



Course Syllabus for INTRODUCTION TO Artificial Intelligence (802456)

COURSE OBJECTIVES

Artificial intelligence (AI) is a research field that studies how to realize the intelligent human behaviors on a computer. The ultimate goal of AI is to make a computer that can learn, plan, and solve problems autonomously. The main purpose of this course is to provide the most fundamental knowledge to the students so that they can understand what the AI is and visualize the most common cores for AI techniques and to be able to understand the possible applications of AI in real systems.

COURSE OUTCOMES

Attending this course, the student will gain the following outcomes:

1. Student will have an understanding of the AI essence, its advantage and disadvantages.
2. Student will address the common knowledge types and search engines and be familiar with rule based knowledge and Expert Systems.
3. Student will be familiar with the most common AI tools
4. The student will be able to select and design the most appropriate AI paradigm for a certain application.
5. The students will be able to analyze and evaluate the designed AI system and emphasize its performance.
6. Student will be able to utilize the Artificial Neural Nets, Fuzzy Logic and Genetic computation.
7. The will be able to use the most common AI packages such as MATLAB tools.
8. Students will improve their knowledge collection and self-learning abilities.
9. Students can enhance their group-working and cooperative atmosphere.

PREREQUISITES

802347 & 802382

TEXTBOOKS

1. Russell S. and Peter N., "Artificial Intelligence: A Modern Approach", 3rd Edition, Prentice Hall, 2009.



REFERENCES

In addition to the aforementioned textbook, the following references are recommended:

1. Lugar G., "Artificial Intelligence: Structure and Strategies for Complex Problem Solving", Course Technology Publishers, 2004.
2. Toshinori Munakata, "Fundamentals of the New Artificial Intelligence Neural, Evolutionary, Fuzzy and More", Springer, 2008

COURSE CONTENTS:

- **Introduction** (Goals of AI, Techniques, Branches, Knowledge types, Knowledge representation etc.)
- **Search Engines** (Basic search types, Heuristic search, non-Heuristic search)
- **Reasoning** (Forward chaining, Backward chaining)
- **Expert Systems** (Expert systems construction, knowledge acquisition, Inference engines, developing shells, applications)
- **Neural Networks** (construction, types, training, applications)
- **Fuzzy Logic** (Fuzzification, Defuzzification, Inference systems, Memberships, applications)
- **Evolutionary Computation** (Genetic computation and Applications)
- **Applications**
- **MATLAB utilization**

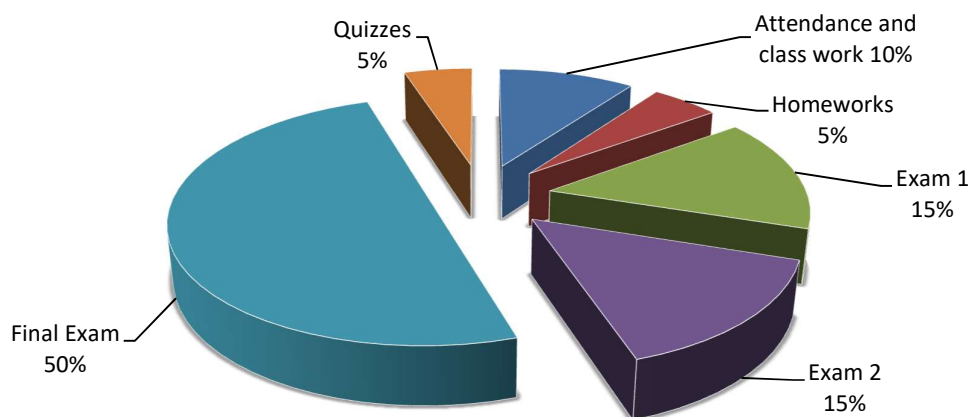
COURSE MANAGEMENT

The course will be organized in modules according to main themes:

Module	Topic	Duration
1	▪ Introduction	1 Week
2	▪ Search Engines	1 Week
3	▪ Reasoning	2 Weeks
4	▪ Expert Systems	2 Weeks
5	▪ Neural Networks	2 Week
	Exam 1	
6	▪ Fuzzy Logic	2 Weeks
7	▪ Evolutionary Computation	2 Weeks
	Exam 2 (Experimental)	
8	▪ Applications	2 Weeks
	Final Exam	



GRADING



METHODS OF ASSESSING OUTCOMES

The expected learning outcomes will be assessed by review of homework, class participation, performance on the midterm exams and Final Exams.

Class Attendance and participation: each student is expected to attend and participate in each class..

Homework/Assignments: Different assignments will be given over the semester to allow the student to demonstrate understanding of course material. Some assignments are completed in class. No late Homework will be accepted. MATLAB is essential for applying the AI tool

Mid-term Exams: Two exams will be conducted as scheduled in the course plan.

Final exam: At the end of the semester a final exam will be done.

INSTRUCTOR

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