

THE UNIVERSITY OF TEXAS AT AUSTIN

EM 394V: Wave Propagation

Spring 2006

SYLLABUS

UNIQUE NUMBERS: 13065

INSTRUCTOR: Rui Huang
WRW 117D, 471-7558, ruihuang@mail.utexas.edu

CLASS TIME: T/Th 9:30 to 11 a.m.

CLASS ROOM: WRW 413

OFFICE HOURS: Open

SYNOPSIS:

Propagation of disturbances in various media (gaseous, liquid, and solid) is familiar to everyone in forms such as transmission of sound and radio waves, spreading of ripples, and transmission of seismic tremors in the earth. These phenomena share many common features of wave propagation, despite of sufficient differences in physics. This course focuses on propagation of mechanical waves in solids. The subjects range from elementary theories for one-dimensional waves in strings to three-dimensional theories for waves and vibrations in plates. Along with theoretical development, experimental results and practical applications are presented for better physical appreciation of wave propagations.

TOPICS:

- Fundamental equations of elastodynamics
- Transverse waves in strings
- Longitudinal, torsional, and flexural waves in rods
- Waves in infinite solids
- Plane waves in semi-infinite solids (reflection and refraction at surfaces and interfaces)
- Waves and vibrations in plates (elastic wave guides)
- Approximate plate theories (classical theories for beams, membranes, and thin plates)

PREREQUISITES: Graduate standing, and EM 388 (Solid Mechanics I) or equivalent.

REFERENCES:

- K.F. Graff, *Wave Motion in Elastic Solids*, Dover Publications, 1975;
- J. Miklowitz, *Elastic Waves and Waveguides*, North-Holland Publishing, 1978.

GRADING: Homework (25%), Midterm Exam (30%), and Final (45%).

EVALUATION:

The Measurement and Evaluation Center forms for the College of Engineering will be used during the last week of class to evaluate the course and the instructor.

SPECIAL NOTES:

The University of Texas at Austin provides upon request appropriate academic adjustments for qualified students with disabilities. For more information, contact the Office of the Dean of Students at 471-6259, 471-4641 TDD or the College of Engineering Director of Students with Disabilities at 471-4321.