

CE 548

Fuzzy Logic with Engineering Applications

Course Outline

Dr. Timothy Ross, PE
Dr. Mahmoud Reda Taha, P. Eng.
Department of Civil Engineering, University of New Mexico



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Instructors	Dr. Timothy Ross, PE (Tapy Hall, Room 216) Tel: 277- 277-3459 e-mail: ross@unm.edu Dr. Mahmoud Reda Taha, P.Eng (Tapy Hall, Room 124) Tel: 277-1258 e-mail: mrtaha@unm.edu
Lectures	Once weekly: <u>Wednesday</u> 1:00-3:15 pm Dane Smith, Room 132
Office Hours	Dr. Ross: Monday, Wednesday 10am-noon and by appointment Dr. Taha: Mon, 1:00-4:00 pm, Wed. 10-noon or by appointment
Course Objectives	Many technical disciplines involve environments where all necessary information is not available or is ambiguous. This course will propose fuzzy sets and fuzzy logic as appropriate mathematical models of this incompleteness and ambiguity. The course will focus on example problems in various engineering, mathematics, and science disciplines with an emphasis on environmental issues and processes impacting the environment. These studies will include nonlinear system simulation, neural networks, genetic algorithms, pattern recognition, classification, reasoning, and decision-making. Case studies will be provided throughout the course illustrating the various models in class.
Textbook	- <i>Ross, T. J. 2004, Fuzzy logic with Engineering Applications. Second Edition. John Wiley & Sons. UK.</i>
Mid Terms	Two mid term exams will be held. The time and location of the mid term exams will be discussed with the students.
Term Project	<ul style="list-style-type: none">- The term project shall present the student comprehension of the fuzzy logic and his/her ability of modelling engineering systems.- The term project shall involve the modeling of a complex system in the students field of interest. Guidance will be given throughout the class on the selection of an appropriate project.- The project will involve the development or use of software for a case-specific application. with the following components:<ul style="list-style-type: none">- Automated generation of MFs and rules from I/O data- Comparison of solution to other conventional methods or means- Written report (and software code if developed)- Short verbal presentation of the basic ideas and methods
Expected performance	Students are expected to get familiar with computer programming, especially the use of MATLAB. Example codes will be provided to the students. Students are expected to participate in class discussions.

Grading

Component	% Final Grade-CE 548
Homework	20
Mid Term 1 Exam	20
Mid Term 2 Exam	20
Final Project	30
Class participation	10

CE 502 Course Syllabus - Tentative Schedule

Lecture #	Date	Topic	Instructor
1	Jan 19	Ch 1/Ch 2	T. J. Ross
2	Jan 26	Ch 2 / Ch 3	T. J. Ross
3	Feb 2	Ch 4	M. M. Reda Taha
4	Feb 9	Ch 5	T. J. Ross
5	Feb 16	Ch 5	T. J. Ross
6	Feb 23	Ch 6	M. M. Reda Taha
7	March 2	Ch 6/Ch 7	M. M. Reda Taha
8	March 9	Ch 7	M. M. Reda Taha
<i>Spring Break</i>			
9	March 23	Ch 8	T. J. Ross
10	March 30	Ch 9	Jonathan Lucero (LANL)
11	April 6	Ch 10	T. J. Ross
12	April 13	Ch 11	M. M. Reda Taha
13	April 20	Ch 11/Ch 13	M. M. Reda Taha/ T. J. Ross
14	April 27	Ch 13	Jerry Parkinson (LANL)
15	May 4	Ch. 15	T. J. Ross

CE 548 Assignments and their due dates

#	Assignments	Due Date
1	Homework # 1	Feb 16
2	Homework # 2	March 23
3	Homework # 3	April 20

CE 548 Mid-terms and Final dates

#	Assignments	Due Date
1	Mid-Term 1	March 7-11
2	Mid-Term 2	April 25-29
3	Final Project Presentation	May 11, 12:30 pm