Course Prerequisites: Consent, familiarity with a programming language (preferred MATLAB or C)

Instructor: Dr. Powsiri Klinkhachorn
927 ESB, Tel: 293-6375 X2522, (klink@csee.wvu.edu)

Classroom: ESB 215, 10:00-10:50 MWF

WebPage: www.csee.wvu.edu/classes/cpe521

Office Hours: 11:30 am - 12:30 am, MWF or by appointment (please call or e-mail to make sure that I will be in my office.)

Catalog Description: CpE 521: Applied Fuzzy Logic. 3 hr. PR: Consent. Theory and applications of fuzzy logic; fuzzy fundamentals, fuzzy rules, decision-making systems, control systems, pattern recognition systems, and advanced topics. Algorithms and computer programming for software realization with engineering applications.

Text: Fuzzy Logic: Intelligence, Control, and Information, J. Yen, R. Langari, Prentice Hall, 1999

References:
3) Fuzzy Engineering, Bart Kosko, Prentice Hall, 1997

Course Outline:
1) Introduction
2) Basic Concepts of Fuzzy Logic
3) Fuzzy Sets
4) Fuzzy Relation, Fuzzy Graphs, and Fuzzy Arithmetic
5) Fuzzy If-Then Rules
6) Fuzzy Logic Applications
   • Control Systems
   • Decision Making Systems
   • Pattern Recognition
   • Neuro-Fuzzy
7) Genetic Algorithms and Fuzzy Logic
8) Microcontroller and Fuzzy logic
There will be no examinations. Each student is expected to do quizzes, homework assignments and submit the final project with a written report on the topic as agreed upon by the student and the instructor.

Assignments/Homework/Class Presentation 50%  
Final Project/Demo 35%  
Portfolio 5%  
Attendance/Quizzes 10%

A - 90 - 100  
B - 80 - 89  
C - 70 - 79  
D - 60 - 69  
F - 59 and below

**Homework:** Homework will be assigned almost every week. You are required to do all homework. For each assignment, student must turn in *formal report* that describes the technique (algorithms, software listing), results, and the conclusion in printed form accompanying with the diskette of the software either in PC or Mac format and provide clear instructions on how to use the program. Failure to run the program from the student's instructions and diskette is the responsibility of the student. All homework will be due at the beginning of class. Any homework assignments turned in after the beginning of class will be counted one day late. Each homework set will age 10% per working day late (i.e. Monday through Friday). This means that the maximum grade possible decreases by 10% per day until the homework assignment is worth zero after ten days. **Note:** You are encouraged to consult the instructor if you have any questions on homework. *The homework is expected to be an individual work. If two or more students' homework are similar/identical, the homework score will be divided by the number of party involved.**

**Final Project:** Each student is expected to select and write a Fuzzy Logic application program to demonstrate the high level of understanding in the subject of Fuzzy Logic that much beyond the normal homework assignments. The student will formally present the work to fellow students and the instructor in the last few weeks of the class. Prior to start the final project, normally about a month and half before final, the student must provide a written proposal with specific description and objective of the project to the instructor. The instructor will provide any necessary feedback and may ask the student to modify or rewrite the proposal as agreed upon. Final report must be written in a standard formal report that will be specified by the instructor.

**Portfolio:** It should include all the collection of related materials, articles, homework, software, etc. These documents would allow you in the future to show your work/discovery for another engineer to recreate/study your work if necessary.

**Attendance/Quizzes:** Attendance (5%) and quizzes (5%) are required. It will be very difficult to pass this course without attending class. It will be very difficult to do well in the course without attending class. The student is expected to show up and sign-in at the beginning of the class. Late attendance and absences will be deducted from the grade unless the student has a formal written excuse or prior approval by the instructor.

---

**West Virginia University** is committed to social justice. I concur with that commitment and expects to maintain a positive learning environment based upon open communication, mutual respect, and non-discrimination. Our University does not discriminate on the basis of race, sex, age, disability, veteran status, religion, sexual orientation, color or national origin. Any suggestions as to how to further such a positive and open environment in this class will be appreciated and given serious consideration.

If you are a person with a disability and anticipate needing any type of accommodation in order to participate in this class, please advise me and make appropriate arrangements with Disability Services (293-6700).