Master of Science in Artificial Intelligence ( <u>MSAI</u> )								
Course Name	Natural Language Processing		معالجة اللغات الطبيعية					
Course Information	Course Code	Course No.	Credit Hour	Prerequisite(s)				
	0911-1675	675	3 (3-0-6)	Machine Learning				
Course Track	Program Core		Electives					

**Course Description.** This course presents a broad graduate-level introduction to Natural Language Processing (Computational Linguistics), the study of computing systems that can process, understand, or communicate in human language. The primary focus of the course is on understanding various NLP tasks and related algorithms for effectively solving such inherently complex tasks of processing language. The course includes main elements such as Words, Speech, Syntax, and Semantics and pragmatics. These main elements includes minor topics will be covered as well. Some implemented versions of the algorithms (e.g., NLTK and GATE) will used to demonstrate how the techniques discussed in class "really work". Students will be engaged in the extensions and experimentation of existing tools and techniques as part of the course projects and assignments. Major topics may include the following: N-gram Language Models, Part of Speech Tagging, Syntactic Parsing, Semantic Analysis, Information Extraction, LTSM Recurrent Neural Network and other Machine Learning approaches to NLP as well as models and techniques related to Machine Translation, Information Extraction, Question Answering and Summarization, Dialogue and Conversational Agents

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

- 1. **Describe** concepts and theories in computational linguistics related to syntax, semantic, discourse and dialog etc. in computer processing of natural language. **[A, B]**
- 2. **Identify**, apply and evaluate appropriate algorithms and machine learning techniques to solve NLP tasks in text analysis, machine translation and speech processing, etc. **[C, D]**

3. Analyze and Evaluate the efficiency and performance of various algorithms and models. [E]

4. Apply appropriate NLP and machine learning techniques in practical applications. [E, F]

Assessment	Assignments	15%	Quiz		Capstone	40%			
Policy (PC)	Midterm	15%	Final	30%	Project	-10 /0			
Textbook	<ol> <li>Daniel Jurafsky and James H. Martin "Speech and Language Processing: An Introduction to Natural Language Processing," 2<sup>nd</sup> Edition, Prentice Hal, 2008. ISBN-13: 978-0131873216.</li> <li>Jacob Eisenstein "Introduction to Natural Language Processing" MIT Press, 2019, ISBN- 10: 0262042843.</li> </ol>								
References	<ol> <li>Manning and Schütze, "Foundations of Statistical Natural Language Processing", MIT Press. Cambridge, MA: May 1999. ISBN-13: 978-0262133609</li> <li>NLTK: Natural Language Toolkit, <u>www.nltk.org</u></li> <li>GATE: General Architecture for Text Engineering, <u>www.gate.ac.uk</u></li> </ol>								