

SYLLABUS

MATH 362
10:00 - 11:40 T,Th

Fuzzy Sets and Logic

Instructor: Dr. Michael Aristidou

Phone: 425 - 895-4435

Office Hours: 11:40-12:30 T,Th

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Textbook: *Fuzzy Set Theory: Foundations and Applications*, by G.J.Klir, U.H. St. Clair and B. Yuan.
Prentice Hall PTR, 1st Edition (1997)

Other sources:

- (1) *An Introduction to Fuzzy Logic for Practical Applications*, by K. Tanaka.
Springer; 1st Edition (1996)
- (2) *Fuzzy Logic with Engineering Applications*, by T. J. Ross.
John Wiley & Sons, 2nd Edition (2004)
- (3) *Fuzzy Sets and Fuzzy Logic: Theory and Applications*, by G.J.Klir, and B. Yuan
Prentice Hall PTR, 1st Edition (1995)

Course Overview: This course introduces the basic theory of Fuzzy Sets and Fuzzy Logic and explores some of their applications. *Topics include:* Classical Sets and their Operations, Fuzzy Sets and their Operations, Membership Functions, Fuzzy Relations, Fuzzification/Defuzzification, Classical Logic, Multivalued Logic, Fuzzy Logic, Fuzzy Reasoning, Fuzzy Arithmetic, Classical Groups and Fuzzy Groups. *Applications include:* Approximate Reasoning, Fuzzy Control, Fuzzy Behavior and Interaction in Computer Games.

Course Outline: The following topics will be covered:

- Ch.1 – Introduction
- Ch.3 – Classical Set Theory
- Ch.4,5 – Fuzzy Set Theory
- Ch.6 – Classical Relations
- Ch.7 – Fuzzy Relations
- Ch.2 – Classical Logic
- Ch.9 – Fuzzy Logic
- Ch.10 – Applications
- Ch.8 – Fuzzy Arithmetic

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Topics from other sources, and papers, related to groups, fuzzy groups, fuzzy control, and other applications on computer game design.

Grading: 35% - Test 1
35% - Test 2
30% - Project (20% project + 10% 15-min presentation)

(**NO** test scores will be dropped)

Project: The project could be of practical or theoretical nature, but always related to the material and objectives of the course. Concepts from the material taught should be used within the project. Students should form groups of two individuals and cooperate. Equal contribution from both members of the group, in both the project and presentation, is expected. Each group should come up with its own project. The projects could be related to works from other courses, but they should always be relevant to the topics covered in this course.

(For the project, the following sources could be useful:

(1) *AI for Game Developers*, by D.M. Bourg and G. Seemann (O'Reilly 2004)

(2) *Fuzzy Expert Systems and Fuzzy Reasoning*, by W.Siler and J.J. Buckley (Wiley 2005))

Grading Scale: A = 87-100%, B = 77-86%, C = 67-76%, D = 50-66%, F = 0-49%

Test Make-up Policy: Speak to me **BEFORE** the test or leave a telephone or an e-mail message. If you are not able to contact me before the test, contact me within the **NEXT** couple of days. Documentation to verify the reason you missed the test is required. Only one make-up test will be allowed for the semester and that if there are extremely special circumstances.

Class Policy: All cell phones, pagers, laptops, etc. must be turned off during class. No food or drinks are allowed in class. Only pencil is to be used on tests. All tests must be your work. Dishonesty is a violation of the code of student conduct and it will not be tolerated.

Important Dates: 5-10 June: Test 1
1-5 July: Test 2
24-27 July: Project Presentations