

Spring 2014 H1000 Analytical Methods in Civil Engineering

Description: This course provides a comprehensive introduction to analytical methods in civil engineering including differential equations, vector calculus, optimization, statistics, etc. We discuss theory and applications of advanced mathematical models in civil engineering.

Code and Section: 2415, 2TU

Textbook: Advanced Engineering Mathematics by E. Kreyszig, 9th ed., John Wiley and Sons, 2006, ISBN: 0-471-48885-2

References:

- 1) Advanced Engineering Mathematics by K. A. Stroud, 4th Edition, Industrial Press
- 2) www.WolfRamAlpha.com

Time and location: Tue, 06:50-09:20pm HR/11

Instructor: Prof. Hansong Tang

Office hours: Tue and Thur 3:00-5:00 pm

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Grading:	Homework (including attendance):	10%
	Quizzes:	10%
	Middle term:	20%
	Projects:	20%
	Final:	40%

Schedule

Week 1	Example of math problem in civil eng. and ordinary differential equations
Week 2	Ordinary differential equations
Week 3	Laplace transform
Week 4	Fourier analysis and partial differential equations
Week 5	Linear algebra
Week 6	Linear algebra
Week 7	Vectors analysis
Week 8	Middle term
Week 9	Partial differential equations
Week 10	Partial differential equations

Week 11 Numerical analysis

Week 12 Numerical analysis

Week 13 Optimization

Week 14 Review

Note: 1 or 2 weeks may be lost due to school close

Course learning goals:

Students will become familiar with basic mathematics, analytical analysis, and computer algorithms. In particular

- Write mathematical problems in a precise, effective, and understandable way
- Understand the definitions and major theorems underlying the math problems
- Be able to identify math problems arising from civil engineering and know some methods to solve them