

CIVE 615/MEM 678: INFRASTRUCTURE CONDITION EVALUATION VIA NDT

Instructor: Ivan Bartoli, Antonios Kontsos,
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Lectures: Wednesday, 6:00 pm - 8:50 pm

Prerequisites: None

References: *Nondestructive Evaluation: Theory, Techniques, and Applications*, Peter Shull, ed., Marcel Dekker, Inc., New York, 2002.
Ultrasonic testing of materials, J. Krautkramer and H. Krautkramer, Springer-Verlag, 1990.
Handbook of nondestructive evaluation, Charles Hellier, 2001.
Hand-outs may be given by the instructor for certain topics.

Description: This course covers the tools necessary for the inspection and evaluation of materials and structures. Most relevant methods used for Non-Destructive Evaluation (NDE) of structural components will be discussed. Physical principles of continuum mechanics, electrical engineering, acoustics and elastic wave propagation underlying the NDE methods will be covered. Sensor data acquisition and digital signal processing will be addressed.

Homework: Assignments, deadlines and delay policy established by the instructor during the course.

Exams: One midterm (to be scheduled), one group project and one final.
Group project (2-3 people) with one page proposal, 8 pages final report and oral presentation.
Midterm will cover the topics of the first half of the course.

Grading: 30% Homework + 30% Midterm + 35% Final (Project) + 5% Class Participation

Relevant topics:

- Introduction to Infrastructure Condition Evaluation and NDE.
- Ultrasonic testing
- Impact-echo
- Acoustic emission
- Digital Image Correlation
- Liquid penetrant
- Infrared testing
- Eddy Current
- Radiography
- Introduction to signal processing
- Introduction to Structural Health Monitoring with special emphasis on bridges

Course Policies: The instructor will strictly follow the recommendations of Drexel University regarding academic dishonesty: http://www.drexel.edu/provost/policies/academic_dishonesty.asp.

No reference material will be allowed during the midterm and the final examinations. An equation sheet may be provided by the instructor.