CPCS-331 Syllabus

Catalog Description

CPCS-331 Artificial Intelligence (I)
Credit: 3 (Theory: 3, Lab: 0, Practical: 1)
Prerequisite: CPCS-204 , CPCS-223
Classification: Department Required

The objective of this course is to provide a broad overview of AI and building intelligent systems. Topics include intelligent agents, problem-solving as a search activity, knowledge representation, planning, reasoning and learning. Students will also be introduced to evolutionary computation (EC), natural language processing (NLP), and programming in Prolog.

Class Schedule

Meet 50 minutes 3 times/week or 80 minutes 2 times/week

Lab/Tutorial 90 minutes 1 times/week

Textbook

Stuart Jonathan Russell, Peter Norvig, , "Artificial Intelligence", Prentice Hall; 3 edition (2010)

ISBN-13 9780136042594 **ISBN-10** 0136042597

Grade Distribution

Week	Assessment	Grade %
3	Homework Assignments 1	2
6	Quiz 1	2.5
8	Exam 1	10
9	Group Project 1	10
10	Group Project 2	10
10	Homework Assignments 2	3
12	Quiz 2	2.5
14	Project (Individual)	10
14	Exam 2	10
15	Lab Exam	10
16	Comprehensive Final Exam	30

Last Articulated

April 3, 2018

Relationship to Student Outcomes

a	b	c	d	e	f	g	h	i	j	k
x									x	

Course Learning Outcomes (CLO)

By completion of the course the students should be able to

1. Demonstrate how Turing test and the Chinese-room thought experiment can be setup to test whether a given system (specified formally or informally) is intelligent or not. (a)
2. **Choose an appropriate PEAS description, the characteristics of environment and the agent architecture, for a given problem to be solved by an intelligent agent. (a)**
3. Formulate a given problem as a search problem, clearly indicating the initial state, successor function(s) and goal state. (a)
4. **Apply uninformed/informed search strategies to solve a given search/optimization problem. (j)**
5. Analyse different uninformed/informed searchstrategies in terms of their time/space complexities, soundness, completeness and optimilaity. (j)
6. **Use forward/backward planning algorithms to solve a given planning problem, which is described infomally in natural language text or represented formally in STRIPS . (j)**
7. Apply resolution/inference to a set of logic statements available in a knowledge base to answer a query. (j)
8. Distinguish among different reasoning methods, giving appropriate examples. (j)
9. Apply Baye's theorem to determine the probability of a hypothesis, given evidence in a real-world problem. (a)
10. **Develop a rule-based expert system to solve a small-scaled problem in a given domain, for example medical/ weather forecasting. (j)**
11. Differentiate between different types of learning such as supervised versus unsupervised, and inductive versus deductive learning. (j)
12. Formulate a given real-world problem as a machine learning problem, clearly specifying the main steps involved in the solution. (j)
13. **Apply a simple machine learning algorithm such as decision tree to a given classification task. (j)**
14. Describe different selected topics (Natural Language Processing/Evolutionary Computation/Computer Vision) related to AI. (j)

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Topics Coverage Durations

Topics	Weeks
Introduction to artificial intelligence	1
Intelligent agents	2
AI search strategies	3
Fundamentals of planning	1
Knowledge representation, reasoning and expert systems	3
Fundamentals of machine learning	3
Selected topics: Evolutionary Computation/Natural Language Processing/ Computer Vision	2

Coordinator(s)

Prof. Imtiaz Khan, Professor