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| **ISHIK UNIVERSITY FACULTY OF SCIENCE Department of INFORMATION TECHNOLOGY,2017-2018 Spring Course Information for** **IT 456 INTRO TO ARTIFICIAL INTELLIGENCE & ROBOTICS** |

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| --- | --- |
| **Course Name:** | INTRO TO ARTIFICIAL INTELLIGENCE & ROBOTICS |
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| --- | --- | --- | --- | --- | --- | --- |
| **Code** | **Course type** | **Regular Semester** | **Theoretical** | **Practical** | **Credits** | **ECTS** |
| IT 456 | 2 | 8 | 3 | - | 3 |  |

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| **Name of Lecturer(s)-Academic Title:** | Goran Abdulrahman Mohammed - |
| **Teaching Assistant:** | Goran Abdulrahman |
| **Course Language:** | ENGLISH |
| **Course Type:** | Non-area Elective |
| **Office Hours** | a |
| **Contact:** | Email:goran.abdulrahman@ishik.edu.iq Tel:+9647700760123  |
| **Teacher's academic profile:** | PhD..  |
| **Course Objectives:** | The course captures the essence of A.I. and introduces basic ideas regarding knowledge representation and search algorithms. The course will introduce the concepts and the techniques behind implementing these ideas. One of the major fields of A.I. is the field of Robotics. This field is currently enjoying tremendous scientific, practical, and popular success in various fields. This course will also cover some of the basic concepts in robotics systems covering issues like sensors, actuators, and describing the most important approaches of robot control. The field of robotics is strongly related to the engineering field. However, since this course is an introductory course aimed for I.T. department students, it covers all the necessary background information without delving into the inner workings of the subjects presented |
| **Course Description (Course overview):** | The course captures the essence of A.I. and introduces basic ideas regarding knowledge representation and search algorithms. The course will introduce the concepts and the techniques behind implementing these ideas. Artificial Intelligence is the science of making computer software that reasons about the world around it. The theory and insights brought about by AI research will set the trend in the future of computing. One of the major fields of A.I. is the field of Robotics. This field is currently enjoying tremendous scientific, practical, and popular success in various fields. This course will also cover some of the basic concepts in robotics systems covering issues like sensors, actuators, and describing the most important approaches of robot control. The field of robotics is strongly related to the engineering field. However, since this course is an introductory course aimed for I.T. department students, it covers all the necessary background information without delving into the inner workings of the subjects presented. |
| **COURSE CONTENT**

|  |  |  |  |
| --- | --- | --- | --- |
| **Week** | **Hour** |               **Date**               | **Topic** |
| **1** | 3 | 4-8/2/2018 | Introduction to Artificial Intelligent and Robotics |
| **2** | 3 | 11-15/2/2018 | A brief History, uses and applications of A.I and Robotics |
|  |  |  |  |
| **3** | 3 | 18-22/2/2018 | Neural Network - Supervised Learning |
| **4** | 3 | 25/2-1/3/2018 | Neural Network - Backpropagation |
|  |  |  |  |
| **5** | 3 | 4-8/3/2018 | Genetic Algorithm |
| **6** | 3 | 25-29/3/2018 | Fuzzy Logic |
|  |  |  |  |
| **7** | 3 | 1-5/4/2018 | Midterm Exam |
| **8** | 3 | 8-12/4/2018 | State space graph and problem representation |
|  |  |  |  |
| **9** | 3 | 15-19/4/2018 | Midterm Exam |
| **10** | 3 | 22-26/4/2018 | Robot movements: Effectors and Actuators, DOF, locomotion and stability, wheel and steering |
|  |  |  |  |
| **11** | 3 | 29/4-3/5/2018 | Sensors:data Processing, passive and active |
| **12** | 3 | 6-10/5/2018 | Complex sensors: ultrasonic and laser, camera and image processing. |
|  |  |  |  |
| **13** | 3 | 13-17/5/2018 | Robot Control: Feedback, error |
| **14** | 3 | 20-24/5/2018 | Programming language, Robot Lab, |
|  |  |  |  |
| **15** | 3 | 27-31/5/2018 | Quiz Theoretical and Lectures Review |
| **16** | 3 | 3-7/6/2018 | Final Exam |
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| **17** | 3 | 10-14/6/2018 | Final Exam |

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| **COURSE/STUDENT LEARNING OUTCOMES**

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|  |  |
| **1** | Understand the reasons behind, goals and trends of AI |
| **2** | AI application areas |
| **3** | Basic knowledge representations schemes, their associated search techniques and state­space search |
| **4** | Robots background and basic robot components and its control |
| **5** | Methods of robot control and representation |

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| **COURSE'S CONTRIBUTION TO PROGRAM OUTCOMES**(Blank : no contribution, I: Introduction, P: Profecient, A: Advanced )

|  |  |  |
| --- | --- | --- |
|  | **Program Learning Outcomes** | **Cont.** |
| **1** | An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution | I |
| **2** | An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs | I |
| **3** | An ability to function effectively on teams to accomplish a common goal |  |
| **4** | An understanding of professional, ethical, legal, security, social, and economic issues and responsibilities | I |
| **5** | An ability to analyze the local and global impact of computing on individuals, organizations, and society |  |
| **6** | An ability to use current techniques, skills, and tools necessary for computing practice | P |
| **7** | An ability to use and apply current technical concepts and practices in the core information technologies of human computer interaction, information management, programming, networking, web systems and technologies |  |
| **8** | An ability to identify and analyze user needs and take them into account in the selection, creation, evaluation and administration of computer-based systems | P |
| **9** | An ability to effectively integrate IT-based solutions into the user environment | I |
| **10** | An ability apply problem solving skills, core IT concepts, best practices and standards to information technologies |  |
| **11** | An ability to identify and evaluate organizational requirements and current and emerging technologies |  |
| **12** | An ability to select, design, integrate and administer IT-based solutions into the organizational environment |  |

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| **Prerequisites (Course Reading List and References):** | None |
| **Student's obligation (Special Requirements):** | Attend lectures, take quizzes and exam, participate in class |
| **Course Book/Textbook:** | Artificial Intelligence and Games. By: Georgios N. Yannakakis and Julian Togelius. Introduction to AI Robotics Robin R. Murphy |
| **Other Course Materials/References:** | Other related videos |
| **Teaching Methods (Forms of Teaching):** | Lectures, Excersises, Presentation, Assignments, Case Studies, Demonstration |
| **COURSE EVALUATION CRITERIA**

|  |  |  |
| --- | --- | --- |
| **Method** | **Quantity** | **Percentage (%)** |
| Attendance | 1 | 10 |
| Quiz | 1 | 10 |
| Homework | 1 | 10 |
| Midterm Exam(s) | 1 | 30 |
| Final Exam | 1 | 40 |
| **Total** | **100** |
| **Examinations:**Essay Questions, Fill in the Blanks, Short Answers, Matching |  |  |

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| **Extra Notes:** |
| **ECTS (ALLOCATED BASED ON STUDENT) WORKLOAD**

|  |  |  |  |
| --- | --- | --- | --- |
| **Activities** | **Quantity** | **Duration (Hour)** | **Total Work Load** |
| Course Duration (Including the exam week: 16x Total course hours) |  |  | 0 |
| Hours for off-the-classroom study (Pre-study, practice) |  |  | 0 |
| Assignments Mid-terms |  |  | 0 |
| Final examination |  |  | 0 |
| Other |  |  | 0 |
| **Total Workload** | **0** |
| **ECTS Credit (Total workload/25)** | **0** |

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**Peer review**

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| --- | --- | --- |
| Signature: | Signature: | Signature: |
| Name: | Name: | Name: |
| Lecturer                                                                       | Head of Department                                                         | Dean |

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