

DMS 52C: PHYSICAL PRINCIPLES OF DIAGNOSTIC MEDICAL SONOGRAPHY III

Foothill College Course Outline of Record

Heading	Value
Effective Term:	Summer 2025
Units:	2
Hours:	2 lecture per week (24 total per quarter)
Prerequisite:	DMS 52B.
Degree & Credit Status:	Degree-Applicable Credit Course
Foothill GE:	Non-GE
Transferable:	CSU
Grade Type:	Letter Grade Only
Repeatability:	Not Repeatable

Student Learning Outcomes

- Identify quality control procedures utilized in diagnostic ultrasound systems.
- Explain the principles of harmonic imaging and volume scanning.

Description

A continuation of DMS 52B with an emphasis on advanced principles of ultrasound image optimization, volume rendering, Doppler imaging, and quality assurance. In addition, this course prepares students for the national registry examination. Intended for students in the Diagnostic Medical Sonography Program; enrollment is limited to students accepted in the program.

Course Objectives

The student will be able to:

- Explain the principles of harmonic imaging and volume scanning
- Discuss optimization of Doppler imaging
- Identify quality control procedures utilized in diagnostic ultrasound systems
- Review fundamental and advanced physical principles of ultrasound to successfully pass the national registry examination by ARDMS

Course Content

- Harmonic acoustic imaging and volume scanning
 - Principles of harmonics and volume scanning
- Optimization of Doppler imaging
 - Spectral analysis
 - Flow reversal versus aliasing
 - Wall filter
 - Color gain
 - Doppler artifacts
- Quality assurance in diagnostic ultrasound systems
 - Bioeffects and patient safety as defined by AIUM standards
 - Utilization of tissue equivalent phantom

- ALARA principle (as low as reasonably achievable)
 - Standardized values for SPTA (spatial peak temporal average), TI (thermal index)
 - Documentation for quality assurance
- Preparation for national registry examination – Sonography Principles and Instrumentation (SPI) exam
 - Review of fundamental physical principles of ultrasound physics
 - Review of advanced physical principles of ultrasound physics

Lab Content

Not applicable.

Special Facilities and/or Equipment

DVD/TV video system, internet access, computer, overhead projector.

Method(s) of Evaluation

Methods of Evaluation may include but are not limited to the following:

Practice mock board exam
Assessments

Method(s) of Instruction

Methods of Instruction may include but are not limited to the following:

Lecture presentations
Classroom discussions

Representative Text(s) and Other Materials

Edelman, Sidney. Understanding Ultrasound Physics. 2018.

Although this text is older than the suggested "5 years or newer" standard, it remains a seminal text in this area of study.

Types and/or Examples of Required Reading, Writing, and Outside of Class Assignments

Read text assignments as per syllabus - estimated as 20 pages per week.

Discipline(s)

Diagnostic Medical Technology