

Diagnostic Medical Sonography (DMSC & DMSG)

Diagnostic Medical Sonography - Cardiovascular (DMSC) or General Imaging (DMSG)

The diagnostic medical sonographer is a highly-skilled professional who uses specialized equipment to create diagnostic images.

The Diagnostic Medical Sonography program at Cincinnati State prepares students to become entry-level diagnostic medical sonographers in two specialty areas:

- Cardiac and vascular sonography (DMSC)
- Abdominal, obstetric, and gynecological sonography (DMSG)

Program graduates earn an Associate of Applied Science degree that includes general education and technical sonography courses. The program also includes supervised clinical experience on site at various health care facilities in the Greater Cincinnati area. Clinical experiences are unpaid.

Courses in this program are scheduled primarily between 8:00 a.m. and 5:00 p.m., Monday through Friday.

Students must have a minimum grade point average (GPA) of 2.75 to graduate. Graduates are eligible to take the American Registry of Diagnostic Medical Sonographers national certification examination.

The program is accredited by The Commission on Accreditation of Allied Health Education Programs upon the recommendation of the Joint Review Committee on Education in Diagnostic Medical Sonography (JRC-DMS), 9355 113th St. N, #7709, Seminole, FL 33775. Website: <http://caahep.org>. Phone (727) 210-2350. FAX (727) 210-2354.

For more information, please contact the Health and Public Safety Division at (513) 569-1670.

To apply for this program at Cincinnati State, visit the Admissions (<http://www.cincinnati-state.edu/academics/admission/>) section of the College website.

Diagnostic Medical Sonography—Cardiovascular (DMSC)

Students seeking admission to the Diagnostic Medical Sonography - Cardiovascular program must complete specific requirements.

After completing Semester 2 of Year 1, students should apply for selective enrollment into the DMS program. Year 2 courses begin in Fall Semester. Students should meet with their academic advisor to discuss eligibility and deadlines for selective enrollment.

First Year		Lec	Lab	Credits
Semester 1				
FYE 1XX		1	0	1
First Year Experience Elective (B)				
MCH 104	Comprehensive Medical Terminology (B)	3	0	3
BIO 151	Anatomy and Physiology 1 (G)	3	2	4
ENG 101	English Composition 1 (G)	3	0	3
MAT 151	College Algebra (G)	3	2	4
Semester 2				
BIO 152	Anatomy and Physiology 2 (B)	3	2	4
DMS 100	Survey of Sonography (B)	2	2	3
PHY 110	Health Physics (B)	2	3	3
MCH 1XX		1	3	2
Multicompetency Healthcare Elective (B)				
After completing Year 1, Semester 1 and 2 courses, apply for Selective Enrollment into the DMSC program.				
Second Year				
Semester 1				
DMSC 110	Advanced Electrocardiography (B)	1	2	2
DMS 111	Sonographic Principles and Instrumentation 1 (T)	3	0	3
DMSC 120	Cardiovascular Sonography (T)	3	0	3
DMSC 121	Cardiovascular Sonography Scan Lab 1 (T)	0	6	2
ENG 1XX	English Composition Elective (G)	3	0	3
Semester 2				
DMS 112	Sonographic Principles and Instrumentation 2 (T)	2	0	2
DMSC 122	Cardiovascular Sonography Scan Lab 2 (T)	0	6	2
DMSC 131	Vascular Sonography 1 (T)	3	0	3
DMSC 141	Echocardiography 1 (T)	3	0	3
PSY 110	Introduction to Psychology (G)	3	0	3
Semester 3				
DMSC 223	Cardiovascular Sonography Scan Lab 3 (T)	0	3	1
DMSC 281	Cardiovascular Internship 1 (T)	0	24	1
Third Year				
Semester 1				
DMSC 224	Cardiovascular Sonography Scan Lab 4 (T)	0	4	2
DMSC 232	Vascular Sonography 2 (T)	2	0	2
DMSC 242	Echocardiography 2 (T)	2	0	2

DMSC 282	Cardiovascular Internship 2 (T)	0	24	1
Semester 2				
DMSC 250	Cardiovascular Imaging Seminar (T)	1	2	2
DMSC 283	Cardiovascular Internship 3 (T)	0	32	2
Total Credits:		47	117	66

Electives

First Year Experience Elective

FYE 100	Essentials for College Success	1
FYE 105	Skills for Academic and Personal Success	2
FYE 110	Intensive College Success Strategies	3

English Composition Elective

ENG 102	English Composition 2: Contemporary Issues	3
ENG 103	English Composition 2: Writing about Literature	3
ENG 104	English Composition 2: Technical Communication	3

Multicompetency Healthcare Elective

MCH 138	Patient Care Skills	2
MCH 130	Nurse Aide Training	4

Some courses are offered in alternative versions identified with a letter after the course number-- for example, ENG 101 and ENG 101A.

- This curriculum displays only course numbers without the added letter.
- The alternative version, when available, meets the requirements of the course version without the added letter.

The letters G, B, and T (displayed after course titles or elective descriptions) identify types of courses required by the Ohio Department of Higher Education as part of an associate's degree curriculum.

G = General Education course in this curriculum

B = Basic Skills course in this curriculum

T = Technical course in this curriculum

Diagnostic Medical Sonography— General Imaging (DMSG)

Students seeking admission to the Diagnostic Medical Diagnostic Medical Sonography - General Imaging program must complete specific requirements. After completing Semester 2 of Year 1, students should apply for selective enrollment into the DMS program. Year 2 courses begin in Fall Semester. Students should meet with their academic advisor to discuss eligibility and deadlines for selective enrollment.

First Year

Semester 1

		Lec	Lab	Credits
FYE 1XX	First Year Experience Elective (B)	1	0	1
MCH 104	Comprehensive Medical Terminology (B)	3	0	3
BIO 151	Anatomy and Physiology 1 (G)	3	2	4
ENG 101	English Composition 1 (G)	3	0	3
MAT 151	College Algebra (G)	3	2	4

Semester 2

DMS 100	Survey of Sonography (B)	2	2	3
PHY 110	Health Physics (G)	2	3	3
BIO 152	Anatomy and Physiology 2 (B)	3	2	4
MCH 1XX	Multicompetency Healthcare Elective (B)	1	3	2

After completing Year 1, Semester 1 and 2 courses, apply for Selective Enrollment into the DMSG program.

Second Year

Semester 1

DMSG 110	Sterile Techniques (B)	1	2	2
DMS 111	Sonographic Principles and Instrumentation 1 (T)	3	0	3
DMSG 120	General Imaging Sonography (T)	3	0	3
DMSG 121	General Imaging Sonography Scan Lab 1 (T)	0	6	2
ENG 1XX	English Composition Elective (G)	3	0	3

Semester 2

DMS 112	Sonographic Principles and Instrumentation 2 (T)	2	0	2
DMSG 122	General Imaging Sonography Scan Lab 2 (T)	0	6	2
DMSG 131	Abdominal Sonography 1 (T)	3	0	3
DMSG 141	Obstetrics and Gynecology Sonography 1 (T)	3	0	3
PSY 110	Introduction to Psychology (G)	3	0	3

Semester 3

DMSG 223	General Imaging Sonography Scan Lab 3 (T)	0	3	1
DMSG 281	General Imaging Internship 1 (T)	0	24	1

Third Year

Semester 1

DMSG 224	General Imaging Sonography Scan Lab 4 (T)	0	4	2
DMSG 232	Abdominal Sonography 2 (T)	2	0	2

DMSG 242	Obstetrics and Gynecology Sonography 2 (T)	2	0	2
DMSG 282	General Imaging Internship 2 (T)	0	24	1
Semester 2				
DMSG 250	General Imaging Seminar (T)	2	0	2
DMSG 283	General Imaging Internship 3 (T)	0	32	2
Total		48	115	66
Credits:				

Electives

FYE Experience Elective

FYE 100	Essentials for College Success	1
FYE 105	Skills for Academic and Personal Success	2
FYE 110	Intensive College Success Strategies	3

English Composition Elective

ENG 102	English Composition 2: Contemporary Issues	3
ENG 103	English Composition 2: Writing about Literature	3
ENG 104	English Composition 2: Technical Communication	3

Multicompetency Healthcare Elective

MCH 138	Patient Care Skills	2
MCH 130	Nurse Aide Training	4

Some courses are offered in alternative versions identified with a letter after the course number-- for example, ENG 101 and ENG 101A.

- This curriculum displays only course numbers without the added letter.
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The letters G, B, and T (displayed after course titles or elective descriptions) identify types of courses required by the Ohio Department of Higher Education as part of an associate's degree curriculum.

G = General Education course in this curriculum

B = Basic Skills course in this curriculum

T = Technical course in this curriculum

Diagnostic Medical Sonography - Cardiovascular (DMSC)

- Obtain, review, and integrate pertinent patient history and supporting clinical data to facilitate optimum diagnostic results.
- Perform appropriate procedures and record anatomic, pathologic, and/or physiologic data for interpretation by a physician.
- Record, analyze, and process diagnostic data and other pertinent observations made during the procedure for presentation to the interpreting physician.
- Demonstrate effective communication skills with patients and all members of the healthcare team.
- Act in a professional manner within recognized ethical and legal standards.

- Demonstrate knowledge of sonographic biological effects and proper application of sonographic instrumentation relative to imaging and image quality.
- Demonstrate the ability to perform adult cardiac sonographic examinations according to protocol guidelines established by national professional organizations and the protocols of the employing institutions utilizing real-time equipment and Doppler display modes.
- Demonstrate the ability to perform vascular sonographic examinations according to protocol guidelines established by national professional organizations and the protocols of the employing institutions utilizing real-time equipment, Doppler display modes, and physiologic testing.

Diagnostic Medical Sonography - General (DMSG)

- Obtain, review, and integrate pertinent patient history and supporting clinical data to facilitate optimum diagnostic results.
- Perform appropriate procedures and record anatomic, pathologic, and/or physiologic data for interpretation by a physician.
- Record, analyze, and process diagnostic data and other pertinent observations made during the procedure for presentation to the interpreting physician.
- Demonstrate effective communication skills with patients and all members of the healthcare team.
- Act in a professional manner within recognized ethical and legal standards.
- Demonstrate knowledge of sonographic biological effects and proper application of sonographic instrumentation relative to imaging and image quality.
- Demonstrate the ability to perform sonographic examinations of the abdomen, superficial structures, and non-cardiac chest according to protocol guidelines established by national professional organizations and the protocols of the employing institutions utilizing real-time equipment and Doppler display modes.
- Demonstrate the ability to perform sonographic examinations of the gravid and nongravid pelvis according to protocol guidelines established by national professional organizations and the protocols of the employing institutions utilizing real-time equipment with both transabdominal and endocavitary transducers, and Doppler display modes.

DMSC Courses

DMSC 110 Advanced Electrocardiography 2 Credits. 1 Lecture Hour. 2 Lab Hours.

A course on electrocardiography principles and techniques. Topics include: patient preparation, 12-lead ECG setup and interpretation, common dysrhythmia recognition, myocardial infarct patterns, and chamber enlargement.

Prerequisites: Admitted to the DMS program through the selective enrollment process, and instructor consent
Instructor Consent Required

DMSC 120 Cardiovascular Sonography

3 Credits. 3 Lecture Hours. 0 Lab Hour.

A course on cardiovascular scanning techniques and the operation of ultrasound systems. Topics include: professional standards and behaviors, basic ultrasound machine controls, scan planes, demonstration of appropriate imaging, and use of descriptive terminology associated with cardiac and vascular studies.

Prerequisites: Instructor consent

Corequisites: DMSC 121: Cardiovascular Sonography Scan Lab 1

Instructor Consent Required

DMSC 121 Cardiovascular Sonography Scan Lab 1

2 Credits. 0 Lecture Hour. 6 Lab Hours.

A course on developing skills in the scanning techniques and protocols related to cardiac and vascular structures and physiology.

Prerequisites: Instructor consent

Corequisites: DMSC 120: Cardiovascular Sonography DMS 111 : Sonographic Principles and Instrumentation 1 DMSC 110 : Advanced Electrocardiography

Instructor Consent Required

DMSC 122 Cardiovascular Sonography Scan Lab 2

2 Credits. 0 Lecture Hour. 6 Lab Hours.

A continuation of DMSC 121, emphasizing increased experience using scanning techniques and protocols related to cardiac and vascular structures and physiology.

Prerequisites: DMSC 121 (minimum grade C)

Corequisites: DMSC 131 : Vascular Sonography 1 DMSC 141 : Echocardiography 1 DMS 112 : Sonographic Principles and Instrumentation 2

DMSC 131 Vascular Sonography 1

3 Credits. 3 Lecture Hours. 0 Lab Hour.

A course on theory and principles of vascular sonography. Topics include: vascular anatomy and physiology; etiology of pathologies; imaging techniques and protocols; and detecting and differentiating abnormalities, pathologies, and other deviations from normal development.

Prerequisites: DMSC 120 and DMSC 121 (minimum grade C for both)

Corequisites: DMSC 141 : Echocardiography 1 DMSC 122 : Cardiovascular Sonography Scan Lab 2 DMS 112 : Sonographic Principles and Instrumentation 2

DMSC 141 Echocardiography 1

3 Credits. 3 Lecture Hours. 0 Lab Hour.

A course on theory and principles of adult cardiac sonography. Topics include: cardiac anatomy and physiology; etiology of pathologies; imaging techniques and protocols; and detecting and differentiating abnormalities, pathologies, and other deviations from normal development.

Prerequisites: DMSC 120 and DMSC 121 (minimum grade C for both)

Corequisites: DMSC 131 : Vascular Sonography 1 DMSC 122 : Cardiovascular Sonography Scan Lab 2 DMS 112 : Sonographic Principles and Instrumentation 2

DMSC 223 Cardiovascular Sonography Scan Lab 3

1 Credit. 0 Lecture Hour. 3 Lab Hours.

A continuation of DMSC 122, emphasizing increased skills and experience using scanning techniques and protocols related to cardiac and vascular structures and physiology.

Prerequisites: DMSC 122 (minimum grade C)

DMSC 224 Cardiovascular Sonography Scan Lab 4

2 Credits. 0 Lecture Hour. 4 Lab Hours.

Students demonstrate required sonography competencies and proficiencies prior to completion of the program.

Prerequisites: DMSC 223

DMSC 232 Vascular Sonography 2

2 Credits. 2 Lecture Hours. 0 Lab Hour.

A continuation of DMSC 131, with additional information on theory and principles of vascular sonography.

Prerequisites: DMSC 131 (minimum grade C)

DMSC 242 Echocardiography 2

2 Credits. 2 Lecture Hours. 0 Lab Hour.

A continuation of DMSC 141, with additional information on theory and principles of adult cardiac sonography.

Prerequisites: DMSC 141 (minimum grade C)

DMSC 245 Cardiovascular Specialties

2 Credits. 1 Lecture Hour. 2 Lab Hours.

A course on advanced procedures and emerging technologies in the field of cardiovascular ultrasound.

Prerequisites: DMSC 232, DMSC 242 (minimum grade C for both)

DMSC 250 Cardiovascular Imaging Seminar

2 Credits. 1 Lecture Hour. 2 Lab Hours.

A course on integration of concepts and clinical applications in cardiovascular sonography. Topics include: current trends and advanced cardiovascular procedures and technologies, transition to an entry-level cardiovascular sonography position, mock registry examinations, and preparation for national credentialing examinations. Grades issued are Satisfactory or Unsatisfactory.

Prerequisites: DMSC 224, DMSC 232, and DMSC 242 (minimum grade C for all)

DMSC 281 Cardiovascular Internship 1

1 Credit. 0 Lecture Hour. 24 Lab Hours.

Students participate in supervised practice of cardiac and vascular diagnostic ultrasound procedures in hospitals, clinics, and private physician offices. Students are evaluated on professional behavior and performance, and clinical competency.

Prerequisites: DMSC 122 and DMSC 131 and DMSC 141 (minimum grade C for all)

Corequisites: DMSC 223 : Cardiovascular Sonography Scan Lab 3

DMSC 282 Cardiovascular Internship 2

1 Credit. 0 Lecture Hour. 24 Lab Hours.

A continuation of DMSC 281. Students participate in supervised practice of cardiac and vascular diagnostic ultrasound procedures in hospitals, clinics, and private physician offices.

Prerequisites: DMSC 281

Corequisites: DMSC 232 : Vascular Sonography 2 DMSC 242 : Echocardiography 2 DMSC 224 : Cardiovascular Sonography Scan Lab 4

DMSC 283 Cardiovascular Internship 3

2 Credits. 0 Lecture Hour. 32 Lab Hours.

A continuation of DMSC 282. Students participate in supervised practice of cardiac and vascular diagnostic ultrasound procedures in hospitals, clinics, and private physician offices.

Prerequisites: DMSC 282

Corequisites: DMSC 250 : Cardiovascular Imaging Seminar

DMSG Courses

DMSG 110 Sterile Techniques

2 Credits. 1 Lecture Hour. 2 Lab Hours.

A course on fundamental surgical skills and surgical room set-up procedures. Topics include: rules and regulations for sterile environments, sterile trays and other equipment, technician behavior in sterile environments, infection risk control, surgical asepsis, anesthesia, and specimen care.

Prerequisites: Admitted to the DMS program through the selective enrollment process, and instructor consent

Instructor Consent Required

DMSG 120 General Imaging Sonography

3 Credits. 3 Lecture Hours. 0 Lab Hour.

A course on general imaging scanning techniques and the operation of ultrasound systems. Topics include: professional standards and behaviors, basic ultrasound machine controls, scan planes, demonstration of appropriate imaging techniques, and use of descriptive terminology associated with abdomen, obstetrics, and gynecological studies.

Prerequisites: Instructor consent

Corequisites: DMSG 121: General Imaging Sonography Scan Lab 1
Instructor Consent Required

DMSG 121 General Imaging Sonography Scan Lab 1

2 Credits. 0 Lecture Hour. 6 Lab Hours.

A course on developing skills in the scanning techniques and protocols related to abdominal, superficial parts, obstetrics, and gynecological structures and physiology.

Prerequisites: Instructor consent

Corequisites: DMSG 120: General Imaging Sonography DMS 111 : Sonographic Principles and Instrumentation 1 DMSG 110 : Sterile Techniques

Instructor Consent Required

DMSG 122 General Imaging Sonography Scan Lab 2

2 Credits. 0 Lecture Hour. 6 Lab Hours.

A continuation of DMSG 121, emphasizing increased experience using scanning techniques and protocols related to abdominal, superficial parts, obstetrics, and gynecological structures and physiology.

Prerequisites: DMSG 121 (minimum grade C)

Corequisites: DMSG 131 : Abdominal Sonography 1 DMSG 141 : Obstetrics and Gynecology Sonography 1 DMS 112 : Sonographic Principles and Instrumentation 2

DMSG 131 Abdominal Sonography 1

3 Credits. 3 Lecture Hours. 0 Lab Hour.

A course on theory and principles of abdominal and superficial parts sonography. Topics include: normal and abnormal etiology, diagnostic techniques and correlation with clinical tests, scanning techniques and protocols, and detection of abnormalities and pathologies.

Prerequisites: DMSG 120 and DMSG 121 (minimum grade C for both)

Corequisites: DMSG 141 : Obstetrics and Gynecology Sonography 1 DMSG 122 : General Imaging Sonography Scan Lab 2 DMS 112 : Sonographic Principles and Instrumentation 2

DMSG 141 Obstetrics and Gynecology Sonography 1

3 Credits. 3 Lecture Hours. 0 Lab Hour.

A course on theory and principles of obstetrical and gynecological sonography. Topics include: normal and abnormal etiology; diagnostic techniques related to gynecology and fetal development; scanning techniques and protocols; and detecting abnormalities, pathologies, and other deviations from normal development.

Prerequisites: DMSG 120 and DMSG 121 (minimum grade C for both)

Corequisites: DMSG 131 : Abdominal Sonography 1 DMSG 122 : General Imaging Sonography Scan Lab 2 DMS 112 : Sonographic Principles and Instrumentation 2

DMSG 223 General Imaging Sonography Scan Lab 3

1 Credit. 0 Lecture Hour. 3 Lab Hours.

A continuation of DMSG 122, emphasizing increased experience using scanning techniques and protocols related to abdominal, superficial parts, obstetrics, and gynecological structures and physiology.

Prerequisites: DMSG 122 (minimum grade C)

DMSG 224 General Imaging Sonography Scan Lab 4

2 Credits. 0 Lecture Hour. 4 Lab Hours.

Students demonstrate required sonography competencies and proficiencies prior to completion of the program.

Prerequisites: DMSG 223

DMSG 232 Abdominal Sonography 2

2 Credits. 2 Lecture Hours. 0 Lab Hour.

A continuation of DMSG 131, with additional information on theory and principles of abdominal and superficial parts sonography.

Prerequisites: DMSG 131 (minimum grade C)

DMSG 242 Obstetrics and Gynecology Sonography 2

2 Credits. 2 Lecture Hours. 0 Lab Hour.

A continuation of DMSG 141, with additional information on theory and principles of obstetrical and gynecological sonography.

Prerequisites: DMSG 141 (minimum grade C)

DMSG 245 General Imaging Specialties

2 Credits. 1 Lecture Hour. 2 Lab Hours.

A course on advanced procedures and emerging technologies in the field of general imaging ultrasound.

Prerequisites: DMSG 232, DMSG 242 (minimum grade C for both)

DMSG 250 General Imaging Seminar

2 Credits. 1 Lecture Hour. 2 Lab Hours.

A course on integration of concepts and clinical applications in general sonography. Topics include: current trends and advanced sonographic procedures and technologies, transition to an entry-level general imaging sonography position, mock registry examinations, and preparation for national credentialing examinations. Grades issued are Satisfactory or Unsatisfactory.

Prerequisites: DMSG 224, DMSG 232 and DMSG 242 (Minimum grade C for all)

DMSG 281 General Imaging Internship 1

1 Credit. 0 Lecture Hour. 24 Lab Hours.

Students participate in supervised practice of general imaging and obstetrical diagnostic ultrasound procedures in hospitals, clinics, and private physician offices. Students are evaluated on professional behavior and performance, and clinical competency.

Prerequisites: DMSG 122 and DMSG 131 and DMSG 141 (minimum grade C for all)

Corequisites: DMSG 223 : General Imaging Sonography Scan Lab 3

DMSG 282 General Imaging Internship 2

1 Credit. 0 Lecture Hour. 24 Lab Hours.

A continuation of DMSG 281. Students participate in supervised practice of general imaging and obstetrical diagnostic ultrasound procedures in hospitals, clinics, and private physician offices.

Prerequisites: DMSG 281

Corequisites: DMSG 232 : Abdominal Sonography 2 DMSG 242 : Obstetrics and Gynecology Sonography 2

DMSG 283 General Imaging Internship 3

2 Credits. 0 Lecture Hour. 32 Lab Hours.

A continuation of DMSG 282. Students participate in supervised practice of general imaging and obstetrical diagnostic ultrasound procedures in hospitals, clinics, and private physician offices.

Prerequisites: DMSG 282

Corequisites: DMSG 250 : General Imaging Seminar

DMS Courses

DMS 100 Survey of Sonography

3 Credits. 2 Lecture Hours. 2 Lab Hours.

A course on foundational concepts in the field of medical sonography.

Topics include: the role of the sonographer in the healthcare setting, ultrasound system controls and functions, image production and display, and basic ultrasound physics.

Prerequisites: BIO 151 and MCH 104 (minimum grade C for both)

Corequisites: BIO 152

DMS 111 Sonographic Principles and Instrumentation 1

3 Credits. 3 Lecture Hours. 0 Lab Hour.

A course on principles of physics in relation to ultrasound function and instrumentation. Topics include: characteristics of sound energy; using ultrasound in imaging; and waveforms, propagation, velocity, wavelength, acoustic impedance, reflection, and other types of interaction with tissue.

Prerequisites: DMS 100

Instructor Consent Required

DMS 112 Sonographic Principles and Instrumentation 2

2 Credits. 2 Lecture Hours. 0 Lab Hour.

A continuation of DMS 111. Topics include: integrating knowledge of physics with instrumentation theory and applications; understanding advanced signal processing, complex instrumentation, recording devices, biological effects, hemodynamics, Doppler principles, and quality control methods; and producing high quality diagnostic images.

Prerequisites: DMS 111

DMS 255 Ethics and Medical Law in Sonography

1 Credit. 1 Lecture Hour. 0 Lab Hour.

A course on ethical and legal issues related to the sonography profession. Topics include: laboratory accreditation, professional education, and research standards and practices.

Prerequisites: DMSC 232 and DMSC 242, or DMSG 232 and DMSG 242 (minimum grade C for all)