REQUIRED/ELECTIVE:
Elective

CATALOG DATA:

Artificial Intelligence
Credits: (3)
Prerequisite: (CSE 2383 and CSE 2813 both with a grade of C or better)

PREREQUISITE BY TOPIC:
1. Intermediate programming skills
2. Boolean algebra
3. Data structures
4. Algorithm development and analysis
5. Trees and graphs; linked lists
6. Predicate logic and proofs

TEXTBOOKS AND OTHER REQUIRED MATERIAL:

COORDINATOR:
Susan M. Bridges

COURSE OBJECTIVES:
1. To acquaint students with the major areas of the field of artificial intelligence.
2. To give students dept of exposure to a few areas within artificial intelligence in order for them to gain an appreciation of the techniques that are available and the problems that are yet to be solved.

TOPICS COVERED: (Number of class hrs)
1. Definition of artificial intelligence (3 classes)
2. Intelligent agents (3 classes)
3. Problem-solving as state space search (6 classes)
4. Automated reasoning and logic systems (6 classes)
5. Knowledge representation (6 classes)
6. Learning (4 classes)
7. Sub-symbolic AI (4 classes)
8. Representing and reasoning about uncertainty (5 classes)
9. Planning (4 classes)
10. Natural language processing (4 classes)

CONTRIBUTION TO PROFESSIONAL COMPONENT:
Engineering topics of engineering design.

ASSESSMENTS:
1. Programming assignments and reports
2. Quizzes
3. Exams
RELATIONSHIP TO PROGRAM OUTCOMES:
1. Students will be able to read and understand technical articles describing work in the field of artificial intelligence. (g, se4)
2. Students will be able to implement a simple expert system. (c, se3)
3. Students will be able to implement a back propagation neural network and conduct experiments to assess its performance. (c)
4. Students will be able to evaluate the applicability of different search procedures to an AI problem and determine which is most likely to be most applicable and effective. (b)

PREPARED BY:
Susan Bridges, Professor of Computer Science and Engineering, May 31, 2005

ESTIMATE CSAB CATEGORY CONTENT:

<table>
<thead>
<tr>
<th>CORE</th>
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<tbody>
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<td>Data Structures</td>
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<td>Algorithms</td>
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<td>Software Design</td>
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<td>Computer Organization and Architecture</td>
<td>______</td>
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<tr>
<td>Concepts of Programming and Languages</td>
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ORAL AND WRITTEN COMMUNICATIONS:

Every student is required to submit at least ___2__ written reports (not including exams, tests, quizzes, or commented programs) of typically ___6___ pages and to make _____ oral presentations of typically _____ minutes duration. Include only material that is graded for grammar, spelling, style, and so forth, as well as for technical content, completeness, and accuracy.

SOCIAL AND ETHICAL ISSUES:

None

THEORETICAL CONTENT:

Search algorithms and their complexity and effectiveness. (6 classes)

Predicate logic and theorem proving. (6 classes)

PROBLEM ANALYSIS:

Students were required to construct an expert system. This required analysis of the problem domain.

Students were required to implement an algorithm for heuristic search. This required students to analyze the problem in order to determine how to represent problem states, operators, search control structures and heuristics.

In the neural network assignment, students were required to analyze the problem in order to identify the input and outputs for the system and to determine an initial structure for the network. They were also required to analyze results of experiments conducted with the neural network.
SOLUTION DESIGN:

Students were required to design and implement an expert system.

Students were required to design an algorithm for heuristic search.

Students were required to design a neural network to solve a classification problem and to design a set of experiments to analyze the performance of the network.