Advanced Topics in Artificial Intelligence

Course Description

Learning Objectives
At the end of the course students will be able to:

- Describe Neural Networks Models
  - Implement Feed-forward Neural Networks using Math Lab
  - Implement Back propagation Neural Networks using Math Lab
  - Implement Feed-forward Neural Networks in a high level programming language
  - Implement Back propagation Neural Networks in a high level programming language

- Describe Fuzzy Logic
  - Understand the difference between traditional Logic and Fuzzy Logic
  - Implement membership functions using Math lab
  - Apply concepts of Fuzzyfication

- Describe Genetic Algorithms
  - Explain the strategies used by Genetic Algorithms
  - Describe how Genetic algorithms are applied in optimization problems

Major Course Requirements

<table>
<thead>
<tr>
<th>Research paper</th>
<th>10%</th>
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<tbody>
<tr>
<td>Projects (3)</td>
<td>60%</td>
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<tr>
<td>Midterm Exam</td>
<td>15%</td>
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<tr>
<td>Final Exam</td>
<td>15%</td>
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Class Format: The class will have a face to face and online component.

Research Paper–
A research topic will be assigned to a group of 3 students. The topics are Neural Networks, Fuzzy Logic, and Genetic Algorithms. Each group has to write a research paper. The research paper must have: Title, Abstract, Introduction, Topic description including definitions, applications (examples), Tools, Conclusion and Bibliography. The bibliography needs to have at least 15 references including journals, conference papers. Times new roman 12; 5 pages, 1.5 space

Project
Each group has to implement a small application of the topic assigned for the research paper. Examples are the use of Math lab to implement a neural network, or fuzzy logic. Demonstrations of an open source tool is also a possibility.

Midterm Exam–
The midterm exam will be a take home exam. The exam will consist of three or four questions that each student has to answer individually.

Class Participation
Every week a set of questions will be posted online. Students have to answer each question. In addition, students have to read and respond to 5 student posts expanding what has already been discussed.

Syllabus
(course outline)

1. Neural Networks
   a. Introduction to Artificial Neural Networks
   b. Feed
2. Fuzzy Logic
3. Genetic Algorithms
4. Intelligent Agents

Academic Integrity/Plagiarism

University students are expected to conduct themselves in accordance with the highest standards of academic honesty. Academic misconduct for which a student is subject to penalty includes all forms of cheating, such as illicit possession of examinations or examination materials, falsification, forgery, complicity or plagiarism. (Plagiarism is the presentation of the work of another as one’s own work.) In this class, academic misconduct or complicity in an act of academic misconduct on an assignment or test will result in a zero in the exam or assignment.

Dropping a Class

I hope that you never find it necessary to drop this or any other class. However, events can sometimes occur that make dropping a course necessary or wise. Please consult with me before you decide to drop to be sure it is the best thing to do. Should dropping the course be the best course of action, you must initiate the process to drop the course by going to the Student Services Center and filling out a course drop form. Just stopping attendance and participation WILL NOT automatically result in your being dropped from the class. June 20 is the last day to drop a class with an automatic grade of “W” this term.

Classroom/professional behavior

Texas A&M University-Corpus Christi, as an academic community, requires that each individual respect the needs of others to study and learn in a peaceful atmosphere. Under Article III of the Student Code of Conduct, classroom behavior that interferes with either (a) the instructor’s ability to conduct the class or (b) the ability of other students to profit from the instructional program may be considered a breach of the peace and is subject to disciplinary sanction outlined in article VII of the Student Code of Conduct. Students engaging in unacceptable behavior may be instructed to leave the classroom. This prohibition applies to all instructional forums, including classrooms, electronic classrooms, labs, discussion groups, field trips, etc.

Statement of Civility (can be in place of classroom/professional behavior)

Texas A&M University-Corpus Christi has a diverse student population that represents the population of the
state. Our goal is to provide you with a high quality educational experience that is free from repression. You are responsible for following the rules of the University, city, state and federal government. We expect that you will behave in a manner that is dignified, respectful and courteous to all people, regardless of sex, ethnic/racial origin, religious background, sexual orientation or disability. Behaviors that infringe on the rights of another individual will not be tolerated.

**Grade Appeals (College of Science and Engineering Version)**

As stated in University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures, a student who believes that he or she has not been held to appropriate academic standards as outlined in the class syllabus, equitable evaluation procedures, or appropriate grading, may appeal the final grade given in the course. The burden of proof is upon the student to demonstrate the appropriateness of the appeal. A student with a complaint about a grade is encouraged to first discuss the matter with the instructor. For complete details, including the responsibilities of the parties involved in the process and the number of days allowed for completing the steps in the process, see University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures. These documents are accessible through the University Rules website at [http://www.tamucc.edu/provost/university_rules/index.html](http://www.tamucc.edu/provost/university_rules/index.html), and the College of Science and Engineering Grade Appeals webpage (http://sci.tamucc.edu/students/GradeAppeal.html). For assistance and/or guidance in the grade appeal process, students may contact the chair or director of the appropriate department or school, the Office of the College of Science and Engineering Dean, or the Office of the Provost.

**Disabilities Accommodations**

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please call or visit Disability Services at (361) 825-5816 in Corpus Christi Hall 116.

If you are a returning veteran and are experiencing cognitive and/or physical access issues in the classroom or on campus, please contact the Disability Services office for assistance at (361) 825-5816.

**Statement of Academic Continuity**

In the event of an unforeseen adverse event, such as a major hurricane and classes could not be held on the campus of Texas A&M University–Corpus Christi; this course would continue through the use of Blackboard and/or email. In addition, the syllabus and class activities may be modified to allow continuation of the course. Ideally, University facilities (i.e., emails, web sites, and Blackboard) will be operational within two days of the closing of the physical campus. However, students need to make certain that the course instructor has a primary and a secondary means of contacting each student.

Recommended by university, language provided that mirrors language used in other publications such as the student handbook or rules/procedures.
Recommended by university, select one from the two items regarding behavior/civility or insert a similar statement based on your class needs.
Required by SACS or HB2504—language must be included.