Academic Programs Booklet

College of Engineering

2024

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College of Engineering

List of MSc Programs *2*
List of College Requirement Courses *2*
MSC IN TELECOMMUNICATIONS AND NETWORKS ENGINEERING **3**
Program Components *3*
Detailed Study Plan *3*
Major Elective Courses ..... ***Error! Bookmark not defined.***
Course Description *4*
UNIVERSITY REQUIREMENTS COURSES DESCRIPTIONS **4**
COLLEGE REQUIREMENT COURSES DESCRIPTIONS ..... ERROR! BOOKMARK NOT DEFINED.

College of Engineering

List of MSc Programs

1- MSC. in Telecommunications and Networks Engieering

List of College Requirement Courses

Course Code	Course Title	Course Hours			Course Type	Pre requisite
		LEC	PRAC	CRD		
EEM600	**Principles of Artificial Intelligence**	4	0	4	MR	
EEM601	**Statistical Data Analysis and Research Methods**	4	0	4	MR	
EEM602	**Internet of Things (IoT)**	4	0	4	MR	
TNE603	**Modern Telecommunications systems**	4	0	4	MR	
TNE604	**Advanced computer Networks**	4	0	4	MR	
TNE605	**Special topics in Communications Systems**	4	0	4	MR	
EEM 699	**Thesis**	0	36	12	MR	Completion of 20 Credits

MSC in Telecommunications and Networks Engineering

Program Components

Course Type	CRD
University Requirement (UR)	0
College Requirement (CR)	0
General Studies Compulsory (GSCC)	0
Major Requirement (MR)	24
Major Elective (ME)[1]	0
General Studies Elective (GSE)[2]	0
Thesis	12
Total Credit (CRD)	36

Detailed Study Plan

Year 1 - Semester 1

Course Code	Course Title	Course Hours			Course Type	Pre requisite	Major GPA
		LEC	PRAC	CRD			
EEM600	Principles of Artificial Intelligence	4	0	4	MR		YES
EEM601	Statistical Data Analysis and Research Methods	4	0	4	MR		YES
EEM602	Internet of Things (IoT)	4	0	4	MR		YES

Year 1 - Semester 2

Course Code	Course Title	Course Hours			Course Type	Pre requisite	Major GPA
		LEC	PRAC	CRD			
TNE603	Modern Telecommunications systems	4	0	4	MR		YES
TNE604	Advanced computer Networks	4	0	4	MR		YES
TNE605	Special topics in Communications Systems	4	0	4	MR		YES

Year 2 - Semester 3

Course Code	Course Title	Course Hours			Course Type	Pre requisite	Major GPA
		LEC	PRAC	CRD			
EEM699	Thesis	0	36	12	MR	Completion of 20 Credits	NO

Course Description

Major Requirement Courses Descriptions (MR):

Course Code:	***EEM600***	**Course Title:**	***Principles of Artificial Intelligence***
Course Description:	This applied course is designed for graduate students. The goals of the course are to develop the skills necessary to identify appropriate statistical techniques, estimate models, analyze data, and interpret results for independent research and to critically evaluate contemporary research using advanced quantitative methods. The course will include descriptive and inference statistics, hypothesis testing, confidence intervals, processing and analysis of research data using different parametric and nonparametric statistical methods, regression analysis for linear and nonlinear models, and introduction to the design of experiments. Research methods, research ideas through literature survey, planning and designing specific methods for conducting research, analyzing data using scientific methodology and presenting research results in a systematic and objective way.		

Course Code:	**EEM601**	**Course Title:**	**Statistical Data Analysis and Research Methods**
Course Description:	This applied course is designed for graduate students. The goals of the course are to develop the skills necessary to identify an appropriate statistical technique, estimate models, analyze data, and interpret results for independent research and to critically evaluate contemporary research using advanced quantitative methods. The course will include descriptive and inference statistics, hypothesis testing, confidence intervals, processing and analysis of research data using different parametric and nonparametric statistical methods, regression analysis for linear and nonlinear models, and introduction to the design of experiments. Research methods, research ideas through literature survey, planning and designing specific methods for conducting research, analyzing data using scientific methodology and presenting research results in a systematic and objective way.		

Course Code:	**EEM602**	Course Title:	**Internet of Things (IoT)**
Course Description:	This advanced course delivers an understanding of Embedded Systems and Internet of Things and their enabling smart everywhere applications, like smart grid, smart city, smart home, industrial automation, telemetry, etc. Typical architectures of IoT systems are introduced, including microcontrollers and sensors. It is industrially focused, tailored to the demands of companies that design and manufacture mobile electronic equipment which interfaces with wireless networks and applications. Students will also learn how to use typical IoT enabling communications technologies.		

Course Code:	**TNE603**	**Course Title:**	**Modern Telecommunications Systems**
Course Description:	The modelling of the corresponding channels as well as their implications on the design and architecture of modern wireless telecommunications systems. The fundamental multiplexing and space time coding concepts as well as the principles and challenges of signal processing for broadband communications are also covered. This course also includes the latest technologies used in next generations of cellular and mobile networks and their applications.		

Course Code:	**TNE604**	**Course Title:**	**Advanced Computer Networks**
Course Description:	The Advanced Computer Networking course provides students with a comprehensive understanding of modern networking principles, protocols, and technologies. It emphasizes advanced topics in Cyber and Network Security and Multimedia Systems. By integrating theoretical concepts with practical applications, the course equips students with the skills necessary to address complex networking challenges. Topics covered include cryptography, secure communication protocols, network security protocols, multimedia compression, streaming, and real-time communications. Through a combination of lectures, hands-on labs, case studies, and projects, students gain the expertise to design, implement, and secure advanced networking systems. By the end of the course, students are prepared to apply their knowledge in real-world scenarios and present innovative solutions.		

Course Code:	**TNE605**	**Course Title:**	**Special Topics in Communications Systems**
Course Description:	This course will focus the following topics that is used in advanced and modern communications systems **Optical Communications:** covering the design and operating characteristics of advanced digital optical fibre communication systems. Students will obtain an understanding of the optical sources; principles of optical modulation; characteristics of optical fibre waveguides, optical amplifiers and optical receivers. The role of these components in determining the performance of practical optical communications systems will be applied. **Satellite Communications:** This part aims to provide students with an understanding of the operation of space technologies that are used to deliver satellite data for various applications. It features an overview of the space environment, spacecraft or satellite design principles, configuration and sub-systems, along with the techniques to undertake a basic space mission analysis and design for satellite applications. **Antenna and propagations:** Antennas and the propagation of radio signals on the physical layer are a fundamental aspect of telecommunications systems. It is essential to design devices that radiate electromagnetic waves over an air interface efficiently. Therefore, this course aim design suitable antenna to be used in wireless devices to operate and comply with suitable standards.		

Course Code:	**EEM699**	Course Title:	**Master's Thesis**
Course Description:	The **Master of Science in Telecommunications and Networks Engineering** offers students the opportunity to delve deeply into advanced or specialized topics related to AI systems and applications. It provides a platform for planning and executing significant projects, research endeavors, investigations, or innovative developments in the field.		