**Course Specification**

(**CS 361 Artificial Intelligence** )

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| *University:* | Helwan University |
| *Faculty:* | Faculty of Computers & Information |
| *Department:* | ***Computer science*** |

**1. Course Data**

|  |  |
| --- | --- |
| **Code:** | **CS 361** |
| **Course title:** | Aritificial Intelligence |
| **Level:** | 3 |
| **Specialization:** | Computer Science |
| **Credit hours:** | 3 hours |
| **Number of learning units (hours):**  | (3) theoretical 2) practical |

**2. Course Objective**

Knowledge Representations: Predicate Calculus, Structured Representations, Network Representations. State Space Search: trees and graphs, heuristic search, model based reasoning, case-based reasoning, reasoning with uncertain or incomplete knowledge, Overview of AI languages, and Overview of AI Application Areas.
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**3. Intended Learning Outcomes:**

**A- Knowledge and Understanding:**

 A6. Describe the Modeling Problems.

A15. Recognize Artificial Intelligent Principles.

**B- Intellectual Skills**

B3. Develop Analytical Skills.

 B8. Gather and assess relevant information, using abstract ideas to interpret

 it effectively.

 B12. Locate and assess the strengths and weaknesses of the problem

 argument (Critical reasoning).

 B13. Design different Pattern Recognition techniques.

B18. Classify different problems.

B23. Classify different Data types.

**C- Professional and Practical Skills**

 C1. Choose the appropriate Programming Language.

C5. Acquire information independently.

**D- General and Transferable Skills**

D3. Use different Problem Solving techniques.

D4. Follow Analytical Thinking.

 D5. Follow Creative Thinking.

 D6. Use Modeling capability in software projects.

 D7. Use Effective reasoning in problem solving.

D12. Use Logical inference in problem solving.

 D13. Practice Designing skills in software projects.

**4. Course contents**

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| --- | --- | --- | --- |
| **Topic** | **No. of hours** | **Lecture** | **Tutorial/ Practical** |
| * **Search**
* Graph search
* Constraint Satisfaction
* Games
 | 15 | 5 | 5 |
| * **Knowledge representation and Inference**
* Prepositional and First Order Logic
* Rule-based systems
* **Natural language**
 | 15 | 5 | 5 |
| * **machine learning**
* Nearest Neighbors
* Decision Trees
* Neural networks
 | 15 | 5 | 5 |

**Mapping contents to ILOs**

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| --- | --- |
| Topic | Intended Learning Outcomes (ILOs) |
| Knowledge and understanding | Intellectual Skills | Professional and practical skills | General and Transferable skills |
| **Search** | A15,A16 | B8,B3 | C1 | D3,D4,D5 |
| **Knowledge representation and Inference** | A15 | B12,B13,B18 | C5 | D3,D6,D7 |
| **machine learning** | A15 | B23, B18 | C1 | D3,D13,D12 |

**5. Teaching and Learning Methods**

Lectures

Exercises

Case Studies

Lab Work

**6. Teaching and Learning Methods for students with limited capability**

 Using data show

 e-learning management tools

**7. Students Evaluation**

 Written Exams: to assess Concepts related to AI.

 Project: to assess understanding of programming techniques developed in PROLOG.

**a) Used Methods**

Lab exam

Assignments

Lab work

Programming projects

**b) Time**

Assessment 1: Test 1 Week 4

Assessment 2: Test 2 Week 7

Assessment 3: Midterm Exam Week 10

Assessment 4: Practical Exam Week 14

Assessment 5: final written exam Week 16

**c) Grades Distribution**

Mid-term Examination 20 %

Final-Year Examination 50 %

Semester Work 20 %

Practical Exam 10%

 Total 100%

Any formative only assessments

**List of Books and References**

**a) Notes**

Course Notes

- Handouts

**b) Mandatory Books**

 Artificial Intelligence structures and strategies for complex problem solving, George Fluger, fourth edition, Pearson education Ltd 2002.

**c) Suggested Books**

AI: A modern Approach, Russell & Novig, 2nd edition

**d) Other publications**

**Course Coordinator:**  Prof. dr. Iraqy Khalifa

**Chairman of the Department:** Prof. dr. Iraqy Khalifa