

1. Course Number and Course Title:

CMP 333 – Artificial Intelligence

2. Credits Hours:

3 – 0 – 3

3. Prerequisites:

Prerequisite: CMP 305 Data Structures and Algorithms

4. Name and Contact Information of Instructor:

Dr. Michel Pasquier

5. Course Description (Catalog Description):

Introduces the fundamental concepts and techniques of artificial intelligence. Studies the structure and components of intelligent agents and systems. Includes problem-solving methods, heuristic search, knowledge representations, and logical reasoning systems. Examines selected topics such as planning and approximate reasoning, as well as case studies of AI in the real world.

6. Textbook and other Supplemental Material:

Textbook:

- S. Russell and P. Norvig. *Artificial Intelligence: A Modern Approach*, 4th edition, Prentice Hall, 2020.

Supplemental material:

- M.A. Boden, *Artificial Intelligence: A Very Short Introduction*, Oxford University Press, 2018.
- D. Poole and A. Mackworth, *Artificial Intelligence: Fundamental of Computational Agents*, 2nd edition, Cambridge University Press 2017. (online @ artint.info)
- I. Bratko. *Prolog Programming for Artificial Intelligence*, 4th edition, Addison-Wesley, 2011.

7. Course Learning Outcomes:

Upon completion of the course, students will be able to:

1. Explain what AI is about and its importance for Computer Science, IT, and society.
2. Describe the structure and components of various types of intelligent agents.
3. Apply problem solving principles and employ various heuristic search techniques.
4. Characterize constraint satisfaction problems and use CSP-specific algorithms.
5. Apply game theory and related algorithms to games and multi-agent problems.
6. Represent complex knowledge using formal logic and apply inference algorithms.
7. Model partial or uncertain knowledge using approximate reasoning techniques.
8. Use modern tools such as AIspace or SWI-Prolog to explore and apply AI theories.

8. Teaching and Learning Methodologies:

Methods include lectures, problem-based learning, class discussions, and group work. Students learning is assessed via in-class quizzes, exams, homework, and AI programming projects.

9. Course Topics and Schedule:

Topic/Activity	Weeks
----------------	-------

American University of Sharjah | College of Engineering

Introduction to Artificial Intelligence	Week #1
Intelligent agents and systems, agent architectures	Week #2
Problem solving, state-based search approach	Week #3
Problem formulation, uninformed search algorithms	Week #4
Informed search algorithms, heuristics and design	Week #5
Memory-bounded search, local search	Week #6
Constraint satisfaction problems and algorithms	Week #7
Game playing, adversary search	Week #8
Logic, knowledge-based systems – Midterm	Week #9
Logical reasoning, propositional logic, inference	Week #10
First-order logic, inference, reasoning systems	Week #11
Logic programming using Prolog	Week #12
Logical reasoning agents with Prolog	Week #13
Selected topics: planning, approximate reasoning	Week #14
Revision	Week #15
Final Exam	Week #16