

Midland College
MASTER SYLLABUS

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.

STUDENT LEARNING OUTCOMES

Upon successful completion of the course, the student will describe the interaction of sound and soft tissues; explain sound production and propagation; and summarize the basic principles and techniques of ultrasound.

Additionally, the student will demonstrate knowledge and understanding of:

1. Basic math principles used in sonography
2. The nature of ultrasound and the properties of vibration
3. The properties of sound waves (amplitude, pressure, power, intensity, frequency, wavelength and propagation speed)
4. The interaction of sound in tissue, including propagation, reflection, refraction and attenuation of sound
5. The construction of transducers and the piezoelectric effect
6. Focusing, imaging resolution and the characteristics of ultrasound beams
7. The design and function of various transducer arrays and types of scanners
8. Signal processing and pulsing characteristics of pulse echo instruments
9. 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, and the Sonography Program Handbook. The subject matter of the Sonography Program's curricula concerns the health and safety of the patients cared for by the Sonography students and graduates. Thus, it is critical that students are present for all class sessions in their entirety.

It is the student's responsibility to obtain notes and material covered in class during their absence.

- The student is expected to participate in class discussions.
- Reading assignments should be completed prior to lectures.
- Material from reading which is not covered in class may appear on tests.

Late assignments will not be accepted and will result in a grade of zero (0).

Missed quizzes and exams will be accepted, with the loss of one letter grade per scheduled class day that it is late.

If a quiz or exam is missed, it is the student's responsibility to arrange for the make-up quiz/exam prior to the next class date. The student may also expect an alternative method of testing for the make-up exam.

All portions of this course **MUST** be completed. Failure to complete each component 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:

- **Exams** – 40%

Each exam will be made from a random sample of the material presented before the exam date. Multiple testing formats may be utilized.

- **Quizzes – 20%**
Weekly quizzes will be given over content including exam protocols, material covered throughout unit, and normal and abnormal sonographic images. Multiple quizzing formats will be utilized.
- **Assignments – 5%**
During this course, the student will complete assignments including, but not limited to:
 - Registry review questions
 - Online comprehension quizzes
 - Online worksheets
- **Final Exam – 30%**
The final exam will consist of multiple-choice questions and will be similar to the format utilized by the registry. The exam will be cumulative, consisting of a random sample of material presented during the semester.
- **Attendance – 5%**

COURSE SCHEDULE

Class will meet for three hours every week on campus except for scheduled Midland College holidays. See attached class schedule for topics to be covered each week.

ADVISING

Any student that scores below a 70 on an exam is responsible for emailing the instructor and scheduling an advising session within 24 hours of the exam review.

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 individual(s) have been designated to handle inquiries regarding the nondiscrimination policies: Nicole Cooper, Title IX Coordinator, 3600 N. Garfield, SSC 129, Midland, Texas 79705, (432) 685-4781, title9@midland.edu, or see [Midland College's Nondiscrimination Policies](#). For further information on notice of non-discrimination, visit the [ED.gov Office of Civil Rights website](#), or call 1 (800) 421-3481.

AMERICANS WITH DISABILITIES ACT (ADA) STATEMENT

Midland College provides services for students with disabilities through Student Services. In order to receive accommodations, students must visit <https://www.midland.edu/services-resources/accommodation-services.php> and complete the [Application for Accommodation Services](#) located under the Apply for Accommodations tab. **Services or accommodations are not automatic, each student must apply each semester and be approved to receive them.** All documentation submitted will be reviewed and a “Notice of Accommodations” letter will be sent to instructors outlining any reasonable accommodations. For more information or questions, please contact Bradley Gyatney, Director of Residence Life and Accommodations, at bgwatney@midland.edu or 432-685-6467.

GRIEVANCES AND COMPLAINTS

Concerns should be expressed as soon as possible to allow for early resolution. Midland College encourages students to discuss their concerns with their instructor first. If you feel uncomfortable discussing your situation with your instructor, students can discuss their concerns with the Department Chair first, then the Dean of Allied Health. If a resolution is still not possible, students may proceed with the [formal complaint process](#).

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 drug screen.

OTHER CONTACT INFO

Dean: Brandi Havner, MS, RDMS, Office: AMS A43, Phone: 432-685-6440

Midland College Police: 432-685-4734