Sample Brief Course Description	
Course title	Special Topics in Communications
Course code	ECE 496
College	Engineering
Department / Program	Electrical Engineering / Communications Engineering
Year/ Level	5^{th} year / 9^{th} Level
Course Type	A. ☐ University ☐ College ☐ Department ■ Others b. ☐ Required ■ Elective
Credited Hours	3
Contact Hours	(LT:3, LB:0, TR:0)
Pre-requisites (if any)	Passing (136) credit hours
Co-requisites (if any)	---
Course description	This course will cover the following: Fundamental concepts in the design of state of the art of 4G /5G cellular systems including the design and implementation of Evolved Universal Terrestrial Network (E-UTRAN). Modulation schemes include QAM, SC-FDMA, and OFDM. The principles of radio transmission, and MIMO antennas. The basic concepts of channels allocation in LTE/5G cellular systems.

	Introduction to the physical layer in LTE/5G including frame structure, design of sequences, physical signals, physical shared channels, control channels (4G/5G), broadcast, and access channels.
Course Main Objectives	To allow student to: 1. Introduce mobile communication systems and their relevance in today's life. 2. Define and describe the function of each element in Evolved Universal Terrestrial Network. 3. Introduce different types of communication channels and their characteristics. 4. Be familiarize with new technologies such as SON and CR. 5. Acquire skills to carry out technical search.
Learning Outcomes	**1. Knowledge and Understanding:** 1.1 Define the principles, and technologies used in the design of 4G /5G cellular systems including the design of Evolved Universal Terrestrial Network (E-UTRAN 1.2 Describe the characteristics of communication channels, and the physical layer frame structure in 4G/5G systems 1.3 Recall knowledge of research methodologies in report written.
	2. Skills: 2.1 Write literature review for a given research problem. 2.2 Communicate effectively to demonstrate theoretical knowledge comprehension and specialized transfer of knowledge, skills, and complex ideas.
	3. Values: 3.1 Support work teams and providing leadership while establishing goals to meet and planning tasks.
References	**Required Textbooks:** C Cox, "An Introduction to 5G - The New Radio, 5G Network and Beyond", Wiley-Blackwell; 1st edition, 31 Dec 2020, ISBN-13 : 978-1119602668.