**CS321L-CS322 ARTIFICIAL INTELLIGENCE**

**COURSE SYLLABUS**

1. Course Code: CS321L – CS322
2. Course Title: Artificial Intelligence
3. Pre-requisite/Co- requisite: CS373
4. Course Description: This course introduces Artificial Intelligence (AI), explore use cases and applications of AI, understand AI concepts and terms like machine learning, deep learning and neural networks. It exposed to various issues and concerns surrounding AI such as ethics and bias, & jobs, and get advice from experts about learning and starting a career in AI. You will also demonstrate AI in action with a mini project. This course does not require any programming or computer science expertise and is designed to introduce the basics of AI to anyone whether you have a technical background or not.
5. Credit / Class Schedule: 2 unit/ 2 hours Lecture; 1 unit/ 3 hours Laboratory
6. Course Content:

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| **WEEK** | **Topic** |
| 1 | Orientation on the course syllabus, course requirements, discussion on how students will be assessed, overview of the course |
| 2 | Artificial Intelligence   * Introduction * Intelligent Agents |
| 3 | Problem Solving   * Solving Problem by Searching * Search in Complex Environments |
| 4 | Problem Solving   * Constraint Satisfaction Problem * Adversarial Search and Games |
| 5 | Long Examination 1 |
| 6 | Knowledge, reasoning, and planning   * Logical Agents * First Order Logic * Inference in the First order logic |
| 7 | Knowledge, reasoning, and planning   * Knowledge Representation * Automated Planning |
| 8 | Long Examination 2 |
| 9 | Uncertain knowledge and reasoning   * Quantifying Uncertainty * Probabilistic Reasoning * Probabilistic Reasoning over Time |
| 10 | Uncertain knowledge and reasoning   * Making Simple Decisions * Making Complex Decisions |
| 11 | Uncertain knowledge and reasoning   * Multiagent Decision Making * Probabilistic Programming |
| 12 | Long Examination 3 |
| 13 | Machine Learning   * Learning from Examples * Knowledge in Learning * Learning Probabilistic Models |
| 14 | Machine Learning   * Deep Learning * Reinforcement Learning |
| 15 | Communicating, Perceiving, and Acting   * Natural Language Processing * Deep Learning for Natural Language Processing |
| 16 | Communicating, Perceiving, and Acting   * Robotics * Computer Vision |
| 17 | Conclusions   * Philosophy, Ethics, and Safety of AI * The Future of AI |
| 18 | Long Examination 4 |

1. Course Outcome:

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| **Course Objectives**  *A student completing this course should at the minimum be able to****:*** | |
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| 1 | Explain the concept Artificial Intelligence. |
| 2 | Examine Intelligent Agents and categorize them. |
| 3 | Apply Searching in a problem solving. |
| 4 | Assess Search in Complex Environments. |
| 5 | Construct Constraint Satisfaction Problem |
| 6 | Demonstrate Adversarial Search in Games |
| 7 | Compare Logical Agents and Intelligent Agents |
| 8 | Formulate First Order Logic in Artificial Intelligence. |
| 9 | Appraise Inference in the First order logic |
| 10 | Organize a Knowledge Representation |
| 11 | Value Automated Planning |
| 12 | Quantify Uncertainty |
| 13 | Distinguish Probabilistic Reasoning from Probabilistic Reasoning over Time |
| 14 | Categorize Simple Decisions Making and Complex Decisions Making |
| 15 | Employ Multiagent Decision Making |
| 16 | Evaluate Probabilistic Programming |
| 17 | Practice Learning from Examples |
| 18 | Evaluate Knowledge in Learning |
| 19 | Manage Learning in Probabilistic Models |
| 20 | Differentiate Deep Learning to Reinforcement Learning |
| 21 | Discuss Natural Language Processing |
| 22 | Explain Deep Learning for Natural Language Processing |
| 23 | Apply AI to Robotics and Computer Vision |
| 24 | Value the Philosophy, Ethics, and Safety of AI |
| 25 | Support the Future of AI. |

1. Course Evaluation:

***Components Percentage***

Quizzes/Activity 30%

Project (programming application) 30%

Long Examinations 40%

**Total 100%**

1. Reference:

Russell, S. and Norvig, P. (2022). Artificial Intelligence: A Modern Approach, 4th edition, Global Edition. Pearson Education Limited, United Kingdom.

A picture containing light, night sky

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Hurbans, R. (2020). Grokking Artificial Intelligence Algorithm, MEAP Edition, Version 5. Manning Publications, USA.

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