

Course Name	Speech Recognition and Processing for Multimedia		التعرف على الكلام ومعالجته للوسائط المتعددة			
Course Information	Course Code	Course No.	Credit Hour	Prerequisite(s)		
	0911-1674	674	3 (3-0-6)	Pattern Recognition		
Course Track	<input type="checkbox"/> Program Core <input checked="" type="checkbox"/> Elective					
<p><b>Course Description.</b> The main purpose of this course is to provide a comprehensive and clear coverage of Speech Production, Acoustic Models of Speech &amp; Short-time Time Domain Processing, Time Domain Processing, Linear Prediction, Short-time Fourier Transform &amp; Applications, Homomorphic Signal Processing &amp; Cepstral Analysis. This course focuses on Auditory Models, Robustness &amp; Speech Enhancement, Automatic Speech Recognition (ASR). The course will enable the students to get acquisition with Classic HMM/GMM systems, Contemporary Neural Network systems, incl. end-to-end systems, Speech Coding, VAD, Speaker Recognition, Speaker Diarization, Emotion Recognition, Language Models, Conversational Systems, Speech Synthesis.</p>						
<p><b>Course Outcomes.</b> After the completion of this course, the student will be able to:</p> <ol style="list-style-type: none"><li>1. <b>Explain</b> the fundamentals of audio and speech signal processing and associated techniques. [A]</li><li>2. <b>Implement</b> practical problems with some basic audio and speech signal processing techniques. [E]</li><li>3. <b>Describe</b> and <b>implement</b> methods and systems for efficient quantization and coding of speech signals and <b>solve</b> given problems regarding these methods. [A, E]</li><li>4. <b>Describe</b> and <b>implement</b> methods for speech enhancement and solve given problems regarding these methods. [A, E]</li><li>5. <b>Describe</b> and <b>implement</b> pattern-recognition applications of speech processing, such as speaker and speech recognition, and evaluate these methods. [A, D]</li></ol>						
Assessment Policy (PC)	Assignments	15%	Quiz	---	Capstone Project	20 %
	Midterm	15%	Final	30%		
Textbook	1. Rabiner and Schafer, "Theory and Applications of Digital Speech Processing", Prentice Hall, 2010. 2. Huang, Acero, and Hon, "Spoken Language Processing", Prentice Hall, 2001.					
References	1. Rabiner and Juang, "Fundamentals of Speech Recognition", Prentice Hall, 1993. 2. Deller, Hansen, and Proakis, "Discrete-time Processing of Speech Signals", 2000. 3. Soumya Sen, Anjan Dutta, Nilanjan Dey, "Audio Processing and Speech Recognition: Concepts, Techniques and Research Overviews", Springer; 1 <sup>st</sup> edition, 2019, ISBN-13: 978-9811360978					