

Course Specifications

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|---|------------------------------|
| Programme(s) on which the course is given | M.Sc. of Computer Science |
| Major or minor element of programs | Major |
| Department offering the program | Mathematics |
| Department offering the course | Mathematics |
| Academic year / Level | Post-graduate studies |
| Semester | |
| Date of specification revision | September 2008 |
| Date of specification approval | September 2008 |

A- Basic Information

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|--------------------------------|--------------|
| Title: Artificial Intelligence | Code: M636 |
| Credit Hours: 2 | Total: 2 hr. |
| Lecture: 2 | Tutorial: - |
| | Practical: - |
| | Other: - |

B- Professional Information

1 – Overall Aims of Course

- Design and implementation of intelligent systems, in areas such as natural language processing, expert reasoning, planning, robotics, problem solving and learning. Students will design their own versions of "classic" AI problems, and complete one substantial design project. Programming will be done primarily in Prolog, which will be covered briefly at the beginning of the course.

2 – Intended Learning Outcomes of Course (ILOs)

a- Knowledge and Understanding:

The student should be able to

- a1-** Revision on what is an intelligent system vs. conventional systems.
- a2-** Have the knowledge about the essential characteristics of knowledge representation and acquisition.
- a3-** Understand the main technology behind an intelligent system (i.e. search techniques, planning, learning ... etc.)
- a4-** Learn the different AI techniques available (i.e. Expert Systems, Neural Networks, Genetic Algorithms).

b- Intellectual Skills

- b1-** Understand how common sense can be represented in a computer.
- b2-** Knowing the different knowledge representation techniques available.
- b3-** Understanding the difficulty of such algorithms and the type of problems that can be represented and manipulated in AI.

c- Professional and Practical Skills

- c1-** Apply the AI techniques to different problems, while discussing the pros and cons.
- c2-** Differentiating between problems that are solvable and that are not.
- c3-** Getting to know Prolog programming language.

d- General and Transferable Skills

- d1-** The Prolog programming language.
- d2-** The use of Natural Language Processing in computer science.

3- Contents

| Topics | No. of hours | Lecture |
|---|--------------|---------|
| Revision of what is AI and intelligence , computer programs and IQ, branches and applications of AI . | 4 | 2 |
| Knowledge representation and knowledge acquisition: semantic nets , frames , inheritance, rules. | 4 | 2 |
| Expert Systems and decision rules, and fuzzy expert systems. ES rules, building ES, and inferencing. | 6 | 3 |
| Neural Networks, forward and backward chaining, types of neural networks, usage and applications. | 6 | 3 |
| Genetic algorithms, NP-complete problems and how to present problems using GA, GP vs GA. | 4 | 2 |

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| Rough sets, knowledge presentation using RS, usage and decision extraction. | 4 | 2 |
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4- Teaching and learning methods

4.1- Lectures

4.2- Working on hand in assignments

4.3- Project and report knowledge collection

5- Student assessment methods

5.1 Mid term written exam to assess understanding competencies

5.2 Programming Project to assess programming skills

5.3 Oral Exam to assess attendance and interesting.

5.4 Semester hand in assignments to assess understanding professionalism.

5.5 Final term written Exam to assess comprehension.

Assessment schedule

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|--------------|-------------------------|--------------|
| Assessment 1 | Mid term | Week 4 and 7 |
| Assessment 2 | semester activities | Week 5 and 8 |
| Assessment 3 | Final Project/report | Week 13 |
| Assessment 4 | Final term written exam | Week 14 |

6- Weighting of assessments

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| Mid-Term Examination | 20% |
| Semester Work (homework assignments + quizzes) | 10% |
| Project | 10% |
| Final-term written Examination | 60% |
| Total | 100% |

Any formative only assessments

7- List of references

7.1- Course notes

Collected and prepared notes that cover the main topics in the course content

7.2- Essential books (text books)

Elementary text books under the title: *Artificial Intelligence a modern approach*.

7.3- Recommended books : Artificial Intelligence techniques

7.4- Periodicals, Web sites, ... etc

Non.

8- Facilities required for teaching and learning

Lecture: PC's - packages for ready made scientific programs. - Data Show, instrumentation, and packages.

Names of professors/lecturers contributing to the design and delivery of the course

i Dr. P El-Kafrawy

ii Dr. Hani

Course coordinator:

Head of Department: Mohamed A. Ramadan

Date: / /