

# DIAGNOSTIC MEDICAL SONOGRAPHY, ASSOCIATE OF APPLIED SCIENCE

Curriculum Code #2402

Effective May 2019

Division of Health and Wellness Sciences (<http://catalog.lorainccc.edu/academic-programs/allied-health-nursing-health-physical-education-recreation>)

Diagnostic medical sonography is an imaging process used to assist physicians in gathering sonographic data necessary to reach diagnostic decisions. Sonographers are highly-skilled professionals qualified by technological education to provide patient services using diagnostic ultrasound under the supervision of a physician. American Heart Association Healthcare Provider certification is required upon entrance into the program. Lorain County Community College has articulation agreements with colleges and universities including programs offered by Lorain County Community College's University Partnership.

**Note:** Preadmission courses must be completed before a program application can be submitted.

Preadmission Courses		Hours
ALHN 107	CAREER EXPLORATIONS IN DIAGNOSTIC MEDICAL SONOGRAPHY <sup>1,2</sup>	1
ALHN 112	INTRO TO MEDICAL TERMINOLOGY <sup>1</sup>	1
ALHN 113	INTRODUCTION TO PATIENT CARE <sup>1,3</sup>	1
BIOG 121	ANATOMY AND PHYSIOLOGY I <sup>1</sup>	4
ENGL 161	COLLEGE COMPOSITION I	3
MTHM 168	STATISTICS <sup>1</sup>	3
PHYC 115	PHYSICS FOR THE ALLIED HEALTH SCIENCES <sup>1,2</sup>	4
SDEV 101	COLLEGE 101 <sup>4</sup>	1
Hours		18

## First Year

### Fall Semester

ALHN 121	GENERAL PATHOLOGY <sup>1,2</sup>	2
BIOG 122	ANATOMY AND PHYSIOLOGY II <sup>1,2</sup>	4
BIOG 123	CROSS-SECTIONAL ANATOMY <sup>1,2</sup>	2
PEFT 151	LIFETIME FITNESS	1
SONO 111	ORIENTATION TO DIAGNOSTIC MEDICAL SONOGRAPHY <sup>1,2,5</sup>	1
PSYH 151 or SOCY 151G	INTRODUCTION TO PSYCHOLOGY or INTRODUCTION TO SOCIOLOGY	3
Hours		13

### Spring Semester

SONO 131	INTRODUCTION TO DIAGNOSTIC MEDICAL SONOGRAPHY <sup>1,2</sup>	7
SONO 221	ULTRASOUND PHYSICS AND INSTRUMENTATION I <sup>1,2</sup>	2
Hours		9

## Summer Semester

SONO 122	IMAGING MODALITIES <sup>1,2,6</sup>	1
SONO 215	DIAGNOSTIC MEDICAL SONOGRAPHY I <sup>1,2,7,8</sup>	7
Hours		8

## Second Year

### Fall Semester

SONO 222	ULTRASOUND PHYSICS AND INSTRUMENT II <sup>1,2</sup>	2
SONO 223	DIAGNOSTIC MEDICAL SONOGRAPHY II <sup>1,2,7,8</sup>	8
Hours		10

### Spring Semester

SONO 224	ADVANCED DIAGNOSTIC MEDICAL SONOGRAPHY STUDIES <sup>1,2,7,8</sup>	6
SONO 229	PROFESSIONAL ISSUES IN DIAGNOSTIC MEDICAL SONOGRAPHY <sup>1,2</sup>	1
Hours		7
Total Hours		65

- <sup>1</sup> Indicates that a grade of C (2.0) or better must be earned in order to continue in the sequence.
- <sup>2</sup> Indicates that this course has a prerequisite.
- <sup>3</sup> Indicates that credit is waived for ALHN 113 if one has STNA certification/license.
- <sup>4</sup> A student must register for the orientation course when enrolling for more than six credit hours per semester or any course that would result in an accumulation of 13 or more credit hours.
- <sup>5</sup> Indicates one must have admission into the diagnostic medical sonography program.
- <sup>6</sup> Indicates course is not required if one has American Registry Radiology Technology ARRT certification.
- <sup>7</sup> This course offers an opportunity for experiential learning.
- <sup>8</sup> Students will purchase Trajecsys clinical software access in LCCC bookstore. Software access rights are good for one year.

All courses listed prior to the first year fall semester must be completed prior to admission to the sonography program.

A minimum GPA of 3.0 is required in college-level coursework for admission into the program.

Program Contact(s):

### Craig Peneff

440-366-7189  
cpeneff@lorainccc.edu

For information about admissions, enrollment, transfer, graduation and other general questions, please contact your advising team (<https://www.lorainccc.edu/admissions-and-enrollment/advising-and-counseling>).

**More program information can be found on our website.**  
(<https://www.lorainccc.edu/health/sonography>)

## Admission Requirements for Diagnostic Medical Sonography

1. Official high school or GED and college/program transcripts (if applicable) on file in the LCCC Records office.
2. Program application form on file by January 5 of each year to be considered for program admission the following year.
3. Satisfactory completion with a grade of C or better of the pre-admission courses on the diagnostic medical sonography curriculum guide which includes the following college or post-secondary education coursework:
  - ALHN 107 CAREER EXPLORATIONS IN DIAGNOSTIC MEDICAL SONOGRAPHY
  - ALHN 112 INTRO TO MEDICAL TERMINOLOGY
  - ALHN 113 INTRODUCTION TO PATIENT CARE
  - BIOG 121 ANATOMY AND PHYSIOLOGY I
  - ENGL 161 COLLEGE COMPOSITION I
  - MTHM 168 STATISTICS
  - PHYC 115 PHYSICS FOR THE ALLIED HEALTH SCIENCES
4. Minimum GPA of 3.0 for college-level courses including transfer/transient work (excludes developmental education and more than two physical education courses).
5. Completion of HESI A2 test with a minimum composite score of 75 (vocabulary and general knowledge, reading comprehension, grammar, basic math, biology, anatomy and physiology, physics, critical thinking and the learning style inventory). Can be taken after completion of BIOG 121, MTHM 168 and PHYC 115. May remediate and wait one month to repeat and must be completed within six months of initial test date. Scores will be valid for a three year period; therefore a three year wait is required prior to the third attempt. A composite score below 75 on the retest will disqualify the program application.
6. Anatomy & Physiology course grades (BIOG 121 & BIOG 122) and number of attempts to pass with a grade of C or better are used in the acceptance process.

**Allied health professionals:** Applicants from a patient care related allied health/nursing background may transfer credit or receive credit through prior learning assessment for the following diagnostic medical sonography preadmission courses:

- ALHN 112 INTRO TO MEDICAL TERMINOLOGY
- ALHN 113 INTRODUCTION TO PATIENT CARE

This will be handled on a case-by-case basis with the program director.

Radiologic technologists who are graduates of an appropriately accredited college-based degree radiologic technology program would be eligible for receiving credit for all of the diagnostic medical sonography preadmission and support courses plus SONO 122 IMAGING MODALITIES. Graduates of a hospital-based certificate radiologic technology program may receive credit for:

- ALHN 112 INTRO TO MEDICAL TERMINOLOGY
- ALHN 113 INTRODUCTION TO PATIENT CARE
- PHYC 115 PHYSICS FOR THE ALLIED HEALTH SCIENCES
- SONO 122 IMAGING MODALITIES

Learn more about Allied Health program requirements (<http://catalog.lorainccc.edu/academic-information/allied-health-nursing-admissions>)

### Program Learning Outcomes

1. Demonstrate competence and proficiency in performing abdominal, small parts, obstetric, gynecologic and basic vascular (carotid/venous leg) ultrasound examinations.
2. Apply principles of ultrasound physics to patient examinations to obtain diagnostic information.
3. Correlate clinical history, patient symptoms, and laboratory test results with sonographic findings.
4. Identify common pathologic diseases and differential diagnoses through correlation of sonographic appearances, clinical symptoms and laboratory test results.
5. Provide basic patient care, comfort and nursing skills.
6. Practice and apply the ALARA principle in performance of diagnostic ultrasound examinations.
7. Be prepared to take and pass the ARDMS registry examinations in ultrasound physics & instrumentation, abdomen and obstetrics & gynecology.
8. Practice lifelong learning by staying current in sonography through continuing education, achieving certifications in additional specialties and achieving advanced degrees.
9. Be a productive team-player.
10. Be an efficient, cost-effective member of the health care team.
11. Recognize the importance of the multidisciplinary health care team.

### JRCDSM - EXIT COMPETENCIES

Prior to graduation, all Diagnostic Medical Sonography students must satisfactorily have met and completed all course, classroom and clinical objectives. In addition, we endorse and have incorporated into the appropriate courses, the terminal competencies mandated by the Joint Review Committee of Education in Diagnostic Medical Sonography (JRCDSM). The terminal competencies of the JRCDSM are listed below.

The graduate shall be able to:

1. Utilize oral and written communication.
  - a. Maintain clinical record
  - b. Interact with the interpreting physician or other designated physician with oral or written summary of findings as permitted by employer policy and procedure
  - c. Recognize significant clinical information and historical facts from the patient and the medical records which may impact on the diagnostic examination.
  - d. Comprehend and employ appropriate medical terminology, abbreviations, symbols, terms, and phrases.
  - e. Educate other health care providers and the public in the appropriate applications of ultrasound/non-invasive diagnostic vascular evaluation, including the following:
    - Medical terminology
    - Sonographic/other non-invasive diagnostic vascular terminology

- Pertinent clinical signs, symptoms and laboratory tests
  - Pertinent legal principles
2. Provide basic patient care and comfort.
    - a. Maintain infection control and utilize universal precautions.
    - b. Anticipate and be able to respond to the needs of the patient.
    - c. Identify life-threatening situations and implement emergency care as permitted by agency procedure, including the following:
      - Infection control and universal precautions procedures
      - Pertinent patient care procedures
      - Principles of psychological support
      - Emergency conditions and procedures
      - First aid and resuscitation techniques
  3. Demonstrate knowledge and understating of human gross and sectional anatomy.
    - a. Evaluate anatomic structures in the region of interest.
    - b. Recognize the sonographic appearance of normal tissue structures, including the following:
      - Gross sectional anatomy
      - Embryology
      - Normal sonographic patterns
  4. Demonstrate knowledge and understanding of physiology, pathology and pathophysiology.
    - a. Obtain and evaluate pertinent patient history and physical findings.
    - b. Extend standard diagnostic testing protocol as required by patient history or initial findings.
    - c. Review data from current and previous examinations to produce a written/oral summary of technical findings, including relevant interval changes for the interpreting physician's reference.
    - d. Recognize examination findings that require immediate clinical response and notify the interpreting physician of such findings, including the following:
      - Patient interview and examination techniques
      - Chart and referral evaluation
      - Diagnostic testing protocols related to specific disease conditions
      - Physiology including blood flow dynamics
    - Pertinent pathology and paraphysiology
    - Pertinent legal issues
  5. Demonstrate knowledge and understanding of acoustical physics, Doppler ultrasound principles and ultrasound instrumentation.
    - a. Select the appropriate technique(s) for examination(s) being performed.
    - b. Adjust instrument controls to optimize image quality.
    - c. Perform linear, area, circumference and other related measurements from sonographic images or data.
    - d. Recognize and compensate for acoustical artifacts.
    - e. Utilize hard-copy devices to obtain pertinent documentation of examination findings.
    - f. Minimize patient exposure to acoustical energy which includes the following:
      - Acoustical physics
      - Sound production and propagation
      - Interaction of sound and matter
      - Instrument options and transducer selection
      - Principles of ultrasound instruments and modes of operation
      - Operator control options
      - Physics of Doppler
      - Principles of Doppler techniques
      - Methods of Doppler flow analysis
      - Techniques for recording static and dynamic images
      - Acoustical artifacts
  6. Demonstrate knowledge and understanding of the interaction between ultrasound and tissue and the probability of biological effects in clinical examinations, including the following:
    - Biologic effects
    - Pertinent in-vitro and in-vivo studies
  7. Employ professional judgment and discretion.
    - a. Protect the patient's right to privacy.
    - b. Maintain confidentiality.
    - c. Perform with the scope of practice.
    - d. Adhere to the professional codes of conduct/ethics through the following:
      - Medical ethics
      - Pertinent legal principles
    - Professional interaction skills
    - Professional scopes of practice
  8. Understand the fundamental elements for the implementing a quality assurance and improvement program, and the policies, protocols,

and procedures for the general function of the ultrasound laboratory, including the following:

- Administrative procedures
- Quality control procedures
- Elements of quality assurance program
- Records maintenance
- Personnel and fiscal management
- Trends in health care systems

9. Recognize the importance of continuing education, through the following:

- Professional journals
- Conferences
- Lectures
- In-house educational offerings
- Professional organizations and resources
- Recent developments in sonography
- Research statistics and design