



## INSTRUCTIONAL PACKAGE

DMS 101

Ultrasound Physics and Instrumentation I

201720

Spring 2018

# INSTRUCTIONAL PACKAGE

## Part I: Course Information

Effective Term: 201720

COURSE PREFIX: DMS 101

COURSE TITLE: Ultrasound Physics and Instrumentation I

CONTACT HOURS: 2

CREDIT HOURS: 2.0

### **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 fundamental principles of acoustic physics including sound waves, sound wave propagation, sound wave interactions, image production, ultrasound transducers, transducer arrays, transducer operation, imaging modes, and biological effects.

### **PREREQUISITES/CO-REQUISITES:**

Credit level DMS 164, Minimum Grade of C

### **REQUIRED MATERIALS:**

Please visit the Bookstore online site for most current textbook information. Use the direct link below to find textbooks.

[BOOKSTORE](#).

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 student portal for course materials.  
WaveNet and D2L email access.

### **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 for 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\*:

#### Module #1 – Weeks 1-4

**Materials Covered:** The Basics of Sound and Sound Waves  
Chapters 1-3

**\*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 – Weeks 5-6

**Materials Covered:** Pulsed Waves  
Chapter 4

**\*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 – Weeks 6-8**

**Materials Covered:** Intensities and Interaction of Sound Media  
Chapters 5-6

**\*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 – Weeks 10-12**

**Materials Covered:** Range Equation, Sound Beams and  
Transducers  
Chapters 7-11

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

**Learning Outcomes:**

- Interpret transducer operations by performing the following 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.

**Module #5 – Weeks 12-14**

**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	<u>20 %</u>
	100%

**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 ([ACADEMIC CALENDAR](#)). You must attend at least one meeting of all of 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 eighty percent (80%) of his or her classes in order to be eligible to receive credit for any course. However, due to the varied nature of courses taught at the College, a more rigid attendance policy may be required by individual instructors. At a minimum, a student may be withdrawn from a course(s) after he or she has been absent in excess of ten percent (10%) of the total contact hours for a course. **Instructors define absentee limits for their class at the beginning of each term; please refer to the Instructor Course Information Sheet.**

**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, if you use a testing center other than those provided by HGTC, the center may charge a fee for its services.

#### **Online/Hybrid Attendance:**

Students enrolled in distance learning courses (hybrid and online) are required to maintain contact with the instructor on a regular basis to be counted as "in attendance" for the course. All distance learning students must participate weekly in an Attendance Discussion Board in order to demonstrate course participation. Students showing no activity in the course for two weeks will be withdrawn due to lack of attendance.

#### **Part V: Student Resources**

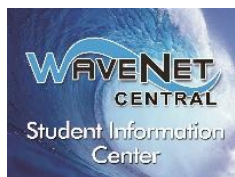


## The Student Success and Tutoring Center (SSTC)

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

1. **Academic coaches** for most subject areas, **Writing Center Support**, and **college success skills**.
2. **On-line student success and academic support resources**.

Visit the SSTC website: [Student Success & Tutoring Center](#) and visit the student services tab in your WaveNet account to schedule appointments using TutorTrac. For more information, call: SSTC Conway, 349-7872; SSTC Grand Strand, 477-2113; and SSTC Georgetown, 520-1455. Room locations and Live Chat is available on the SSTC website.



## Student Information Center: WaveNet Central (WNC)

WNC offers to all students the following **free** resources:

1. **Getting around HGTC:** General information and guidance for enrollment!
2. Use the [Online Resource Center \(ORC\)](#) for COMPASS support, technology education, and online tools.
3. **Drop-in technology support or scheduled training** in the Center or in class.
4. **In-person workshops, online tutorials and more services** are available.

Visit the WNC website: [Wavenet Central](#). Live Chat and Center locations are posted on the website. Or please call one of the following locations: WNC Conway, 349-5182; WNC Grand Strand, 477-2076; and WNC Georgetown, 520-1473.

## Student Testing:

Testing in an **online/hybrid** course may be accomplished in a variety of ways:

- Test administered within D2L
- Test administered in writing on paper
- Test administered through Publisher Platforms

Further more tests may have time limits and/or require a proctor.

Proctoring can be accomplished either face-to-face at an approved site or online through RPNOW, 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. Inquiries may be directed to Jocelyn Williams, Director of Student Development on the Conway Campus Jaime Davis, Counselor/Advisor on the Georgetown Campus or Kristin Griffin, Counselor on the Grand Strand Campus. These individuals will review documentation of the student’s disability and, in a confidential setting with the student, develop an educational accommodation plan.

Note: It is the student’s responsibility to self-identify as needing accommodations and to provide acceptable documentation. After a student has self-identified and submitted documentation of a disability, accommodations may be determined, accepted, and provided.

**Statement of Equal Opportunity/Non-Discrimination Statement**

Horry Georgetown Technical College prohibits discrimination and harassment, including sexual harassment and abuse, on the basis of race, color, gender, national or ethnic origin, age, religion, disability, marital status, veteran status, sexual orientation, gender identity, or pregnancy in educational programs and/or activities.

**Title IX Requirements**

Horry Georgetown Technical College prohibits the offenses of domestic violence, dating violence, sexual assault, and stalking. Any student who believe he or she has experienced or witnessed discrimination including sexual harassment, domestic violence, dating violence, sexual assault or stalking is encouraged to report such incidents to one of the College’s Title IX Coordinators.

\*Faculty and Staff are required to report incidents to the Title IX Coordinators 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).

<b>Inquiries regarding the non-discrimination policies:</b>	
Student and prospective student inquiries concerning Section 504, Title II, and Title IX and their application to the College or any student decision may be directed to the Associate Vice President for Student Affairs.	Employee and applicant inquiries concerning Section 504, Title II, and Title IX and their application to the College may be directed to the Associate Vice President for Human Resources.
<b>Dr. Melissa Batten, AVP Student Affairs</b> <i>Title IX Coordinator</i>  Building 1100, Room 107A, Conway Campus PO Box 261966, Conway, SC 29528-6066 843-349-5228 <a href="mailto:Melissa.Batten@hgtc.edu">Melissa.Batten@hgtc.edu</a>	<b>Jacquelyne Snyder, AVP Human Resources</b> <i>Section 504, Title II, and Title IX Coordinator</i>  Building 200, Room 212A, Conway Campus PO Box 261966, Conway, SC 29528-6066 843-349-5212 <a href="mailto:Jacquelyne.Snyder@hgtc.edu">Jacquelyne.Snyder@hgtc.edu</a>