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Topics include: problem solving using search (search procedures e.g. depth-first, breadth-first, A\*, etc.), constraint satisfaction problems, game playing, knowledge representation and inference procedures. Abstract highlights cover an advanced AI topic (e.g. machine learning, natural language processing). Students will do a small project in this course as well.<http://faculty.ksu.edu.sa/YAlohali/Pages/AICourse.aspx>Pre-requisites:*CSC 212* Data Structure  |  | | --- | | **Prerequisite** **to**: |  Textbook: [Artificial Intelligence: A modern approach](http://aima.cs.berkeley.edu/) Stuart Russell and Peter Norvig, Prentice Hall, 2003 (new edition 2006)  **Course Objectives:**  *The objective of this course is to develop the students' ability to understand the concepts of AI in diversified domain of artificial intelligence. The students will be educated about the informed and un-informed search techniques, problem formulation, optimization techniques, knowledge representation and detailed game theory. The students are expected to present their skills by a course project.*  Course Learning Outcomes *Upon completing CSC 361, students should have the following capabilities:*  1. *Understand the difference in ‘Intelligence’ and ‘Artificial Intelligence’, and the land mark achievements in the development of AI evolution* 2. *To be able to formulate the problem.* 3. *To be able to apply and develop Depth First Search, BFS, Iterative deepening search, Uniform Cost search and knowing about their optimality, completeness, time and space complexity.* 4. *To be able to apply and develop heuristic function, greedy search, A\* search and iterative deepening A\* search* 5. *To be able to define, understand and implement the game playing concepts.* 6. *To be able to understand the knowledgebase, inference engine and knowledge representation* 7. *To be able to implement the learning of this course in terms of a course project based on AI techniques.*   **Expected Performance Criteria**  *Outcomes will be assessed using classroom performance, graded homework assignments, quizzes , graded exercises, course project, and midterm and final examinations.*  *The students are expected to perform assigned programming tasks.*  **Topics:**   1. Introduction to AI 2. Problem solving by search 3. Un-informed search Strategies 4. Informed search Strategies 5. Local search Techniques 6. Constraint satisfaction problem 7. Game Playing 8. Knowledge representation 9. Prepositional Logic 10. First Order Logic 11. Inference Techniques 12. Introduction to Machine Learning or Neural Networks   **Schedule:**  3 classes of 50 minutes each and one tutorial of 50 minutes (for 15 weeks)  **Relationship of course to ABET Criteria:**  ***Criterion 2 - Program Educational Objectives:***  The objective of the course is to enable students to learn about the tools and techniques for understanding and applying their knowledge to solve real world problems. The course will focus on sharpening the practical skills of the students alongwith providing them the theoretical knowledge  ***Criterion 3 – Program Outcomes:***   1. ***an ability to apply knowledge of mathematics, computing, science, and engineering appropriate to the discipline***   *the students are expected to analyze, understand and implement the real word problem by applying their knowledge in mathematics, CS and real life.*   1. ***an ability to analyze a problem, and identify and define the computing requirements appropriate to its solution***   *Students will be given real world problem to suggest solutions for that, for which they have to define goal state, initial state, the successor function and the operator to be applied in order to proceed for the solution.*   1. ***an ability to design, implement and evaluate a computer-based system, process, component or program to meet desired goals****.*   *Students will analyze, design and implement a course project, that alongwith the exams, will depict the level of learning.*   1. ***an ability to function effectively on teams to accomplish a common goal***   *Students work by groups of two to accomplish one or more mini-projects during the course.-*   1. ***an understanding of professional, ethical, legal and social issues and responsibilities***   *--------------*   1. ***an ability to communicate effectively***   *--------------*   1. ***an ability to analyze the local and global impact of computing on individuals, organizations and society, including ethical, legal, security and global policy issues***   *The students are encouraged to learn about the local and global impact of the AI by giving the inspiring examples of the past and current achievements in AI.*  ***a recognition of the need for, and an ability to engage continuing professional development*** *--------------*   1. ***an ability to use the current techniques, skills, and tools necessary for computing practice.***   *The students learn the searching techniques, game design techniques*   1. ***an ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices.***   *--------------*   1. ***an ability to apply design and development principles in the construction of software systems of varying complexity***   *--------------*   |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | |  | ***Program Outcomes*** | ***(a)*** | ***(b)*** | ***(c)*** | ***(d)*** | ***(f)*** | ***(g)*** | ***(j)*** | | Course Learning Outcomes |  | ***10%*** | ***25%*** | ***20%*** | ***15%*** | ***15%*** | ***10%*** | ***5%*** | | ***1*** |  |  |  |  |  | ***x*** |  |  | | ***2*** |  | ***x*** |  |  |  |  |  |  | | ***3*** |  |  | ***X*** |  |  |  |  |  | | ***4*** |  |  | ***X*** |  |  |  |  |  | | ***5*** |  |  |  | ***X*** |  |  |  |  | | ***6*** |  |  |  | ***X*** |  |  |  |  | | ***7*** |  |  |  |  | ***X*** |  |  |  | | ***8*** |  |  |  |  |  |  | ***X*** |  |   ***Criterion 4 – Professional Component:***  *This course provides the students with basic concepts of AI that will be used throughout this course and will serve as the basis for future learning in AI.*  Prepared by: Mr. Basit Shahzad  Reviewed by: Dr. Inayat Ullah Shah  Approved by : Dr. Yousef Al-Ohali | |  | |