



INSTRUCTIONAL PACKAGE

DMS 110

Sonographic Instrumentation I

202510

Fall 2025/Spring 2026/Summer 2026

INSTRUCTIONAL PACKAGE

Part I: Course Information

Effective Term: Fall 2025

COURSE PREFIX: DMS 110

COURSE TITLE: Sonographic Instrumentation I

CONTACT HOURS: 3

CREDIT HOURS: 3

RATIONALE FOR THE COURSE:

This course introduces students to basic ultrasound physics principles and sonographic instrumentation in preparation for portions of the Ultrasound Physics board examination. Topics include sound characteristics, sound wave mechanics, transducers, and sonographic equipment.

COURSE DESCRIPTION:

This course is a study of sonographic propagation principles, transducer parameters, interactive properties with human tissues, possible biologic effects, basic types of equipment, instrumentation, and quality control.

PREREQUISITES/CO-REQUISITES:

PHY 118

REQUIRED MATERIALS:

Please visit the [BOOKSTORE](#) online site for most current textbook information.

Enter the semester, course prefix, number and section when prompted and you will be linked to the correct textbook.

ADDITIONAL REQUIREMENTS:

TECHNICAL REQUIREMENTS:

Access to Desire2Learn (D2L), HGTC's learning management system (LMS) used for course materials.

Access to myHGTC portal for student self-services.

College email access – this is the college's primary official form of communication.

STUDENT IDENTIFICATION VERIFICATION

Students enrolled in online courses will be required to complete identity verification. Please refer to your Instructor Information Sheet for information regarding this requirement.

CLASSROOM ETIQUETTE:

As a matter of courtesy to other students and your professor, please turn off cell phones and other communication/entertainment devices before class begins. If you are monitoring an emergency, please notify your professor prior to class and switch cell phone ringers to vibrate.

NETIQUETTE: is the term commonly used to refer to conventions adopted by Internet users on the web, mailing lists, public forums, and in live chat focused on online communications etiquette. For more information regarding Netiquette expectations for distance learning courses, please visit [Online Netiquette](#).

Part II: Student Learning Outcomes

COURSE LEARNING OUTCOMES and ASSESSMENTS*:

COURSE LEARNING OUTCOMES and ASSESSMENTS*:

Module #1

Materials Covered: The Basics of Sound and Sound Waves
Chapters 1-3 - Edelman
Chapter 1 (pgs. 1-15) - Penny

***Assessment(s):** Complete Review assignment
Unit Test

Learning Outcomes:

- Describe all acoustic physics parameters of sound waves.
- Examine and characterize acoustic physics principles of sound propagation.
- Examine and characterize acoustic physics principles of sound wave interaction.
- Define waves and their acoustic variables.
- Identify parameters of magnitude to sound waves.

Module #2

Materials Covered: Pulsed Waves
Chapter 4 -Edelman
Chapter 1 (pgs. 15-20) - Penny

***Assessment(s):** Complete Review Assignment
Unit Test

Learning Outcomes:

- Describe acoustic physics parameters of pulsed sound waves.
- Define pulsed waves and their acoustic variables.
- Explain the terms related to wave theory and apply mathematical principles.
- Differentiate between physics parameters of pulsed sound vs. sound.

Module #3

Materials Covered: Intensities and Interaction of Sound Media
Chapters 5-6 – Edelman
Chapter 1 (pgs. 21-30) Penny

***Assessment(s):** Complete in class assignment
Unit Test

Learning Outcomes:

- Describe acoustic physics characteristics of sound intensity.
 - Define waves and their acoustic variables.
 - Examine and characterize acoustic physics principles of sound wave interaction.

Module #4

Materials Covered: Range Equation, Sound Beams, Transducers and Two-Dimensional Imaging
 Chapters 7-12 – Edelman
 Chapter 2 - Penny

***Assessment(s):** Complete in class assignment
 Unit Test

Learning Outcomes:

- Interpret transducer components and operations.
- Perform functions on the ultrasound machine: image formats, the pulse echo principle, and the Doppler Effect.
- Apply the correct transducers relevant to each exam and why it is relevant.
- Explain the terms related to wave theory and apply mathematical principles of the Range Equation.
 - Describe the shape and behavior of the sound beam used in clinical imaging.
 - Explain the differences in mechanical vs. array transducers.
 - Describe the various number of elements, shape, steering and focusing of each transducer.
 - Discuss how steering and focusing occurs in array transducers.
 - Define slice thickness and how it relates to resolution.
 - Explain side lobes and grating lobes and their effect on image quality.

Module #5

Materials Covered: Artifacts
 Chapters 20

***Assessment(s):** Artifact Presentation
 Unit Test

Learning Outcomes:

1. Apply academic knowledge of imaging artifacts seen in ultrasound.
2. Apply the rules of logic related to ultrasound image artifacts.
3. Distinguish various artifacts and how to confirm presence and how Sonographers eliminate.

****Students – please refer to the Instructor’s Course Information sheet for specific information on assessments and due dates.***

Part III: Grading and Assessment

EVALUATION OF REQUIRED COURSE MEASURES/ARTIFACTS*:

Students' performance will be assessed, and the weight associated with the various measures/artifacts are listed below.

- Tests/Quizzes
- Presentation
- Assignments
- Final Exam

EVALUATION*

Tests	60 %
Assignments	20 %
Final Exam	20%
	100%

****Students, for the specific number and type of evaluations, please refer to the Instructor's Course Information Sheet.***

GRADING SYSTEM:

Exams, quizzes, and assignments comprise your grade. Grades are assigned according to raw score divided by total possible points in each category.

Grading scale is as follows:

92-100- A
 83-91- B
 74-82- C
 65-73- D
 64 and below- F

This is a major area course and requires a grade of "C" or better

Grades earned in courses impact academic progression and financial aid status. Before withdrawing from a course, be sure to talk with your instructor and financial aid counselor about the implications of that course of action. Ds, Fs, Ws, WFs and Is also negatively impact academic progression and financial aid status.

The Add/Drop Period is the first 5 days of the semester for **full term** classes. Add/Drop periods are shorter for accelerated format courses. Please refer to the [academic calendar](#) for deadlines for add/drop. You must attend at least one meeting of all your classes during that period. If you do not, you will be dropped from the course(s) and your Financial Aid will be reduced accordingly.

Part IV: Attendance

Horry-Georgetown Technical College maintains a general attendance policy requiring students to be present for a minimum of 80 percent (80%) of their classes in order to receive credit for any course. Due to the varied nature of courses taught at the college, some faculty may require up to 90 percent (90%) attendance. Pursuant to 34 Code of Federal Regulations 228.22 - Return to Title IV Funds, once a student has missed over 20% of the course or has missed two (2) consecutive weeks, the faculty is obligated to withdraw the student, and a student may not be permitted to reenroll. **Instructors define absentee limits for their class at the beginning of each term; please refer to the Instructor Course Information Sheet.**

Students at HGTC are responsible for all course work and assignments. Attendance is a must. The **DMS Program requires 90% attendance**. A 10% absence will result in a student academic consultation, and formulation of a plan of action. Any further absences may be grounds for dismissal per program policy. Breach of attendance policies may be addressed on an individual case-by-case basis at the discretion of the Program Director. If a student is absent on the day of a test or quiz, the student must notify the instructor within 24 hours of the date and time of the scheduled makeup exam. The student will be responsible for contacting the testing center on the Grand Strand campus to make up the test. A student who calls in absent a second time on a test day must present a valid written, dated excuse for the absence to make up the test/quiz. Failure to do so will result in a grade of zero for that test/quiz.

For online and hybrid courses, check your Instructor's Course Information Sheet for any required on-site meeting times. Please note, instructors may require tests to be taken at approved testing sites, and if you use a testing center other than those provided by HGTC, the center may charge a fee for its services.

Part V: Student Resources



THE STUDENT SUCCESS AND TUTORING CENTER (SSTC):

The SSTC offers to all students the following **free** resources:

1. Academic tutors for most subject areas, Writing Center support, and Academic Coaching for college success skills.
2. Online tutoring and academic support resources.
3. Professional and interpersonal communication coaching in the EPIC Labs.

Visit the [Student Success & Tutoring Center](#) website for more information. To schedule tutoring or coaching, contact the SSTC at ssc@hgtc.edu or self-schedule in the Penji iOS/Android app or at www.penjiapp.com. Email ssc@hgtc.edu or call SSTC Conway, 349-7872; SSTC Grand Strand, 477-2113; and SSTC Georgetown, 520-1455, or go to the SSTC [Online Resource Center](#) to access on-demand resources.



STUDENT INFORMATION CENTER: TECH Central

TECH Central offers to all students the following free resources:

1. Getting around HGTC: General information and guidance for enrollment, financial aid, registration, and payment plan support!
2. In-person and remote assistance are available for Desire2Learn, Student Portal, Degree Works, and Office 365.
3. Chat with our staff on TECH Talk, our live chat service. TECH Talk can be accessed on the student portal and on TECH Central's website, or by texting questions to (843) 375-8552. Visit the Tech Central website for more information. Live Chat and Center locations are posted on the website. Or please call (843) 349 – TECH (8324), Option # 1.



HGTC LIBRARY:

Each campus location has a library where HGTC students, faculty, and staff may check out materials with their HGTC ID. All three HGTC campus libraries have librarians and staff who can aid with research, computers to support academic research and related school-work, and individual/group study rooms. Printing is available as well at each location. Visit the [Library](#) website for more information or call (843) 349-5268.

STUDENT TESTING:

Testing in an **online/hybrid** course and in **make-up exam** situations may be accomplished in a variety of ways:

- Test administered within D2L.
- Test administered in writing on paper.
- Test administered through Publisher Platforms (which may have a fee associated with the usage)

Furthermore, tests may have time limits and/or require a proctor.

Testing candidates must make their appointments 24 hours in advance.

Students must bring a physical ID in order to take a test.

Proctoring can be accomplished either face-to-face at an approved site or online through our online proctoring service. To find out more about proctoring services, please visit the [Online Testing](#) section of the HGTC's Testing Center webpage.

The **Instructor Information Sheet** will have more details on test requirements for your course.

DISABILITY SERVICES:

HGTC is committed to providing an accessible environment for students with disabilities. Students seeking accommodations are encouraged to visit HGTC's [Accessibility and Disability Service webpage](#) for detailed information.

It is the student's responsibility to self-identify as needing accommodations and to provide appropriate documentation. Once documentation is submitted, the student will participate in an interactive process with Accessibility and Disability Services staff to determine reasonable accommodations. Students may begin the accommodations process at any time; however, accommodations are **not retroactive** and will only be applied from the point at which they are approved. Students must contact the office **each semester** to renew their accommodations.

For assistance, please contact the Accessibility and Disability Services team at disabilityservices@hgtc.edu or 843-796-8818 (call or text).

COUNSELING SERVICES:

HGTC Counseling Services strives to optimize student success through managing personal and academic concerns that may interfere with achieving educational goals. Staff are available to every student for assistance and guidance on personal matters, academic concerns and other areas of concern. HGTC offers free in-person and telehealth counseling services to students. For more information about counseling services, please reach out to counseling@hgtc.edu or visit the website the [Counseling Services webpage](#).

STATEMENT OF EQUAL OPPORTUNITY/NON-DISCRIMINATION STATEMENT:

Our sincere commitment to both effective business management and equitable treatment of our employees requires that we present this Policy Statement as an embodiment of that commitment to the fullest.

Discrimination is conduct that includes unjust or prejudicial treatment based upon an individual's sex, race/color, religion, national origin, age, disability, service in the uniformed services (as

defined in state and federal law), veteran status, political ideas, marital or family status, pregnancy, childbirth, or related medical conditions, including, but not limited to, lactation, genetic information, genetic identity, gender expression, or sexual orientation that excludes an individual from participation in, denies the individual the benefits of, treats the individual differently, or otherwise adversely affects a term or condition of a person's working or learning environment. This includes failing to provide reasonable accommodation, consistent with state and federal law, to persons with disabilities.

INQUIRIES REGARDING THE NON-DISCRIMINATION/TITLE IX POLICIES:

Student and prospective student inquiries concerning Section 504, Title II, Title VII, and Title IX and their application to the College or any student decision may be directed to the Vice President for Student Affairs.

Dr. Melissa Batten, VP Student Affairs

Title IX, Section 504, and Title II Coordinator

Building 1100, Room 107A, Conway Campus

PO Box 261966, Conway, SC 29528-6066

843-349-5228

Melissa.Batten@hgtc.edu

Employee and applicant inquiries concerning Section 504, Title II, and Title IX and their application to the College may be directed to the Vice President for Human Resources.

Jacquelyne Snyder, VP Human Resources

Affirmative Action/Equal Opportunity Officer and Title IX Coordinator

Building 200, Room 205B, Conway Campus

PO Box 261966, Conway, SC 29528-6066

843-349-5212

Jacquelyne.Snyder@hgtc.edu

TITLE IX REQUIREMENTS:

Title IX of the Education Amendments of 1972 protects students, employees, applicants for admission and employment, and other persons from all forms of sex discrimination.

HGTC prohibits the offenses of domestic violence, dating violence, sexual assault, and stalking and will provide students, faculty, and staff with necessary information regarding prevention, policies, procedures, and resources.

Any student, or other member of the college community, who believes that they have been a victim of sexual harassment, domestic violence, dating violence, sexual assault, or stalking may file a report with the college's Title IX Coordinator or campus law enforcement*.

*Faculty and Staff are required to report these incidents to the Title IX Coordinator when involving students. The only HGTC employees exempt from mandatory reporting are licensed mental health professionals (only as part of their job description such as counseling services).

Student and prospective student inquiries concerning Title IX and its application to the College or any student decision may be directed to the Vice President for Student Affairs.

Dr. Melissa Batten, VP Student Affairs

Title IX, Section 504, and Title II Coordinator
Building 1100, Room 107A, Conway Campus
PO Box 261966, Conway, SC 29528-6066
843-349-5228
Melissa.Batten@hgtc.edu

Employee and applicant inquiries concerning Title IX and its application to the College may be directed to the Vice President for Human Resources.

Jacquelyne Snyder, VP Human Resources

Affirmative Action/Equal Opportunity Officer and Title IX Coordinator
Building 200, Room 205B, Conway Campus
PO Box 261966, Conway, SC 29528-6066
843-349-5212
Jacquelyne.Snyder@hgtc.edu

PREGNANCY ACCOMMODATIONS

Under Title IX, colleges must not exclude a pregnant student from participating in any part of an educational program. Horry-Georgetown Technical College is committed to ensuring that pregnant students receive reasonable accommodations to ensure access to our educational programs.

Students should advise the Title IX Coordinator of a potential need for accommodations as soon as they know they are pregnant. It is extremely important that communication between student, instructors, and the Title IX Coordinator begin as soon as possible. Each situation is unique and will be addressed individually.

Title IX accommodations DO NOT apply to Financial Aid. Financial Aid regulations do not give the College any discretion in terms of Financial Aid eligibility.

Certain educational programs may have strict certification requirements or requirements mandated by outside regulatory agencies. Therefore, in some programs, the application of Title IX accommodations may be limited.

To request pregnancy accommodations, please complete the *Pregnancy Intake Form* that can

be found [here](#).