| COURSE INFORMATON | | | | | |
|---|---|---|---|---|---|
| **Course Title** | *Code* | *Semester* | *L+P Hour* | *Credits* | *ECTS* |
| **ARTIFICIAL INTELLIGENCE** | **CSE562** | **1** | **3** | **3** | **10** |

| | |
|---|---|
| **Prerequisites** | |

| | |
|---|---|
| **Language of Instruction** | English |
| **Course Level** | Graduate |
| **Course Type** | Elective |
| **Course Coordinator** | |
| **Instructors** | Prof.Dr. Emin Erkan Korkmaz |
| **Assistants** | |
| **Goals** | The aim of this course is to provide students the knowledege about the basic techniques and methodologies of artificial intelligence and abilities to apply artificial intelligence methods on practical problems. |
| **Content** | Basic concepts and techniques of AI. Problem solving in AI, informed and uninformed search techniques, Local search techniques and simulated annealing.. Meta-heuristic search methods. Introducion to Neural Networks. Game playing, Prolog overview, knowledge representation and reasoning. |

| **Course Learning Outcomes** | **Program Learning Outcomes** | **Teaching Methods** | **Assessment Methods** |
|---|---|---|---|
| 1) Knolwedege about the basic methodologies in artificial intelligence. | 1 | 1,2 | A,C,D |
| 2) Ability to use knowledge to formulate, and solve practical problems using artificial intelligence techniques. | 2 | 1,2 | A,C,D |

| | |
|---|---|
| **Teaching Methods:** | 1: Lecture, 2: Question-Answer, 3: Lab, 4: Case-study |
| **Assessment Methods:** | A: Testing, B: Experiment, C: Homework, D: Project |

| COURSE CONTENT | | |
|---|---|---|
| **Week** | **Topics** | **Study Materials** |
| 1 | Introductory terms, foundations, history and philosophy of AI | Textbook |
| 2 | Intelligent Agents | Textbook |
| 3 | Problem Solving and Introduction to Search Methods | Textbook |
| 4 | Uninformed Search Methodologies | Textbook |
| 5 | Heuristic Search | Textbook |
| 6 | Game Playing | Textbook |
| 7 | Meta-Heuristics | Textbook |
| 8 | Neural Networks | Textbook |
| 9 | Knowledge Based Agents | Textbook |
| 10 | First Order Logic | Textbook |
| 11 | Inference in First Order Logic | Textbook |
| 12 | Prolog and Logic  Programming | Textbook |
| 13 | Prolog and Logic  Programming | Textbook |
| 14 | Probabilistic Reasoning | Textbook |

| RECOMMENDED SOURCES | |
|---|---|
| **Textbook** | Artificial Intelligence: A Modern Approach. Stuart Russell, Peter Norvig, Prentice Hall, Second Edition |
| **Additional Resources** | |

| MATERIAL SHARING | |
|---|---|
| **Documents** | |
| **Assignments** | |
| **Exams** | |

| ASSESSMENT | | |
|---|---|---|
| **IN-TERM STUDIES** | **NUMBER** | **PERCENTAGE** |
| Mid-terms | 1 | 40 |
| Assignment | 3 | 30 |
| Project | 1 | 30 |
| **Total** | | **100** |
| **CONTRIBUTION OF FINAL EXAMINATION TO OVERALL GRADE** | | 30 |
| **CONTRIBUTION OF IN-TERM STUDIES TO OVERALL GRADE** | | 70 |
| **Total** | | **100** |

| | |
|---|---|
| **COURSE CATEGORY** | Expertise/Field Courses |

| COURSE'S CONTRIBUTION TO PROGRAM | | | | | | | |
|---|---|---|---|---|---|---|---|
| No | Program Learning Outcomes | Contribution | | | | | |
| | | 1 | 2 | 3 | 4 | 5 | |
| 1 | Ability to reach wide and deep knowledge through scientific research in the field of Computer Science and Engineering, evaluate, interpret and apply. | | | | X | | |
| 2 | Ability to use scientific methods to cover and apply limited or missing knowledge, and to integrate the knowledge of different disciplines. | | | X | | | |
| 3 | Ability to construct Computer Science and Engineering problems, develop methods to solve the problems and use innovative methods in the solution. | | | | X | | |
| 4 | Ability to develop new and/or original ideas and algorithm; develop innovative solutions in the design of system, component or process. | | | | X | | |
| 5 | Ability to have extensive knowledge about current techniques and methods applied in Computer Engineering and their constraints. | | | X | | | |
| 6 | Ability to design and implement analytical modeling and experimental research, solve and interpret complex situations encountered in the process. | | | | X | | |
| 7 | Ability to use a foreign language (English) at least at the level of European Language Portfolio B2 in verbal and written communication. | | | | X | | |
| 8 | Ability to lead in multidisciplinary teams, develop solutions to complex situations and take responsibility. | X | | | | | |
| 9 | Ability to pass process and the results in Computer Science and Engineering field, in national and international area in or outside of the field, systematically and clearly in written or oral form. | X | | | | | |
| 10 | Awareness of the social, legal, ethical and moral values, and the ability to conduct research and implementation work within the framework of these values. | X | | | | | |
| 11 | Awareness of the new and emerging applications in Computer Science and Engineering field, and the ability to examine them and learn if necessary. | | | | X | | |
| 12 | Ability to describe the social and environmental dimensions of Computer Science and Engineering applications. | | X | | | | |

| ECTS ALLOCATED BASED ON STUDENT WORKLOAD BY THE COURSE DESCRIPTION | | | |
|---|---|---|---|
| Activities | Quantity | Duration (Hour) | Total Workload (Hour) |
| Course Duration (Excluding the exam week: 13x Total course hours) | 13 | 3 | 39 |
| Hours for off-the-classroom study (Pre-study, practice) | 14 | 4 | 56 |
| Midterm examination | 1 | 2 | 2 |
| Homework | 3 | 20 | 60 |
| Project | 1 | 80 | 80 |
| Final examination | 1 | 3 | 3 |
| **Total Work Load** | | | 240 |
| **Total Work Load / 25 (h)** | | | 9.60 |
| **ECTS Credit of the Course** | | | 10 |