

Southeast Missouri State University

Department of Management

Course No. MG442

Title of Course: Artificial Intelligence and Expert Systems

Spring 2000

I. Catalog Description and Credit Hours of Course:

This course will focus on the area of Decision Support Systems, Artificial Intelligence, and Expert Systems. Topics covered include: forward and backward chaining rule-based systems, induction systems, and knowledge representation. (3)

II. Prerequisites(s): IS130 Visual Basic Programming and MG375 Management Information Systems with a minimum grade of "C"

III. Purposes or Objectives of the Course:

Upon completion of this course, the student should be able to:

- A. Describe Artificial Intelligence and provide suggestions for its use in the business environment.
- B. Describe Expert Systems and provide suggestions for their use in the business environment.
- C. Describe and demonstrate examples of forward chaining rule-based Expert Systems.
- D. Describe and demonstrate examples of backward chaining rule-based Expert Systems.
- E. Plan, design and develop an Expert System.

IV. Expectations of Students:

- A. Students will complete all assigned readings in textbook, handouts and relevant professional journal articles.
- B. Students will participate in classroom discussions and activities.
- C. Students will demonstrate achievement of course objectives through exams and projects.
- D. Students will develop individual projects in which they will create Expert Systems using the rule-based reasoning under study.
- E. Students will develop a group project Expert System using the rule-based reasoning of their choice.

V. Course Content or Outline:

- A. Introduction to Decision Support Systems (3)
- B. Introduction to Artificial Intelligence and Expert Systems (3)
 - 1. Major characteristics of Expert Systems
 - 2. MYCIN
- C. Inference Techniques (3)
- D. Rule-based Expert Systems (3)
- E. Backward Chaining Rule-based Systems (6)
 - 1. Designing backward chaining rule-based systems
 - 2. Learn how to create an ES using an ES shell (possibly VP Expert)
- F. Forward Chaining Rule-based Systems (6)
 - 1. Designing forward chaining rule-based systems
 - 2. Learn how to create an ES using a Level 5 shell
- G. Bayesian Approach to Inexact Reasoning (3)
- H. Certainty Theory (3)
- I. Fuzzy Logic (3)
- J. Frame-based Expert Systems (6)
 - 1. Designing forward frame-based systems
 - 2. Learn how to create an ES using a frame-based shell
- K. Induction Systems (3)
- L. Knowledge Engineering and Acquisition (3)

VI. Textbook(s) and/or Other Required Materials or Equipment:

- A. Textbooks
 - 1. E. Turban and J. Aronson, *Decision Support Systems and Intelligent Systems*, Prentice- Hall, 1998.
 - 2. J. Durkin, *Expert Systems: Design and Development*, 1st ed., Prentice-Hall, 1998.
- B. Professional Journal Publications
- C. Other References as Needed

VII. Basis for Student Evaluation:

- A. Quizzes/Tests

- B. Individual projects and one group project.
- C. Class participation