIAGNOSTIC MEDICAL SONOGRAPHY

Information on requirements, forms, and deadlines for applications are available on our website at <https://dacc.nmsu.edu/dms/>. You can also find information at the Health Sciences Division Office (room DAHL 190), or by calling (575) 528-7015.

## Associate of Applied Science Degree

### Certificate of Completion

The Doña Ana Community College Diagnostic Medical Sonography (DMS) Program is accredited by the Commission on Accreditation of Allied Health Education Programs (CAAHEP) upon the recommendation of the Joint Review Committee on Education in Diagnostic Medical Sonography (JRC-DMS). *The program's assessment and outcome report can be found on our website (<https://dacc.nmsu.edu/dms/>) under the "Program Outcomes" link.*

Sonography is an allied health specialty that uses high-frequency sound waves (ultrasound) to image many structures in the body. Sonographers function as members of the healthcare team by providing and evaluating high quality images that aid physicians in the diagnosis and treatment of their patients. Sonographers are highly motivated, independent, critical thinkers who enjoy one-on-one patient interaction.

Employment opportunities are available in a variety of settings, such as hospitals, physicians' offices, and veterinarian practices. There are also opportunities in sales, education, management, research, marketing, and product development. Because job prospects in the Las Cruces–El Paso area occasionally are limited, it may be necessary to conduct a wider job search.

Training involves a combination of academic courses and a clinical internship in the ultrasound department of area hospitals and clinics where students will gain hands-on training under the supervision of registered diagnostic medical sonographers and will work alongside physicians and other health-care professionals. Coursework covers abdominal and OB-Gyn ultrasound, pediatric sonography, acoustic physics and instrumentation, and introductory vascular technology. Students will participate in lab activities and learn to write case reports and journal article reviews. The clinical sites include facilities in Las Cruces, Alamogordo, Ruidoso, and Silver City, New Mexico, as well as El Paso, Texas.

The Diagnostic Medical Sonography program offers a certificate track for students who already possess an associate degree in a medically related, allied healthcare program or a bachelor's degree in a related field. The associate degree track is designed for those who do not meet the entrance requirements for the certificate-track program. Once accepted into the Diagnostic Medical Sonography program the curriculum for certificate and associate degree pathways is identical.

Students in the Diagnostic Medical Sonography program are required to complete and pass a variety of background/screening measures that include a security background check, FBI fingerprinting and drug screening, in order to participate in the clinical education portion of the program. Past criminal violations may prevent a student from completing the program and gaining employment in the field.

Students who satisfy program requirements are qualified to apply for national certification examinations in the specialty areas of Abdominal and OB/GYN Sonography. These examinations are administered by the American Registry of Diagnostic Medical Sonography (ARDMS) and/or the American Registry of Radiologic Technologists (ARRT). Licensing requirements vary by state; New Mexico requires sonographers to obtain a state license. Continuing education beyond graduation is required to maintain credentials earned by the ARDMS and ARRT; and for maintaining state license in New Mexico.

## Required Physical and Cognitive Skills

Sonography students must be able to do the following:

1. Read, write and communicate effectively in English.
2. Possess emotional and physical health sufficient to meet the demands of the profession.
3. Position, move, and lift patients in wheelchairs and stretchers.
4. Maintain prolonged arm positions necessary for scanning.
5. Position and move ultrasound equipment on wheels (up to 500 lbs.)
6. Effectively operate sonographic equipment.
7. Evaluate sonograms, acquiring appropriate diagnostic information.
8. Integrate diagnostic sonograms, laboratory results, patient histories and medical records, and adapt sonographic examinations as necessary.
9. Use independent judgment to acquire the optimal diagnostic sonographic information in each examination performed.
10. Evaluate, synthesize, and communicate diagnostic information to be used by the attending physician.
11. Communicate effectively with the patient and healthcare team, recognizing the special nature of sonographic exams and patients' needs.
12. Establish and maintain effective working relationships with the public and healthcare team.
13. Follow established departmental procedures.
14. Work efficiently and cope with emergency situations.

*Reasonable accommodations may be available through the Student Accessibility Services (SAS) office. Please contact the Program Director for more information.*

## Special Admissions Criteria- Associate Degree

Diagnostic Medical Sonography (DMS) is a limited-entry program admitting students in the spring semester only. Prior to applying to the program, students will have taken all program Core and Related Requirements. The following items are among the criteria considered in the selection of program applicants:

- Completion of program orientation
- Minimum overall college GPA 3.0
- GPA in Core and Related Requirements courses
- County of residence
- Completion of bonus point courses
- Prior healthcare experience

A complete description is available on the DMS program website (<https://dacc.nmsu.edu/dms/>).

## Special Admissions Criteria- Certificate of Completion

This is a limited-entry program accepting students only in the spring semester. Criteria and factors used in evaluating applicants include the following:

- Completion of either
  - (a) an associate degree in an allied health program which is medically related and involves human-patient care (proof of current certification in ones' allied health area is required), OR
  - (b) a bachelor's degree in a related field that includes at least one semester of anatomy & physiology.
- Overall GPA of 3.0 or higher
- College-level course in algebra (MATH 1220G College Algebra or equivalent)
- College-level course in general physics or introductory physics for the health sciences or radiographic physics or equivalent.

## Course Fees

In addition to tuition, a fee of \$200 is charged for each of the following courses: DMS 170, DMS 180, DMS 270, DMS 280.

Prefix	Title	Credits
DMS 170	Clinical Practicum I	1
DMS 180	Clinical Practicum II	4
DMS 270	Clinical Practicum III	3
DMS 280	Clinical Practicum IV	5

Diagnostic Medical Sonography - Associate of Applied Science (<http://catalogs.nmsu.edu/dona-ana/academic-career-programs/diagnostic-medical-sonography/diagnostic-medical-sonography-associate-applied-science/>)

Diagnostic Medical Sonography - Certificate of Completion (<http://catalogs.nmsu.edu/dona-ana/academic-career-programs/diagnostic-medical-sonography/diagnostic-medical-sonography-certificate-completion/>)

Vascular Sonography - Certificate of Completion (<http://catalogs.nmsu.edu/dona-ana/academic-career-programs/diagnostic-medical-sonography/vascular-sonography-certificate/>)

### DMS 100. Introduction to Clinical Practicum

#### 1 Credit (1)

Introduction to working in the medical environment. Includes preparation for clinical internship and observation hours in the ultrasound department. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

### DMS 101. Introduction Sonography/Patient Care

#### 2 Credits (2)

Introduction to the careers in sonography, terminology, medical ethics, scanning planes, applications of ultrasound, professional standards and patient care. May be repeated up to 2 credits. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

### DMS 105. Introduction to Clinical Practicum II

#### 1 Credit (1P)

Development of technical and professional aspects of diagnostic ultrasound in a hospital or clinical setting at the developmental level. Ongoing reinforcement and broadening of knowledge base related to hospital procedures and policies. Continued observation, assistance and performance of patient care and sonographic duties under direct supervision.

#### Learning Outcomes

1. Demonstrate proficiency in patient care skills.
2. Recognize sonographic anatomy.
3. Assist with basic sonographic procedures in the clinical setting.
4. Describe aspects of the clinical experience.

### DMS 116. Vascular Technology I

#### 2 Credits (2)

Review of basic ultrasound physics and principles, peripheral vascular anatomy, hemodynamics, Doppler evaluation, peripheral vascular scanning techniques, physiologic testing and the carotid arteries and the peripheral vascular system. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

### DMS 116 L. Vascular Technology I Lab

#### 1 Credit (2P)

Includes protocol development, scanning techniques, recognition of anatomical relationships and the normal ultrasound appearance of the carotid arteries and peripheral vasculature utilizing real-time sonographic equipment including Doppler. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

### DMS 130. Pelvic Sonography

#### 1 Credit (1)

Includes the anatomy, sectional anatomy and normal physiology of the pelvic structures; including the uterus, ovaries, prostate, pelvic muscles, lower GI, appendix and vessels as well as scanning techniques, sonographic appearance and Doppler evaluation of the pelvis. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

### DMS 130 L. Pelvic Sonography Lab

#### 1 Credit (2P)

Includes protocol development, scanning techniques, recognition of anatomical relationships and the normal ultrasound appearance of the pelvic structures including the uterus, ovaries, prostate, lower gastrointestinal system, appendix and pelvic muscles utilizing real-time sonographic equipment including Doppler. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

### DMS 140. Abdominal Sonography

#### 3 Credits (3)

Includes the anatomy, sectional anatomy and normal physiology of prevertebral vessels, liver, biliary system, pancreas, upper gastrointestinal system, kidneys, adrenals, and spleen as well as scanning techniques, sonographic appearance and Doppler evaluation of the deep abdominal organs. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

### DMS 140 L. Abdominal Sonography Lab

#### 1 Credit (4P)

Includes protocol development, scanning techniques, recognition of anatomical relationships and the normal ultrasound appearance of prevertebral vessels, liver, biliary system, pancreas, upper gastrointestinal system, kidneys and spleen utilizing real-time sonographic equipment including Doppler. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

**DMS 150. Sonographic Principles and Instrumentation I****1 Credit (1)**

Includes the fundamental properties and mathematical relationships between variables of wave parameters, acoustic variables, attenuation, pulsed wave operation, transducers, system operation, Doppler, and artifacts utilizing real-time sonographic equipment. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

**DMS 160. 1st Trimester Obstetric Sonography****1 Credit (1)**

Includes the embryology, anatomy, sectional anatomy, normal physiology, biometrics, assessment, and sonographic appearance of the 1st trimester fetus, placenta, uterus and adnexa as well as scanning techniques according to recognized protocols. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

**DMS 165. 2nd/3rd Trimester Obstetric Sonography****1 Credit (1)**

Includes the anatomy, sectional anatomy, normal physiology, biometrics, assessment, and sonographic appearance of the 2nd and 3rd trimester fetus, placenta, uterus, and adnexa as well as scanning techniques according to recognized protocols. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

**DMS 170. Clinical Practicum I****1 Credit (8-10P)**

Development of technical and professional aspects of diagnostic ultrasound in a hospital or clinical setting at the developmental level. Ongoing reinforcement and broadening of knowledge base related to hospital procedures and policies. Continued observation, assistance and performance of patient care and sonographic duties under direct supervision. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

**Learning Outcomes**

1. Develop professional skills necessary in the clinical environment.
2. Perform basic sonographic procedures with minimal assistance from preceptors.
3. Assist with complex/advanced sonographic procedures under the guidance of preceptors.

**DMS 180. Clinical Practicum II****4 Credits (4)**

Development of technical and professional aspects of diagnostic ultrasound in a hospital or clinical setting at the beginner level. Ongoing reinforcement and broadening of knowledge base related to hospital procedures and policies. Continue observation, assistance and performance of patient care and sonographic duties under direct supervision. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

**Prerequisite:** DMS 170.

**Learning Outcomes**

1. Students will demonstrate general and sonographic knowledge to function as a member of the healthcare team.
2. Students will identify and interpret data from patient charts.
3. Students will perform a broad range of general sonographic examinations with minimal to moderate assistance.
4. Students will demonstrate effective oral and written communication skills.

**DMS 201. Applied Sonographic Procedures****1 Credit (8P)**

Advances scanning skills, system optimization, anatomic recognition of abdominal and pelvic structures utilizing real-time sonographic equipment including Doppler. Includes sonographic evaluation of the first trimester pregnancy and normal fetus. Restricted to: DMS majors. Restricted to Las Cruces campus only.

**DMS 216. Vascular Technology II****2 Credits (2)**

Includes the pathology and pathophysiology of the vascular system, scanning techniques, clinical presentation, ultrasound appearance and Doppler evaluation seen with pathological conditions of the carotid arteries, deep and peripheral vascular systems. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

**DMS 226. Sonographic Case Studies I****1 Credit (1)**

Includes integration of didactic knowledge, clinical presentation, laboratory values, sonographic appearance and related medical imaging of a variety of pathological conditions through a variety of case analysis and presentations. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

**DMS 227. Sonographic Case Studies II****1 Credit (1)**

Continuation of DMS 226, integration of didactic knowledge, clinical presentation, laboratory values, sonographic appearance and related medical imaging of a variety of pathological conditions through a variety of case analysis and presentations. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

**DMS 230. Gynecologic Pathology****2 Credits (2)**

Includes the pathology and pathophysiology of the female reproductive system, scanning techniques, clinical presentation, ultrasound appearance and Doppler evaluation seen with pathological conditions of the uterus, ovaries, and adnexa. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

**DMS 240. Abdominal Pathology I****2 Credits (2)**

Includes the pathology and pathophysiology of abdominal structures of the prevertebral vessels, liver, biliary system, pancreas, spleen and gastrointestinal system; scanning techniques, ultrasound appearance, clinical presentation and Doppler evaluation seen with pathological conditions. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

**DMS 245. Abdominal Pathology II****2 Credits (2)**

Includes the pathology and pathophysiology of abdominal structures of the genitourinary system, spleen, retroperitoneum, adrenal glands, abdominal wall and prostate; scanning techniques, ultrasound appearance, clinical presentation and Doppler evaluation seen with pathological conditions. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

**DMS 248. Pediatric Sonography****2 Credits (2)**

Includes the anatomy of the brain, skull, spine, hips, and normal developmental changes as well as pathology and pathophysiology of specific conditions that affect the premature infant, newborn and pediatric population across a variety of body systems. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

**DMS 250. Sonographic Principles and Instrumentation II****3 Credits (3)**

Includes properties of sound and its use in diagnostic imaging, artifacts, system operation, Doppler, basic hemodynamics, image optimization, bio effects, quality assurance, and new technologies in ultrasound imaging. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

**DMS 260. High Risk Obstetric Sonography****3 Credits (3)**

Includes congenital malformations of the developing fetus, high risk pregnancies, multiple gestation, maternal conditions and invasive procedures. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

**DMS 270. Clinical Practicum III****3 Credits (32P)**

Continued development of technical and professional aspects of diagnostic ultrasound in a hospital or clinical setting at an intermediate level. Ongoing reinforcement and broadening of knowledge base related to hospital procedures and policies. Continued observation, assistance and performance of patient care and sonographic duties under limited supervision. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

**Learning Outcomes**

1. Consistently demonstrate professional skills and etiquette in the clinical setting.
2. Perform basic and advanced sonographic procedures with minimal assistance from preceptors.
3. Perform complex sonographic procedures with guidance from preceptors.
4. Analyze clinical experiences to broaden patient care skills.

**DMS 280. Clinical Practicum IV****5 Credits (20P)**

Application of technical and professional aspects of diagnostic ultrasound in a hospital or clinical setting at a proficient level. Ongoing reinforcement and broadening of knowledge base related to hospital procedures and policies. Continued observation, assistance and performance of patient care and sonographic duties under limited supervision. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

**DMS 290. Small Parts & Superficial Structures****2 Credits (2)**

Includes anatomy, pathology and pathophysiology, protocol development, scanning techniques, recognition of anatomical structures and the normal and pathological ultrasound appearance of the breast, thyroid, neck, scrotum, non-cardiac chest and musculoskeletal ultrasound. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

**DMS 290 L. Small Parts & Superficial Structures Lab****1 Credit (3P)**

Includes scanning of various small part exams and phantoms, including breast, thyroid, scrotal, non-cardiac chest, and musculoskeletal ultrasound exams. Includes targeted scanning exercises to enhance sonographic skills.

**Learning Outcomes**

1. Demonstrate proficiency in scanning breast and testicular phantoms.
2. Recognize and document sonographic anatomy of the thyroid and neck structures.
3. Demonstrate understanding of limited musculoskeletal sonographic examinations.
4. Complete targeted scan exercises in a variety of body systems.

**DMS 291. Registry Preparation: OB/GYN****1 Credit (1)**

Registry preparation mock examinations over materials covered in Obstetric and Gynecological ultrasound. Students must pass this course with a 74% or better OR pass national certification in OB/GYN Sonography. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

**DMS 292. Registry Preparation: Abdomen****1 Credit (1)**

Registry preparation mock examinations over materials covered in abdominal ultrasound including small parts and superficial structures. Students must pass this course with a 74% or better OR pass ARDMS national certification exam in Abdominal Sonography. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

**DMS 293. Registry Preparation: Vascular****1 Credit (1)**

Registry preparation mock examinations over materials covered in vascular ultrasound. Students must pass this course with a 74% or better OR pass national certification in Vascular Technology. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

**Learning Outcomes**

1. Identify and describe vascular anatomy.
2. Recognize vascular pathology based on sonographic images.
3. Describe hemodynamic changes associated with vascular pathology.
4. Demonstrate understanding of patient care, exam protocols, and department procedures.

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