

# 醫用超音波原理

(921 U2000)

**Instructor:** 李百祺 ( 電機二館 309 室, E-mail: paichi@cc.ee.ntu.edu.tw )

**Time:** 週三 2:10pm-5:00pm

**Place:** 電二 503

**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://land.ee.ntu.edu.tw/COURSE1.HTM>.