UNIVERSITY OF Technology

الجامعة التكنولوجية

Bachelor of Science (B.Sc.) Mathematics and Computer Applications

بكالوريوس علوم – رياضيات وتطبيقات الحاسوب

Table of Contents

1. Overview

This catalogue is about the courses (modules) given by the program of Mathematics and Computer Applications to gain the Bachelor of Science degree. The program delivers (40) 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 علوم رياضيات وتطبيقات الحاسوب للحصول على درجة بكالوريوس العلوم. يقدم البرنامج (40) مادة دراسية مع (6000) إجمالي ساعات حمل الطالب و ٢٤٠إجمالي وحدات أوروبية. يعتمد تقديم المواد الدراسية على عملية بولونيا.

2. Undergraduate Courses 2023-2024

Module 1

Code	Course/Module Title	ECTS	Semester
CALC111	Calculus I	7	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	1	63	112

Description
This course covers topics of differential calculus including limits and continuity, higher-order derivatives, curve sketching, differentials and applications of derivatives.

Module 2

Code	Course/Module Title	ECTS	Semester
FOMA112	Foundation of Mathematics I	6	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	1	63	87
Description			
The course will focus on developing an understanding of proofs and rigorous mathematical reasoning. Topics will include logic statements, sets, relations, equivalence relation, Cartesian product, partially ordered sets, totally ordered sets, well ordered sets, mappings, Natural number, integer number. This course aims to provide students with an understanding of the foundations of mathematics, which will serve as the basis for degree-level mathematics. The topics covered include logic statements, sets, relations, and the order of sets.			

Module 3

Code	Course/Module Title	ECTS	Semester
FIMA113	Finite Mathematics	6	1
Lectures (hr/w)	**Lab./Prac./Tutor.**	**SSWL (hr/sem)**	**USSWL (hr/w)**
3	1	63	87

Description
This course provides elementary to intermediate level information on topics that help students apply mathematics in computer science, in line with technological advancements. The topics covered in this course include vectors, matrices, principles of series and sequences, and an overview of transformations.

Module 4

Code	Course/Module Title	ECTS	Semester
COSC114	Computer Science	7	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
4	2	93	82
Description			
This course provides an introduction to computational thinking and problem solving. Computer science course covers the basic concepts of computers including hardware and software. Students will be able to apply elementary computing concepts including variables, loops, functions, lists, conditionals, and basic structured programming. In addition, this course introduces basic elements of the design and analysis of computer algorithms. Also, an introduction to Matlab programming is given with practical Labs.			

Module 5

Code	Course/Module Title	ECTS	Semester
ENLA115	English Language	2	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2		33	17

Description
English is a course for first-class students depending on theoretical lectures. It is a comprehensive course that provides students with the fundamental principles of English. , some of the principles are illustrated with nature. In addition, it is focused on effective teaching and learning. The English course is specially adapted for the Middle East and North Africa. This course combines the best of English language teaching methodologies to help students use English accurately and fluently. It provides Basic Concepts materials and their applications

Module 6

Code	Course/Module Title	ECTS	Semester
WORSH11	**Workshops**	2.00	**1**
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
-	3	45	5
Description			
Preparing applied engineers in the field of engineering sciences who are distinguished by a high level of knowledge and technological creativity, in line with the strict standards adopted globally in quality assurance and academic accreditation of the corresponding engineering programs, while adhering to the ethics of the engineering profession. Enable the student to know and understand work systems, risks, and the factors surrounding them. Enable the student to know and understand theoretical principles in handicrafts and measurements.			

Module 7

Code	Course/Module Title	ECTS	Semester
CALC121	Calculus II	7	2
Lectures (hr/w)	**Lab./Prac./Tutor.**	**SSWL (hr/sem)**	**USSWL (hr/w)**
3	1	63	112
Description			
Calculus II is a comprehensive calculus course that covers advanced applications and techniques of integration, differential equations, and sequences and series. The course is intended as the second part of a sequence that begins with Calculus I.			

Module 8

Code	Course/Module Title	ECTS	Semester
FOMA122	Foundation of Mathematics II	6	2
Lectures (hr/w)	**Lab./Prac./Tutor.**	**SSWL (hr/sem)**	**USSWL (hr/w)**
3	1	63	87
Description			
The Foundation of Mathematics II course focuses on developing students' capacity, confidence, and disposition to utilize mathematics in order to meet the numeracy standard for the Bologna process. It equips students with the necessary knowledge, skills, and understanding of basic concepts in modern mathematics. The topics covered include mappings, sets, groups, and rational numbers.			

Module 9

Code	Course/Module Title	ECTS	Semester

DIMA123	Discrete Mathematics	7	2
Lectures (hr/w)	**Lab./Prac./Tutor.**	**SSWL (hr/sem)**	**USSWL (hr/w)**
4	2	93	82
Description			
This module introduces some of the fundamental mathematical ideas that are used in other mathematical topics and in the design and analysis of computer algorithms and practical labs. The module makes you familiar with basic concepts and notation and helps you to develop a good understanding of Prime Numbers and Prime Factorization, the greatest common divisor, the Euclidean algorithm Relative prime, the least common multiple, Congruences and their Properties, Chinese Remainder Theorem, Congruence classes modulo n, Boolean functions, Algorithm Analysis.			

Module 10

Code	**Course/Module Title**	**ECTS**	**Semester**
GEPH124	General Physics	6	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	2	78	72
Description			
This course included Physics and Measurements: Physical Quantity, Unit Systems, and Dimensional Analysis. Vectors, Motion in one Dimension-Speed, Velocity, Acceleration, Distance, Free-fall under gravity. Motion in two dimensions. Force and Motion. Newton's First Law of Motion, Newton's Second Law, Newton's Third Law, Difference between mass and weight, Units of measurement, Forces, Work and Kinetic Energy, and			

Power.

Module 11

Code	Course/Module Title	ECTS	Semester
HURI126	**HUMAN RIGHTS**	2.00	**2**
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
1	**1**	**33**	**17**

Description

Developing and flourishing the human personality in its emotional, intellectual and social dimensions, and rooting in its sense of dignity, freedom, equality, social justice and democratic practice.Enhancing people's awareness - women and men - of their rights in a way that helps enable them to transform the principles of human rights into a social, economic, cultural and political reality, and raise their ability to defend, maintain and advance them at all levels. Strengthening the bonds of friendship and solidarity among peoples, enhancing respect for the rights of others, preserving cultural pluralism and diversity, flourishing national cultures for all groups and peoples, enriching the culture of dialogue and mutual tolerance, rejecting violence and terrorism, promoting non-violence and combating intolerance, and providing all people with strong immunity against hate speech. Promoting a culture of peace based on justice and respect for human rights, foremost of which is the right to self-determination, the right to resist occupation,

and the democratization of international relations and the institutions of the international community, so as to reflect the common interests of humanity.

Module 12

Code	**Course/Module Title**	**ECTS**	**Semester**
WORSH11	**Workshops**	2.00	**2**
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
-	3	45	5
Description			
Preparing applied engineers in the field of engineering sciences who are distinguished by a high level of knowledge and technological creativity, in line with the strict standards adopted globally in quality assurance and academic accreditation of the corresponding engineering programs, while adhering to the ethics of the engineering profession. Enable the student to know and understand work systems, risks, and the factors surrounding them. Enable the student to know and understand theoretical principles in handicrafts and measurements.			