Master of Science in Artificial Intelligence (MSAI)

Course Name	Research M	ethodology	طرق البحث		
Course	Course Code	Course No.	Credit Hour	Prerequisite(s)	
Information	0911-1663	663	3 (3-0-6)	Foundation of AI	
Course Track	Program Core	Elect	ives		

Course Description. The objective of this course is two folds. The first objective is to build the capacity of young professionals to investigate, identify, demonstrate and promote AI techniques for industrial applications. This part discusses how to promote cross-fertilizing AI techniques with other scientific fields today applied in industry. Then, the course introduce students to a range of ethical issues and restrictions that arise regarding current and future AI. Also, it discusses the moral framework and value system that assess the impact of AI systems. Topics of this part include, Robot rights, AI existential threats, Biases in learning algorithms, Ethics of AI in warfare, Ethics of AI in self-driving cars, moral harms to AI, AI and future of human jobs. The second part explores, in general, the required skill to conduct advanced research in AI and computer science. This part will guide the students how to plan, conduct and report on empirical investigations. It includes techniques and software for defining the research question and the research plan construction including main AI research domains. Making literature review including finding, evaluating and reviewing research papers. Experimental design including data generation, modeling and validation; algorithms calibration, testing, empirical evaluation and benchmarking; results representation, visualization and interpretation. Research reporting, presenting and publishing along with awareness about plagiarism and main AI periodicals. Ethics considerations and best professional practices for the above points will be developed.

Course Outcomes. After the completion of this course, the student will be able to:

- 1. Determine the AI technologies, tools, and algorithms that would be suitable for Industrial applications. [A]
- 2. **Demonstrate** an awareness of ethical implications of AI as a technological and social phenomenon. **[F]**
- 3. **Identify** a research topic in AI and justify its worth and study the research approaches, tools, techniques and methodologies used in AI research. **[B, E]**
- 4. **Develop** and apply fundamental research skills including literature reviews, collection and analysis of data and designing a research project in Al. **[C, D]**

Assessment	Assignments	15%	Quiz		Capstone	40 %			
Policy (PC)	Midterm	15%	Final Exam	30 %	Project	-10 /0			
	1. Dignum, Virginia, "Responsible Artificial Intelligence-How to Develop and Use AI in a Responsible								
Textbook	Way", Springer 2019. ISBN 9783030303716								
	2. Paul R. Cohen, "Empirical Methods for Artificial Intelligence" A Bradford Book 2017.								
References	1. Bostrom (2014), "Superintelligence: Paths, Dangers, Strategies," Oxford Univ Press.								
	2. Lin, P. (Ed.), (2017), "Robot Ethics 2.0", Oxford University Press.								

5. Acquire ability to express arguments clearly and concisely [E]

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