**COURSE PLAN**

|  |  |
| --- | --- |
| Target | 50% (marks) |
| Level-1 | 40% (population) |
| Level-2 | 50% (population) |
| Level-3 | 60% (population) |

1. **Method of Evaluation**

|  |  |
| --- | --- |
| **UG** | **PG** |
| Quizzes/Tests, Assignments (30%) | Quizzes/Tests, Assignments, seminar (50%) |
| Mid Examination (20%) | End semester (50%) |
| End examination (50%) |  |

1. **Passing Criteria**

|  |  |  |
| --- | --- | --- |
| **Scale** | **PG** | **UG** |
| **Out of 10 point scale** | SGPA – “6.00” in each semester  CGPA – “6.00”  Min. Individual Course Grade  –  “C”  Course Grade  Point –  “4.0” | SGPA – “5.0” in each semester  CGPA – “5.0”  Min. Individual Course Grade  –  “C”  Course Grade  Point –  “4.0” |

\*for PG, passing marks are 40/100 in a paper

\*for UG, passing marks are 35/100 in a paper

1. **Pedagogy**

* Presentations
* Flipped Classroom sessions
* Think-Pair-Share Activities
* Video Lectures
* Class Test
* Quiz
* Assignments
* Concept diary (needs to be maintained by students-short and concise notes which include course concepts that he/she has understood.)

1. **References:**

|  |  |  |  |
| --- | --- | --- | --- |
| Text Books | Web resources | Journals | Reference books |
| 1. Russel,S., and Norvig,P., (2015), Artificial Intelligence: A Modern Approach, 3rd  Edition, Prentice Hall |  |  | 1. Saroj Kaushik, Artificial Intelligence, Cengage Learning India, First Edition, 2011 |

**GUIDELINES TO STUDY THE SUBJECT**

**Instructions to Students:**

1. Go through the 'Syllabus' in the Black Board section of the website (https://learn.upes.ac.in) to find the Reading List.
2. Get your schedule and try to pace your studies as close to the timeline as possible.
3. Get your online lecture notes (Content, videos) in the Lecture Notes section.  These are our lecture notes. Make sure you use them during this course.
4. Check your blackboard regularly
5. Go through the study material.
6. Check emails and announcements on the blackboard.
7. Keep updated with the posts, assignments, and examinations which shall be conducted on the blackboard.
8. Be regular, so that you do not suffer in any way
9. C**ell Phones and Other Electronic Communication Devices:** Cell phones and other electronic communication devices (such as Blackberries/Laptops) are not permitted in classes during Tests or the Mid/Final Examination. Such devices MUST be turned off in the classroom.
10. **E-Mail and online learning tool:** Each student in the class should have an e-mail id and a password to access the LMS system regularly. Regularly, important information – Date of conducting class tests, guest lectures, via online learning tool. The best way to arrange meetings with us or ask specific questions is by email and prior appointment. All the assignments preferably should be uploaded on online learning tool. Various research papers/reference material will be mailed/uploaded on online learning platform time to time.
11. **Attendance:** Students are required to have minimum attendance of 75% in each subject. Students with less than said percentage shall NOT be allowed to appear in the end semester examination.

This much should be enough to get you organized and on your way to having a great semester! If you need us for anything, send your feedback through e-mail [to](mailto:abc@ddn.upes.ac.in) your concerned faculty. Please use an appropriate subject line to indicate your message details.

There will no doubt be many more activities in the coming weeks. So, to keep up to date with all the latest developments, please keep visiting this website regularly.

**RELATED OUTCOMES**

1. **The expected outcomes of the Program are:**

|  |  |
| --- | --- |
| PO1 | **Computational Knowledge:** Apply knowledge of computing fundamentals and domain knowledge. |
| PO2 | **Problem Analysis:** Identify, formulate, and solve complex computing problems reaching substantiated conclusions |
| PO3 | **Development of Solutions:** Design and evaluate solutions for complex computing problems with appropriate consideration |
| PO4 | **Investigations of complex Computing problems:** Use research-based knowledge and research methods for analysis and interpretation of data, and synthesis of the information to provide valid conclusions |
| PO5 | **Modern Tool Usage:** Create, identify, and apply appropriate techniques, resources, and modern computing tools to complex Computing activities. |
| PO6 | **Professional Ethics:** Understand and commit to professional ethics and cyber regulations for professional computing practices. |
| PO7 | **Life-long Learning:** Identify the need and have the ability, to engage in independent learning as a computing professional. |
| PO8 | **Communication Efficacy:** Communicate effectively with the computing community, and with society. |
| PO9 | **Individual and Teamwork:** Function effectively in diverse teams and in multidisciplinary environments. |
| PO10 | **Innovation and Entrepreneurship:** Identify a timely opportunity and use innovation to pursue that opportunity. |
| PO11 | **Research Skill -** Extract information through literature survey and experiments, apply appropriate research methodologies, techniques and tools, design, conduct experiments, analyze and interpret data, and contribute individually/in group(s) to the development of scientific/technological knowledge in one or more domains of computer applications. |
| PO12 | **Independent and Reflective Learning -** Observe and examine critically the outcomes of one’s actions and make corrective measures subsequently and learn from mistakes without depending on external feedback. |

1. **The expected outcomes of the Specific Program are: (upto3)**

**AI and ML:**

|  |  |
| --- | --- |
| PSO1 | Apply the knowledge of AI to find solutions for real-life application. |
| PSO2 | Domain Specific Learning and Contribution: Students will be able to design hardware or software solutions in AI, Imaging, Analytics and Security Domains Computer Science basics. Able to contribute to the digital and technical transformation of society through humanized product development. |

1. **The expected outcomes of the Course are: (minimum 3 and maximum 6)**

|  |  |
| --- | --- |
| CO 1 | Understand the basics of the theory and practice of Artificial Intelligence as a discipline and capable of problem formulation. |
| CO 2 | Formulate and solve given problem using Logic Programming and Knowledge  Representation. |
| CO 3 | Design and analyze different issues in Expert Systems and Applications. |
| CO 4 | Apply machine learning, natural language processing, and neural network learning for solving AI problems. |

1. **Co-Relationship Matrix**

Indicate the relationships by1- Slight (low) 2- Moderate (Medium) 3-Substantial (high)

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Program**  **Outcomes**  **Course Outcomes** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** |
| **CO 1** |  |  | 3 | 2 | 2 |  |  |  |  |  |  |  | 2 | 2 |
| **CO 2** |  |  | 1 | 3 | 2 |  |  |  |  |  |  |  | 2 | 2 |
| **CO 3** |  | 3 | 1 | 3 | 3 |  |  |  |  |  |  |  | 3 | 3 |
| **CO 4** |  | 2 | 2 | 2 | 2 |  |  |  |  |  |  |  | 2 | 2 |
| **Average** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

1. **Course outcomes assessment plan:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **components**  **Course Outcomes** | **Assignment** | **Test/Quiz** | **End Semester** | **Any other** |
| **CO 1** |  | **□** | **□** |  |
| **CO 2** | **□** |  | **□** |  |
| **CO 3** |  | **□** | **□** |  |
| **CO 4** |  | **□** | **□** |  |
| **CO 5** | **□** |  | **□** |  |

**BROAD PLAN OF COURSE COVERAGE**

**Course Activities:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **S. No.** | **Description** | **Planned** | | | **Remarks** |
| **From** | **To** | **No. of Sessions** |
| **1.** | Introduction |  |  |  |  |
| **2.** | Logic Programming and Knowledge Representation |  |  |  |  |
| **3.** | Expert System and Applications |  |  |  |  |
| **4.** | Machine - Learning Paradigms |  |  |  |  |
| **5.** | Artificial Neural Networks and Natural Language Processing |  |  |  |  |
| **6.** | Advanced Knowledge Representation Techniques |  |  |  |  |

Sessions: Total No. of Instructional periods available for the course

**SESSION PLAN**

**UNIT-I**

|  |  |  |
| --- | --- | --- |
| **Lecture No.** | **Topics to be Covered** | **CO Mapped** |
| 1 | Philosophy of artificial intelligence, Definitions - Evolution of AI | CO1 |
| 2 | Applications of AI, Classification of AI | CO1 |
| 3 | Intelligent Agents: Agents and Environment-Nature of Environment, Structure Environment | CO1 |
| 4 | Philosophical and ethical issues | CO1 |

**SESSION PLAN**

**UNIT-II**

**Logic Programming and Knowledge Representation**

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| --- | --- | --- |
| **Lecture No.** | **Topics to be Covered** | **CO Mapped** |
| 1 | Logic Programming: Introduction | CO 2 |
| 2 | Propositional Calculus | CO 2 |
| 3 | Basic structural Modeling: Classes, Relationships, Common Mechanisms, Diagrams | CO 2 |
| 4 | Natural Deduction System, A System in Propositional Logic | CO 2 |
| 5 | Resolution, Refutation in Propositional Logic | CO 2 |
| 6 | Predicate Logic, Logic Programming | CO 2 |
| 7 | Knowledge Representation: Introduction, Approaches to Knowledge Representation,  Knowledge Representation using Semantic Network | CO 2 |

**SESSION PLAN**

**UNIT-III: Expert System and Applications**

|  |  |  |
| --- | --- | --- |
| **Lecture No.** | **Topics to be Covered** | **CO Mapped** |
| 1 | Introduction, Phases in Building Expert Systems | CO 3 |
| 2 | Expert System Architecture | CO 3 |
| 3 | Expert Systems Vs Traditional Systems | CO 3 |
| 4 | Truth Maintenance Systems |  |
| 5 | Application of Expert Systems | CO 3 |
| 6 | List of Shells and tools | CO 3 |

**SESSION PLAN**

**UNIT-IV**

**Machine - Learning Paradigms**

|  |  |  |
| --- | --- | --- |
| **Lecture No.** | **Topics to be Covered** | **CO Mapped** |
| 1 | Introduction, Machine Learning System | CO 4 |
| 2 | Supervised and Unsupervised Learning | CO 4 |
| 3 | Inductive Learning | CO 4 |
| 4 | Learning Decision Trees | CO 4 |
| 5 | Deductive Learning | CO 4 |
| 6 | Clustering, Support Vector Machines | CO 4 |

**SESSION PLAN**

**UNIT-V**

**Artificial Neural Networks and Natural Language Processing**

|  |  |  |
| --- | --- | --- |
| **Lecture No.** | **Topics to be Covered** | **CO Mapped** |
| 1 | Introduction Artificial Neural Networks | CO5 |
| 2 | Single - Layer Feed Forward Networks | CO5 |
| 3 | Multi-Layer Feed Forward Networks | CO5 |
| 4 | Radial-Basis Function Networks | CO5 |
| 5 | Design Issues of Artificial Neural Networks | CO5 |
| 6 | Recurrent Networks | CO5 |

**SESSION PLAN**

**UNIT-V**

**Advanced Knowledge Representation Techniques**

|  |  |  |
| --- | --- | --- |
| **Lecture No.** | **Topics to be Covered** | **CO Mapped** |
| 1 | Case Grammars, Semantic Web | CO5 |
| 2 | Natural Language Processing: Introduction | CO5 |
| 3 | Sentence Analysis Phases | CO5 |
| 4 | Grammars and Parsers | CO5 |
| 5 | Types of Parsers | CO5 |
| 6 | Semantic Analysis, Universal Networking Knowledge. | CO5 |