Southern Technical University
الجامعة التقنية الجنوبية

First Cycle – bachelor's degree (B.Sc.) -
Electromechanical Techniques Engineering
بكالوريوس - هندسة التقنيات الكهروميكانيكية

Table of Contents

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 (xx) 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 تقنيات الكهروميكانيكية للحصول على درجة بكالوريوس العلوم. يقدم البرنامج)٣٩(مادة دراسية، مع)٦٠٠٠(إجمالي ساعات حمل الطالب و ٢٤٠ إجمالي وحدات أوروبية. يعتمد تقديم المواد الدراسية على عملية بولونيا.

2. Undergraduate Courses 2023-2024

Module 1

Code	Course/Module Title	ECTS	Semester
STUMETC111	Fundamentals of Electrical Engineering	9	1
Class (hr/w)	**Lect/Lab/Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
4	5	139	86
Description			

This course provides the main features of the Fundamentals of Electrical Engineering for the students of 1st level, first-semester, in electromechanical systems techniques engineering department. Learning outcomes which gained by this program will help a student to achieve and demonstrate the learning opportunities that are provided during the course study. The aims which can be achieved during teaching this course program are

1. Learn the fundamentals and principles of electrical engineering.
2. Understand electric circuit elements.
3. Analysis of electric circuits.
4. Apply Electrical circuits theorems.
5. Calculate of currents, voltages and electrical power for DC and AC circuits 6. Analysis of resonance in AC circuits (Series and parallel resonance).
7. Analysis of Electromagnetic circuits.

Module 2

Code	Course/Module Title	ECTS	Semester
STUMETC 112	Engineering Materials	9	1
Class (hr/w)	**Lect/Lab**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	4	109	116

Description

This course provides the main features of the engineering materials for the students of 1st level, first-semester, in electromechanical systems techniques engineering department. Learning outcomes which gained by this program will help a student to achieve and demonstrate the learning opportunities that are provided during the course study. The aims which can be achieved during teaching this course program are

1. It provides a knowledge of material science.
2. Illustration and discussion the principles of material structure-selection and description.
3. To select a material for a given use based on considerations of cost and performance.
4. To be able to create a new material that will have some desirable properties.
5. To understand the limits of materials and the change of their properties with use.

Module 3

Code	Course/Module Title	ECTS	Semester
STUMETC 113	Mathematics	7	1
Class (hr/w)	**Lect/Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	3	94	81
Description			

This course provides the main features of the mathematics for the students of 1st level, firstsemester, in electromechanical systems techniques engineering department. Learning outcomes which gained by this program will help a student to achieve and demonstrate the learning opportunities that are provided during the course study. The aims which can be achieved during teaching this course program are

1. To develop problem solving skills and understanding of mathematics through the application of techniques.
2. To understand fundamental functions, differentiation, integration.
3. This course deals with the basic concepts of differentiation of the functions.
4. This is the basic subject for all simple function, polynomials, and power, rational functions.
5. To understand problems like derivatives applications, change rate, draw functions, derivatives of trigonometric functions, natural logarithm and exponential functions, log function and other types of functions.
6. To develop knowledge and techniques to integrate various types of function and integration application, finding area, volumes, methods of integration.

Module 4

Code	Course/Module Title	ECTS	Semester
STUMETC 114	Fundamentals of computer/1	3	1
Class (hr/w)	**Lect/Lab**	**SSWL (hr/sem)**	**USWL (hr/w)**
1	3	49	26

Description

This course provides the main features of the Fundamentals of computer/1 for the students of 1st level, first-semester, in electromechanical systems techniques engineering department. Learning outcomes which gained by this program will help a student to achieve and demonstrate the learning opportunities that are provided during the course study. The aims which can be achieved during teaching this course program are

1. To develop problem-solving skills and an understanding of the computer through the application of techniques

2- To understand the work of the electronic computer and the possibility of dealing with it

3. Developing an understanding of the fundamental concepts of computer science, including programming, algorithms, data structures, computer architecture, operating systems, and networks.

4. Developing practical skills in software development, including programming, debugging, testing, and documentation.

5. Developing problem-solving skills, including the ability to analyze problems, design solutions, and implement them using appropriate programming languages and tools.

6. Developing an understanding of the ethical and social issues related to computing, including privacy, security, intellectual property, and the digital divide.

7. Developing an understanding of the role of computer science in society, including its impact on industry, government, healthcare, and education.

8. Developing an appreciation for the diversity of applications of computer science, including artificial intelligence, machine learning, robotics, and data science.

Module 5

Code	Course/Module Title	ECTS	Semester
STUMETC 115	Democracy and Human Rights	2	1
Class (hr/w)	**Lect**	**SSWL (hr/sem)**	**USWL (hr/w)**
2		33	17
Description			
This course provides the main features of the human rights for the students of 1st level, firstsemester, in electromechanical systems techniques engineering department. Learning outcomes which gained by this program will help a student to achieve and demonstrate the learning opportunities that are provided during the course study. The aims which can be achieved during teaching this course program are 1- Knowledge of human rights. 2- Learn about the natural and protected human rights that governments and the international community provide for people. 3- The aim of this study unit is to introduce students to what a right is, what their natural rights are, and what their political rights are.			

Module6

Code	Course/Module Title	ECTS	Semester
STUMETC 121	Electronic Physics	9	2
Class (hr/w)	**Lect/Lab**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	4	109	116

Description

This course provides the main features of the electronic physics for the students of 1st level, second-semester, in electromechanical systems techniques engineering department. Learning outcomes which gained by this program will help a student to achieve and demonstrate the learning opportunities that are provided during the course study. The aims which can be achieved during teaching this course program are

1. To understand the fundamentals of structure of the atom, orbitals in the atom, energy levels connectivity, semiconductors.
2. To have knowledge about the physics of semiconductor materials.
3. To understand the characteristics and theories in semiconductor materials in terms of crystal structures, charge carriers and energy bands.
4. To describe crystalline structures of semiconductors. describe band structures of semiconductors.
5. To explain the properties of n-type and p-type semiconductors.

Module 7

Code	Course/Module Title	ECTS	Semester
STUMETC 122	Engineering Mechanics	7	2
Class (hr/w)	**Lect**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	3	94	81

Description

This course provides the main features of the engineering mechanics for the students of 1st level, second-semester, in electromechanical systems techniques engineering department. Learning outcomes which gained by this program will help a student to achieve and demonstrate the learning opportunities that are provided during the course study. The aims which can be achieved during teaching this course program are

1. To develop problem solving skills and understanding of mechanics theory through the application of techniques.
2. To understand force, resultant and vectors from a mechanical devices.
3. This course deals with the basic concept of statics and dynamics mechanics.
4. This is the basic subject for all mechanics parts.
5. To understand force moment, equilibrium, centroid and moment of inertia problems.
6. To know about friction problems perform mechanics dynamics analysis.

Module 8

Code	Course/Module Title	ECTS	Semester
STUMETC 123	Engineering and electrical Drawing	6	2
Class (hr/w)	**Lect/prac**	**SSWL (hr/sem)**	**USWL (hr/w)**
1	6	110	40

Description

This course provides the main features of the engineering and electrical drawing for the students of 1st level, second-semester, in electromechanical systems techniques engineering department. Learning outcomes which gained by this program will help a student to achieve and demonstrate the learning opportunities that are provided during the course study. The aims which can be achieved during teaching this course program are

1. To understand manual drafting and dimensioning of views
2. To perform lines drawing, simple sketches and modify dimensions.
3. This course deals with the basic concept of electrical drawing.
4. To understand sections and isometrics.
5. Explains the principles of orthographic views
6. To understand multi view projection.
7. To understand sectional view drawing

Module 9

Code	Course/Module Title	ECTS	Semester
STUMETC 124	English language/1	2	2
Class (hr/w)	**Lect**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	33	17
Description			

This course provides the main features of the Fundamentals of English language/1 for the students of 1st level, second-semester, in electromechanical systems techniques engineering department. Learning outcomes which gained by this program will help a student to achieve and demonstrate the learning opportunities that are provided during the course study. The aims which can be achieved during teaching this course program are

1. Develop students skills in understanding the basic grammars of English.
2. Develop students' speaking skills in English.
3. Develop students' listening skills in English.
4. Develop students' reading skills in English.
5. Develop students' reading skills in English.

Module 10

Code	Course/Module Title	ECTS	Semester
STUMETC 125	Workshops	6	2
Class (hr/w)	**prac**	**SSWL (hr/sem)**	**USWL (hr/w)**
	6	94	56

Description

This course provides the main features of the workshops for the students of 1st level, secondsemester, in electromechanical systems techniques engineering department. Learning outcomes which gained by this program will help a student to achieve and demonstrate the learning opportunities that are provided during the course study. The aims which can be achieved during teaching this course program are

1. Enable the student to know and understand the theoretical and practical principles of the plumbing workshop.
2. Enable the student to know and understand the theoretical and practical principles of the electrical workshop.
3. Enable the student to know and understand the theoretical and practical principles of the blacksmithing workshop.
4. Enable the student to know and understand the theoretical and practical principles of the turning workshop.
5. Enable the student to know and understand the theoretical and practical principles of the automobile workshop.
6. Design of various models and Manufacture of some simple products.

Module 11

Code	Course/Module Title	ECTS	Semester
STUMETC 126	جرائم حزب البعث البائ د	2	2
Class (hr/w)	**Lect**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	1	48	2
Description			
يف هذا المقرر الدراي س سيتعرف الطالب على جرائم حزب البعث البائد. أن الاهداف يه هـ : 1- المعرفة بانتهاكات الحقوق والحريات من قبل النظام البعثي البائد. 2- المعرفة باساليب البعث البائد الظالمه التي اثرت على الميدان النفسي والاجتماعي . 3- المعرفة باثر القمع والحروب على البيئة والسكان. .			

Module 12

Code	Course/Module Title	ECTS	Semester
STUMETC 231	Electrical Machines	8	3
Class (hr/w)	**Lect/Lab**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	4	109	91

Description

This course provides the main features of the Electrical Machines for the students of 2nd level, third-semester, in electromechanical systems techniques engineering department. Learning outcomes which gained by this program will help a student to achieve and demonstrate the learning opportunities that are provided during the course study. The aims which can be achieved during teaching this course program are

1. It provides a knowledge of electrical machines.
2. Illustration and discussion the principles of DC and AC machines, Description of the machine, as well as its operation in electrical machines.
3. The ability to analyses existing electrical machines and contribute to new designs.

Module 13

Code	Course/Module Title	ECTS	Semester
STUMETC 232	Thermodynamic and fluid	8	3
Class (hr/w)	**Lect/Lab**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	4	109	91

Description

This course provides the main features of the Thermodynamic and fluid for the students of 2nd level, third-semester, in electromechanical systems techniques engineering department. Learning outcomes which gained by this program will help a student to achieve and demonstrate the learning opportunities that are provided during the course study. The aims which can be achieved during teaching this course program are

1. It provides a knowledge of Thermodynamics and Fluid Mechanics.
2. Illustration and discussion the principles of heat, work, internal energy, $1^{st}$and 2^{nd} law of thermodynamics as well as applications.
3. The ability to analyses existing fluid systems and contribute to new designs.

Module 14

Code	Course/Module Title	ECTS	Semester
STUMETC 233	Electrical and Electronic Circuits	6	3
Class (hr/w)	**Lect/Lab/ Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	5	124	26

Description

This course provides the main features of the fundamentals of electrical and electronic circuits for the students of 2nd level, third-semester, in electromechanical systems techniques engineering department. Learning outcomes which gained by this program will help a student to achieve and demonstrate the learning opportunities that are provided during the course study. The aims which can be achieved during teaching this course program are

1. An understanding of Dimensional Analysis of Electrical and electronic circuits.
2. At the end of the year the student should be able demonstrate knowledge and understanding of the concepts, theory, and application of electrical and electronic circuits.
3. The ability to the analysis of electrical and electronic circuits.
4. Selection and application of appropriate analysis techniques.
5. knowledge of engineering methodologies

Module 15

Code	Course/Module Title	ECTS	Semester
STUMETC 234	Advance Mathematics	5	3
Class (hr/w)	**Lect/ Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	2	79	46

Description

This course provides the main features of the advance mathematics for the students of 2nd level, third-semester, in electromechanical systems techniques engineering department. Learning outcomes which gained by this program will help a student to achieve and demonstrate the learning opportunities that are provided during the course study. The aims which can be achieved during teaching this course program are

1. to graduates a qualified engineer's who they have theoretical experience in advanced mathematics in electromechanical field.
2. To provide theoretical knowledge and principles of advanced mathematics and the ability to analysis and solve the mathematical problems.
3. Illustration and discussion the main theoretical principles of functions of two and more variables, different types of differential equations and their solutions, Laplace transforms, power series, Taylor and Fourier series, vectors , techniques of derivative, integration and differential equation with their applications in electromechanical field.

Module 16

Code	Course/Module Title	ECTS	Semester
STUMETC 235	English Language/2	3	3
Class (hr/w)	**Lect**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	1	48	27

Description

This course provides the main features of the English language/2 for the students of 2nd level, third-semester, in electromechanical systems techniques engineering department. Learning outcomes which gained by this program will help a student to achieve and demonstrate the learning opportunities that are provided during the course study. The aims which can be achieved during teaching this course program are

1. Develop students skills in understanding the grammars of English.
2. Develop students' speaking skills in English.
3. Develop students' listening skills in English.
4. Develop students' reading skills in English.
5. Develop students' reading skills in English.

Module17

Code	Course/Module Title	ECTS	Semester
STUMETC 241	Electrical devices and measurements	8	4
Class (hr/w)	**Lect/Lab**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	4	109	91

Description

This course provides the main features of the Fundamentals of Electrical devices and measurement for the students of 2nd level, fourth-semester, in electromechanical systems techniques engineering department. Learning outcomes which gained by this program will help a student to achieve and demonstrate the learning opportunities that are provided during the course study. The aims which can be achieved during teaching this course program are

1. Illustration and discussion the theory of measurement including static characteristics of instruments, various standards, error analysis, classifications and statistical analysis.
2. Illustrate the principles design theory of various dc and ac analogue voltmeters, Ammeters Watt meters, and single phase energy meter.
3. Discuss and analyze various dc and ac bridges used for the measurement of resistances, impedances and associated parameters like inductance, capacitance and frequency.
4. Explain the various active and passive transducers; also it includes a detail discussion of the theory and application of some transducers for example, strain gauges, LVDT, thermister, piezoelectric, etc.
5. Illustration and discussion of CRT and the various parts of CRO. And the theory of operation of the instrument.
6. Giving knowledge and unfolds the details of various signal analyzers such as distortion, waveform and spectrum analyzers.
7. Illustrate the certain advantages of electronic meters as compared to analogue.

Module 18

Code	Course/Module Title	ECTS	Semester
STUMETC 242	Electronics	7	4
Class (hr/w)	**Lect/Lab**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	4	109	66

Description

This course provides the main features of the electronics for the students of 2st level, fourthsemester, in electromechanical systems techniques engineering department. Learning outcomes which gained by this program will help a student to achieve and demonstrate the learning opportunities that are provided during the course study. The aims which can be achieved during teaching this course program are

1. To provide a knowledge of electronic circuits.
2. Illustration and discussion the principles of electronics.
3. The ability to analyze and solve problems.
4. Knowledge of the methods associated with electronics according to modern techniques methods.

Module 19

Code	Course/Module Title	ECTS	Semester
STUMETC 243	Strength of Materials	7	4
Class (hr/w)	**Lect/Lab**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	4	109	66

Description

This course provides the main features of the strength of materials for the students of 2nd level, fourth-semester, in electromechanical systems techniques engineering department. Learning outcomes which gained by this program will help a student to achieve and demonstrate the learning opportunities that are provided during the course study. The aims which can be achieved during teaching this course program are

1. The mathematical background for the different topics of strength of materials introduced in this course
2. To understand stress concept and types of stresses
3. Illustrate the internal forces in beams, how to draw shear force and bending moment diagrams Electrical circuits theorems.
4. To understand stress strain relationship and solving problems
5. To understand beam analysis, stresses in beams, beam theory and shear stresses
6. To understand torsion in shafts, determination of shear stresses and twisting angle due to torsion.

Module 20

Code	Course/Module Title	ECTS	Semester
STUMETC 244	Programming	5	4
Class (hr/w)	**Lab**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	3	79	46
Description			

This course provides the main features of the programming for the students of 2nd level, fourth-semester, in electromechanical systems techniques engineering department. Learning outcomes which gained by this program will help a student to achieve and demonstrate the learning opportunities that are provided during the course study. The aims which can be achieved during teaching this course program are

1. Understanding and knowing how programming languages work
2. Dealing with problems and analyzing them logically.
3. Problem-solving using programming.
4. Choose the best way to perform the tasks programmatically.
5. Implementation and translation of ideas appropriately to meet my needs and the needs of others from the program.

Module 21

Code	Course/Module Title	ECTS	Semester
STUMETC 245	Fundamentals of computer/2	3	4
Class (hr/w)	**Lab**	**SSWL (hr/sem)**	**USWL (hr/w)**
1	**2**	49	26
Description			
This course provides the main features of the Fundamentals of computer/2 for the students of 2nd level, fourth-semester, in electromechanical systems techniques engineering department. Learning outcomes which gained by this program will help a student to achieve and demonstrate the learning opportunities that are provided during the course study. The aims which can be achieved during teaching this course program are 1- Introducing the student to the most basic rules in dealing with networks 2- The student's knowledge of the development that has accompanied networks since their inception to the present time. 3- The student acquires practical skills through the use of Excel 2010. 4- Defining the network components and their work for a student. 5- Enabling the student to use application software to provide services to the user in performing many tasks on the computer.			

Module 22

Code	Course/Module Title	ECTS	Semester
STUMETC 51	Electric Power Systems	7	5
Class (hr/w)	**Lect/Lab**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	4	109	66

Description

This course provides the main features of the electric power system for the students of 3rd level, fifth-semester, in electromechanical systems techniques engineering department. Learning outcomes which gained by this program will help a student to achieve and demonstrate the learning opportunities that are provided during the course study. The aims which can be achieved during teaching this course program are

1. It provides a knowledge of electrical power system.
2. Illustration and discussion the principles of power station and types , transmission line .
3. To study the types of electrical generation stations, types of transmission lines and insulators used in the transmission of electrical power .
4. Knowledge of the functions of the parts of the generating station
5. Load curve analysis and capacity generation stations
6. To analyze transmission lines and calculate the diameters and number of conductors in the transmission line.

Module 23

Code	Course/Module Title	ECTS	Semester
STUMETC 352	Heat transfer and Hydraulic systems	7	5
Class (hr/w)	**Lect/Lab**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	4	109	66

Description

This course provides the main features of the heat transfer and hydraulic systems for the students of 3rd level, fifth-semester, in electromechanical systems techniques engineering department. Learning outcomes which gained by this program will help a student to achieve and demonstrate the learning opportunities that are provided during the course study. The aims which can be achieved during teaching this course program are 1- To define the heat transfer modes concepts.

2- To define the theoretical basics of the conduction heat transfer Coincided with a laboratory experiment.

3- To define the theoretical basics of the forced and free convective heat transfer Coincided with a laboratory experiment.

4- To define the theoretical basics of the radiation heat transfer.

5- To define the theoretical basics of the heat exchangers Coincided with a laboratory.

6- To define the theoretical basics of the mixed modes of heat transfer.

Module 24

Code	Course/Module Title	ECTS	Semester
STUMETC 353	Communications	7	5
Class (hr/w)	**Lect/Lab**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	4	109	66

Description

This course provides the main features of the communication for the students of 3rd level, fifth-semester, in electromechanical systems techniques engineering department. Learning outcomes which gained by this program will help a student to achieve and demonstrate the learning opportunities that are provided during the course study. The aims which can be achieved during teaching this course program are

1. It provides a knowledge of communications**.**
2. Illustration and discussion the principles of communications system, description of type of signals , filters and modulation(AM,FM and PM) as well as transportation lines with basic equations and analysis.
3. To understand the components of signals, their types, and the operations that are performed on them.
4. To understand the analysis of communication systems and how to obtain the best designs.

Module 25

Code	Course/Module Title	ECTS	Semester
STUMETC 354	Theory of Machines	6	5
Class (hr/w)	**Lect/Lab**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	4	109	41

Description

This course provides the main features of the theory of machines for the students of 3rd level, fifth-semester, in electromechanical systems techniques engineering department. Learning outcomes which gained by this program will help a student to achieve and demonstrate the learning opportunities that are provided during the course study. The aims which can be achieved during teaching this course program are

1. It provides a knowledge of theory of machines.
2. Illustration and discussion the principles of machines, description of the machine, as well as its operation in theory of machines.
3. To analyses existing theory of machines and contribute to new designs.

Module 26

Code	Course/Module Title	ECTS	Semester
STUMETC 355	English Language/3	3	5
Class (hr/w)		**SSWL (hr/sem)**	**USWL (hr/w)**
2		33	42

Description

This course provides the main features of the Fundamentals of English language/3 for the students of 3rd level, fifth-semester, in electromechanical systems techniques engineering department. Learning outcomes which gained by this program will help a student to achieve and demonstrate the learning opportunities that are provided during the course study. The aims which can be achieved during teaching this course program are

1. Develop students skills in understanding the grammars of English.
2. Develop students' speaking skills in English.
3. Develop students' listening skills in English.
4. Develop students' reading skills in English.
5. Develop students' reading skills in English.

Module27

Code	Course/Module Title	ECTS	Semester
STUMETC 361	Synchronous and special Machines	7	6
Class (hr/w)	**Lect/Lab/Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	5	124	51

Description

This course provides the main features of the synchronous and special machines for the students of 3rd level, sixth-semester, in electromechanical systems techniques engineering department. Learning outcomes which gained by this program will help a student to achieve and demonstrate the learning opportunities that are provided during the course study. The aims which can be achieved during teaching this course program are

1. To provide a knowledge of synchronous & special machines .
2. Illustration and discussion the principles of synchronous & special machines, description of the machine, as well as its operation in synchronous & special machines.
3. To analyses existing of synchronous & special machines and contribute to new designs.

Module 28

Code	Course/Module Title	ECTS	Semester
STUMETC 362	Control and Vibration Theory	6	6
Class (hr/w)	**Lect/Lab**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	4	109	41

Description

This course provides the main features of the control and vibration theory for the students of 3rd level, sixth-semester, in electromechanical systems techniques engineering department. Learning outcomes which gained by this program will help a student to achieve and demonstrate the learning opportunities that are provided during the course study. The aims which can be achieved during teaching this course program are

1. It provides a knowledge of control and vibration theory.
2. Illustration and discussion the principles of control and vibration theory .
3. The student should be able demonstrate knowledge and understanding of the concepts, theory and application of control and vibration theory.

Module 29

Code	Course/Module Title	ECTS	Semester
STUMETC 363	Industrial Engineering	6	6
Class (hr/w)	**Lect**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	2	78	72
Description			
This course provides the main features of the industrial engineering for the students of third level, sixth-semester, in electromechanical systems techniques engineering department. Learning outcomes which gained by this program will help a student to achieve and demonstrate the learning opportunities that are provided during the course study. The aims which can be achieved during teaching this course program are 1. It provides a knowledge of Industrial engineering. 2. Illustration and discussion the principles of the scope of Industrial Engineering and the Management Process. 3. To understand of the fundamentals of production and the productivity.			

Module 30

Code	Course/Module Title	ECTS	Semester
STUMETC 364	Electromechanical designs	6	6
Class (hr/w)	**Lect**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	2	78	72
Description			

This course provides the main features of the electromechanical designs for the students of 3rd level, sixth-semester, in electromechanical systems techniques engineering department. Learning outcomes which gained by this program will help a student to achieve and demonstrate the learning opportunities that are provided during the course study. The aims which can be achieved during teaching this course program are

1- Cover the basics of machine design, including the design process, engineering mechanics and materials, failure prevention under static and variable loading, and Characteristics of the principal types of mechanical elements.

2- Offer a practical approach to the subject through a wide range of real-world applicationsand examples.

3- Identify appropriate analytical models to describe and predict the behavior of standard machine components;

4- Apply stress analysis theory, fatigue theory and appropriate criteria of failure to the design of simple machine elements;

5- Select appropriate mechanical components from manufacturers' catalogues;

6- Apply codes and standards to machine component design;

7- Understand safety and reliability concepts in the design of machine elements.

8- Communicate the results of a design assignment by means of drawings and a design report.

Module 31

Code	Course/Module Title	ECTS	Semester
STUMETC 365	Engineering and Numerical Analysis	5	6
Class (hr/w)	**Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	1	63	62

Description

This course provides the main features of the engineering and numerical analysis for the students of 3rd level, sixth-semester, in electromechanical systems techniques engineering department. Learning outcomes which gained by this program will help a student to achieve and demonstrate the learning opportunities that are provided during the course study. The aims which can be achieved during teaching this course program are

1. It provides a knowledge of engineering and numerical analysis.
2. Illustration and discussion the principles of engineering and numerical analysis.
3. To provide you with an understanding of the fundamentals of engineering and numerical analysis.

Module 32

Code	Course/Module Title	ECTS	Semester
STUMETC 471	Power Electronics and Drive	7	7
Class (hr/w)	**Lect/Lab**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	4	109	66

Description

This course provides the main features of the power electronics and drive for the students of 4th level, seventh-semester, in electromechanical systems techniques engineering department. Learning outcomes which gained by this program will help a student to achieve and demonstrate the learning opportunities that are provided during the course study. The aims which can be achieved during teaching this course program are

1. To acquire in-depth knowledge of power electronic circuits for real-time applications.
2. To solve problems in power electronics.
3. To analyze power electronics using existing modern tools for enhancement of knowledge.

Module 33

Code	Course/Module Title	ECTS	Semester
STUMETC 472	Electromechanical Devices	7	7
Class (hr/w)	**Lect/Lab**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	4	109	66

Description

This course provides the main features of the electromechanical devices for the students of 4th level, seventh-semester, in electromechanical systems techniques engineering department. Learning outcomes which gained by this program will help a student to achieve and demonstrate the learning opportunities that are provided during the course study. The aims which can be achieved during teaching this course program are

1. To provide a knowledge of electromechanical devices.
2. Illustration and discussion the principles of electromechanical devices.
3. The student should be able demonstrate knowledge and understanding of the concepts, theory and application of electromechanical devices.

Module 34

Code	Course/Module Title	ECTS	Semester
STUMETC 473	Automation and Control	7	7
Class (hr/w)	**Lect**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	1	64	111

Description

This course provides the main features of the automation and control for the students of 4th level, seventh-semester, in electromechanical systems techniques engineering department. Learning outcomes which gained by this program will help a student to achieve and demonstrate the learning opportunities that are provided during the course study. The aims which can be achieved during teaching this course program are

1. It provides a knowledge of automation and control.
2. Illustration and discussion the principles of automation and control.
3. The student should be able demonstrate knowledge and understanding of the concepts, theory and application of automation and control.

Module 35

Code	Course/Module Title	ECTS	Semester
STUMETC 483	Computer Aided Design and Manufacturing	6	7
Class (hr/w)	**Lect/Lab**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	4	109	41
Description			
This course provides the main features of the computer aided design and manufacturing for the students of 4th level, eighth-semester, in electromechanical systems techniques engineering department. Learning outcomes which gained by this program will help a student to achieve and demonstrate the learning opportunities that are provided during the course study. The aims which can be achieved during teaching this course program are 1. It provides a knowledge of computer aided design and manufacturing (CAM CAD). 2. Learn to draw in 2D, 3D. 3. Drawing some manufacturing drawings by AutoCAD.			

Module 36

Code	Course/Module Title	ECTS	Semester
STUMETC 475	English Language/4	3	7
Class (hr/w)	**Lect**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	2	64	11

Description

This course provides the main features of the English language/4 for the students of 4th level, eighth-semester, in electromechanical systems techniques engineering department. Learning outcomes which gained by this program will help a student to achieve and demonstrate the learning opportunities that are provided during the course study. The aims which can be achieved during teaching this course program are 1. Develop students' speaking skills in English.

2. Develop students' listening skills in English.
3. Develop students' reading skills in English.
4. Develop students' reading skills in English.

Module37

Code	Course/Module Title	ECTS	Semester
STUMETC 481	Signals and systems	8	8
Class (hr/w)	**Lect/Lab**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	5	124	76

Description

This course provides the main features of the signals and systems for the students of 4th level, eighth-semester, in electromechanical systems techniques engineering department. Learning outcomes which gained by this program will help a student to achieve and demonstrate the learning opportunities that are provided during the course study. The aims which can be achieved during teaching this course program are

1. It provides a knowledge of signals and systems.
2. Illustration and discussion the principles of signals and systems.
3. Knowledge of the methods associated with signals and systems.

Module 38

Code	Course/Module Title	ECTS	Semester
STUMETC 482	Microprocessors and Microcontrollers	8	8
Class (hr/w)	**Lect/Lab**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	5	124	76

Description

This course provides the main features of the microprocessors and microcontrollers for the students of 4th level, eighth-semester, in electromechanical systems techniques engineering department. Learning outcomes which gained by this program will help a student to achieve and demonstrate the learning opportunities that are provided during the course study. The aims which can be achieved during teaching this course program are

1. To provide a knowledge of microprocessors and microcontrollers.
2. Illustration and discussion the principles of microprocessors and microcontrollers in digital systems, Description of the digital control concepts using microprocessors and micro controllers and it`s applications.
3. Explanation the architecture of 8086 microprocessor and 8051 microcontroller and the internal hardware of them, as well as the assembly programing languages of each microchip. The method of learning is based on an applied approach.

Module 39

Code	Course/Module Title	ECTS	Semester
STUMETC 474	Air Condition And Cooling systems	8	8
Class (hr/w)	**Lect/Lab**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	5	124	76

Description

This course provides the main features of the air condition and cooling systems for the students of 4th level, seventh-semester, in electromechanical systems techniques engineering department. Learning outcomes which gained by this program will help a student to achieve and demonstrate the learning opportunities that are provided during the course study. The aims which can be achieved during teaching this course program are

1. Understand basics of air-condition and refrigeration systems and their operations.
2. Have ability to compute the thermal loads, thermal comfort and design conditions and ducts system design.
3. Control device and automatic control of the air- conditioning and refrigeration systems and their applications and have ability and knowledge to select air-conditioning and refrigeration equipment's.

Module 40

Code	Course/Module Title	ECTS	Semester
STUMETC 484	Engineering project	6	8
Class (hr/w)	**prac**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	4	93	57
Description			
This course provides the main features of the engineering project for the students of 4th level, seventh semester, in electromechanical systems techniques engineering department. Learning outcomes which gained by this program will help a student to achieve and demonstrate the learning opportunities that are provided during the course study.			

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