

**Midland College  
Syllabus  
Spring Semester  
DMSO 1342  
Intermediate Ultrasound Physics (2-4-0)**

**Course Description:**

This course is a continuation of the study of acoustical physics. Topics include interaction of ultrasound with tissues, the mechanics of ultrasound production and display, various transducer designs and construction, quality assurance, bio-effects and image artifacts. Methods of Doppler flow analysis may be introduced. Prerequisites: DMSO 1302.

**Text, References and Supplies:**

Edelman, Sidney K., Understanding Ultrasound Physics, Fourth Edition.  
Kremkau, Frederick W., Sonography Principles and Instruments, Ninth Edition.

**Student Learning Outcomes:**

Upon successful completion of the course the student will understand and demonstrate competency in the following:

1. Understand signal processing and pulsing characteristics of pulse echo instruments.
2. Discuss the various components of pre and post processing, tissue harmonic imaging and the use of contrast agents.
3. Describe and discuss the various image storage, display, recording and archiving techniques used in ultrasound.
4. Recognize the various artifacts found in ultrasound imaging.
5. Understand the concepts of a comprehensive Quality Assurance Program in ultrasound.
6. Describe the parameters measured when utilizing an AIUM test phantom.
7. Develop a comprehensive Quality Assurance/Quality Control Program for an ultrasound department.
8. Understand the safety principles involving high frequency sound waves and apply this to the proper use of diagnostic ultrasound.
9. Understand the bio-effects produced by high frequency sound waves and apply this to the proper use of diagnostic ultrasound.

**Student Contributions, Responsibilities and Class Policies:**

Attendance is essential to the student's success and is outlined in the Midland College Catalog and Student Handbook, as well as, the Diagnostic Medical Sonography Student Handbook. The student is expected to participate in class discussions. Reading assignments are also important and should be completed prior to lectures for each unit. Material from reading which is not covered in class may appear on tests. Missed exams/quizzes will be accepted with loss of one (1) letter grade per day it is late. Late assignments will be accepted with loss of 25% per scheduled class day that it is late.

Alternate exams and/or exam format may be substituted. Failure to comply with all components of this course will result in a failing grade.

### **Evaluation of Students:**

The final grade will be a criterion-referenced standard percentage, not curved, composed as follows: 20% from weekly quizzes, 10% from attendance 10% from semester physics project, 35% from unit exams, and 25% from the final examination.

1. There will be three unit exams consisting of approximately 50-70 questions. Each exam will be constructed from a random sample of the material presented prior to the exam date. Multiple formats may be used including short answer, short essay, diagram labeling and multiple choice.
2. The final exam will consist of 100 multiple choice questions and will be similar to the format utilized by the registry. The exam will be constructed of a random sample of all the material presented during the semester.
3. In the event that an exam is missed, it is the student's responsibility to arrange for the make-up exam as soon as possible: a loss of one letter grade per day for any missed exam and an additional letter grade for each successive day thereafter will be assessed. The student may also expect an alternate method of testing for the make-up exam. If an exam is not made up, the student will receive a zero for that exam, and the grades will be averaged accordingly.
4. Class assignments may consist of online tasks including online research, online worksheets and online chats between class members.
5. Weekly unit quizzes will consist of 20 questions over the material covered in the previous week. Multiple quizzing formats will be utilized.

### **Course Schedule:**

Class will meet from 8:00 am to 11:00 am each Tuesday except for scheduled Midland College holidays. Many of the lab assignments may be completed outside of the classroom or at the clinical facility. Dates for the labs that will be completed at the college will be announced in advance. They will be during scheduled class time or at 4:30 pm on a scheduled class day.

### **Americans with Disabilities Act (ADA):**

Any student who, because of a disabling condition, may require some special arrangements in order to meet course requirements should contact Shep Grinnan as soon as possible. Mr. Grinnan's office is located in the Scharbauer Student Center Building. These conditions may include documented physical or educational disabilities. Please be aware that services or accommodations are not automatic. Each student must request them and secure the proper authorizations/documentation.

### **Licensure Eligibility Notification**

Completion of Midland College degrees and/or certificates does not guarantee eligibility to take a certification/registry/licensure examination. The eligibility of each person is determined on an individual basis by the regulatory body of the specific discipline. If you have a conviction of a crime other than a minor traffic violation, physical or mental disability/illness, hospitalization/treatment for chemical dependency within the past five years, current intemperate use of drugs or alcohol or a previous denial of a licensure or action by a licensing authority, you will need to contact the specific regulatory body for an individual ruling. Some programs require a criminal background check and urine and drug screen.

## **Non-discrimination Statement**

Midland College does not discriminate on the basis of race, color, national origin, sex, disability or age in its programs and activities. The following individuals have been designated to handle inquiries regarding the non-discrimination policies: **Tana Baker, Title IX Coordinator/Compliance Officer, 3600 N. Garfield, SSC 242, Midland, TX 79705, (432) 685-4781, [tbaker@midland.edu](mailto:tbaker@midland.edu)**; **Natasha Morgan, Director Human Resources/Payroll, 3600 N. Garfield, PAD 104, Midland, TX 79705, (432) 685-4534, [nmorgan@midland.edu](mailto:nmorgan@midland.edu)**. For further information on notice of non-discrimination, visit <http://wdcrobcolp01.ed.gov/CFAPPS/OCR/contactus.cfm> or call **1 (800) 421-3481**.

## **Instructor Information:**

Instructor: Brandi Havner, BAAS, RDMS  
Office: Marie Hall Sim-Life Center/Davidson Family HSB, RM 108  
Office phone: 432-685-5572  
Email: [bhavner@midland.edu](mailto:bhavner@midland.edu)  
Office hours: As posted. Students are encouraged to contact their instructor; making an appointment will help facilitate an instructor's availability at a specific time.

## **Division Information:** Health Sciences

Division Dean: Carmen Edwards, DNP, MSN, RN, 209 DFHS Building, 432-686-4822  
Program Chair: Brandi Havner, RDMS, BAAS, 108 DFHS Building, 432-685-5572  
Division Secretary: Karen Harris, 208 DFHS Building, 432-685-4600