Artificial Intelligence

Course Definition

Information

Technology

Engineering

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1. Basic Information:

Course Name	Artificial Intelligence
Course Code	BAI501
Number of Presentational Sessions*	2x10
Number of Synchronous Sessions**	10
Number of Shorter Tests***	4
Number of Exams***	1
Theoretical Sessions Work Load (hrs.)	60
Practical Sessions Work Load (hrs.)	30
Credit Hours	6

*Each presentational session comprises both recorded lecture (1.5 hrs.) and interactive learning content (1.5 hrs.).

**Each synchronous session comprises the interactive lecture carried out in real time in a virtual class (1.5 hrs.).

***Each shorter test is 0.5 hr. long. The final exam is 2 hrs. long.

N.B.

Generally, each chapter requires two presentational sessions: one for the recorded content and one for the interactive content (unless the chapter is too long, in which case it may require more sessions). This note applies to synchronous sessions as well, where each chapter requires one synchronous session generally.

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2. Prerequisites Courses:

Course	Code
Algorithms and Data Structures (1)	BDA501

3. Course Objectives:

The main aims of this course "Artificial Intelligence" are:

- Study knowledge representation methods that provide inference possibilities.
- Using logical proof methods.
- Handling uncertainty.
- Study intelligent search algorithms and use of heuristics.
- Study games algorithms.

4. Learning Outcomes (LO):

By the end of this course, the learner is expected to acquire and learn the following subjects:

- Using propositional and predicate calculus as formal languages to describe real world knowledge.
- Proving theorems using logical methods.
- Handling uncertainty.
- Problems modeling for search methods.
- Solving hard search problems using intelligent search algorithms.
- Finding and using proper heuristics.
- Using games algorithms.

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5. Assessment Results:

Chapter Number	Chapter Title	General Objectives	Assessment Type				
			Interactive Content & Recorded Sessions	Applied Activities (Synch. Sessions)	Final Exam*/ Shorter Tests**	Presentations and Interviews***	Reports***
CH1	Propositional Calculus	Comprehension –Analytical Thinking –Tools and Application Hands– On	✓	✓	✓	✓	✓
CH2	Predicate Calculus	Comprehension –Analytical Thinking –Tools and Application Hands– On	✓	✓	✓	✓	✓
CH3	Handling Uncertainty	Comprehension –Analytical Thinking –Tools and Application Hands– On	✓	✓	✓	✓	✓
CH4	Intelligent Search Algorithms	Comprehension –Analytical Thinking –Tools and Application Hands– On	✓	✓	✓	✓	✓

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CH5	Games Algorithms	Comprehension –Analytical Thinking –Tools and Application Hands– On	✓	✓	✓	✓	✓	

*The final exam is two hours long and is given at the end of the course.

**Shorter tests are about 30 minutes long and are given after three or four lectures throughout the semester during synchronous sessions.

***Presentations, interviews, and reports are submitted once after each three or four lectures throughout the semester during synchronous sessions.

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6. Course Syllabus:

Chapter	Subject	Content	Number of Learning Objects	Number of synchronous Learning Objects
CH1	Propositional Calculus	1. Syntax 2. Semantic 3. Models 4. Entailment 5. Inference 6. Resolution 7. Forward and backward chaining	11	5
CH2	The Predicate Calculus	1. Syntax 2. Semantic 3. Quantifiers 4. Substitution 5. Unification 6. Resolution 7. Proof	11	5
CH3	Uncertainty Handling	1. Bayes 2. Certainty factor	8	4

CH4	Intelligent Search Algorithms	1. Blind search algorithms 2. Heuristics 3. Hill climbing algorithm 4. A* algorithm 5. Sale man problem	11	5
CH5	Games Algorithms	1. MinMax algorithm 2. Alpha−Beta algorithm	4	2

7. Practical Activity:

- **Tools and Labs:**

Tool Name	Description
Word, power point, excel	Microsoft office

- **Practical Activities per Chapters:**

Chapter	Activities Type	Remarks
CH1	☑ Exercises ☑ Homework ☐ Webinars ☐ Project ☐ Experiment ☐ Other	
CH2	☑ Exercises ☑ Homework ☐ Webinars ☐ Project ☐ Experiment ☐ Other	

CH3	☑ Exercises ☑ Homework ☑ Webinars ☐ Project ☐ Experiment ☐ Other	
CH4	☑ Exercises ☑ Homework ☐ Webinars ☐ Project ☐ Experiment ☐ Other	
CH5	☑ Exercises ☑ Homework ☐ Webinars ☐ Project ☐ Experiment ☐ Other	

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8. References:

1. Artificial Intelligence: A Modern Approach 3rd Edition. Stuart J. Russell and Peter Norvig.