

醫用超音波原理

(921 U2000)

Instructor: 李百祺 (博理館 425 室, E-mail: paichi@ntu.edu.tw)

Time: 週三 9:10am-12:10pm

Place: 博理館 114 室

Objective: Introduce basic principles of diagnostic ultrasound imaging systems. Clinical applications, design considerations and recent progress in the ultrasound industry will also be discussed.

Textbook: Class notes.

Related materials will be distributed when appropriate.

Prerequisites: Signals and Systems, Probability, or consent of instructor.

Topics:

1. Overview of Diagnostic Ultrasonic Imaging Systems.
2. Acoustic Wave Propagation.
3. Scattering, Attenuation and Speckle.
4. Transducers - Generation and Detection of Ultrasound.
5. Diffraction and Beam Formation Using Arrays.
6. Real-Time Image Formation.
7. Contrast Resolution.
8. Color and Spectral Doppler.
9. Doppler Ambiguity Function.
10. Exposimetry.
11. Emerging Technologies and Trends in Industry.

Grading: 30% Computer Homework

25% Written Exam 1

25% Written Exam 2

20% Term Report

*Class notes available at <http://ultrasound.ee.ntu.edu.tw/course1.htm>.