

Midland College
Syllabus
Spring Semester
DMSO 1302
Basic Ultrasound Physics (3-0-0)

Course Description:

This course covers basic acoustical physics and acoustical waves in human tissue with an emphasis on ultrasound transmission in soft tissues, attenuation of sound energy, parameters affecting sound transmission and resolution of sound beams.

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 have knowledge and understanding and the importance of:

1. Proper utilization of safety measures in the workplace.
2. Basic math principles used in sonography.
3. The nature of ultrasound and the properties of vibration.
4. The properties of sound waves (amplitude, pressure, power, intensity, frequency, wavelength and propagation speed).
5. The interaction of sound in tissue including propagation, reflection, refraction and attenuation of sound.
6. The construction of transducers and the piezoelectric effect.
7. Focusing, imaging resolution and the characteristics of ultrasound beams.
8. The design and function of various transducer arrays and types of scanners.
9. Signal processing and pulsing characteristics of pulse echo instruments
10. Resolution and field of view for image display devices.

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 and late assignments will be accepted with the loss of one (1) letter grade 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:

Final grade will be a criterion-referenced standard percentage, not curved, composed as follows: 20% from weekly quizzes, 10% from attendance and class assignments, 45% from unit exams and 25% from the final examination.

1. There will be three unit exams consisting of 50-70 questions. Each exam will be constructed from a random sample of the material presented prior to the exam date. Multiple testing formats may be utilized
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 consist of a random sample of 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 within one week. 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 will consist of tasks including but not limited to online research, worksheets and group projects.
5. Weekly quizzes will consist of 10-30 questions over the material covered in the previous week.
6. Multiple quizzing formats will be utilized. In the event that a quiz is missed, it is the student's responsibility to arrange for a make-up quiz. If a quiz is not made up, the student will receive a zero for that quiz and the grades will be averaged accordingly.

Course Schedule:

Class will meet for three hours every Tuesday from 8:30 am to 11:30 am except for scheduled Midland College holidays. See attached class schedule for topics to be covered each lecture, quiz and exam schedule.

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; Natasha Morgan, Director Human Resources/Payroll, 3600 N. Garfield, PAD 104, Midland, TX 79705, (432) 685-4534, 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
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