

University of Technology
الجامعة التكنولوجية



First Cycle – Bachelor's Degree (B.Sc.) - Electrical Engineering / Electrical Engineering

بكالوريوس في الهندسة الكهربائية / الهندسة الكهربائية (الدورة الاولى)



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1. Overview

This catalogue is about the courses (modules) given by the program of Electrical 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.

نظرة عامه

يتناول هذا الدليل المواد الدراسية التي يقدمها برنامج الهندسة الكهربائية للحصول على درجة بكالوريوس العلوم. يقدم البرنامج (48) مادة دراسية، على سبيل المثال، مع (6000) إجمالي ساعات حمل الطالب و 240 إجمالي وحدات أوروبية. يعتمد تقديم المواد الدراسية على عملية بولونيا.

2. Undergraduate Courses 2023-2024

Module 1

| Code | Course/Module Title | ECTS | Semester |
|---|----------------------------|---------------|-------------|
| DEHR105 | Democracy and Human Rights | 2 | 1 |
| Class (hr/w) | Lect/Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 2 | | 33 | 17 |
| Description | | | |
| The course description of Human Rights and Democracy shows the most important characteristics of teaching the subject and the expected outcomes for the student. It seeks to give the student a glimpse into what human rights and democracy are and introduces him to their history, present, and future, as well as achieving the possibility of knowing how these rights and freedoms develop and what are their effects and implications on the individual and society. | | | |

Module 2

| Code | Course/Module Title | ECTS | Semester |
|---|-----------------------|---------------|-------------|
| WSHE106 | Workshops | 4 | 1 |
| Class (hr/w) | Lect/Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| | 6 | 90 | 10 |
| Description | | | |
| This module enables the students to work mainly in the Engineering workshops. In these workshops, the students will learn about several Engineering specialties such as manufacturing, Maintenance, Welding and Fabrication. This is done whilst also learning about working safely and effectively and making products from a drawing. | | | |

Module 3

| Code | Course/Module Title | ECTS | Semester |
|--|-----------------------|---------------|-------------|
| COSC108 | Computer | 3 | 1 |
| Class (hr/w) | Lect/Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 1 | 2 | 48 | 27 |
| Description | | | |
| <p>This module provides a brief introduction to computer science and the architecture of computer systems. Introduces the types of computer programming languages, algorithms, and flowchart preparation methods. This course motivates the students to solve mathematical and system problems by learning C++ programming. C++ is being used in a wide variety of domains from the natural sciences to all engineering disciplines.</p> | | | |

Module 4

| Code | Course/Module Title | ECTS | Semester |
|--|---------------------------------|---------------|-------------|
| EDAC111 | Engineering Drawing and AutoCAD | 3 | 1 |
| Class (hr/w) | Lect/Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| | 4 | 63 | 12 |
| Description | | | |
| <p>This module explains the concept of graphic communications, their type, and their role in sanitary construction. Familiarize with different drawing equipment, technical standards, and procedures for the construction of geometric figures. Equipped with the skill that enables them to convert pictorial (3-D) drawings to orthographic (2-D) drawings and vice versa. Explain the principle and application of sectioning. Well-familiar with the purpose, procedures, materials, and conventional symbols utilized to make sketch maps.</p> | | | |

Module 5

| Code | Course/Module Title | ECTS | Semester |
|---|--|---------------|-------------|
| FUEE112 | Fundamentals of Electrical Engineering 1 | 7 | 1 |
| Class (hr/w) | Lect/Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 3 | 3 | 93 | 82 |
| Description | | | |
| <p>This module enables the students to develop problem solving skills and understanding of circuit theory through the application of techniques. To understand voltage, current and power from a given circuit. This course deals with the basic concept of electrical circuits. This is the basic subject for all electrical and electronic circuits. To understand Kirchoff's current and voltage Laws problems. To perform Loop (mesh) and Nodal analysis. Calculations of currents, voltages and electrical power for DC circuits. To</p> | | | |

understand DC electrical circuits theorems.

Module 6

| Code | Course/Module Title | ECTS | Semester |
|---|-----------------------|---------------|-------------|
| MATH113 | Mathematics 1 | 6 | 1 |
| Class (hr/w) | Lect/Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 3 | 1 | 63 | 87 |
| Description | | | |
| <p>This module gives the students The ability to use complex numbers and vectors in engineering and science. Recognize the engineering style to solve the group of equations using matrices. Recognize the engineering style, formula, expression, Graphs, and relationship of various types of functions. Ability to Graphs and derivatives of various types of functions. Ability to identify, formulate and solve engineering problems Mathematically.</p> | | | |

Module 7

| Code | Course/Module Title | ECTS | Semester |
|---|------------------------|---------------|-------------|
| MEEN114 | Mechanical Engineering | 5 | 1 |
| Class (hr/w) | Lect/Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 3 | | 48 | 77 |
| Description | | | |
| <p>This module deals with the basic concept of Mechanical Engineering. Providing students with the basics of scientific knowledge in the field of mechanical engineering and improving their professional abilities in the direction of analytical and creative thinking using mathematical laws and equations, data analysis and modern methods in formulating and solving problems.</p> | | | |

Module 8

| Code | Course/Module Title | ECTS | Semester |
|--|-----------------------|---------------|-------------|
| WSHE106 | Workshops | 4 | 2 |
| Class (hr/w) | Lect/Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| | 6 | 90 | 10 |
| Description | | | |
| <p>This module enables the students to work mainly in the Engineering workshops. In these workshops, the students will learn about several Engineering specialties such as manufacturing, Maintenance, Welding and Fabrication. This is done whilst also learning about working safely and effectively and making products from a drawing.</p> | | | |

Module 9

| Code | Course/Module Title | ECTS | Semester |
|---|-----------------------|---------------|-------------|
| ENLA107 | English Language | 2 | 2 |
| Class (hr/w) | Lect/Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 2 | | 33 | 17 |
| Description | | | |
| <p>This module is designed to prepare the students to use the English language correctly and appropriately, all language skills (speaking, listening, reading and writing) needed in modern Electrical engineering. Topics covered include Numbers in words, algebraic and differential equations, Scalars and vectors, signals and systems, Measurement instruments and standards, passive components (R, L, C), diodes, transistors, operational amplifiers, power supplies, microprocessors, microcontrollers, and the computer.</p> | | | |

Module 10

| Code | Course/Module Title | ECTS | Semester |
|--|-----------------------|---------------|-------------|
| DITE121 | Digital Techniques | 5 | 2 |
| Class (hr/w) | Lect/Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 3 | 2 | 78 | 47 |
| Description | | | |
| <p>In this module, the students will be provided with an introduction and concepts of contemporary digital systems design. Starting with the fundamental building blocks of digital systems the module outlines both theoretical and practical issues for implementation. Practical work includes the use of digital simulation and analysis for implementing real-world problems.</p> | | | |

Module 11

| Code | Course/Module Title | ECTS | Semester |
|--|--|---------------|-------------|
| FUEE122 | Fundamentals of Electrical Engineering 2 | 7 | 2 |
| Class (hr/w) | Lect/Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 3 | 3 | 93 | 82 |
| Description | | | |
| <p>In this module, the students will develop problem-solving skills and an understanding of AC circuit theorems through the application of techniques. To understand voltage, current and power from a given AC circuit. This course deals with the basic concept of AC electrical circuits. This is the basic subject for all electrical and electronic circuits. To understand Kirchhoff's current and voltage Laws problems. To perform Loop (mesh) and Nodal analysis. Calculations of currents, voltages and electrical power for AC circuits. To understand AC electrical circuits theorems.</p> | | | |

Module 12

| Code | Course/Module Title | ECTS | Semester |
|--|-----------------------|---------------|-------------|
| MATH123 | Mathematics 2 | 6 | 2 |
| Class (hr/w) | Lect/Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 3 | 1 | 63 | 87 |
| Description | | | |
| <p>In this module, the students will study the various types of ordinary integrations. Recognize the various types of integration techniques and methods of solution. Ability to formulate the integration to calculate Average and RMS values. Ability to calculate the area between the curves by using double Integrals (by Cartesian and Polar coordinate systems). The ability to use multiple Integrals.</p> | | | |

Module 13

| Code | Course/Module Title | ECTS | Semester |
|---|------------------------|---------------|-------------|
| PHEL124 | Physics of Electronics | 6 | 2 |
| Class (hr/w) | Lect/Lab./Prac./Tutor | SSWL (hr/sem) | USWL (hr/w) |
| 4 | | 63 | 87 |
| Description | | | |
| <p>This module teaches the students the concept of the atom, its components, the most important atomic models, spectral hydrogen chains, and the dual nature of light and electrons. Understand the basics of de Broglie's law, the probability of the existence of an electron, and Heisenberg's precision principle. Identify the major and minor quantum numbers, the number of orbital, and the electron spin. Explain the basics of semiconductors, their types, energy levels and the Fermi level. The ability to analyze diodes, solves electronic problems, and find currents and voltages in a circuit. The ability to design various electronic circuits. Learn how to deal with different types of transistors and how to design them as signal amplifiers and switches.</p> | | | |

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