



UNIVERSITI TEKNOLOGI MARA

CSC583: ARTIFICIAL INTELLIGENCE ALGORITHMS

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| Course Name (English) | ARTIFICIAL INTELLIGENCE ALGORITHMS APPROVED |
| Course Code | CSC583 |
| MQF Credit | 3 |
| Course Description | The aim of this course is to introduce students to the fundamentals of key intelligent systems technologies including expert systems, neural networks, fuzzy systems, evolutionary computation and swarm intelligence. Besides that, the students will also be familiarized with the integration of intelligent systems technologies for science and engineering applications |
| Transferable Skills | Demonstrate ability to understand and apply artificial intelligence methods in solving real-world problems. |
| Teaching Methodologies | Lectures, Lab Work, Discussion |
| CLO | CLO1 Apply concepts of artificial intelligence CLO2 Construct problem solving in artificial intelligence methods CLO3 Demonstrate professionalism in artificial intelligence methods |
| Pre-Requisite Courses | No course recommendations |
| Topics | |
| 1. Introduction to Artificial Intelligence 1.1) Theory of intelligence 1.2) Artificial Intelligence Methods 1.3) Artificial Intelligence Programming Paradigm | |
| 2. Knowledge-based System and Fuzzy Expert System 2.1) Rule-based expert system 2.2) Uncertainty management 2.3) Fuzzy expert system 2.4) Trending areas in Expert System | |
| 3. Artificial Neural Networks 3.1) Fundamentals of artificial neural network 3.2) Supervised learning 3.3) Unsupervised learning 3.4) Reinforcement learning 3.5) Deep Learning 3.6) Trending areas in ANN | |
| 4. Evolutionary Computation 4.1) Fundamentals of evolutionary computation 4.2) Genetic Algorithm 4.3) Evolutionary Programming 4.4) Genetic Programming 4.5) Trending areas in EC | |
| 5. Swarm Intelligence 5.1) Fundamentals of swarm intelligence 5.2) Trending areas in SI | |
| 6. Hybrid Intelligent System 6.1) Neural expert systems 6.2) Neuro-fuzzy systems 6.3) Evolutionary neural networks 6.4) Trending areas in hybrid Intelligent Systems | |

7. Trending areas in Machine Learning and Robotics
7.1) N/A

| Assessment Breakdown | % |
|-----------------------|--------|
| Continuous Assessment | 60.00% |
| Final Assessment | 40.00% |

| Details of Continuous Assessment | Assessment Type | Assessment Description | % of Total Mark | CLO |
|----------------------------------|-----------------|---|-----------------|------|
| | Assignment | Presentation of state-of-the-art of AI (SPT=1.6) | 5% | CLO1 |
| | Assignment | Construction of Prolog Program (SPT=2.1) | 5% | CLO2 |
| | Assignment | ANN application (SPT=8.5) | 25% | CLO2 |
| | Group Project | Computer vision application (SPT=1.8) | 5% | CLO3 |
| | Test | Test 1, topics covered : Chapter 1 - 4 (F2F=1, SPT=3) | 10% | CLO1 |
| | Test | Test 2, topics covered : chapter 5 - 6 (F2F=1, SPT=3) | 10% | CLO1 |

| Reading List | Reference Book Resources |
|--------------------|---|
| | <ul style="list-style-type: none"> • Stuart J. Russel and Peter Norvig 2016, <i>Artificial Intelligence: A Modern Approach</i>, Pearson International [ISBN: 10:1-1292-024] • Ethem Alpaydin 2014, <i>Introduction to Machine Learning</i>, 3rd Ed., MIT Press [ISBN: 978-0-262-028] • Dan Simon 2013, <i>Evolutionary Optimization Algorithms</i>, John Wiley and Sons Ltd [ISBN: 10:0470937416] • Diego Galar Pascual 2015, <i>Artificial Intelligence Tools</i>, CRC Press [ISBN: 9781466584051] • PARAG KULKARNI, PRACHI JOSHI 2015, <i>ARTIFICIAL INTELLIGENCE</i>, PHI Learning Pvt. Ltd. [ISBN: 9788120350465] • Jozef Kelemen, Jan Romportl, Eva Zackova 2012, <i>Beyond Artificial Intelligence</i>, Springer Science & Business Media [ISBN: 9783642344220] |
| Article/Paper List | This Course does not have any article/paper resources |
| Other References | This Course does not have any other resources |