University Of Information Technology And Communications

جامعة تكنولوجيا المعلومات والاتصالات

First Cycle – Bachelor's Degree (B.Sc.) – Media Technology and Communications Engineering

بكالوريوس - هندسة تكنولوجيا الاعلام والاتصالات

Table of Contents

1. Overview

This catalogue is about the courses (modules) given by the program of Media Technology and Communications Engineering to gain the Bachelor of Science degree. The program delivers (48) Modules with (6000) total student workload hours and 240 total ECTS. The module delivery is based on the Bologna Process.

نظره عامه

يتناول هذا الدليل المواد الدراسية التي يقدمها برنامج هندسة تكنولوجيا الاعلام والاتصالات للحصول على درجة بكالوريوس العلوم. يقدم البرنامج (٤٨) مادة دراسية، مع (٦٠٠٠) إجمالي ساعات حمل الطالب و٢٤٠ إجمالي وحدات أوروبية. يعتمد تقديم المواد الدراسية على عملية بولونيا.

2. Undergraduate Courses 2023-2024

Module 1

Code	Course/Module Title	ECTS	Semester
MAT1	Mathematics I	6	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	-	48	102
Description			

Qualifying, training and teaching the student on the properties of matrices and their mathematical applications in the field of physics and engineering and benefiting from them in solving linear systems, as well as studying the types of functions of one variable and how to find ends and continuities, and then studying the most important basics of engineering by explaining derivations, integrations and their applications. The second part of this curriculum, which is the important part in scientific and engineering life, is solving differential equations of the first and second degree, linking them with the rest of the other topics, and explaining several ways to solve this type of differential equations. Mathematics lectures for the first course are given in 3 theoretical hours each week, interspersed with many examples, issues and discussions to clarify the vocabulary of the mathematics curriculum in more detail.

Module 2

Code	Course/Module Title	ECTS	Semester
DSD1	Digital Systems Design I	6	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	3	78	72
Description			

The aim of this course is to provide the students the ability to analyze, design and implement digital circuits; starting with combinational circuits and moving on to the sequential circuits, Foundation in design and analysis of the operation of digital gates. Design and implementation of combinational logic circuits. Concepts of numbering systems, Boolean algebra, Karnaugh maps, adders, subtractors, comparators, decoders, encoders, multiplexers and demultiplexers, and the design ability of different logic circuits

Module 3

Code	Course/Module Title	ECTS	Semester
ECT1	Electrical Circuits I	6	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	3	78	72
Description			

This course is designed to provide a complete overview of electric circuit analysis used in electrical engineering and electronics engineering. Electric circuit analysis is the most fundamental concept for electrical engineering, electronics engineering, and computer engineering. It is for that reason that electric circuit analysis is usually the first course taught in electrical, electronics, and computer engineering programs at universities, as basically anything related to electrical, electronics, or computer engineering stems from electric circuit analysis.In this course you will learn everything about electric circuits and electronics, from the basics such as what an electric circuit is and the fundamentals of electrical quantities like voltage, current, and power, all the way to complex techniques for analyzing electric and electronics circuits.

Module 4

Code	Course/Module Title	ECTS	Semester
EDW1	Engineering Drawing	3	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
	3	48	27
Description			

Engineering drawings are typically of two kinds: part drawing and assembly drawing. The part drawing shows the dimensions of individual parts (a bracket, an extrusion, a tube, a bent aluminum sheet, etc.), while the assembly drawing shows how these are to be attached in relation to each other. A home-built kitplane may require 100-200 drawings, a GA aircraft may require 10,000, and a fighter or a commercial jetliner 50,000 to over 100,000 drawings. For this reason, a logical numbering system that allows parts and assemblies to be quickly located is strongly recommended. This way, all drawings pertaining to the left wing aileron could start with WL-A-drw number, while the right wing flap system would be WR-F-drw number. Such systems increase productivity by speeding up drawing searches – which are very frequent.

Module 5

Code	Course/Module Title	ECTS	Semester
ENG1	English Language I	4	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	-	33	67
Description			

In this course, the students will embark on a linguistic adventure, starting with a general introduction to the fundamentals of English grammar. Topics such as verb Be, possessive adjectives, and the usage of the possessive 's will be covered. Students then will delve into the practical aspects of language, including the present simple tense, forming questions and negatives, they will learn how to express habits, routines, and frequency using adverbs of frequency. Another essential aspect of communication is describing places, so they will explore how to use "there is/are" and demonstratives. Next, they will focus on personal abilities and possibilities using "can-can't," adverbs, and the past tense forms "was-were-could." Furthermore, students will be able to master the past simple tense, including regular and irregular verbs, and using appropriate time expressions. Additionally, they will explore prepositions ("in," "at," "on") and discuss plans and intentions using the going to future. Throughout the course, there will be ample opportunities for listening and speaking practice to improve the students' oral skills. they will also focus on reading and writing, with an emphasis on tense usage, enabling them to communicate effectively in different contexts.

Module 6

Code	Course/Module Title	ECTS	Semester
EPH1	Electronics Physics	5	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	-	48	77
Description			
The course "Electronic Physics" offers students a comprehensive understanding of the fundamental principles and concepts underlying electronic devices and circuits. Through this course, students will delve into the physics of semiconductors, diodes, transistors, and other electronic components, and explore their diverse applications across various engineering domains. By combining theoretical knowledge with practical applications, students will develop the skills necessary to analyze, design, and troubleshoot electronic circuits. Moreover, this course serves as a crucial foundation for future studies in fields such as electrical engineering, electronics, and related disciplines. Through engaging lectures and hands-on activities, students will gain a deep understanding of electronic physics and its practical implications.			

Module 7

Code	Course/Module Title	ECTS	Semester
MAT2	Mathematics II	6	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	-	48	102
Description			
This part is considered anchored and complementary to the subject of calculus that the student studied in the first course, relying entirely on theories, facts, and methods of integration that the student studied. It is also assumed that the student is familiar with it well before studying this course, as this part is considered a basis for advanced courses in the link between the initial courses And advanced courses. The difficulty that the student faces in absorbing this course has been taken into account, as it includes the largest possible number of solved examples and applied aspects. The units of this course have been mentioned above under the subject of course objectives and learning and teaching strategy.			

Module 8

Code	Course/Module Title	ECTS	Semester
DSD2	Digital Systems Design II	6	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	3	78	72
Description			

The aim of this course is to provide the students the ability to analyze, design and implement digital sequential circuits; Design synchronous sequential circuits using state diagrams. This course is the second course of a two-course sequence to provide students with the practical knowledge of digital logic system. To develop the ability to analyze and design sequential logic circuits used to construct digital systems. Topics discussed include flip-flops, timing state table, state diagram, excitation table, characteristic table and characteristic equation, synchronous and asynchronous counters, counters applications, registers, and registers applications.

Module 9

Code	Course/Module Title	ECTS	Semester
ECT2	Electrical Circuits II	6	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	3	78	72
Description			

This course is designed to provide a complete overview of electric circuit analysis used in electrical engineering and electronics engineering. Electric circuit analysis is the most fundamental concept for electrical engineering, electronics engineering, and computer engineering. It is for that reason that electric circuit analysis is usually the first course taught in electrical, electronics, and computer engineering programs at universities, as basically anything related to electrical, electronics, or computer engineering stems from electric circuit analysisIn this course you will learn everything about electric circuits and electronics, from the basics such as what an electric circuit is and the fundamentals of electrical quantities like voltage, current, and power, all the way to complex techniques for analyzing electric and electronics circuits..

Module 10

Code	Course/Module Title	ECTS	Semester
CPR2	Computer Programming I	5	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	3	78	47
Description			
Python programming is widely used in Artificial Intelligence, Natural Language Generation, Neural Networks, and other advanced fields of Computer Science. Moreover, Python is one of the most demanded programming languages in the market, so there are huge job opportunities for candidates having knowledge of Python programming.			

Module 11

Code	Course/Module Title	ECTS	Semester
AUT2	Audio Technology	4	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	63	37
Description			
Digital audio has revolutionized the way in which we record, edit, and produce sound. The Digital Audio Course is designed to provide students with a comprehensive understanding of digital audio's technical and theoretical aspects. Students will learn about the basics of sound theory and audio signal flow, as well as the technical aspects of audio recording, editing, and mixing. students will have gained the skills and knowledge necessary to work in the audio industry and produce high-quality audio projects. The Digital Audio Course offers an introduction to digital audio concepts and terminology, which is essential for anyone looking to work in the audio industry. Students will learn about the basics of sound theory, including the properties of sound waves and how the human ear perceives them. This knowledge is essential for anyone looking to record, edit, and mix audio, as it provides a foundation for understanding how audio equipment and software work.			

Module 12

Code	Course/Module Title	ECTS	Semester
HRF2	Human Rights and Demorcurcy	3	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	-	33	42
Description			

تعد حقوق الانسان والديمقراطية من الموضوعات ذات الاولوية والاهمية على الصعيدين المحلي والدولي ،فقد عقدت بشأنها العديد من المؤتمرات والندوات، ووقعت لأجله عشرات المعاهدات ،كما شغل هذا الموضوع ذهن رجال الفكر والقانون والسياسة ،ومايزالون منشغلين به ،فقد انبرت اقلامهم في سبيل توضيحه او المطالبة به. ونظرا لاهميته لمختلف فئات المجتمع الانساني عامة،فقد اصبح اليوم من المقررات الدراسية الاساسية في المؤسسات التعليمية لكثير من بلدان العالم ومنها العراق،ولعل اللجوء الى تدريس مثل هكذا مواضيع والتعريف بمفاهيمها ومعرفة انواعها وخصائصها وتوضيح تاريخ تطورها والاطلاع على المواثيق والاعلانات والاتفاقيات الدولية المهمة المتعلقة بهذا الشأن ،ومن ثم محاولة تحليل مضمونها وتبيان حدودها وعرض موضعها القانوني، اصبح اليوم من الامور الملحة الملقاة على عاتق اغلب الكليات الانسانية والعلمية،وذلك من اجل تعميق وترسيخ فكرة حقوق الانسان في فكر ووجدان الطلبة، وتعميق الوعي لديهم بأن هذه المبادىء هي عالمية،ولاتختصر بأقليم معين،جاء التأكيد عليها في الكثير من الوثائق والاتفاقيات ، فضلا عن وجوب الدفاع عنها من المكاسب الحضارية للمجتمع الانساني. ومع ان المناهج الدراسية في العديد من الكليات لاتخلو من الاشارة الى الكثير من موضوعات حقوق الانسان ومفاهيم الديمقراطية والحريات العامة، الا ان المعنيين بشؤون التعليم أدركوا اهمية تخصيص مادة مستقلة بذاتها لتدريسها لطلبة الدراسات الاولية في المؤسسات التعليمية كافة، وذلك بعد التغيرات الجذرية التي حصلت بالعراق بعد عام 2003.

Module 13

Code	Course/Module Title	ECTS	Semester
EMT3	Engineering Mathematics I	6	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	-	48	102
Description			

The Engineering Mathematics 1 module is a course typically offered in engineering and related fields at the undergraduate level. It provides students with a solid foundation in mathematical concepts and techniques that are essential for solving engineering problems. The module covers various mathematical topics and their applications in engineering, such as calculus, differential equations, complex numbers, and numerical methods. The Engineering Mathematics module aims to equip students with the mathematical skills and tools necessary to analyze and solve complex engineering problems. It emphasizes the application of mathematical concepts to real-world scenarios encountered in various engineering disciplines. Differential Equations: This topic focuses on ordinary differential equations (ODEs) and partial differential equations (PDEs), their classifications, solution techniques, and applications in engineering models. The Differential Equations is a fundamental lecture in mathematics and engineering that focuses on the theory, techniques, and applications of differential equations. Differential equations are mathematical equations that involve derivatives and describe how variables change with respect to one or more independent variables. They have wide applications in various fields.

Module 14

Code	Course/Module Title	ECTS	Semester
ELC3	Electronics	6	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	3	78	72
Description			

Electronics is a scientific and engineering discipline that studies and applies the principles of physics and mathematical concepts to design, create, and operate devices that manipulate electrons and other charged particles. Electronics is a subfield of electrical engineering, but it differs from it in that it focuses on using active devices such as transistors, diodes, and integrated circuits to control and amplify the flow of electric current and to convert it from one form to another, such as from alternating current (AC) to direct current (DC) or from analog to digital.[1] Electronics also encompasses the fields of microelectronics, Nano-electronics, optoelectronics, and quantum electronics, which deal with the fabrication and application of electronic devices at microscopic, Nano-scopic, optical, and quantum scales. Electronics has a profound impact on various aspects of modern society and culture, such as communication, entertainment, education, health care, industry, and security. The main driving force behind the advancement of electronics is the semiconductor industry, which produces the basic materials and components for electronic devices and circuits.

Module 15

Code	Course/Module Title	ECTS	Semester
CPR3	Computer Programming II	5	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	3	78	47
Description			

Python programming is widely used in Artificial Intelligence, Natural Language Generation, Neural Networks, and other advanced fields of Computer Science. Moreover, Python is one of the most demanded programming languages in the market, so there are huge job opportunities for candidates having knowledge of Python programming.

Module 16

Code	Course/Module Title	ECTS	Semester
EMF3	Electromagnetic Fields	4	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	-	33	67
Description			

This course presents a study of electromagnetic fields and their relationship to problem solving in engineering. The course of study begins with the development of an understanding of the basics, moves to integration of the basic knowledge, and proceeds to the ability to use that knowledge to solve electromagnetic field problems.

Module 17

Code	Course/Module Title	ECTS	Semester
VDT3	Video Technology	5	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	63	62
Description			

This module gives students knowledge regarding video formats (NTSC, PAL, SECAM) what are the differences between each standard used definitions of highly used standard, component video, composite video, SDI, HDMI, how audio embedded through the video cables, the whole process of modulation. Part two going through display devices and how they implement the video vision such (Plasma technology, Liquid crystal display, Light Emitting Diode, Cathode Ray Tube Devices).The part three of the module is separated to three parts first about optical systems of cameras and all its calculations such as F-Number, Depth of fields, focal length, iris, photo-electric effect and how it been used in manufacturing CCD's

Module 18

Code	Course/Module Title	ECTS	Semester
STP3	Statistics and Probability	4	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	-	48	52
Description			

During the semester the students will be given an introduction to the three main aspects of statistics: design (of experiments/surveys), description (of data collected) and inference (the extension of conclusions from the data gathered in the sample to the larger population). These concepts will be presented through lectures three hours a week. They will also learn about the normal and binomial distributions as well as the methodology of confidence intervals and significance tests. From the methods that they learn in class they will be able to critique real world surveys and experiments, interpret graphs as well as conduct basic statistical inference for one or two groups

Module 19

Code	Course/Module Title	ECTS	Semester
EMT4	Engineering Mathematics II	6	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	-	48	102
Description			

The Engineering Mathematics course is a fundamental component of engineering education at the undergraduate level. It is designed to provide students with a strong mathematical foundation that is essential for tackling engineering problems and understanding advanced engineering concepts. The Engineering Mathematics course aims to develop students' problem-solving skills, analytical thinking, and mathematical reasoning. It provides a solid foundation for subsequent engineering courses and enables students to apply mathematical concepts to solve real-world engineering problems. Additionally, it prepares students for advanced mathematical topics they may encounter in specialized engineering disciplines. The Fourier Series is a specialized course in mathematics and engineering that focuses on the theory and applications of Fourier series. Fourier series is a mathematical tool used to represent periodic functions as a sum of sinusoidal functions (sines and cosines). It has wide-ranging applications in various fields, including signal processing, and communications.

Module 20

Code	Course/Module Title	ECTS	Semester
DEL4	Digital Electronics	6	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	3	78	72
Description			

A digital circuit is typically constructed from small electronic circuits called logic gates that can be used to create combinational logic. Each logic gate is designed to perform a function of boolean logic when acting on logic signals. A logic gate is generally created from one or more electrically controlled switches, usually transistors but thermionic valves have seen historic use. The output of a logic gate can, in turn, control or feed into more logic gates.Another form of digital circuit is constructed from lookup tables, (many sold as "programmable logic devices", though other kinds of PLDs exist). Lookup tables can perform the same functions as machines based on logic gates, but can be easily reprogrammed without changing the wiring. This means that a designer can often repair design errors without changing the arrangement of wires. Therefore, in small volume products, programmable logic devices are often the preferred solution. They are usually designed by engineers using electronic design automation software.Integrated circuits consist of multiple transistors on one silicon chip, and are the least expensive way to make large number of interconnected logic gates. Integrated circuits are usually interconnected on a printed circuit board which is a board which holds electrical components, and connects them together with copper traces.

Module 21

Code	Course/Module Title	ECTS	Semester
CMF4	Communications Fundamentals	7	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	2	78	97
Description			

Communication is the process of exchanging messages or information between two or more parties. Organizations today are heavily dependent on information to meet organizational needs. Effective communication plays a key role in fulfilling these needs and contributes significantly to organizational success. Despite its importance, communication has not been given enough attention and grown as it should have between civil and military entities.

Module 22

Code	Course/Module Title	ECTS	Semester
MPS4	Microprocessors	5	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	63	62
Description			

This course introduces microprocessor architecture and microcomputer systems including memory and input/output interfacing. Topics include low-level language programming, bus architecture, I/O systems, memory systems, interrupts, and other related topics. The course deals with advanced concepts in the programming and the interfacing of microprocessors/microcontrollers to the outside world as demonstrated by a variety of application examples. It covers the advanced architecture of modern processors and the many I/O peripherals now commonly found on-board the device. Detailed studies of computer I/O and interrupt techniques as applied to analog-to-digital, digital-to-analog, timers, parallel and serial interfaces are included. Laboratory activities provide the student with experience in developing the hardware and software required to incorporate microprocessors into systems that solve real-world interfacing problems.

Module 23

Code	Course/Module Title	ECTS	Semester
MLE4	Media laws and Ethics	3	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	-	33	42
Description			

مادة اخلاقيات وقوانين الأعلام هي مادة نظرية تعطي الطالب فكرة عامة عن مفهوم عملية الأتصال وكيف تتم العملية الأتصالية التي هي اساس الأعلام وتعريفه باهم القوانين والقواعد الأخلاقية والقانونية التي يقوم عليها الطالب باهدافها واطلاعه على اهم النظريات الأعلامية العالمية التي تم العمل بها عالميا والتعرف على وظائف وسائل الأعلام مما يجعله قادر على تكوين صورة عامة عن اساسيات الأعلام بشكل عام وعن اخلاقيات وقوانين الأعلام بشكل خاص حتى يكون لديه دراية بكيفية عرض الرسالة الأعلامية مستقبلا في الحياة العملية بشكل يضمن تحقيق الحيادية والمصداقية والشفافية وهو اساس عمل المؤسسات الأعلامية وتنمية مهارات تفكيره في طرح المادة الأعلامية بطريقة موضوعية تضمن ايصال الحقيقة باقل قدر من الخسائر وتعطية صورة عن مميزات الأعلام الجديد وكيف استطاع الجمهور الأن من التحكم بالعملية الأتصالية وكيفية اعطاء هذا المتلقي مكانته التي يستحقها لتاثيرة على العملية الأتصالية وخاصة بعد التطور التقني المتمثل بدخول الأنترنت ومواقع التواصل الأجتماعي وضرورة دراسة الجمهور ومعرفة احتياجاته وبالتالي التأثير علية وعلى وجهات نظر بشكل يضمن الأيجابية والحيادية وتعريفه بكيفية وآلية التعامل الحقيقي مع الأحداث وايضا تمكن الطالب من الأطلاع على اهم حقوق وواجبات العامل في المؤسسه الأعلامية وخلال عرض هذه المواضيع وغيره اثناء السنة الدراسية بالأمكان التعرف على طريقة تفكيره وكيفية نظرت الجيل للأمور وتطوير القدرة على التحليل والأستنتاج والتقويم واصدار الأحكام عمل المؤسسات الأعلامية وتعريف

Module 24

Code	Course/Module Title	ECTS	Semester
ENG4	English Language II	3	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	-	33	42
Description			

In this course, the students will begin by exploring various tenses and question forms. This foundation will pave the way for their language journey ahead. Next, they will dive into the present tenses, both progressive and simple, to express ongoing actions and general truths, respectively. they will then shift their focus to past tenses, including the simple and progressive forms, to have an idea on how to discuss past events and describe ongoing actions in the past. Expressing quantity using "much," "many," "some," and "any" Will be covered along with future forms, to discuss future plans and express intentions effectively. Then the students will delve into comparative and superlative forms. They will later focus on present perfect tense and discussing unfinished past events and definitive past actions, along with the past perfect and narrative tenses. Finally, hypothetical situations and future possibilities will be discussed by the usage of conditionals. Throughout the course, there will be ample opportunities for listening and speaking practice to improve their oral skills. they will also focus on reading and writing, with an emphasis on tense usage, enabling them to communicate effectively in different contexts.

Module 25

Code	Course/Module Title	ECTS	Semester
LAG5	Linear Algebra	5	5
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	-	48	77
Description			

Linear algebra courses have two basic parts. The first part is matrix arithmetic, a fairly simple, computational set of arithmetic rules. The second part of the course involves vector spaces. This will be most students' first exposure to axiomatic mathematics. In this section of the course, students will see material presented in the higher-level mathematical model of definition-theorem-proof. Students will usually find the vector space material more abstract and thus more difficult. The purpose of this course is to enable you to employ the concepts and techniques of linear mathematics and to provide a stepping stone to higher-level mathematics classes. S–2 MATH 2085 ö Linear Algebra Syllabus It is assumed you have completed a second-semester calculus course and are familiar with differentiation and integration of real valued functions of a single variable.

Module 26

Code	Course/Module Title	ECTS	Semester
AWP5	Antenna and Wave Propagation	6	5
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	63	62
Description			

This course aims to provide students with capabilities to be able to design and implement Microwave system and antenna and to understand the effect of the frequency over the implemented and designed hardware. Moreover, choosing the matching hardware that is regarded optimum in term of power losses, reflected and transmitted is the core of this course.

Module 27

Code	Course/Module Title	ECTS	Semester
CNT5	Computer Networks I	5	5
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	63	62
Description			

This module explores the principles, concepts, and technologies associated with computer networks. It provides students with a comprehensive understanding of how computer networks function, how they are designed, and how they can be effectively utilized in various applications.Students should be familiar with commonly used notions and protocols in computer networks and be able to design and implement a simple network. The module focus on the main steps inside any network system which include: The design phase, the routing phase, and the services phase. The used practical side of this module will be a good knowledge to students for simulating a real scenario problems with their solutions. After completing this module, students should have gained a thorough understanding of various aspects related to computer networks.

Module 28

Code	Course/Module Title	ECTS	Semester
DCM5	Digital Communications	6	5
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	3	78	72
Description			

This course serves as a graduate-level introduction to digital communication systems' fundamental concepts. A digital communication system is one that converts a source (speech, video, data, etc.) into a stream of bits and subsequently into symbols that can be communicated through channels (cable, wireless, storage, etc.) in order to send information from one place to another. The course provides a general understanding of digital communication system designs.

Module 29

Code	Course/Module Title	ECTS	Semester
SSC5	Space Science I	3	5
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	-	48	27
Description			

A course in the physics of space science typically covers the fundamental principles of physics that underlie our understanding of the universe, with an emphasis on the properties and behavior of celestial bodies, the space environment, and the tools and techniques used in space science research.
The course may begin with an introduction to the scientific method and the history of space science, including major discoveries and breakthroughs that have shaped our current understanding of the universe. It may then cover topics such as the laws of motion, gravitation, and electromagnetism, and their application to objects in space, including planets, moons, asteroids, and comets.
The course may also cover the properties and behavior of charged particles in magnetic fields, including the Earth's magnetosphere, and the effects of space weather on the Earth's environment.
Students will be introduced to the tools and techniques used in space science research, including telescopes, spacecraft, and remote sensing, and will learn how to analyze and interpret data from space science experiments and observations.
The course may also cover current theories and models of the universe, including the Big Bang theory, dark matter, and dark energy, and their implications for the future of space science research.Throughout the course, students will be expected to communicate their knowledge and findings effectively, both orally and in writing, and to critically examine the role of space science in society and the ethical and environmental implications of space exploration and colonization.

Module 30

Code	Course/Module Title	ECTS	Semester
WDG5	Web Design	5	5
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	3	78	47
Description			

Web design refers to the design of websites that are displayed on the internet. It usually refers to the user experience aspects of website development rather than software development. Web design used to be focused on designing websites for desktop browsers; however, since the mid-2010s, design for mobile and tablet browsers has become ever-increasingly important. A web designer works on the appearance, layout, and, in some cases, content of a website. Appearance, for instance, relates to the colors, font, and images used. Layout refers to how information is structured and categorized. A good web design is easy to use, aesthetically pleasing, and suits the user group and brand of the website. Many webpages are designed with a focus on simplicity, so that no extraneous information and functionality that might distract or confuse users appears.

Module 31

Code	Course/Module Title	ECTS	Semester
NUA6	Numerical Analysis	5	6
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	2	78	47
Description			

Numerical analysis is a branch of mathematics that uses mathematical, computational, and computational methods to solve mathematical and engineering problems that cannot be solved by traditional analytical methods.

Numerical analysis depends on the use of algorithms (computational methods) and computer programs for numerical calculations and complex variables. The study of numerical mathematical methods is used to find the approximate solution to some mathematical problems that appear when applying mathematics in different branches in pure and applied sciences and analyze their convergence, accuracy and stability. Through the use of numerical analysis, problems can be solved with high accuracy and in a shorter time, by converting a complex problem into a series of simple operations that can be easily performed using a computer. Thus, engineers and scientists in all fields can tackle larger and more complex problems very effectively.

Theory and practice approaches are taught .The error sources and the convergence of all algorithms will be estimated with respect to the various techniques used , the course will involve the use of Mat lab or C++ in lab.

Module 32

Code	Course/Module Title	ECTS	Semester
DSP6	Digital Signal Processing	5	6
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	63	62
Description			
Course starts from the basic concepts of discrete-time signals and proceed to learn how to analyze data via the Fourier transform, how to manipulate data via digital filters and how to convert analog signals into digital. The solid theoretical bases are complemented by applied examples in Matlab. Design and lab exercises are also significant components of the course.			

Module 33

Code	Course/Module Title	ECTS	Semester
CNT6	Computer Networks II	6	6
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	63	87
Description			
This module explores the concepts for computer network protocols. It provides students with a comprehensive understanding of how computer networks protocols function, how they are designed, and how they can be effectively utilized in various applications. Students should be able to understand Common Network Protocols including RIP, OSPF, HTTP, DNS, FTP, and others. They should understand the purpose, and functionality of these protocols. Also the students will take a brief look on network security issues. By mastering these concepts, students completing a network protocols module will have a deep understanding of the principles, functionality, and operation of network protocols. They will be equipped to analyze, evaluate, design, and troubleshoot protocols, ensuring efficient and reliable communication in computer networks, also the functionality of the WWW will be cleared.			

Module 34

Code	Course/Module Title	ECTS	Semester
ITC6	Information Theory and Coding	6	6
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	63	87
Description			

The module introduce the principles and the applications of information and coding theory, The course will begin with studying how the information is measured in terms of probability and entropy, followed by knowing the relationships among conditional and the joint entropies; how these are used to calculate the capacity of a communication channel, with and without noise; along with the coding schemes, including error correcting codes; how the discrete channels and measures of the information generalize to their continuous forms. The course also presents an introduction to the ciphering and deciphering methods for data protection from the hackers and eavesdroppers.

Module 35

Code	Course/Module Title	ECTS	Semester
SSC6	Space Science II	3	6
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	-	48	27
Description			

space science II is the study of communication systems, techniques, and technologies used in space missions. It involves the design, analysis, and optimization of communication systems that enable spacecraft to communicate with each other and with ground stations on Earth. The field of communication engineering in space science encompasses a wide range of topics, including antenna design, error control coding, , spacecraft communication subsystems, space-based internet and broadband communication, free-space optical communication, interference and spectrum management, spacecraft operations and ground segment, and emerging trends in space communication.Effective communication is critical to the success of space missions. The communication systems used in space must be able to transmit and receive signals over long distances, in harsh environments, and under challenging conditions. Communication engineers must design systems that are reliable, efficient, and capable of handling large amounts of data. They must also consider factors such as power consumption, weight, and size, as well as the impact of radiation and other environmental factors on the performance of communication systems.

Communication engineering in space science is a multidisciplinary field that draws on knowledge from areas such as electrical engineering, computer science, physics, and mathematics. It is an important area of study for space agencies, aerospace companies, and research institutions that are involved in the development of space technology and exploration. The field of communication engineering in

Module 35

space science is constantly evolving, as new technologies and techniques are developed to meet the growing demands of space missions.

Module 36

Code	Course/Module Title	ECTS	Semester
MGD6	Media Graphics Design	5	6
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	63	62
Description			

This course introduces students to the principles and techniques of graphic design and digital media. Through a combination of lectures, hands-on projects, and critiques, students will learn how to create effective designs for a variety of platforms, including social media, websites, digital ads, and more. Overall, a course on graphic design and digital media can provide students with valuable skills and knowledge that can be applied to a variety of industries. The course can be tailored to meet the needs and interests of the students, and can provide a solid foundation for further studies or a career in the field.

Module 37

Code	Course/Module Title	ECTS	Semester
EDS7	Embedded Systems	5	7
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	3	78	47
Description			

The module on embedded systems provides a comprehensive exploration of the key principles and practical aspects involved in the design and development of embedded systems. Students will begin by gaining a solid understanding of the definition, characteristics, and components of embedded systems. They will then delve into the world of microcontrollers and microprocessors, learning about their architecture, programming models, and instruction sets.

The module also covers essential topics such as embedded system development tools, embedded C programming, interrupts and timers, communication protocols, real-time operating systems (RTOS), power management, security, testing and debugging, as well as design considerations. Students will engage in hands-on activities and experiments using Arduino UNO, allowing them to apply their knowledge in a practical setting.

Module 38

Code	Course/Module Title	ECTS	Semester
SCM7	Satellite Communications I	6	7
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	2	78	72
Description			
Satellite Communication Systems provide vital and economical fixed and mobile communication services over very large coverage areas of land, sea and air. In this course, you will learn the fundamentals and the techniques for the design and analysis of satellite communication systems.Topics include Satellite Orbits, Space Stations and Ground Terminals, Frequency Allocation, Link Calculation and Signal Propagation, Rain Fading and Link Availability, Digital Modulation, Error Correction Codes, Multiple Access, Receiver Synchronization, and the basics of Satellite Networking.			

Module 39

Code	Course/Module Title	ECTS	Semester
MBS7	Mobile Broadcasting Systems	6	7
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	63	87
Description			
Mobile broadcast is a technology designed to deliver SMS messages to multiple people at once in a particular geographic area within a certain period of time. Cell broadcast messages differ from group texting, as recipients cannot see responses by others. In cell broadcast messages, recipients have the perception that the message is being sent to them alone. A mobile broadcast is also known as a cell broadcast and also sometimes called short message service-point to point (SMS-PP). This form of mobile broadcast is a one-to-many messaging service that takes advantage of geo-targeting. Mobile and cell broadcast messages are sent and controlled by service providers, and part of the GSM standard set by the ETSI GSM committee.			

Module 40

Code	Course/Module Title	ECTS	Semester
SCP7	Soft Computing	5	7
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	63	62
Description			

The Soft Computing course introduces students to the fascinating field of computational intelligence and its practical applications. Through a combination of theoretical concepts and hands-on implementation, students will explore various soft computing techniques and their use in solving complex real-world problems. The course covers topics such as fuzzy logic, neural networks, evolutionary computing, support vector machines, machine learning algorithms, deep learning, swarm intelligence, and their integration into hybrid systems. Students will gain a deep understanding of these techniques and their applications in domains such as image processing, data mining, natural language processing, control systems, and time series analysis. Throughout the course, students will work with MATLAB, a powerful software tool, to implement and evaluate soft computing algorithms. By the end of the course, students will be equipped with the knowledge and skills to design, implement, and analyze soft computing systems, and they will be prepared to apply these techniques to tackle complex challenges in various industries.

Module 41

Code	Course/Module Title	ECTS	Semester
CCT7	Computer Control	4	7
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	63	37
Description			

Closed loop physical systems are those that use feedback to control their behavior and achieve a desired output. These systems typically consist of a plant or process, a sensor to measure the output, and a controller to adjust the input based on the measured output. The controller can be either an analog or digital device, and may include a conventional controller such as a proportional-integral-derivative (PID) controller.

Module 42

Code	Course/Module Title	ECTS	Semester
GPR7	Graduation Project I	4	7
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
1	3	63	37
Description			

Module 43

Code	Course/Module Title	ECTS	Semester
OFC8	Optical Fiber Communications	5	8
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	63	62
Description			
The module intends to provide students with the design and operating principles of modern optical communication systems and networks. Upon completion of the course, students should be familiar with commonly used components and subsystems in optical communication and network systems and be able to design a simple optical communication link. Topics covered in this module include light sources, optical fibers and their properties, optical amplifiers, optical transmitters and receivers, communications systems and optical networks.			

Module 44

Code	Course/Module Title	ECTS	Semester
IOT8	Internet of Things	5	8
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	63	62
Description			

The course on "Internet of Things (IoT)" provides a comprehensive understanding of IoT concepts, architectures, protocols, security, and cloud computing. Students will explore the significance of IoT in modern technology and its impact on various domains. The course covers the working principles of IoT, including device interconnectivity, data transmission, and communication protocols like WiFi, MQTT, and HTTP. Security and privacy considerations in IoT deployments are emphasized, along with best practices for protecting IoT devices, networks, and data. The role of cloud computing in IoT, particularly IoT Platform as a Service (IoT PaaS), is examined for managing and analyzing IoT data. Practical skills in programming IoT devices using platforms like Arduino UNO and NodeMCU ESP8266 are developed. Real-world applications of IoT, such as remote monitoring systems, home automation, and industrial process control, are explored, along with the challenges and considerations involved in deploying IoT solutions. By the end of the course, students will have the knowledge and skills needed to design, develop, and deploy successful IoT applications.

Module 45

Code	Course/Module Title	ECTS	Semester
WMC8	Wireless and Mobile Communications	5	8
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	63	62
Description			

Able to understand the examples of wireless communication systems, paging systems, cordless telephone systems, understand the second generation cellular networks, third generation wireless networks, wireless in local loop, wireless local area networks, and personal area networks, also able to understand the concepts of spectrum allocation, basic cellular system, frequency reuse, channel assignment strategies, handoff strategies, interference, improving coverage and capacity, cell splitting. To understand various multiple accesses techniques: FDMA, TDMA, spread spectrum multiple access SDMA and to understand the difference between wireless and fixed telephone networks, development of wireless networks.

Module 46

Code	Course/Module Title	ECTS	Semester
SCM8	Satellite Communications II	6	8
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	2	78	72
Description			
Satellite Communication Systems provide vital and economical fixed and mobile communication services over very large coverage areas of land, sea and air. In this course, you will learn the fundamentals and the techniques for the design and analysis of satellite communication systems.Topics include Satellite Orbits, Space Stations and Ground Terminals, Frequency Allocation, Link Calculation and Signal Propagation, Rain Fading and Link Availability, Digital Modulation, Error Correction Codes, Multiple Access, Receiver Synchronization, and the basics of Satellite Networking.			

Module 47

Code	Course/Module Title	ECTS	Semester
STE8	Studio Technology	5	8
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	63	62
Description			
This course is designed to provide students with an understanding of the technology and equipment used in modern recording studios. Students will learn about the various components of a recording studio, including microphones, mixers, digital audio workstations, and software. They will also gain practical experience using this equipment to record, mix, and master audio.			

Module 48

Code	Course/Module Title	ECTS	Semester
GPR8	Graduation Project II	4	8
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
1	3	63	37
Description			

Contact

Program Manager:

Mohammad M. Rasheed | Ph.D. in IT | Assistant Prof.

Email: mohammad.rasheed@uoitc.edu.iq

Mobile no.: +9647704267250

Program Coordinator:

Atheer Marouf Mahmood Al-Chalabi | MSc. in Software Engineer | Assistant Lecturer

Email: atheeralchalabi@uoitc.edu.iq

Mobile no.: 07818808812