SYLLABUS

MATH 362
12:00 - 1:50 M,W,F

Fuzzy Sets and Logic

Instructor: Dr. Michael Aristidou **Phone:** 425 - 895-4435

Office Hours: 10:00-11:00 M,W,F **E-mail:** maristidou@digipen.edu

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

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
+
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. Groups are encouraged to come up with their own projects, but those project should be approved by the instructor. 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: 18-21 May: Test 1
15-18 June: Test 2
22 June: Project Presentations*

* Notice that June 22nd is also the last day of this course, contrary to what the catalogue says. The catalogue's July 27th last day is for a 2-times-per-week MAT 362, and not for a for a 3-times-per-week MAT362 as the current course.