

**EMBRY-RIDDLE AERONAUTICAL UNIVERSITY**  
**Department of Computing and Mathematics**  
**COURSE OUTLINE FOR**

**Course No.:** CS455  
**Cr Hrs:** 3

**Title:** Artificial Intelligence

**Lecture Hours:** 3

**Laboratory Hours:** 0

**COURSE DESCRIPTION:**

This course introduces students to the basic concepts of Artificial Intelligence with emphasis on knowledge engineering. Students gain experience, through individual and group exercises, in the various phases of the development: planning, requirement and specification, design, implementation and testing. Students study and apply commercial tools to the development of knowledge-base systems in the aerospace and aviation domain. Prerequisite: CS 222 or permission of instructor.

**GOALS:**

The course provides the student with an in depth introduction to knowledge base systems via the use of software packages for knowledge representation, acquisition, verification and validation. The student learns the fundamentals of knowledge base systems, techniques associated with the knowledge representation, acquisition, verification, and validation, and the software engineering of knowledge base systems. The student gets familiar with the automated AI tools for knowledge representation, acquisition, verification and validation. Students will get exposed to LISP, and artificial intelligence programming language. The emphasis in the course is project oriented towards aviation applications by the use of an expert systems shell and related AI tools.

**PERFORMANCE OBJECTIVES:**

1. Understand the difference between the procedural and nonprocedural languages.
2. Appreciate the rule of artificial intelligence in solving problems.
3. Understand the use of knowledge base systems in solving real world problems.
4. Understand different types of knowledge representations.
5. Have the basic understanding of different knowledge acquisition techniques.
6. Demonstrate the use of at least one of the existing commercially available tools for knowledge base systems.
7. Write programs in at least one of the special AI languages (i.e. LISP, PROLOG, etc.)

**Department of Computing and Mathematics  
COURSE OUTLINE FOR CS455, Continued**

**TEXTBOOK**

Engineering of Knowledge based systems, by Gonzalez and Dankel

**SUGGESTED SUPPLEMENTAL MATERIALS:**

- a. Pederson, K., *Expert Systems Programming*, John Wiley, 1989.
- b. Liebowitz, *Introduction to Expert Systems*, Mitchell Publishing, 1988.
- c. Rosenman, Radford and Gero, *Knowledge-Based Design Systems*, Addison-Wesley, 1990.
- d. Harmon and King, *Expert Systems*, John Wiley, 1985.
- e. Ringland and Duce, *Approaches to Knowledge Representation*, John Wiley, 1988.
- f. Gierratano, *Expert Systems Principles and Programming*, PWS-Kent, 1989.
- g. Access to the current articles in such magazines as: IEEEXPERT Magazine and AI Expert Magazine.

**PREREQUISITE KNOWLEDGE BY TOPIC:**

1. Basic programming techniques.
2. Ability to perform logical thinking in solving problems.

TOPIC	CLASS HOURS	COURSE OBJECTIVES
1. History of Artificial Intelligence	9	Provide students with a breath first view of what is AI, and different areas that are considered as part of the AI
2. knowledge base Systems Fundamentals	5	An indepth discussion of knowledge base systems
3. Knowledge Engineering	6	An indepth discussion of the different techniques and methodologies in knowledge engineering
4. Knowledge Representations	10	An indepth discussion of the different knowledge representation techniques, their advantages and disadvantages
5. Knowledge base System Development	6	Discussion of tools, techniques and processe used during the development of knowledge base systems
6. Current Topics in knowledge base Systems	4	Discussion of the current state of the art in the area of knowledge base system. Review of current research papers in this area
7. Programming Language	3	Brief discussion of AI languages. Syntax overview of one of the AI languages

**LABORATORY:****COMPUTER USAGE:**

At least one expert system shell which is available on a network of computers. Also at least one special language program.

**GRADING SYSTEM:**

There will be periodic homework assignments and announced and unannounced quizzes. There will be a term project requiring development of an expert system with aviation focus. One full period exam, and a final exam will be used to measure the mastery of the material by the students.

**ESTIMATED CONTENT:**

<b>Skills:</b>	<b>%30</b>
<b>Content:</b>	<b>%70</b>