**COURSE DESCRIPTION FORM**

**INSTITUTION**  National University of Computer and Emerging Sciences

Computer Science

**PROGRAM (S) TO BE**

**EVALUATED**

1. **Course Description**

(Fill out the following table for each course in your computer science curriculum. A filled-out form should not be more than 2-3 pages.)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Course Code** | CL2002 | | | |
| **Course Title** | Artificial Intelligence Lab | | | |
| **Credit Hours** | 1 | | | |
| **Prerequisites by Course(s) and Topics** |  | | | |
| **Assessment Instruments with Weights** (homework, quizzes, midterms, final, programming assignments, lab work, etc.) | Assessment with the weight.   |  |  | | --- | --- | | **Assessment Type** | **Weight** | | Lab Evaluations | 50 | | Final | 50 | | | | |
| **Course Coordinator** | Mr. Zeshan Khan | | | |
| **URL (if any)** |  | | | |
| **Current Catalog Description** |  | | | |
| **Textbook** (or **Laboratory Manual** for Laboratory Courses) | Lab Manual | | | |
| **Reference Material** |  | | | |
| **Course Goals** | |  | | --- | | **A. Course Learning Outcomes (CLOs)** | | 1. Understand Artificial Intelligence 2. Apply AI Algorithms on optimization problems | | |  |  | | --- | --- | | **B. Program Learning Outcomes** | | | For each attribute below, indicate whether this attribute is covered in this course or not. Leave the cell blank if the enablement is little or non-existent. | | | |  |  | | --- | --- | | 1. Computing Knowledge: | Apply knowledge of mathematics, natural sciences, computing fundamentals, and a computing specialization to the solution of complex computing problems. | | ✔ | | |  |  | | --- | --- | | 2. Problem Analysis: | Identify, formulate, research literature, and analyse complex computing problems, reaching substantiated conclusions using first principles of mathematics, natural sciences, and computing sciences. | |  | | |  |  | | --- | --- | | 3. Design/Develop Solutions: | Design solutions for complex computing problems and design systems, components, and processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations. | |  | | |  |  | | --- | --- | | 4. Investigation & Experimentation: | Conduct investigation of complex computing problems using research based knowledge and research based methods | | ✔ | | |  |  | | --- | --- | | 5. Modern Tool Usage: | Create, select, and apply appropriate techniques, resources and modern computing tools, including prediction and modelling for complex computing problems. | |  | | |  |  | | --- | --- | | 6. Society Responsibility | Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal, and cultural issues relevant to context of complex computing problems. | |  | | |  |  | | --- | --- | | 7. Environment and Sustainability: | Understand and evaluate sustainability and impact of professional computing work in the solution of complex computing problems. | |  |  | |  | | |  |  | | --- | --- | | 8. Ethics: | Apply ethical principles and commit to professional ethics and responsibilities and norms of computing practice. | |  | | |  |  | | --- | --- | | 9. Individual and Team Work: | Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings. | |  | | |  |  | | --- | --- | | 10. Communication: | Communicate effectively on complex computing activities with the computing community and with society at large. | |  | | |  |  | | --- | --- | | 11. Project Mgmnt and Finance: | Demonstrate knowledge and understanding of management principles and economic decision making and apply these to one's own work as a member or a team. | |  | | |  |  | | --- | --- | | 12. Life Long Learning: | Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological changes. | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | |  |  | | **C. Relation between CLOs and PLOs**  (CLO: Course Learning Outcome, PLOs: Program Learning Outcomes) | | | | | | | | | | | | | | | |  | | | |  |  | | **PLOs** | | | | | | | | | | | | **1** | | **2** | | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | | **CLOs** | | 1 | | ✔ | |  | |  |  |  |  |  |  |  |  |  |  | | 2 | |  | |  | |  | ✔ |  |  |  |  |  |  |  |  | | | | | |
| **Topics Covered in the Course, with Number of Lectures on Each Topic** (assume 15-week instruction and one-hour lectures) | |  |  |  |  | | --- | --- | --- | --- | |  | | | | | List of Topics | No. of Weeks | Contact Hours | CLO | | Introduction to the Artificial Intelligence, AI Tools | **1** | **3** | **1** | | Python Introduction | **1** | **3** | **1** | | Agents, Environment and Multi Agent System | **1** | **3** | **1** | | Uniform Search Algorithms,  BFS, DFS, Iterative deepening, uniform cost, bidirectional | **3** | **9** | **2** | | Informed Search Algorithms | **2** | **6** | **2** | | Local Search Algorithms | **2** | **6** | **2** | | Genetic Algorithms | **2** | **6** | **2** | | Machine Learning | **1** | **3** | **2** | | Perceptron/Learning | **1** | **3** | **2** | | Clustering, K-means | **1** | **3** | **2** | | Total | **15** | **45** |  | | | | |
| **Laboratory Projects/Experiments Done in the Course** | Yes | | | |
| **Programming Assignments Done in the Course** | Yes, Python | | | |
| **Class Time Spent on** (in credit hours) | **Theory** | **Problem Analysis** | **Solution Design** | **Social sand Ethical Issues** |
| 0.5 | 0.5 | 2.0 | 0 |
| **Oral and Written Communications** | No | | | |

**Instructor Name: Mr. Zeshan Khan**

**Instructor Signature**

**Dated: Fall 2021**