University of Technology

Electromechanical Engineering Department

Electromechanical Systems Engineering Branch

2023 – 2024

First Cycle,

Bachelor's Degree (B.Sc.) Electromechanical Systems Engineering Program

Appendix 2 Program Catalogue

Table of Contents

1. Mission and Vision Statement

Vision Statement

Aiming to build an engineering establishment in electromechanical systems field to be outstanding one among the top international university.

Mission Statement

1- Prepare our students for successful careers in the energy and renewable energies profession,
2- Conduct high quality and innovative research, and
3- Serve the community and industry providing educational and research resources.

For future plans, the branch intends to cover all required courses in electromechanical engineering sectors in Iraq, including control, electric machines, applied mechanics, robotics systems. Through the communications with Ministry of industry an oil (symposiums, industrial advisory board meeting), the branch developed his courses according to the needs of the ministries.

2. Program Specification

Program Code	BSc-EREE	ECTS	240
Duration	4 Year, 8 Semesters	Method of Attendance	Full Time

Subject Areas Requirements

The Electromechanical Systems Engineering program produces graduates who are preparedtoenterthepracticeofelectromechanical systems and its application. For two paths, therearethree major components of the program: (1) foundation in the mathematical and physical sciences, (2) engineering topics in both mechanical and electric systems with design applications, and (3) general education in the humanities, Englishcourse and ethics.

Mathematics and PhysicalSciences

The engineering science fundamentals and engineering design skills are built upon the basicmathematicsandphysicalsciences.Themathematicsworkbeginswitha three levels course (six courses) sequence on differential and integral calculus. The first two coursesincludetopicsinlimits,derivatives,andtheintegralsoffunctionsofonevariable, work on partial derivatives and multiple integrals is presented. Vector analysis and three-dimensional analytical geometry, solution of the first and second order linear differential equations with numerous applications, Laplace transforms, power series solutions, numerical methods, linear systems and numerical analysis with engineering applications in numerical differentiation andintegration. With this foundation in mathematics, our students have necessary tools for applications in analysis and design.

Physics (two courses) in the first level includes materials science, classification of materials, atomic structure and the type of bonding forces, types of materials and their applications and the mechanical material properties.
It is noted that the number of hours for Math and Basic Science is 30 hours and it's satisfies ICAEE requirement.

EngineeringTopics

Theaimoftheprogramistograduatestudentscapabletoworkasmechanicalandelectrical engineer in electromechanical systems field. The engineering topics are divided into four parts; preliminary joint courses, mechanical courses, electrical courses and final joint courses.

Preliminary joint courses:

- Workshop Training; Preparation of engineering cadres trained scientific and practical areas in the electricity, automobiles, machining(lathe, milling, drilling), forging, denting, filings, forging, welding, andcasting.
- Computer Courses; Computer Science (Visual BASIC programs), Advanced Programming (C++), Application of Advance Computer (Microprocessors and MATLABlanguages).
- Industrial Engineering, determine the most effective ways for an organization to use the

basic factors ofproduction.

- EngineeringandMachineDrawingistoteachstudentsmanualdrafting and dimensioning of views, explains the principles of orthographic views, multi view projection and sectional view drawing.

Engineering courses are divided into twoparts;

Mechanical Courses,

- Engineering Mechanics. This unit of study aims to provide theoretical knowledge and principles of Statics andDynamics.
- Strength of Material and Vibration. In this course, students will learn; the behavior of solid bodies under loads and deflections, study the simple bending theory for beams and the simple torsion theory for shafts circular and non-circular, deflection of beams, complex stresses, compounds beam and discussion the principles of free & forced vibrations
- Control System, illustration and discussion the Main Theoretical Principles of control systems and understanding of using different systemDamping.
- Thermodynamics, Fundamental thermodynamic concepts including system, state, state postulate, equilibrium, process and cycle, Heat, work, 1st Law of Thermodynamics, Properties of a substance, Energy balances for idealized closed systems, Energy and mass balances for idealized control volumes, 2ndLaw of Thermodynamics, Carnot cycles, thermal efficiencies, Entropy, isentropic processes, isentropic efficiencies, idealized power cycles (Otto, Diesel and Rankine Cycles).
- FluidMechanics.This courseprovidesaworkingknowledgeofFluidMechanics and Illustration and discussion the principles of Principle of fluid motional flow classification Bernoulli's equation as well as applications of Bernoulli's equation and anther subject in FluidMechanics.
- Heat Transfer; teach theoretical basics of the conduction, convection and radiation heat transfer Coincided with a laboratoryexperiment.

Electrical Courses,

- Fundamental of Electric Engineering (illustration and discussion the fundamentalfelectricengineeringanddefinition,proceedingtothestudenttheDC Electrical Circuits, series, parallel, series-parallel and identify the equations voltages &current for circuitsabove).
- Electric and Electronic Circuits, in electrical engineering, we are often interested in communicatingortransferringenergyfromonepointtoanother.Todothisrequires an interconnection of electrical devices. Such interconnection is referred to as an electriccircuit.
- Electrical Machines, Illustration and discussion the principles of DC and AC machines, description of the machine, as well as its operation in electrical machines.
- Power systems, Giving Knowledge about the generation, transmission, and distribution typesystems.
- Communication, theoretical and practical experiences in analog and digital communication and AM and FM modulation.

- Power Electronics and Electrical Drives, theoretical and practical experiences in the field of power electronics and electrical drives such as AC to DC converters (Rectifiers), DC to AC converters (invertors), DC to DC converters (DC choppers), AC to AC converters (AC voltage regulator and cycloconverter), speed control of DC motors, and speed control of AC motors (inductions and synchronous motors).

Final Joint Courses,

- Electromechanical Equipment, this course specification provides the main features of the Electromechanical Systems andDevices.
- Computer aided design and computer aided manufacturing.
- Signal processing, this course provides the types of signals and analysis of signals. In addition, the comparative between signals is given as well.

Others Including GeneralEducation

The third major area of the curriculum is the general education component. The University of Technology has a mandated General Education Requirements for all degrees. To satisfy the General Education Requirements the Electrometrical Systems Engineering Program set required courses in the general education component as follows:

- English Language(two levels), this course will improve the ability of the students to understand, speak, read and write English as a second language with some technical texts. It is also intended to teach them, how to use technical English effectively as a language of instruction, Lab. Experiments and Exercises, examples, using Technical Terminologies as close as possible to the lectures they receive during their study.
- Human Rights (second level), Freedom and Democracy, the course covers the concept of human rights and development, definition, classes, properties, and the most important human rights conventions and declarations and international conventions on human rights andhumanrightsinreligionsandtheroleofnon-governmentalorganizationsinthisfield and other human rights issues. The substance of freedom and democracy include the conceptoffreedomandkinds,democracyandthetypesandcomponents,individualliberty and freedom forced to reconcile the sovereignty, freedom, democracy during the Greeks time, lobbyists, the most important theories on the nature of election, the rights of minorities in democratic governance and other topics that make the student familiar with theissues.
- Ethics in Engineering (fourth level), concentrates on professional Ethics.
- Sport (first level), concentrates on different sport activities.

3. Program Goals (objectives)

1- Entering the electromechanical systems engineering profession as practicing engineers and consultants with prominent companies and organizations in diverse areas that related to electromechanical systemsengineering.
2- Pursuing graduate education and research at major research universities in electromechanical systems engineering, and related fields
3- Advance in their chosen fields to supervisory and management positions

4- Engage in continued learning through professional development
5- Participate in and contribute to professional societies and community services

4. Student (Graduate) Learning Outcomes

Students from the electromechanical systemsprogram will attain (by the time of graduation):

1. An ability to identify, formulate, and solve engineering in electromechanical systems engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply the engineering design process to produce solutions that meet specified needs with consideration for public health and safety, and global, cultural, social, environmental, economic, and other factors as appropriate to the discipline
3. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
4. An ability to communicate effectively with a range of audiences
5. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
6. An ability to recognize the ongoing need to acquire new knowledge, to choose appropriate learning strategies, and to apply this knowledge
7. An ability to function effectively as a member or leader of a team that establishes goals, plans tasks, meets deadlines, and creates a collaborative and inclusive environment

5. Academic Staff (Faculty)

Faculty Name	Highest Degree Earned- Field and Year	Rank	E-mail
Mohammed Kadhim Edan	PhD. in Elect. Eng. (2017)	P	50055@uotechnology.edu.iq
Hashim Abed Hussein Hameed	PhD. in Mech. Eng. (2006)	P	
Jamal Abdul-Kareem Mohammed Abdullah	PhD. in Elect. Eng. (2007)	P	
Hussein Thani Rishag Tubi Swadi	PhD. in Elect. Eng. (2005)	AST	
Abduljabbar Owaid Hanfesh jarad	PhD. in Elect. Eng. (2009)	AST	
Ahlam Louabi Shreajee	PhD. in Elect. Eng. (2017)	AST	
Manal Kadhim Oudah Hasan	PhD. in Elect. Eng. (2009)	AST	
Israa Saad Ahmed Naseif	PhD. in Mech. Eng. (2017)	AST	
Wisam Essmat Abdul-Lateef	PhD. in Mechatronics Eng. (2017)	AST	
Tariq Mohammad Hammza khalaph	PhD. in Mech. Eng. (2016)	AST	
Adnan Ghareeb Tuaamah Al-Hasnawi	PhD. in Mech. Eng. (2016)	AST	
Abduljabbar Muttair Ahmed Mizban Alsaedi	PhD. in Mech. Eng. (2012)	I	
Anees Fadhel Saad Hazam	PhD. in Mech. Eng. (2018)	I	
Faten Noaman Abdullah Noaman	PhD. in Mech. Eng. (2019)	I	

Murooj Nadhom Mohammed Ali Musa	PhD. in Elect. Eng. (2020)	I	
Bassam Ali Ahmed Mohammed Ali	PhD. in Mech. Eng. (2021)	A	
Majida Khaleel Ahmed Mohsen	PhD.Elect. Eng. (2007)	A	
Adel Ridha Othman Ali	MSc. Mech. Eng. (2008)	A	
Najat Shyaa Jasim Mohammed	MSc. Elect. Eng. (2001)	I	
Wisam Ali Hassan ALZUHAIRI	MSc. Law (2012)		
Rafah Kareem Mahmood Hasan	MSc. in Computer (2015)	I	

6. Credit Grading and GPA

Credits

University of Technology is following the bologna Process with the European Credit Transfer System (ECTS) credit system. The total degree program number of ECTS is 240, 30 ECTS per semester. 1 ECTS is equivalent to 25 hrs student workload, including structure and unstructured workload.

Grading

Before the evaluation, the results are divided into two subgroups: pass and fail. Therefore, the results are independent of the students who are failed a course. The grading system is defined as follows:

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50-100)	A - Excellent	امتياز	90 - 100	Outstanding
	B – very Good	جيد جدا	80 – 89	Above average with some errors
	C - Good	جيد	70 – 79	Sound work with notable Error
	D - Satisfactory	متوسط	60 – 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work with met minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب قيد المعالجة	45-49	More work required but credit awarded
	F - fail	راسب	0 - 44	Considerable amount of work required
Notes:				
Marks with decimal places above or below 0.5 will rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The university has a policy NOT to condone “near pass fail” so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

Calculation of the Cumulative Grade Point Average (CGPA)

The CGPA is calculated by the summation of each module score multiplied by its ECTS, all are divided by the program total ECTS.

CGPA of a 4 – year B.SC. Degrees:

CGPA = [91st module score x ECTS) + (2nd module score x ECTS) + …]/240

7. Curriculum/Modules

Semester 1: 30 ECTS: 1 ECTS = 25 hrs

No.	Subject	units				Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Model Type
		First term			units						
		Theo.	Prac.	Tut.							
1	Computer Sciences I	2	2	-	2	3	63	12	75	3	S
2	Workshop I	-	6	-	3	3	93	7	100	4	B
3	Mathematics I	4	-	-	4	3	63	87	150	6	B
4	Fundamentals of Electrical DC Circuits	2	2	-	3	3	63	62	125	5	C
5	Engineering Mechanics(Static)	2	2	-	3	3	63	37	100	4	C
6	Physics I	4	-	-	4	3	63	87	150	6	B
7	Human Rights	2	-	-	2	3	33	17	50	2	S
							441	309	750	30	

Semester 2: 30 ECTS: 1 ECTS = 25 hrs

No.	Subject	units				Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Model Type
		First term			units						
		Theo.	Prac	Tut.							
1	Engineering Mechanics (Dynamic)	2	2	-	3	3	63	37	100	4	C
2	Workshop II	-	6	-	3	3	93	7	100	4	B
3	Mathematics II	4	-	-	4	3	63	87	150	6	B
4	Fundamentals of Electrical AC Circuits	2	2	-	3	3	63	62	125	5	C
5	Fundamentals of Engineering Drawing (Auto CAD)	-	3	-	2	3	48	27	75	3	S
6	Physics II	4	-	-	4	3	63	87	150	6	B
7	English Language I	2	-	-	2	3	33	17	50	2	S
							426	324	750	30	

8. Contact:

Program Manager: Mohammed K Al-Saadi, Prof., PhDin Elec. Eng. (2017)

Program Coordinator: Israa Saad Ahmed, Prof, Assist, PhDMech Eng. 2017

Appendix 3 Modules Catalogue

Table of Contents

1. Overview

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

2. Undergraduate Courses

First Semester

Module 1

Code	Course/module Title	ECTS	Semester
WSHE106	Workshop	4	1, 2
Class (hr/w)	Lect./Lab./Prac./Tutor	SSWL(hr/sem)	SWL (hr/year)
-	- / - / 6 / -	-	200
Description			
Preparation of engineering cadres trained scientific and practical areas in the electricity, automobiles, machining(lathe, milling, drilling), forging, denting, filings, forging, welding, andcasting.			

Module 2

Code	Course/module Title	ECTS	Semester
COSC108	Computer Science I	3	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL(h/sem)	USWL (h/w)
1	- /2 / - / -	48	27
Description			
Windows, Computer Science (Visual BASIC programs).			

Module 3

Code	Course/module Title	ECTS	Semester
MATH113	Mathematics I	6	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL(h/sem)	USWL (h/w)
4	-	63	87
Description			
Themathematicsworkbegins with differential and integral calculus, limits,derivatives,andtheintegralsoffunctionsofonevariable, work on partial derivatives and multiple integrals is presented.			

Module 4

Code	Course/module Title	ECTS	Semester
FUEE114	Fundamentals of Electrical Engineering(DC)	5	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL(h/sem)	USWL (h/w)
2	- / 2 / - / -	63	62
Description			
In this course, students learn some details of Fundamental of AC and DC circuits and their analysis by using different methods, Firstly, they are taken the atomic structure to understand the concept of current and voltage, then they are given the Kirchhoff's current and voltage laws and how they can employ them to analysis of the AC and DC circuits. Besides, the analysis methods are presented to learn the students the analysis of the AC and DC circuits. In addition, the analysis the AC and DC circuits by network theorems are given.			

Module 5

Code	Course/module Title	ECTS	Semester
PHYS115	Physics I	6	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL(h/sem)	USWL (h/w)
4	-	60	90
Description			
The aims which can be achieved during teaching this course program are concept of materials science, classification of materials, atomic structure and the type of bonding forces.			

Module 6

Code	Course/module Title	ECTS	Semester
SPOR116	Sport	2	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL(h/sem)	USWL (h/w)
2	-	33	17
Description			
The objectives of this course is providing formal education and of encouraging pupils' personal development in a wider social and cultural context. Formal education involves the acquisition of competences knowledge, skills and attitudes across a range of domains. Personal development takes place in a variety of spiritual, moral, social and cultural contexts. It involves an awareness of appropriate behavior, an understanding of the environment in which pupils live, and a development of their individual identity.			

Module 7

Code	Course/module Title	ECTS	Semester
ENME117	Engineering Mechanic(Dynamic)	4	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL(h/sem)	USWL (h/w)
2	2	63	37
Description			
This unit of study aims to provide theoretical knowledge and principles of static.			

Second semester

Module 1

Code	Course/module Title	ECTS	Semester
WSHE106	Workshop	4	2
Class (hr/w)	Lect./Lab./Prac./Tutor	SSWL (hr/sem)	SWL (hr/year)
-	- / - / 6 / -	-	200
Description			
Preparation of engineering cadres trained scientific and practical areas in the electricity, automobiles, machining(lathe, milling, drilling), forging, denting, filings, forging, welding, andcasting.			

Module 2

Code	Course/module Title	ECTS	Semester
MATH122	Mathematics II	6	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL(h/sem)	USWL (h/w)
4	-	63	87
Description			
Vector analysis and three-dimensional analytical geometry are included in this course. Topics include solution of the first and second order linear differential equations with numerous applications.			

Module 3

Code	Course/module Title	ECTS	Semester
FUEE123	Fundamentals of Electrical Engineering (AC)	5	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL(h/sem)	USWL (h/w)
2	- / 2 / - / -	63	62
Description			
In this course, students learn some details of Fundamental of AC and DC circuits and their analysis by using different methods, Firstly, they are taken the atomic structure to understand the concept of current and voltage, then they are given the Kirchhoff's current and voltage laws and how they can employ them to analysis of the AC and DC circuits. Besides, the			

analysis methods are presented to learn the students the analysis of the AC and DC circuits. In addition, the analysis the AC and DC circuits by network theorems are given.

Module 4

Code	Course/module Title	ECTS	Semester
FATD124	Fundamentals of AutoCAD tools Drawing	3	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL(h/sem)	USWL (h/w)
-	- / 3 / - / -	48	27
Description			
Fundamental of Electric Engineering (illustration and discussion the fundamentalfelectricengineeringanddefinition,proceedingtothestudenttheDC Electrical Circuits, series, parallel, series-parallel and identify the equations voltages &current for circuitsabove).			

Module 5

Code	Course/module Title	ECTS	Semester
PHYS125	Physics II	6	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL(h/sem)	USWL (h/w)
4	-	63	87
Description			
This course considers the types of materials and their applications and the mechanical material properties.			

Module 6

Code	Course/module Title	ECTS	Semester
ENLA126	English Language I	2	2
Class (hr/w)	Lect./Lab./Prac./Tutor	SSWL(h/sem)	USWL (h/w)
2	-	33	17
Description			
This course will improve the ability of the students to understand, speak, read and write English as a second language with some technical texts. It is also intended to teach them, how to use technical English effectively as a language of instruction, Lab. Experiments and Exercises, examples, using Technical Terminologies as close as possible to the lectures they receive during their study.			

Module 7

Code	Course/module Title	ECTS	Semester
ENME127	Engineering Mechanics	4	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL(h/sem)	USWL (h/w)
2	- / 2 / - / -	63	37
Description			
This unit of study aims to provide theoretical knowledge and principles of Statics andDynamics.			

3. **Contact:**
   Program Manager: Israa Saad Ahmed, Prof, Assist, PhD Mech Eng. 2017
   Program Coordinator: Murooj N. Mohammed Ali, Lectruer,

Appendix 4 Modules Description Form

First Semester

Module 1

Module Information			
Module Title	Workshops		Module Delivery
Module Type	Basic		They ☐ Lecture ☐ Lab ☐ Tutorial ■ Practical ☐ Seminar
Module Code	WSHE106		
ECTS Credit/year	8		
SWL/year	200		
Module level	1	Semester of Delivery	1, 2
Module Leader	Training and Workshops Center	College	
Module Leader Academic Title	Prof.Wissam H. Alawee	e-mail	Wissam.h.alawee@uotechnology.edu.iq
Module Tutor		Module Leader's Qualification	Ph.D.
Peer Reviewer Name	Iqbal Alshalal	e-mail	Iqbal.a.alshalal@uotechnology.edu.iq
Scientific Committee Approval Date	1/6/2023	e-mail	
		Version Number	1

Relation with other Modules			
Prerequisite Module	-	Semester	-
Co-requisite Module	-	Semester	-

Module Aims, Learning Outcomes and Inductive Contents

Module Aims	1-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. 2. Enable the student to know and understand work systems, risks, and the factors surrounding them. 3. Enable the student to know and understand theoretical principles in handicrafts and measurements.
Module Learning Outcomes	1- To familiarize the student with the vocabulary of occupational safety and its importance in the field of work. 2- Acquisition of the student's manual operation skills, for example (Filings and Tinsmith workshops), and mechanical operation skills, for example (Turning). 3- Acquisition of the student's mechanical forming skills, for example (Casting and Blacksmithing). 4- The student acquires basic engineering skills such as Welding, Carpentry, and Electrical installations that serve him in the professional field. 5- Enabling the student to operate the various machines and devices in mechanical operations and formation. 5- Cooperative learning by working collectively.
Inductive Contents	1. Introducing the student to the basics of the art of turning and milling, types of cold working machines, the skill of dealing with them, choosing metals, operational tools, and methods of measurement and standardization 2. Introducing the student to the basics of the art of casting, hot forming, metal selection, method of working on casting furnaces and tools, and manufacturing casting molds 3. Familiarize students with the basics of cars and the systems they use, as well as maintenance, disassembly, and assembly processes. 4. Introducing students to the basics of household and industrial electrical appliances, the skill of using tools, and designing electrical circuits and control panels 5. Introducing the student to the basics of the art of plumbing, leveling surfaces, the skill of using tools, manufacturing and installing geometric shapes, and methods of measurement and standardization 6. Introducing the student to the basics of the art of blacksmithing, cold and hot forming of metals, the method of hardening them, and the skills of dealing with hand tools, forming machines, and heating furnaces 7. Introducing the student to the basics of the art of filing and manual operation of metals with the help of manual, electrical, and mechanical tools, the skills of dealing with them, and the methods of measurement and standardization

	8. Introducing the student to the basics of the art of welding, the installation and assembly of metals, the types of welding machines, the skills of dealing with them, the types of welding, and the methods of measurement and standardization 9. Introducing the student to the basics of the art of carpentry and woodworking with the help of manual, electrical, and mechanical tools, the skills of dealing with them, and methods of measurement and standardization

Learning and Teaching Strategies	
Strategies	

Student Workload (SWL)			
Structured SWL (h/sem)	90	Structured SWL (h/w)	6.00
Unstructured SWL (h/sem)	10	Unstructured SWL (h/w)	0.66
Total SWL (h/sem)	200		

Module Evaluation					
		Time/No.	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative Assessment	Quizzes		20%		
	Assignments	-			All
	Projects / practice	Every 3 weeks	60%	continous	
	Report	-			
Summative Assessment	Midterm Exam	-			
	Final Exam	Every 3 weeks	20%	continous	All
Total assessment			100%		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered

Week 1	Welding workshop. -Occupational safety and its importance in welding workshops. -Introduction to the basics of welding. -Electric arc exercise. -An exercise for welding straight lines in a circular motion (helical).
Week 2	Welding workshop - An exercise for welding straight lines with a crescent movement and other welding methods -Construction welding exercise.
Week 3	Welding workshop. -Welding two pieces together. -Written exam in practical exercises. -
Week 4	Casting workshop -Occupational safety and its importance in plumbing workshops. -Introduction to the basics of metal casting. -Simple wooden disc exercise. Half workout.
Week 5	Casting workshop Wheel exercise. Pushing arm exercise.
Week 6	Casting workshop. -Complete pulley exercise. -Circular pole exercise. -Written exam in practical exercises.
Week 7	Blacksmith Workshop -Occupational safety and its importance in blacksmithing workshops. -Introduction to the Basics of Blacksmithing. - Barbell adjustment exercise. -Eight-star exercise.

	- Exercise forming the number eight in English. -Six formation exercises in English.
Week 8	Blacksmith Workshop -An exercise forming the number five in English. - Exercise forming the number nine in English. .-An exercise in forming an iron model in the form of a circle
Week 9	Blacksmith Workshop - S-shape exercise. - Air hammer hot barbell exercise. - Exercise to form a circle on an electric bending machine. - Exercising cold and hot ornament formation. - A written exam in practical exercises .
Week 10	Automotive Workshop -Occupational safety and its importance in car maintenance workshops. -An introduction to cars and their basic parts. -Parts of the engine, how it works, types of engines, and methods of classification.
Week 11	Automotive Workshop - Open the engine and identify the parts -Lubrication system -Cooling system.
Week 12	Automotive Workshop -The fuel system. -The old and new ignition circuits. -Written exam in practical exercises.
Week 13	Turning Workshop -Introduction to lathe machines and identifying their parts -Measuring tools and the use of an oven measuring instrument -Circular column lathing exercise on different diameters.

Week 14	Turning Workshop -Exercise using the pen (semicircular R) brackets. An exercise in making different angles using a pen (square + angle pen 55).
Week 15	Turning Workshop - Making shaft with different diameter exercises using (left and right pen) - Workout (Tube Connection). -Written exam in practical exercises.
Week 16	Fitting workshop Occupational safety and its importance in filing workshops -An introduction to the basics of filing -Pen holder exercise “preparation and preparation
Week 17	Fitting workshop Pencil holder exercises finishing and assembling
Week 18	Fitting workshop -The catcher exercise. - Clamping exercise. Written exam in practical exercises.
Week 19	Carpentry workshop -Occupational safety and its importance in carpentry workshops. - An introduction to carpentry, its types, types of wood, tools used, and preparation Preparing the tools used Face modification exercise using the reindeer
Week 20	Carpentry workshop Garden fence work and how to connect its parts, the eight-star exercise
Week 21	Carpentry workshop - Wood smoothing exercise using smoothing paper

	- Wood dyeing exercise in three stages Final smoothing and varnishing exercise Written exam in practical exercises
Week 22	The tinsmith workshop Occupational safety and its importance in plumbing workshops An introduction to plumbing, its tools, and plumbing stages Planning and marking exercise on metal plates
Week 23	The tinsmith workshop Geometric shapes Types of individuals and methods of individuals Geometric shape individuals exercise on a metal board
Week 24	The tinsmith workshop Cone members exercise - Exercise of cylinders with an oblique cut Roll forming operations Connection without the use of an intermediary Written exam in practical exercises
Week 25	Electric Workshop Occupational Safety and its importance in electrical workshops An introduction to the basics of electrical installations - Linking a simple circuit consisting of a lamp to the control of a single-way switch. Connect two lamps in series with one-way switch control. Connecting two lamps in parallel with the control of a single road switch. Connect two lights with one-way dual switch control.
Week 26	electric Workshop Connect a fluorescent lamp circuit to a one-way switch control

	Connecting an electric supply socket circuit to the control of a separate or combined one-way switch Written exam in practical exercises
Week 27	electric Workshop Occupational Safety and its importance in blacksmithing workshops Introduction to the basics of Blacksmithing - Barbell adjustment exercise Eight-star exercise - Exercise forming the number eight in English Exercise forming the number six in English
Week 28	supplementary training curriculum Welding workshop Casting workshop Blacksmith's workshop
Week 29	supplementary training curriculum - Automotive workshop - Turning workshop Fitting workshop
Week 30	supplementary training curriculum - carpentry workshop - The tinsmith workshop Electric workshop

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	Workshop technology and measurements, Ahmed Salem Al-Sabbagh.	yes
Recommended		

Texts		
Websites		

Module 2

Module Information			
Module Title	Computer Science I		Module Delivery
Module Type	Support		Theory ☐ Lecture ■ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	COSC108		
ECTS Credit	3		
SWL	75		
Module level	1	Semester of Delivery	1
Module Leader	Najat Shyaa Jasim	College	Electromechanical Eng. Dept.
Module Leader Academic Title	Lecturer	e-mail	eme@uotechnology.edu.iq
Module Tutor		Module Leader's Qualification	MSc. in Elec. Eng.
Peer Reviewer Name		e-mail	50031@uotechnology.edu.iq
Scientific Committee Approval Date		e-mail	
		Version Number	

Relation with other Modules			
Prerequisite Module		Semester	
Co-requisite Module		Semester	

Module Aims, Learning Outcomes and Inductive Contents	
Module Aims	In this course, the student will learn how to use software in his work (Visual Basic Language)
Module Learning Outcomes	In this course, – Computer Science students will learn: 1. Computer Hardware (Microprocessor, Memory, Input and Output Devices). Programming Languages, Operating Systems / Types of Files and Directories

	2. Numbers representation (Binary, Decimal, Octal, Hexadecimal) 3. Logic Gates 4. Algorithm and Flow Chart 5. Programming in Visual Basic: a- Introduction to visual basic b- Elements of the Integrated Development Environment (IDE) c- Toolbox (Properties and its Events) d- Built the project by using Toolbox and Properties Window e- Built the project by using Code Module f- Input box and Messages box g- Visual Basic Operators h- Conditional Statements (IF, Select Case) 6. One Dimensional Array 7. Two Dimensional Array Subroutine
Inductive Contents	In this course for Computer Science, the topics are: ● Logic Gates ● Numbers representation (Binary, Decimal, Octal, Hexadecimal) ● Algorithm & Flow Chart ● Programming in Visual Basic

Learning and Teaching Strategies	
Strategies	The branch use a problem based learning which new and student active method. The method help the student getting the program outcomes.

Student Workload (SWL)			
Structured SWL (h/sem)	48	Structured SWL (h/w)	4.00
Unstructured SWL (h/sem)	27	Unstructured SWL (h/w)	2.67
Total SWL (h/sem)	75		

Module Evaluation					
		Time/No.	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative Assessment	Quizzes	1	7.5%	5	LO # 1, 2
	Assignments	1	7.5%	7	LO # 3, 4
	Projects /				

	Lab.				
	Report				
Summative Assessment	Midterm Exam	1.5 hr	15%	10	LO # 1 – 4
	Final Exam	3 hr	70%	17	All
Total assessment			100%		

Delivery Plan (Weekly Syllabus)	
	Materials Covered
Week 1	Computer Hardware (processor and memory)
Week 2	Computer Hardware (Input and output devices)
Week 3	Computer Software concepts
Week 4	Binary and decimal number system
Week 5	Octal and Hexadecimal Number System
Week 6	Logic Gates
Week 7	Algorithms
Week 8	Flow Charts
Week 9	Visual Basic Window Components and IDE
Week 10	Visual Basic Projects and Forms
Week 11	Visual Basic Tools
Week 12	Visual Basic Tools
Week 13	Visual Basic Functions
Week 14	Visual Basic Functions
Week 15	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1 and 2	Windows 7 / operating systems
Week 3 and 4	Microsoft Word2007
Week 5 and 6	Microsoft Excel 2007
Week 7 and 8	Microsoft Power Point 2007

Week 9 and 10	Visual basic programming
Week 11 and 12	Assignment Statement
Week 13 and 14	Declaration Statement

Learning and Teaching Resources		
	Text	Available in the library
Required Texts	Basic Principles of Learning Visual Basic Language 2016	
Recommended Texts	Basic Principles of Learning Visual Basic Language C++ 2014	
Websites		

Module 3

Module Information			
Module Title	Mathematics I		Module Delivery
Module Type	Basic		Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	MATH113		
ECTS Credit	6		
SWL	150		
Module level	1	Semester of Delivery	1
Module Leader	Israa Saad Ahmed	College	Electromechanical Eng. Dept.
Module Leader Academic Title	Prof. Assistance	e-mail	eme@uotechnology.edu.iq
Module Tutor		Module Leader's Qualification	PhD. Mech. Eng.
Peer Reviewer Name		e-mail	Israa.S.Ahmed@uotechnology.edu.iq
Scientific Committee Approval Date		e-mail	
		Version Number	

Relation with other Modules			
Prerequisite Module		Semester	
Co-requisite Module		Semester	

Module Aims, Learning Outcomes and Inductive Contents	
Module Aims	The student will learn the first part of mathematics
Module Learning Outcomes	In this course, for students will learn

	1. Introduction, Quadratic Formula, Binomial Formula 2. Function (Inverse Hyperbolic Function). 3. Limits &Continuity. 4. Matrices (Operation, inverse of Square Matrix, Eigen values & Eigen Vectors). 5. Volumes (Volumes by slicing, Disk Around x-axis, Washer Around x-axis, washer around y-axis). 6. Functions (Inequality, Intervals, Domain & Range) 7. Determinants (Properties, Grammer's Rule, Applications) 8. Functions (Trigonometric Functions, Inverse Trigonometric Functions, Logarithmic Function)
Inductive Contents	In this course, students will learn: • Introduction, Quadratic Formula, Binomial Formula • Straight Line, Conic Sections (Circle, Parabola, Ellipse, Hyperbola) • Functions (Inequality, Intervals, Domain & Range) • Functions (Inverse Functions, Drawing Function, Absolute Value) • Functions (Trigonometric Functions, Inverse Trigonometric Functions, Logarithmic Function) • Function(Natural Logarithmic Function, Exponential Function, Hyperbolic Functions) Functions (Inverse Hyperbolic Functions) • Limits & Continuity • Determinants (Properties, Grammer's Rule, Applications) • Matrices (Operations, Inverse of Square Matrix, Eigen Values & Eigen Vectors) • Polar Coordinates • Complex Numbers • Applications of Complex Numbers • Vectors, Properties of Vectors • Vectors in Free Space • Applications of Vectors.

Learning and Teaching Strategies	
Strategies	The branch use a problem based learning which new and student active method. The method help the student getting the program outcomes.

Student Workload (SWL)			
Structured SWL (h/sem)	63	Structured SWL (h/w)	4.00

Unstructured SWL (h/sem)	87	Unstructured SWL (h/w)	5.80
Total SWL (h/sem)	150		

Module Evaluation					
		Time/No.	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative Assessment	Quizzes	1	7.5%	5	LO # 1 , 2, 3
	Assignments	1	7.5%	7	LO # 4 , 5
	Projects / Lab.				
	Report				
Summative Assessment	Midterm Exam	1.5 hr	15%	10	LO # 1 - 6
	Final Exam	3 hr	70%	17	All
Total assessment			100%		

Delivery Plan (Weekly Syllabus)	
	Materials Covered
Week 1	Introduction,quadratic formula, binomial formula Straight line,conic section (circle, parabola, Inequality, intervals, domain & range, Inverse function
Week 2	Drawing function, Absolute value, Trigonometric function Inverse trigonometric function
Week 3	logarithmic function, natural logarithmic function, Exponential function
Week 4	Hyperbolic functions Inverse hyperbolic function
Week 5	Limits and continuity
Week 6	Matrices & Determinants, properties, Grammers Rule
Week 7	Applications, Matrices (operations)
Week 8	Inverse of Square matrix
Week 9	Eigen values & Eigen vectors
Week 10	Mid-term Exam
Week 11	polar coordinates
Week 12	Complex Numbers, Applications of complex number
Week 13	Vectors
Week 14	properties of vectors
Week 15	vectors in free space, Applications of vectors
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources		
	Text	Available in the library
Required Texts	Thomas Calculus, George B. Thomas et al, 12th, edition, 2010, USA	YES
Recommended Texts		
Websites		

Module 4

Module Information			
Module Title	Fundamentals of Electrical Engineering(DC)		Module Delivery
Module Type	Core		Theory ☐ Lecture ■ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	FUEE114		
ECTS Credit	5		
SWL	125		
Module level	1	Semester of Delivery	1
Module Leader	Mohammed Kadhim Edan	College	Electromechanical Eng. Dept.
Module Leader Academic Title	Prof.	e-mail	eme@uotechnology.edu.iq
Module Tutor		Module Leader's Qualification	PhD. Elect. Eng.
Peer Reviewer Name		e-mail	50055@uotechnology.edu.iq
Scientific Committee Approval Date		e-mail	
		Version Number	

Relation with other Modules			
Prerequisite Module		Semester	
Co-requisite Module		Semester	

Module Aims, Learning Outcomes and Inductive Contents	
Module Aims	In this course, students learn some details of Fundamental of AC and DC circuits and their analysis by using different methods, Firstly, they are taken the atomic structure to understand the concept of current and voltage, then they are given the Kirchhoff's current and voltage laws and how they can employ them to analysis of the AC and DC circuits.

	Besides, the analysis methods are presented to learn the students the analysis of the AC and DC circuits. In addition, the analysis the AC and DC circuits by network theorems are given.
Module Learning Outcomes	In this course, the students will learn: 1) Analysis of DC circuits by using Kirchhoff's current and voltage laws 2) Analysis of DC circuits by using analysis methods 3) Analysis of DC circuits by using network theorem 4) Fundamental of AC circuits 5) Analysis of AC circuits by using Kirchhoff's current and voltage laws 6) Analysis of AC circuits by using analysis methods 7) Analysis of AC circuits by using network theorem
Inductive Contents	In this course, these topics will be presented to the students during weekly lecture • DC electrical circuit • Analysis methods of DC circuits • Network theorems of DC circuit • Sinusoidal alternating wave • Complex number • AC circuits • Methods of AC circuits analysis • Network theorems of AC circuits

Learning and Teaching Strategies	
Strategies	The branch use a problem based learning which new and student active method. The method helps the student getting the program outcomes.

Student Workload (SWL)			
Structured SWL (h/sem)	63	Structured SWL (h/w)	5.0
Unstructured SWL (h/sem)	62	Unstructured SWL (h/w)	5.0
Total SWL (h/sem)	125		

Module Evaluation					
		Time/No.	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative Assessment	Quizzes	1	7.5%	5	LO # 1, 2
	Assignments	1	7.5%	7	LO # 3, 4
	Projects /	1	10%	14	LO # 5

	Lab.				
	Report				
Summative Assessment	Midterm Exam	1.5 hr	15%	10	LO # 1 – 5
	Final Exam	3 hr	60%	17	All
Total assessment			100%		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction - Ohm's law, power, energy, efficiency.
Week 2	Resistances in series , voltage source in series ,KVL ,batteries, polarity & drop voltages.
Week 3	voltage divider rule ,voltage relation(relative potential ,voltage description with one & tow points) .
Week 4	Internal resistance of voltage source ,voltage regulation .
Week 5	DC parallel circuits. Resistance in parallel, parallel network.
Week 6	KCL, current divider rule, open & short circuit.
Week 7	Series- parallel circuits.Series- parallel network KS, Ladder networks.
Week 8	Current Sources : A source conversion, dependent & independent source, current source in series, current source in parallel .
Week 9	Analysis Method : Brunch current method, loop current method (mesh).
Week 10	Nodal voltage method.
Week 11	Bridges method.
Week 12	Delta-Star transformation and Star-Delta transformation.
Week 13	Network Theorems : Super position theorem.
Week 14	Thevinin'stheorem.

Week 15	Norton's theorem.
Week 16	**Preparatory week before the final Exam**

Delivery Plan (weekly lab. Syllabus)	
	Materials Covered
Week 1and 2	Ohm's Law
Week 3 and4	Kirchhoff's Law
Week 5 and 6	Delta/star+ transformation
Week 7 and 8	The Thevenin's theorem
Week 9and 10	Super position theorem
Week 11 and 12	Induction and capacitive Reactance
Week 12 and 13	oscilloscope

Learning and Teaching Resources		
	Text	Available in the library
Required Texts	Robert L. Boylestad, Introductory Circuit Analysis, Charles E. Merrill Publishing Company, 1977	
Recommended Texts	U. A. Bakshi and V. U. Bakshi, Basic Electrical Engineering, Technical Publications Pune, 2008	
Websites		

Module 5

Module Information		
Module Title	Physics I	Module Delivery
Module Type	Basic	The☒y
Module Code	PHYS115	☐ Lecture
ECTS Credit	6	☐ Lab

SWL	150		☐ Tutorial ☐ Practical ☐ Seminar
Module level	1	Semester of Delivery	1
Module Leader	Faten Noaman Abdullah Noaman	College	Electromechanical Eng. Dept.
Module Leader Academic Title	Lucturere	e-mail	eme@uotechnology.edu.iq
Module Tutor		Module Leader's Qualification	PhD. in Mech. Eng.
Peer Reviewer Name		e-mail	50241@uotechnology.edu.iq
Scientific Committee Approval Date		e-mail	
		Version Number	

Relation with other Modules			
Prerequisite Module		Semester	
Co-requisite Module		Semester	

Module Aims, Learning Outcomes and Inductive Contents	
Module Aims	In this course, students learn the principles of semiconductor materials. The doping of semiconductor, using it in P-N junction and its applications in different types of diodes, transistors, and solar cells.
Module Learning Outcomes	In this course, students will learn: 1. Study the general classification of engineering materials according to energy bands theory. 2. Realization the principles, properties, and electrical conduction especially in semiconductors. 3. Concept of intrinsic and extrinsic semiconductors. 4. Operation principle and models of p-n junction. 5. Realization the principles of some semiconductors devices as transistor and solar cells.
Inductive Contents	• Electronics physics • Magnetic properties. • Thermal properties. • Logic circuits

Learning and Teaching Strategies	
Strategies	The branch use a problem based learning which new and student active method. The method help the student getting the program outcomes.

Student Workload (SWL)			
Structured SWL (h/sem)	63	Structured SWL (h/w)	4.00
Unstructured SWL (h/sem)	87	Unstructured SWL (h/w)	6.0
Total SWL (h/sem)	150		

Module Evaluation					
		Time/No.	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative Assessment	Quizzes	1	7.5%	5	LO # 1, 2
	Assignments	1	7.5%	7	LO # 3, 4
	Projects / Lab.				
	Report				
Summative Assessment	Midterm Exam	1.5 hr	15%	10	LO # 1 - 4
	Final Exam	3 hr	70%	17	All
Total assessment			100%		

Delivery Plan (Weekly Syllabus)	
	Materials Covered
Week 1	Introduction to materials science and engineering
Week 2	Classification of Materials, Metals, Polymers
Week 3	Ceramics, Composites, Advanced Materials
Week 4	Nano-materials, Biomaterials, Smart materials

Week 5	Semiconductors, Concepts of nanostructures, Modern Materials' Needs
Week 6	Atomic Structure and Interatomic Bonding
Week 7	Atomic structure, Atomic bonding in solid
Week 8	Types and applications of materials, Types of metal alloys, Ferrous alloys, Nonferrous alloys
Week 9	Types of ceramics, Types of polymers, Types of conductors and semiconductors, Types of composite
Week 10	Mid-term Exam
Week 11	Mechanical properties, Elastic deformation
Week 12	Mechanical behavior of materials, Hardness and other mechanical properties.
Week 13	Principles of energy and work, What is the energy?
Week 14	Forms of energy, General equation of work,
Week 15	Renewable energies
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources		
	Text	Available in the library
Required Texts	S. M. Sze, "Physics of Semiconductor Devices," third edition	
Recommended Texts	Thomas L. Floyd, "Electronic Devices,"9th Ed., P.CM, 2012	
Websites		

Module 6

Module Information			
Module Title	Sports	Module Delivery	
Module Type	Support	■ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	SPOR116		
ECTS Credits	2		
SWL (hr/sem)	50		
Module Level	1	Semester of Delivery	1

Administering Department		EMEN	College	EME	
Module Leader	Muaid Waleed		e-mail		
Module Leader's Acad. Title		Prof. Assistance	Module Leader's Qualification		MSc
Module Tutor	Name (if available)		e-mail	E-mail	
Peer Reviewer Name		Name	e-mail	E-mail	
Scientific Committee Approval Date			Version Number		

Relation with other Modules			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents	
Module Objectives	The objectives of this course is providing formal education and of encouraging pupils' personal development in a wider social and cultural context. Formal education involves the acquisition of competences knowledge, skills and attitudes across a range of domains. Personal development takes place in a variety of spiritual, moral, social and cultural contexts. It involves an awareness of appropriate behavior, an understanding of the environment in which pupils live, and a development of their individual identity.
Module Learning Outcomes	A. Knowledge and Understanding A1. Enabling student to get the knowledge and understanding of the theoretical principles of sport. A2. This knowledge includes an in-depth understanding of the skills, tactics and strategies required for effective training, practices and game-day decisions. A3. Helping the students for achieving a physical fitness Improvement, sports skills Acquisition and mental abilities Improvement.
Indicative Contents	1. to offer a variety of sports activities including traditional sports, outdoor sports, fitness, lifetime sports, etc., visits to out of school institutions, 2. to offer a variety of training methods to enhance physical fitness components

	using circuit training, video and ICT tools for movement analysis, observation sheets, etc. 3. to promote the use of self-evaluation sheets, tests, competitions, demonstrations, video analysis, etc., 4. to provide knowledge of the organization of an element of a lesson/a competition/ a tournament; to create awareness of the student's role as a team player, coach, referee, assistant, journalist, observer, etc., 5. to encourage participation with fair play: respecting others, the rules, materials and equipment, cooperating with others, working for a common goal and supporting the teacher, 6. to offer different topics to link theory and practice, being presented by the students as small projects in class.

Learning and Teaching Strategies	
Strategies	The learning/ teaching of the sport complementary course develops individual and group needs. It is based on the following didactic principles: 1. acquiring new motor skills and further developing motor skills learned before, 2. using a variety of approaches and teaching methods, 3. focusing on students' varied learning styles and pace of learning, 4. using differentiation in order to meet students' individual needs, 5. focusing on students' abilities to apply skills, tactics and creative ideas, 6. reinforcing social skills, 7. promoting student's autonomy through teaching and learning, 8. improving students' performance by feedback, evaluation and self-evaluation, 9. linking and integrating practical and theoretical components, 10. using a range of teaching and learning resources including ICT.

Student Workload (SWL)			
Structured SWL (h/sem)	33	**Structured SWL (h/w)**	2
Unstructured SWL (h/sem)	17	**Unstructured SWL (h/w)**	2.8
Total SWL (h/sem)	**100**		

Module Evaluation					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	**Midterm Exam**	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

	Material Covered
Week 1	Sports - concept, benefits and types
Week 2	Fitness - the concept and elements of fitness
Week 3	Football - concept + history,
Week 4	Football - basic soccer skills
Week 5	Football Law - Article 1, 2
Week 6	Football Law - Articles 3, 4, 5
Week 7	Basketball - concept + history
Week 8	Basketball - basic basketball skills
Week 9	Volleyball concept and skills
Week 10	Anatomy, The skeleton, Circulatory system
Week 11	Muscular system - concept + muscle, injuries
Week 12	ا Sport and Circulatory System
Week 13	Scouting - concept + stages + scouting law
Week 14	Biorhythm - concept + benefits + historical overview
Week 15	Biorhythm cycles
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources		
	Text	**Available in the Library**
Required Texts	Volleyball (history- skills - plans - match management and training). Sports Series / Fundamentals of the Football Game. Sports training and future prospects.	no

	Applications in scout education. Student strategies and methods of sports training. Football rules.	
Recommended Texts		
Websites	https://www.s2s.net/home.php?P_hirek_azonosito=201 https://www.google.com/search?rlz=1C1GCEA_enIQ933IQ934&q https://ar.wikipedia.org/wiki/%D8%AA%D8%AF%D8%B1%D9%8A%D8%A8 https://www.7uah.com/search/label/%D8%A7%D9%84%D8%AA%D8%AF%D8%B1%D9%8A%D8%A8%20%D8%A7%D9%84%D8%B1%D9%8A%D8%A7%D8%B6%D9%8A	

Grading Scheme			
Group	**Grade**	**Marks %**	**Definition**
Success Group (50 - 100)	**A -** Excellent	90 - 100	Outstanding Performance
	B - Very Good	80 - 89	Above average with some errors
	C - Good	70 - 79	Sound work with notable errors
	D - Satisfactory	60 - 69	Fair but with major shortcomings
	E - Sufficient	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX –** Fail	(45-49)	More work required but credit awarded
	F – Fail	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

Module Information			
Module Title	Engineering Mechanics (static)		Module Delivery
Module Type	Core		Theory ☐ Lecture ■ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	ENME127		
ECTS Credit	4		
SWL	100		
Module level	1	Semester of Delivery	1
Module Leader	Anees Fadhel Saad Hazam	College	Electromechanical Eng. Dept.
Module Leader Academic Title	Lecturer	e-mail	eme@uotechnology.edu.iq
Module Tutor		Module Leader's Qualification	PhD. in Mech. Eng.
Peer Reviewer Name		e-mail	anees.f.saad@uotechnology.edu.iq
Scientific Committee Approval Date		e-mail	
		Version Number	

Relation with other Modules			
Prerequisite Module		Semester	
Co-requisite Module		Semester	

Module Aims, Learning Outcomes and Inductive Contents

Module Aims	In this course, students learn how to apply the basic principles from physics and mechanics to analysis and solve the forces, moment and couples problems. In this course, students learn how to apply the basic principles from physics and mechanics to analysis and solve the forces, moment and couples problems in three-dimensional (3D).
Module Learning Outcomes	In this course, students will learn: 1. Fundamentals of Engineering Mechanics 2. How to analyze the forces and moment in mechanisms 3. Calculate the Resultant in two dimensional force systems 4. Fundamentals of Engineering Mechanics(3D) 5. How to analyze the forces and moment in mechanisms(3D) 6. Calculate the Resultant in three-dimensional force systems 7. Introduction to dynamic
Inductive Contents	In this course, for engineering mechanics students will learn: ● Introduction to Statics ● Scalar quantity, vector quantity, standers units ● Two-dimensional force systems, rectangular components ● Moment, principle of moment, couple, couple-force system ● Resultants ● Three-dimensional force system, component forces for three dimensions ● Moment in three-dimensional force system, dot product, couple in three-dimensional force system, couple-force system in three-dimensional force system ● Resultant in three-dimensional force systems ● Equilibrium, free body diagram ● Types of friction, type's friction problems ● Three-dimensional force system, component forces for three dimensions ● Moment in three-dimensional force system, dot product, couple in three-dimensional force system, couple-force system in three-dimensional force system ● Resultant in three-dimensional force systems ● Equilibrium, free body diagram ● Types of friction, type's friction problems ● Introduction to dynamic ● Velocity, acceleration & motion laws

Learning and Teaching Strategies	
Strategies	The branch use a problem based learning which new and student active method. The method help the student getting the program outcomes.

Student Workload (SWL)			
Structured SWL (h/sem)	63	Structured SWL (h/w)	5.00
Unstructured SWL (h/sem)	37	Unstructured SWL (h/w)	5.00
Total SWL (h/sem)	100		

Module Evaluation					
		Time/No.	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative Assessment	Quizzes	1	7.5%	5	LO # 1 , 2, 3
	Assignments	1	7.5%	7	LO # 4 , 5
	Projects / Lab.	1	10%		LO # 3
	Report				
Summative Assessment	Midterm Exam	1.5 hr	15%	9	LO # 1 - 5
	Final Exam	3 hr	60%	17	All
Total assessment			100%		

Delivery Plan (Weekly Syllabus)	
	Materials Covered
Week 1	Introduction to static
Week 2	Two–dimensional force systems, rectangular components
Week 3	Resultants
Week 4	Moment in three-dimensional force system, dot product, couple in three-dimensional force system
Week 5	Equilibrium, free body diagram
Week 6	Types of friction, types friction problem

Week 7	Composite bodies & figures: approximations
Week 8	Resultant in three –dimensional force systems.
Week 9	Mid-term Exam
Week 10	Introduction to dynamic
Week 11	Velocity, acceleration &motion laws
Week 12	Projectile motion
Week 13	Plane curvilinear motion
Week 14	Kinetics of particles, work power, Efficiency, principle of work
Week 15	Impulse & momentum
Week 16	Preparatory week before the final Exam

Delivery Plan (weekly lab. Syllabus)	
	Materials Covered
Week 1and2	The determination of the resultant of two forces (or more)
Week 3 and 4	The determination of friction coefficient between two surfaces
Week and 5	Centroids and center of gravity
Week 6 and 7	Center of gravity of the composite areas
Week 8 and 9	The investigation of Hook's law using helical spring
Week 10 and 11	The fundamental law of rotation
Week 12 and 13	The law of energy conservation

Learning and Teaching Resources		
	Text	Available in the library
Required Texts	Engineering Mechanics Statics, J. L. Meriam and L.G. Kraige, John Wiley & Sons, 2013.	
Recommended Texts	R. C. Hibbeler, "Engineering Mechanics: Statics & Dynamics", 14th ed. Pearson Prentice Hall.	
Websites		

Second Semester

Module 1

Module Information معلومات المادة الدراسية					
Module Title	**Workshops II**			**Module Delivery**	
Module Type	**Support**			☐**Theory** ☐ **Lecture** ☐ **Lab** ☐ **Tutorial** ☒ **Practical** ☐ **Seminar**	
Module Code	**WOSH121**				
ECTS Credits	**4**				
SWL (hr/sem)	**100**				
Module Level		1	**Semester of Delivery**		2
Administering Department		EMEN	**College**	EME	
Module Leader	Training and Workshops Center		**e-mail**	twc @uotechnology.edu.iq	
Module Leader's Acad. Title		Assist. Lect.	**Module Leader's Qualification**		MSc
Module Tutor	-		**e-mail**	-	
Peer Reviewer Name		-	**e-mail**	-	
Scientific Committee Approval Date		07/06/2023	**Version Number**		1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	-	**Semester**	-
Co-requisites module	-	**Semester**	-

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1-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. 2. Enable the student to know and understand work systems, risks, and the factors surrounding them. 3. Enable the student to know and understand theoretical principles in handicrafts and measurements..
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- To familiarize the student with the vocabulary of occupational safety and its importance in the field of work. 2- Acquisition of the student's manual operation skills, for example (Filings and Tinsmith workshops), and mechanical operation skills, for example (Turning). 3- Acquisition of the student's mechanical forming skills, for example (Casting and Blacksmithing). 4- The student acquires basic engineering skills such as Welding, Carpentry, and Electrical installations that serve him in the professional field. 5- Enabling the student to operate the various machines and devices in mechanical

	operations and formation. 5- Cooperative learning by working collectively.
Indicative Contents المحتويات الإرشادية	10. Introducing the student to the basics of the art of turning and milling, types of cold working machines, the skill of dealing with them, choosing metals, operational tools, and methods of measurement and standardization 11. Introducing the student to the basics of the art of casting, hot forming, metal selection, method of working on casting furnaces and tools, and manufacturing casting molds 12. Familiarize students with the basics of cars and the systems they use, as well as maintenance, disassembly, and assembly processes. 13. Introducing students to the basics of household and industrial electrical appliances, the skill of using tools, and designing electrical circuits and control panels 14. Introducing the student to the basics of the art of plumbing, leveling surfaces, the skill of using tools, manufacturing and installing geometric shapes, and methods of measurement and standardization 15. Introducing the student to the basics of the art of blacksmithing, cold and hot forming of metals, the method of hardening them, and the skills of dealing with hand tools, forming machines, and heating furnaces 16. Introducing the student to the basics of the art of filing and manual operation of metals with the help of manual, electrical, and mechanical tools, the skills of dealing with them, and the methods of measurement and standardization 17. Introducing the student to the basics of the art of welding, the installation and assembly of metals, the types of welding machines, the skills of dealing with them, the types of welding, and the methods of measurement and standardization 18. Introducing the student to the basics of the art of carpentry and woodworking with the help of manual, electrical, and mechanical tools, the skills of dealing with them, and methods of measurement and standardization**.**

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	This course aims to promote a set of learning strategies, including the strategy of

	learning by lecture, modeling and cooperative learning

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	90	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	10	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	0.6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**100**		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**				
	Assignments	Every 3 weeks	60% 0)		All
	Projects / Lab.				
	Report				
Summative assessment	**Midterm Exam**				
	Final Exam	Week 16	40% (40)	16	All
Total assessment			100% (100 Marks)		

Grading Scheme مخطط الدرجات				
Group	**Grade**	التقدير	**Marks %**	**Definition**
Success Group (50 - 100)	**A -** Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX –** Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

Module 2

Module Information			
Module Title	Mathematics II		Module Delivery
Module Type	Basic		Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	MATH122		
ECTS Credit	6		
SWL	150		
Module level	1	Semester of Delivery	2
Module Leader	Israa Saad Ahmed Naseif	College	Electromechanical Eng. Dept.
Module Leader Academic Title	Prof. Assistance	e-mail	eme@uotechnology.edu.iq
Module Tutor		Module Leader's	PhD. Mech. Eng.

		Qualification	
Peer Reviewer Name		e-mail	Israa.S.Ahmed@uotechnology.edu.iq
Scientific Committee Approval Date		e-mail	
		Version Number	

Relation with other Modules			
Prerequisite Module		Semester	
Co-requisite Module		Semester	

Module Aims, Learning Outcomes and Inductive Contents	
Module Aims	The students will learn the second part of the basic math
Module Learning Outcomes	In this course, for students will learn 1. Differentiation (Derivative Definition, Techniques of Derivative, Applications) 2. Differentiation (Parametric Equations, Implicit Differentiation) 3. Integration (Definite Integrals, Properties, Relation Between Indefinite & definite Integrals) 4. Integration (Partial Fractions For 2nd Equation Degree in Denominator) 5. Integration of (Irrational Functions, Rational Functions) 6. Applications of Definite Integral(Area, Area Under the Curve, 7. Area between Curve and y-axis, Area Between Two Curves) 8. Differential Equations D.E. 1st degree equation: (5- Exact, 6- Bernoulli's Equations)
Inductive Contents	In this course, students will learn: • Differentiation (Derivative Definition, Techniques of Derivative, Applications) • Differentiation (Derivative of Trigonometric Functions, • Derivative of Inverse Trigonometric Functions, Chain Rule,) • Differentiation (Parametric Equations, Implicit Differentiation) • Differentiation (Derivative of Some Functions, Derivative of • Hyperbolic Functions, Derivative of Inverse Hyperbolic Functions)

	• Integration (Indefinite Integrals & Substitution Rule) • Integration (Definite Integrals, Properties, Relation Between • Indefinite & definite Integrals) • Forms of Integration (Substitution Methods, By Part, By Tabular) • Integration (Partial Fractions For 2nd Equation Degree in • Denominator) • Integration (Product between Trigonometric Functions, Product • Between Hyperbolic Functions) • Integration (Simple Square Root, Trigonometric Substitutions, • Hyperbolic Substitutions) • Integration of (Irrational Functions, Rational Functions) • Applications of Definite Integral(Area, Area Under the Curve, • Area between Curve and y-axis, Area Between Two Curves) • Differential Equations D.E, 1st degree equation: • (1-Direct Integration , 2-Variable Separable) • Differential Equations D.E. 1st degree equation: • (3- Homogeneous, 4- Linear Equations) • Differential Equations D.E. 1st degree equation: • (5- Exact, 6- Bernoulli's Equations)

Learning and Teaching Strategies	
Strategies	The branch use a problem based learning which new and student active method. The method help the student getting the program outcomes.

Student Workload (SWL)			
Structured SWL (h/sem)	63	Structured SWL (h/w)	4.0
Unstructured SWL (h/sem)	87	Unstructured SWL (h/w)	6
Total SWL (h/sem)	150		

Module Evaluation					
		Time/No.	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative	Quizzes	1	7.5%	5	LO # 1, 2, 3

Assessment	Assignments	1	7.5%	7	LO # 4, 5, 6
	Projects / Lab.				
	Report				
Summative Assessment	Midterm Exam	1.5 hr	15%	9	LO # 1 – 6
	Final Exam	3 hr	70%	17	All
Total assessment			100%		

Delivery Plan (Weekly Syllabus)	
	Materials Covered
Week 1	Differentiation Derivative by definition Techniques of differentiation Applications
Week 2	Derivative of trigonometric functions Derivative of inverse trigonometric functions Chain rule Parametric equation
Week 3	Implicit differentiation Derivative of some functions Derivative of hyperbolic functions Derivative of inverse of hyperbolic functions
Week 4	Integration : 2-1 Indefinite of integral Definite of integral Properties
Week 5	Relation between indefinite& definite integral Forms of integration Substitution By parts
Week 6	By tabulate By partial fractions For 2^{nd} equation degree in denominator Product between trigonometric functions Product between hyperbolic functions
Week 7	Simple square root Trigonometric substitutions Hyperbolic substitutions
Week 8	Integration of irrational functions Integration of rational function Applications of definite integral
Week 9	Mid-term Exam
Week 10	Areas

	Area under the curve Area between curve and y- axis : 2-4-3 area between two curves Area in polar co-ordinates
Week 11	Volumes by slicing Disks around x-axis
Week 12	Disks around y-axis Volume in polar co-ordinate
Week 13	1st of D.E Introduction
Week 14	Formation of differential equation Solution of differential equation
Week 15	Method-1-by direct integration Method -2- by separating the variables Method -3- homogeneous equation Method -4- linear equation , use of integrating factor
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources		
	Text	Available in the library
Required Texts	Thomas Calculus, George B. Thomas et al, 12th, edition, 2010, USA.	YES
Recommended Texts		
Websites		

Module 3

Module Information معلومات المادة الدراسية		
Module Title	Fundamental of Electrical Engineering (AC)	**Module Delivery**
Module Type	Core	☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**
Module Code	FUEE123	
ECTS Credits	5	
SWL (hr/sem)	125	

Module Level		1	**Semester of Delivery**		2
Administering Department		**EMEN**	**College**	**EME**	
Module Leader	Fatin Nabeel Abdullah		**e-mail**	50060@uotechnology.edu.iq	
Module Leader's Acad. Title		Assist. Professor	**Module Leader's Qualification**		MSc.
Module Tutor	-		**e-mail**	-	
Peer Reviewer Name		-	**e-mail**	-	
Scientific Committee Approval Date		07/06/2023	**Version Number**		1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	-	**Semester**	-
Co-requisites module	-	**Semester**	-

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. To develop problem solving skills and understanding of circuit theory through the application of techniques. 2. To understand voltage, current and power from a given circuit. 3. This course deals with the basic concept of electrical circuits. 4. This is the basic subject for all electrical circuits. 5. To understand Kirchhoff's current and voltage Laws problems.

	6. To perform mesh and Nodal analysis.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks. 1. Recognize how electricity works in electrical circuits. 2. List the various terms associated with electrical circuits. 3. Summarize what is meant by a basic electric circuit. 4. Discuss the reaction and involvement of atoms in electric circuits. 5. Describe electrical power, charge, and current. 6. Define Ohm's law. 7. Identify the basic circuit elements and their applications. 8. Discuss the various properties of resistors, capacitors, and inductors. 9. Explain the two Kirchoff's laws used in circuit analysis. 10. Identify the method of analysis (Mesh & Nodal) method. 11. Identify the network theorem of Thevenin's and Norton's.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. **A-C circuit** Impedance, admittance, phase diagram, resistance & capacitance, frequency response, inductive & capacitive, reaction power & power factor. AC series circuit, impedance phase diagram, R-L, R-C, series R-L-C, voltage divider rule, R-C frequency response, AC parallel circuits, admittance and phase diagram , R-L ,R-C & parallel R-L-C circuits, current divider rule, combined circuit. Method of A.C. Analysis : Source Conversions, Mesh Analysis. Nodal Analysis, Star-Delta and Delta-Star conversions. Network Theorems for A.C. Circuits : Thevenin's Theorem, Norton's Theorem

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	**78**	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	**5**
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	**72**	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	**5**
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**150**		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	1	5%	5	LO # 1 , 2, 3
	Assignments	1	5%	1--9	LO # 4 , 5
	Projects / Lab.		10%		
	Report	1	5 %	11	6

Summative assessment	**Midterm Exam**	1.5 hr	15%	10	LO # 1 - 6
	Final Exam	3 hr	60%	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	AC circuits : Impedance, admittance, phase diagram,
Week 2	resistance & capacitance, frequency response, inductive & capacitive.
Week 3	reaction power & power factor.
Week 4	AC series circuit, impedance phase diagram.
Week 5	R-L, R-C, series R-L-C,
Week 6	voltage divider rule, R-C frequency response.
Week 7	AC parallel circuits, admittance and phase diagram.
Week 8	R-L ,R-C & parallel R-L-C circuits.
Week 9	current divider rule, combined circuit.
Week 10	Method of A.C. Analysis : Source Conversions.
Week 11	Mesh Analysis.
Week 12	Nodal Analysis.
Week 13	Star-Delta and Delta-Star conversions.
Week 14	Network Theorems for A.C. Circuits : Thevenin's Theorem.
Week 15	Norton's Theorem.

Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1 and 2	Lab 1: Thevenin's theorem
Week 3 and 4	Lab 2: Super Position theorem
Week 5 and 6	Lab 3: Induction & Capacitive Reactance
Week 7 and 8	Lab 4: Oscilloscope
Week 9 and 10	
Week 11 and 12	
Week 13 and 14	

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	Introductory circuit Analysis by Robert L. Boylestad .	Yes
Recommended Texts	DC Electrical Circuit Analysis: A Practical Approach Copyright Year: 2020, dissidents.	No
Websites	https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering	

Grading Scheme مخطط الدرجات				
Group	**Grade**	التقدير	**Marks %**	**Definition**
Success Group (50 - 100)	**A -** Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX –** Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

Module 4

Module Information		
Module Title	Fundamentals of AutoCAD tools Drawing	Module Delivery
Module Type	Support	The☐y
Module Code	FATD124	☐ Lecture

ECTS Credit	3		■ Lab ☐ Tutorial ☐ Practical ☐ Seminar
SWL	75		
Module level	1	Semester of Delivery	2
Module Leader	Tariq Mohammad Hammza	College	Electromechanical Eng. Dept.
Module Leader Academic Title	Prof. Assistance	e-mail	eme@uotechnology.edu.iq
Module Tutor		Module Leader's Qualification	PhD. Mech. Eng.
Peer Reviewer Name		e-mail	Tariq.M.Hammza@uotechnology.edu.iq
Scientific Committee Approval Date		e-mail	
		Version Number	

Relation with other Modules			
Prerequisite Module		Semester	
Co-requisite Module		Semester	

Module Aims, Learning Outcomes and Inductive Contents	
Module Aims	Students learn how to create, edit, store, and print engineering drawings.
Module Learning Outcomes	1-Tour of AutoCAD. 2- User Interface. 3- Entering commands. 4- Basic Objects. 5- Object selection. 6- Entering coordinates. 7- Object snap. 8- Construction Aids. 9-Solid and curved objects. 10- Adding and Altering objects. 11- Moving and Duplicating Objects.
Inductive Contents	1- Tour of AutoCAD. 2- User Interface. 3- Entering commands. 4- Basic Objects. 5- Object selection. 6- Entering coordinates.

	7- Object snap. 8- Construction Aids. 9-Solid and curved objects. 10- Adding and Altering objects. 11- Moving and Duplicating Objects. 12- Modifying and Maneuvering**.**

Learning and Teaching Strategies	
Strategies	The branch use a problem based learning which new and student active method. The method help the student getting the program outcomes.

Student Workload (SWL)			
Structured SWL (h/sem)	48	Structured SWL (h/w)	4.0
Unstructured SWL (h/sem)	27	Unstructured SWL (h/w)	2.67
Total SWL (h/sem)			

Module Evaluation					
		Time/No.	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative Assessment	Quizzes				
	Assignments				
	Projects / Lab.	1.5/ 2	25%	7, 10	LO # 1-7
	Report				
Summative Assessment	Midterm Exam	1.5 hr	15%	12	All
	Final Exam	3 hr	60%	15	All
Total assessment			100%		

Delivery Plan (weekly lab. Syllabus)	
	Materials Covered
Week 1	Tour of AutoCAD.

Week 2	User Interface.
Week 3	Entering commands.
Week 4	Basic Objects.
Week 5	Object selection.
Week 6	Entering coordinates.
Week 7	Object snap.
Week 8	Construction Aids.
Week 9	Solid and curved objects.
Week 10	Mid-term Exam
Week 11	Moving and Duplicating Objects.
Week 12	Modifying and Maneuvering.
Week 13	Orthographic projection.
Week 14	Isometric Projection.
Week 15	Final Exam
Week 16	

Learning and Teaching Resources		
	Text	Available in the library
Required Texts	Computer Aided Drawing. Assistant professor Ali Hussein Ali Saeed, UOT, 2011	
Recommended Texts	Engineering Drawing. Assistant professor Abed Alrassol AL-Khfaf , UOT , 1990	
Websites		

Module 5

Module Information			
Module Title	Physics II		Module Delivery
Module Type	Basic		Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	PHYS125		
ECTS Credit	6		
SWL	150		
Module level	1	Semester of Delivery	2
Module Leader	Ahmed Kamil Hasan	College	Electromechanical Eng. Dept.

Module Leader Academic Title	Prof. assistance	e-mail	eme@uotechnology.edu.iq
Module Tutor		Module Leader's Qualification	PhD. Elect. Eng.
Peer Reviewer Name		e-mail	ahmed.k.alali@uotechnology.edu.iq
Scientific Committee Approval Date		e-mail	
		Version Number	

Relation with other Modules			
Prerequisite Module		Semester	
Co-requisite Module		Semester	

Module Aims, Learning Outcomes and Inductive Contents	
Module Aims	In this course, students learn the basic of material science and engineering. Also students learn the principles of mechanical tests of metallic materials.
Module Learning Outcomes	In this course, students will learn: 1) Concept of materials science and materials engineering. 2) Study the general classification of engineering materials, in addition to concept and types of advanced materials. 3) Analyze the atomic structure and types of atomic bonding in solid materials. 4) Realization the principles, properties, synthesize techniques of nanostructures, and advance applications of these materials. 5) Study the mechanical properties of metallic materials where this includes mechanical tests types and (elastic, plastic) behaviors.
Inductive Contents	1- Introduction to materials science and engineering. 2- Atomic Structure and Interatomic Bonding 3- Types and applications of materials 4- Mechanical properties.

Learning and Teaching Strategies	
Strategies	The branch use a problem based learning which new and student active method. The method help the student getting the program outcomes.

Student Workload (SWL)			
Structured SWL (h/sem)	63	Structured SWL (h/w)	4.0
Unstructured SWL (h/sem)	87	Unstructured SWL (h/w)	6.0
Total SWL (h/sem)	150		

Module Evaluation					
		Time/No.	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative Assessment	Quizzes	1	7.5%	5	LO # 1
	Assignments	1	7.5%	7	LO # 2
	Projects / Lab.				
	Report				
Summative Assessment	Midterm Exam	1.5 hr	15%	10	LO # 1 – 3
	Final Exam	3 hr	70%	17	All
Total assessment			100%		

Delivery Plan (Weekly Syllabus)	
	Materials Covered
Week 1	Introduction
Week 2	Types of semiconductor materials
Week 3	Types of semiconductor materials
Week 4	Current density
Week 5	Intrinsic semiconductor

Week 6	Examples
Week 7	The Diode
Week 8	Symbol of Diode in Electronic Circuits
Week 9	Reverse Bias & Current
Week 10	Mid-term Exam
Week 11	General Diode Equation
Week 12	Models of Diode
Week 13	Examples
Week 14	DC or Static Resistance
Week 15	Types of Diodes
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources		
	Text	Available in the library
Required Texts	William D. Callister, “Materials science and engineering (An introduction),” 8th edition.	
Recommended Texts	Bryan Harris,“Engineering composite materials,”The Institute of Materials, London, 1999	
Websites		

Module 6

Module Information		
Module Title	English Language I	Module Delivery
Module Type	Support	Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	ENLA125	
ECTS Credit	2	
SWL	50	

Module level	1	Semester of Delivery	2
Module Leader	Faten Noaman Abdullah Noaman	College	Electromechanical Eng. Dept.
Module Leader Academic Title	Lecturer	e-mail	eme@uotechnology.edu.iq
Module Tutor		Module Leader's Qualification	PhD. Mech. Eng.
Peer Reviewer Name		e-mail	50241@uotechnology.edu.iq
Scientific Committee Approval Date		e-mail	
		Version Number	

Relation with other Modules			
Prerequisite Module	-	Semester	-
Co-requisite Module	-	Semester	-

Module Aims, Learning Outcomes and Inductive Contents	
Module Aims	In this course, students will learn: • Proceeding to the Student the benefits of studying English Language as Second language • Giving Knowledge about using the Technical Terminologies in their studies • Understanding of using the scientific English language in the Academic Program • Giving knowledge of how write, describe, typing the reports in English
Module Learning Outcomes	In this course, – Computer Science students will learn: 1. Introduction to Computer. 2. Computer Hardware (Microprocessor, Memory, Input and Output Devices). Programming Languages, Operating Systems / Types of Files and Directories 3. Numbers representation (Binary, Decimal, Octal, Hexadecimal) 4. Logic Gates 5. Algorithm and Flow Chart

	6. Programming in Visual Basic: a. Introduction to visual basic b. Elements of the Integrated Development Environment (IDE) c. Toolbox (Properties and its Events) d. Built the project by using Toolbox and Properties Window e. Built the project by using Code Module f. Input box and Messages box g. Visual Basic Operators h. Conditional Statements (IF, Select Case) 7. One Dimensional Array 8. Two Dimensional Array Subroutine
Inductive Contents	a. Parts of Speech • What are the parts of speech • Noun • Pronoun • Verb • Adjective • Adverb • Proposition • Conjunction • Interjection b. Preposition • What is the preposition? • Why does it use. • How does it use. c. Your world (unit Two). • How to know your world. • How to communicate with each other. • Knowing your Nationality. d. ALL ABOUT YOUFAMILY AND FRIENDS • Personal information • Your family members. • RELATIVES AND EXTENDED FAMILY. • Jobs. e. Everyday Life • Sport. • Food. • Drinks. • Activities. f. My favorite • Questions words. • Pronouns.

	• Demonstratives. • Adjectives. • Favorites. g. Where do I live • ROOMS. • KITCHEN FURNITURE. • Bedroom Furniture. • Living Room Furniture. • Bathroom. • Grammar (difference between SOME and ANY). • DIRECTIONS • Grammar (difference between BUT&AND). • Because and SO.

Learning and Teaching Strategies	
Strategies	The branch use a problem based learning which new and student active method. The method help the student getting the program outcomes.

Student Workload (SWL)			
Structured SWL (h/sem)	33	Structured SWL (h/w)	2.00
Unstructured SWL (h/sem)	17	Unstructured SWL (h/w)	4.67
Total SWL (h/sem)	100		

Module Evaluation					
		Time/No.	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative Assessment	Quizzes	1	5%	5	LO # 1 , 2, 3
	Assignments	1	5%	7	LO # 4 , 5
	Projects / Lab.				
	Report	1	5%	11	6
Summative	Midterm Exam	1.5 hr	15%	9	LO # 1 - 6

Assessment	Final Exam	3 hr	70%	17	All
Total assessment			100%		

Delivery Plan (Weekly Syllabus)	
	Materials Covered
Week 1	Parts of speech, Introduction of English language, Sentences
Week 2	Introduction
Week 3	Countries
Week 4	Jobs
Week 5	Family
Week 6	The time
Week 7	preposition of time
Week 8	My favorites
Week 9	Rooms and furniture
Week 10	Mid-term Exam
Week 11	Question
Week 12	Saying years
Week 13	Questions (past simple)
Week 14	present continuous
Week 15	Positive (present continuous)
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources		
	Text	Available in the library
Required Texts	John and Liz Soars “New Headway Plus” Student’s book.	YES
Recommended Texts	John and Liz Soars “New Headway Plus” Workbook without key	YES
Websites		

Module Information

معلومات المادة الدراسية

Module Title	**Engineering Mechanics (Dynamic)**	Module Delivery

Module Type	**Core**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☐**Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**ENME127**				
ECTS Credits	**4**				
SWL (hr/sem)	**100**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	EMEN		**College**	EME	
Module Leader	Suad Hamzah Abbas		**e-mail**	50098@uotechnology.edu.iq	
Module Leader's Acad. Title	Lecturer		**Module Leader's Qualification**	Ph.D.	
Module Tutor	-		**e-mail**	-	
Peer Reviewer Name	-		**e-mail**	-	
Scientific Committee Approval Date	07/06/2023		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	-	**Semester**	-
Co-requisites module	-	**Semester**	-

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	To introduce the basic engineering principles required for analyzing and solving • Motion and the forces that produce it.
Module Learning Outcomes	By the end of the engineering mechanics module, students will be able to: 1. Understand and apply the principles of dynamics in engineering systems. 2. Analyze and solve problems related to motion of particles. 3. Apply vector mathematics and coordinate systems to engineering

مخرجات التعلم للمادة الدراسية	mechanics problems.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. • Introduction to dynamic • Motion of particles: kinematics and kinetics • Newton's laws of motion • Work, energy, and power • Impulse and momentum Problem-Solving and Applications • Engineering problem-solving techniques • Case studies and practical examples

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	37	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.5
Total SWL (h/sem)	**100**		

الحمل الدراسي الكلي للطالب خلال الفصل	

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	7.5% (7.5)	5 and 13	LO #1, #2 and #11, #12
	Assignments	2	7.5% (7.5)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report				
Summative assessment	Midterm Exam	1.5hr	15% (15)	10	LO #1 - #10
	Final Exam	3hr	60% (60)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to dynamic
Week 2	Kinematics of particles, rectilinear motion.
Week 3	Velocity , acceleration and ,motion laws
Week 4	Plane curvilinear motion (rectangular coordinate (x-y))
Week 5	Projectile motion
Week 6	Plane curvilinear motion(normal and tangential coordinates(n-t))

Week 7	Plane curvilinear motion(polar coordinates(r-θ))
Week 8	Kinetics of particles , Newton's second law
Week 9	Rectilinear motion.
Week 10	Mid-term Exam
Week 11	Curvilinear motion
Week 12	Kinetics of particles, Work, Power.
Week 13	Kinetics of particles, Efficiency.
Week 14	principle of work and kinetic energy.
Week 15	Impulse & momentum
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Weeks 1,2,3	The fundamental law of rotation
Weeks 4 ,5,6	The law of energy conservation
Weeks 7 ,8,9	Calculating the acceleration of a falling body using a simple pendulum
Weeks 10 ,11,12	Disc rolling on an inclined plane
Weeks 13 ,14	Uniformly accelerated motion of a flywheel
Week 15	Final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	R. C. Hibbeler, "Engineering Mechanics: Statics & Dynamics", 14th ed. Pearson Prentice Hall.	Yes
Recommended Texts	J. L. Meriam and L.G. Kraige, "Engineering Mechanics Dynamics", John Wiley & Sons, 2013..	Yes
Websites		

Grading Scheme مخطط الدرجات				
Group	**Grade**	التقدير	**Marks %**	**Definition**
Success Group (50 - 100)	**A -** Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX –** Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

University of Technology

Electromechanical Engineering department

Electromechanical System Engineering Branch

2024 – 2025

Second Cycle,

Bachelor's Degree (B.Sc.) - Electromechanical System Engineering Program

Appendix 2 Program Catalogue

Table of Contents

1. Mission and Vision Statement

Vision Statement

Aiming to build an engineering establishment in electromechanical systems field to be outstanding one among the top international university.

Mission Statement

1- Prepare our students for successful careers in the energy and renewable energies profession,

2- Conduct high quality and innovative research, and

3- Serve the community and industry providing educational and research resources.

For future plans, the branch intends to cover all required courses in electromechanical engineering sectors in Iraq, including control, electric machines, applied mechanics, robotics systems. Through the communications with Ministry of industry an oil (symposiums, industrial advisory board meeting), the branch developed his courses according to the needs of the ministries.

2. Program Specification

Program Code BSc-EREEECTS 240

Duration 4 Year, 8 Semesters Method of AttendanceFull Time

Subject Areas Requirements

The Electromechanical Systems Engineering program produces graduates who are preparedtoenterthepracticeofelectromechanical systems and its application. For two paths, therearethree major components of the program: (1) foundation in the mathematical and physical sciences, (2) engineering topics in both mechanical and electric systems with design applications, and (3) general education in the humanities, Englishcourse and ethics.

Mathematics and PhysicalSciences

The engineering science fundamentals and engineering design skills are built upon the basicmathematicsandphysicalsciences.Themathematicsworkbeginswitha three levels course (six courses) sequence on differential and integral calculus. The first two coursesincludetopicsinlimits,derivatives,andtheintegralsoffunctionsofone variable, work on partial derivatives and multiple integrals is presented. Vector analysis and three-dimensional analytical geometry, solution of the first and second order linear differential equations with numerous applications, Laplace transforms, power series solutions, numerical methods, linear systems and numerical analysis with engineering

applications in numerical differentiation andintegration. With this foundation in mathematics, our students have necessary tools for applications in analysis and design.

Physics (two courses) in the first level includes materials science, classification of materials, atomic structure and the type of bonding forces, types of materials and their applications and the mechanical material properties.

It is noted that the number of hours for Math and Basic Science is 30 hours and it's satisfies ICAEE requirement.

EngineeringTopics

Theaimoftheprogramistograduatestudentscapabletoworkasmechanicalan delectrical engineer in electromechanical systems field. The engineering topics are divided into four parts; preliminary joint courses, mechanical courses, electrical courses and final joint courses.

Preliminary joint courses:

- Workshop Training; Preparation of engineering cadres trained scientific and practical areas in the electricity, automobiles, machining(lathe, milling, drilling), forging, denting, filings, forging, welding, andcasting.
- Computer Courses; Computer Science (Visual BASIC programs), Advanced Programming (C++), Application of Advance Computer (Microprocessors and MATLABlanguages).
- Industrial Engineering, determine the most effective ways for an organization to use the basic factors ofproduction.
- EngineeringandMachineDrawingistoteachstudentsmanualdrafting and dimensioning of views, explains the principles of orthographic views, multi view projection and sectional view drawing.

Engineering courses are divided into twoparts;

Mechanical Courses,

- Engineering Mechanics. This unit of study aims to provide theoretical knowledge and principles of Statics andDynamics.

- Strength of Material and Vibration. In this course, students will learn; the behavior of solid bodies under loads and deflections, study the simple bending theory for beams and the simple torsion theory for shafts circular and non-circular, deflection of beams, complex stresses, compounds beam and discussion the principles of free & forced vibrations

- Control System, illustration and discussion the Main Theoretical Principles of control systems and understanding of using different systemDamping.

- Thermodynamics, Fundamental thermodynamic concepts including system, state, state postulate, equilibrium, process and cycle, Heat, work, 1st Law of Thermodynamics, Properties of a substance, Energy balances for idealized closed systems, Energy and mass balances for idealized control volumes, 2ndLaw of Thermodynamics, Carnot cycles, thermal efficiencies, Entropy, isentropic processes, isentropic efficiencies, idealized power cycles (Otto, Diesel and Rankine Cycles).

- FluidMechanics.ThiscourseprovidesaworkingknowledgeofFluidMechanics and Illustration and discussion the principles of Principle of fluid motional flow classification Bernoulli's equation as well as applications of Bernoulli's equation and anther subject in FluidMechanics.

- Heat Transfer; teach theoretical basics of the conduction, convection and radiation heat transfer Coincided with a laboratoryexperiment.

Electrical Courses,

- Fundamental of Electric Engineering (illustration and discussion the fundamentalfelectricengineeringanddefinition,proceedingtothestudentthe DC Electrical Circuits, series, parallel, series-parallel and identify the equations voltages &current for circuitsabove).

- Electric and Electronic Circuits, in electrical engineering, we are often interested in communicatingortransferringenergyfromonepointtoanother.Todothisrequ ires an interconnection of electrical devices. Such interconnection is referred to as an electriccircuit.

- Electrical Machines, Illustration and discussion the principles of DC and AC machines, description of the machine, as well as its operation in electrical machines.

- Power systems, Giving Knowledge about the generation, transmission, and distribution typesystems.

- Communication, theoretical and practical experiences in analog and digital communication and AM and FM modulation.

- Power Electronics and Electrical Drives, theoretical and practical experiences in the field of power electronics and electrical drives such as AC to DC converters (Rectifiers), DC to AC converters (invertors), DC to DC converters (DC choppers), AC to AC converters (AC voltage regulator and cycloconverter), speed control of DC motors, and speed control of AC motors (inductions and synchronous motors).

Final Joint Courses,

- Electromechanical Equipment, this course specification provides the main features of the Electromechanical Systems andDevices.

- Computer aided design and computer aided manufacturing.

- Signal processing, this course provides the types of signals and analysis of signals. In addition, the comparative between signals is given as well.

Others Including GeneralEducation

The third major area of the curriculum is the general education component. The University of Technology has a mandated General Education Requirements for all degrees. To satisfy the General Education Requirements the Electrometrical Systems Engineering Program set required courses in the general education component as follows:

- English Language(two levels), this course will improve the ability of the students to understand, speak, read and write English as a second language with some technical texts. It is also intended to teach them, how to use technical English effectively as a language of instruction, Lab. Experiments and Exercises, examples, using Technical Terminologies as close as possible to the lectures they receive during their study.

- Human Rights (second level), Freedom and Democracy, the course covers the concept of human rights and development, definition, classes, properties, and the most important human rights conventions and declarations and international conventions on human rights andhumanrightsinreligionsandtheroleofnon-governmentalorganizationsinthisfield and other human rights issues. The substance of freedom and democracy include the conceptoffreedomandkinds,democracyandthetypesandcomponents,individualliberty and freedom forced to reconcile the sovereignty, freedom, democracy during the Greeks time, lobbyists, the most important theories on the nature of election, the rights of minorities in democratic

governance and other topics that make the student familiar with theissues.

- Ethics in Engineering (fourth level), concentrates on professional Ethics.
- Sport (first level), concentrates on different sport activities.

3. Program Goals (objectives)

1- Entering the electromechanical systems engineering profession as practicing engineers and consultants with prominent companies and organizations in diverse areas that related to electromechanical systemsengineering.

2- Pursuing graduate education and research at major research universities in electromechanical systems engineering, and related fields

3- Advance in their chosen fields to supervisory and management positions

4- Engage in continued learning through professional development

5- Participate in and contribute to professional societies and community services

4. Student (Graduate) Learning Outcomes

Students from the electromechanical systemsprogram will attain (by the time of graduation):

1. An ability to identify, formulate, and solve engineering in electromechanical systems engineering problems by applying principles of engineering, science, and mathematics.

2. An ability to apply the engineering design process to produce solutions that meet specified needs with consideration for public health and safety, and global, cultural, social, environmental, economic, and

other factors as appropriate to the discipline

3. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions

4. An ability to communicate effectively with a range of audiences

5. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts

6. An ability to recognize the ongoing need to acquire new knowledge, to choose appropriate learning strategies, and to apply this knowledge

7. An ability to function effectively as a member or leader of a team that establishes goals, plans tasks, meets deadlines, and creates a collaborative and inclusive environment

5. Academic Staff (Faculty)

Faculty Name	Highest Degree Earned-Field and Year	Rank	Email
Jalal Mohammed Jalil	PhD. in Mech. Eng. (1989)	Prof.	50003@uotechnology.edu.iq
Israa Saad Ahmed Naseif	PhD. in Mech. Eng. (2017)	AST	Israa.s.ahmed@uotechnology.edu.iq
Hashim Abed Hussein Hameed	PhD. in Mech. Eng. (2006)	P	50005@uotechnology.edu.iq
Jamal Abdul-Kareem Mohammed Abdullah	PhD. in Elect. Eng. (2007)	P	50128@uotechnology.edu.iq
Mohammed KadhimEdan	PhD. in Elect. Eng. (2017)	P	50055@uotechnology.edu.iq
Azhar Sabah Ameed	MSc. Mech. Eng. (1999)	P	
Hussein ThaniRishagTubiSwadi	PhD. in Elect. Eng. (2005)	AST	
AbduljabbarOwaidHanfeshjarad	PhD. in Elect. Eng. (2009)	AST	
AhlamLouabiShreajee	PhD. in Elect. Eng. (2017)	AST	
ManalKadhimOudahHasan	PhD. in Elect. Eng. (2009)	AST	
WisamEssmat Abdul-Lateef	PhD. in Mechatronics Eng. (2017)	AST	
Tariq Mohammad Hammzakhalaph	PhD. in Mech. Eng. (2016)	AST	
Adnan GhareebTuaamah Al-Hasnawi	PhD. in Mech. Eng. (2016)	AST	
AbduljabbarMuttair Ahmed MizbanAlsaedi	PhD. in Mech. Eng. (2012)	I	
AneesFadhelSaadHazam	PhD. in Mech. Eng. (2018)	AST	
FatenNoaman Abdullah Noaman	PhD. in Mech. Eng. (2019)	AST	
MuroojNadhom Mohammed Ali Musa	PhD. in Elect. Eng. (2020)	I	
Bassam Ali Ahmed Mohammed Ali	PhD. in Mech. Eng. (2021)	AST	

MajidaKhaleel Ahmed Mohsen	PhD.Elect. Eng. (2007)	A	
NajatShyaaJasim Mohammed	MSc. Elect. Eng. (2001)	AST	
JenanAyadNamuq	MSc. Elect. Eng. (2015)		
Wisam Ali Hassan ALZUHAIRI	MSc. Law (2012)		
Rafah Kareem MahmoodHasan	MSc. in Computer (2015)	I	
EnasMozaheem Abed	MSc. Mech. Eng. (2001)		
WaleedKadhim Salman Al-Azzawi	MSc. Mech. Eng. (2017)		
Wisam Ali Hassan ALZUHAIRI	MSc. Law (2012)		
Rawaa Ahmed Hilal	MSc. Physics		

9. Credit Grading and GPA

Credits

University of Technology is following the bologna Process with the European Credit Transfer System (ECTS) credit system. The total degree program number of ECTS is 240, 30 ECTS per semester. 1 ECTS is equivalent to 25 hrs student workload, including structure and unstructured workload.

Grading

Before the evaluation, the results are divided into two subgroups: pass and fail. Therefore, the results are independent of the students who are failed a course. The grading system is defined as follows:

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50-100)	A - Excellent	امتياز	90 - 100	Outstanding
	B – very Good	جيد جدا	80 – 89	Above average with some errors
	C - Good	جيد	70 – 79	Sound work with notable Error
	D - Satisfactory	متوسط	60 – 69	Fair but with major shortcomings

	E - Sufficient	مقبول	50 - 59	Work with met minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب قيد المعالجة	45-49	More work required but credit awarded
	F - fail	راسب	0 - 44	Considerable amount of work required
Notes:				
Marks with decimal places above or below 0.5 will rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The university has a policy NOT to condone "near pass fail" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

Calculation of the Cumulative Grade Point Average (CGPA)

The CGPA is calculated by the summation of each module score multiplied by ita ECTS, all are divided by the program total ECTS.

CGPA of a 4 – year B.SC. Degrees:

CGPA = [91st module score x ECTS) + (2nd module score x ECTS) + …]/240

10.Curriculum/Modules

Semester 1: 30 ECTS: 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
CBRI201	Crimes of the Baath Regime in Iraq	33	17	2	S	Human Rights in the first stage
ADMT202	Advanced Mathematics I	63	87	6	B	MathematicsIin the first stage
ELMA203	Electrical Machines I	63	62	5	C	Fundamental of Electrical Engineering in the first stage
ELCI204	Electrical Circuits	63	62	5	C	Fundamental of Electrical Engineering in the first stage
THDY205	Thermodynamics	63	37	4	C	
STMA206	Strength of Material	63	62	5	C	Mechanics in the first stage
COMP208	Computer II	48	27	3	S	Computer Science I in the first stage

Semester 2: 30 ECTS: 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
SPRT209	**Sport**	33	17	2	S	
ADMT210	**Advanced Mathematics II**	63	87	6	B	Mathematics II in first stage
ELMA211	**Electrical Machines II**	63	62	5	C	Fundamental of Electrical Engineering in the first stage
ELCI212	**Electronic Circuits**	63	62	5	C	Fundamental of Electrical Engineering in the first stage
FLMA213	**Fluid Mechanics**	63	62	5	C	
HETR214	**Heat Transfer**	63	62	5	C	Thermodynamics in first course
ENLA207	**English Language II**	33	17	2	S	English Language I

11. Contact:

Program Manager: Israa Saad Ahmed, Prof. Assistance, PhDin Mech. Eng. (2017)

Program Coordinator: Murooj N. Mohammed Ali, Lecturer, PhD Electrical Eng. 2020

Appendix 3 Modules Catalogue

Table of Contents

4. Overview

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

5. Undergraduate Courses

First Semester

Module 1

Code	Course/module Title	ECTS	Semester
CBRI201	Crimes of the Baath Regime in iraq	2	1
Class (hr/w)	Lect./Lab./Prac./Tutor	SSWL(hr/sem)	USWL (hr/sem)
2		33	17
Description			
The goal of this course is to learn the students about making this generation aware of the crimes committed by the Baathist regime, and the extent of human rights violations publicly			

Module 2

Code	Course/module Title	ECTS	Semester
ADMT202	Advanced Mathematics I	6	1
Class (hr/w)	Lect./Lab./Prac./Tutor	SSWL(h/sem)	USWL (h/sem)
4	-	63	87
Description			
Themathematicsworkbegins with the topics includingthe problems with partial differential equations, differential equations,methods to solve second order differential equations, and some applications each of them			

Module 3

Code	Course/module Title	ECTS	Semester
ELMA203	Electrical Machines I	5	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL(h/sem)	USWL (h/sem)
2	-/2-/-/-	63	62
Description			
As electrical machines either it is a generator or a motor are importance in our daily life, this course deals with DC machines. It is essentially providing knowledge of the DC machine construction, working principle and mathematical models for different types of DC generator and DC motor. It is also introducing performance analysis of the DC based on studding different characteristics of the machines. Moreover, it deals with efficiency calculation to evaluate the machine performance.			

Module 4

Code	Course/module Title	ECTS	Semester
ELCI204	Electrical Circuits	5	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL(h/sem)	USWL (h/sem)
2	- / 2-/ - / -	63	62
Description			
This course specification provides the main features of the theory of electric circuit for the students of 2nd year in the Electromechanical Engineering Department. Learning outcomes which gained by this program will help a typical student to achieve and demonstrate the learning opportunities that are provided during the course study and to comply with the programmer specification as Energy and Renewable Energies Engineering.			

Module 5

Code	Course/module Title	ECTS	Semester
THDY205	Thermodynamics	4	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL(h/sem)	USWL (h/sem)
2	- / 2 / - / -/ -	63	37
Description			
Thermodynamics is the branch of physics that deals with the relationships between heat, work, temperature, and energy. Its principles are crucial for understanding how energy is transferred and transformed in physical and chemical processes.			

Module 6

Code	Course/module Title	ECTS	Semester
STMA206	Strength of Materials	5	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL(h/sem)	USWL (h/sem)
2	- / 2 / - / -	63	62
Description			
This course provides an understanding of the mechanics of deformable materials and structures. It introduces the concepts of stress and strain, and basic structural elements like rods, beams, and shearing and bending elements.			

Module 7

Code	Course/module Title	ECTS	Semester
COMP208	**Computer II**	3	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL(h/sem)	USWL (h/sem)
1	-/2/-/-	48	27
Description			
This course deals with C++ program and the following topics are included in this course 1- Introduction to C++ 2- Selection 3- Iteration 4- Array 5- Pointer 6- Reference			

Second semester

Module 1

Code	Course/module Title	ECTS	Semester
SPRT209	Sport	2	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL(h/sem)	USWL (h/sem)
2	-	33	17
Description			
This course considers the main sport games.			

Module 2

Code	Course/module Title	ECTS	Semester
ADMT210	Advanced Mathematics II	6	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL(h/sem)	USWL (h/sem)
4	-	63	87
Description			
Themathematicsworkbegins with the topics includingsequence, convergence of sequence, series, power series, Fourier series. Laplace transform, inverse Laplace transform, and solution of differential equation using Laplace transform is also presented in this course.			

Module 3

Code	Course/module Title	ECTS	Semester
ELMA211	Electrical Machines II	5	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL(h/sem)	USWL (h/sem)
2	- / 2 / - / -	63	62
Description			
As types of an AC electrical machine, transformer and three-phase induction motor are playing essential part in our life regarding power transmission and consuming, this course deals with transformer and three-phase induction motor. It is essentially providing knowledge of the transformer and three-phase induction motor construction, working principle. It is also introducing performance analysis of the transformer based on its equivalent circuit. Moreover, it deals with prediction of the motor equivalent circuit parameters in order to analysis the motor performance including torque and efficiency			

Module 4

Code	Course/module Title	ECTS	Semester
ELCI212	Electronics Circuits	5	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL(h/sem)	USWL (h/sem)
2	-/ 2 / - / -/ -	63	62
Description			
This course specification provides the main features of the theory of electronic circuit for the students of 2nd year in the Electromechanical Engineering Department. Learning outcomes which gained by this program will help a typical student to achieve and demonstrate the learning opportunities that are provided during the course study and to comply with the programmer specification as Energy and Renewable Energies Engineering.			

Module 5

Code	Course/module Title	ECTS	Semester
FLMA213	Fluid Mechanics	5	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL(h/sem)	USWL (h/sem)
2	-/ 2- / - / -	63	62
Description			
Fluid mechanics is one of the basic sciences in which the laws of equilibrium and movement of fluids are studied. It can be divided into statics fluid and dynamics fluid. It has a wide application in hydraulic engineering and in the work of transporting and storing liquids and gases.			

Module 6

Code	Course/module Title	ECTS	Semester
HETR214	**Heat Transfer**	5	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL(h/sem)	USWL (h/sem)
2	2	63	62
Description			
The goal of this course is to build up the student's interest in fundamentals of the English language basics such as grammar, punctuation, tense types, reading skills, Writing skills, and presentation skills.			

Module 7

Code	Course/module Title	ECTS	Semester
ENLA207	English Language II	2	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL(h/sem)	USWL (h/sem)
2	-	33	17
Description			
The goal of this course is to build up the student's interest in fundamentals of the English language basics such as grammar, punctuation, tense types, reading skills, Writing skills, and presentation skills.			

6. Contact:

Program Manager: Israa Saad Ahmed, Prof. Assistance, PhD in Mech. Eng. (2017)
Program Coordinator: Murooj N. Mohammed Ali, Lecturer, PhD Electrical Eng. (2020)

Appendix 4 Modules Description Form

FirstSemester

Module 1

Module Information			
Module Title	Crimes of the Baath Regime in iraq		Module Delivery
Module Type	Support		■ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical Sem☐ar
Module Code	CBRI201		
ECTS Credit/year	2		
SWL/year	50		
Module level	1	Semester of Delivery	1
Module Leader	Wisam Ali Hassan	College	
Module Leader Academic Title	Assist Lecturer	e-mail	
Module Tutor	-	Module Leader's Qualification	MSc.
Peer Reviewer Name	-	e-mail	wisam.A.Hasan@uotechnology.edu.iq
Scientific Committee Approval Date		e-mail	-
-	-	Version Number	1

Relation with other Modules			
Prerequisite Module	Democracy and Human Rights	Semester	1
Co-requisite Module	-	Semester	-

Module Aims, Learning Outcomes and Inductive Contents	
Module Aims	• Making this generation aware of the crimes committed by the Baathist regime • The extent of human rights violations publicly • Spreading awareness of the extent of violation of Sharia and law
Module Learning Outcomes	The student will learn about generation aware of the crimes committed by the Baathist regime.

Inductive Contents	19. Introducing the student to Rejecting Baathist **20.** Familiarize students withRecognizing the ugliness crimes committed . **21.** Introducing students to the Killing and slaughtering the Shiite Kurds 22. Introducing the student to theHiding signs of genocide 23. Familiarize studentswithexpressing an opinion.

Learning and Teaching Strategies			
Strategies		-	
Student Workload (SWL)			
Structured SWL (h/sem)	33	Structured SWL (h/w)	2.00
Unstructured SWL (h/sem)	17	Unstructured SWL (h/w)	1.13
Total SWL (h/sem)	50		

Module Evaluation					
		Time/No.	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative Assessment	Quizzes	-	-	-	-
	Assignments				All
	Projects / Practice	Every 3 weeks	50%	Continuous	-
	Report	-	-	-	-
Summative Assessment	Midterm Exam	-	-	-	-
	Exam	Every 3 weeks	50%	Continuous	All
Total assessment			100%	-	-

Delivery Plan (Weekly Syllabus)	
	Materials Covered
Week 1	**Rejecting Baathist**
Week 2	**Recognizing the ugliness crimes committed**

	.
Week 3	**Violations committed**
Week 4	**For the sake of humanity**
Week 5	**Oppressing.andexterminating.the people**
Week 6	**Cruelty,intimidation and torture**
Week 7	**Politics of repression**
Week 8	**Reject the idea of change**
Week 9	**expressing an opinion**
Week 10	**Burying crime scenes**
Week 11	**Killing and slaughtering the Shiite Kurds**
Week 12	**Concealing the evidence of crimes**
Week 13	**Continuous killing**
Week 14	**Hiding signs of genocide**
Week 15	**Collectiv the people**

Learning and Teaching Resources		
-	Text	Available in the library
Required Texts	**A methodological book (Crimes of the Baath Regime in Iraq)Ministry of Higher Education and Scientific Research**	Yes
Recommended Texts	-	-
Websites	-	-

First Semester

Module 2

Module Information		
Module Title	Advanced Mathematics I	Module Delivery
Module Type	Basic	■ Theory
Module Code	ADMT202	□ Lecture
ECTS Credit	6	□ Lab

SWL	150		☐ Tutorial ☐ Practical ☐ Seminar
Module level	1	Semester of Delivery	1
Module Leader	FatenNoaman Abdullah	College	Electromechanical Eng. Dept.
Module Leader Academic Title	Assistance Prof.	e-mail	eme@uotechnology.edu.iq
Module Tutor	-	Module Leader's Qualification	PhD. Elec. Eng.
Peer Reviewer Name	-	E-mail	50241@uotechnology.edu.iq
Scientific Committee Approval Date	-	E-mail	-
-	-	Version Number	-

Relation with other Modules			
Prerequisite Module	Mathematics I	Semester	1
Co-requisite Module	-	Semester	-

Module Aims, Learning Outcomes and Inductive Contents	
Module Aims	In this course, the students will learn: How to solve the problems with partial differential equations, differential equations,methods to solve second order differential equations, and some applications each of them
Module Learning Outcomes	1.Use and describe the meaning of mathematical concepts and their inter-relationships. 2. Employ procedures and solve standard tasks with and without tool. 3. Formulate, analyze and solve mathematical problems, and assess selected strategies, methods and results. 4.Follow, apply, and assess mathematical reasoning 5. Relate mathematics to its

	importance and use in other subjects, in a professional, social and historical context
Inductive Contents	• Partial differential equations. • Chain rules, implicit derivatives. • Directional derivatives. • Gradient vectors. Differential Equations (first and second order differential equations.

Learning and Teaching Strategies	
Strategies	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL)			
Structured SWL (h/sem)	63	Structured SWL (h/w)	4.00
Unstructured SWL (h/sem)	87	Unstructured SWL (h/w)	5.8
Total SWL (h/sem)	150	-	-

Module Evaluation					
-		Time/No.	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative Assessment	Quizzes	1	10%	5	LO # 1 , 2, 3
	Assignments	1	10%	7	LO # 4 , 5
	Projects / Lab.	-	-	-	-
	Report	1	10%	11	6
Summative Assessment	Midterm Exam	1.5 hr	20%	9	LO # 1 – 6
	Final Exam	3 hr	50%	17	All
Total assessment			100%	-	-

Delivery Plan (Weekly Syllabus)	
	Materials Covered
Week 1	Introduction to derivatives.

Week 2	Partial derivative, definition, rules, and examples.
Week 3	Clairaut's Theorem.
Week 4	Chain Rules
Week 5	Implicit Derivative
Week 6	Directional Derivatives
Week 7	Gradient Vector
Week 8	Directional derivative properties.
Week 9	Applications of partial derivative [Increasing and Decreasing, Tangent planes, Linear approximation].
Week 10	Deferential equations
Week 11	Methods of solving D.E. [separable of variable, reducible to separable of variables, non-homogenous, exact and Non-Exact].
Week 12	Continue solving D.E.
Week 13	Non -Exact OR Reducible to Exact Differential Equation and Integrating Factor.
Week 14	Second order D.E.
Week 15	Solving non-homogenous second order D.E.
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources		
	Text	Available in the library
Required Texts	Thomas' Calculus Early Transcendentals Thirteenth Edition	YES
Recommended Texts	Advancing Differentiation: Thinking and Learning by Richard M. Cash, Ed.D. 2017	YES
Websites	ALL academic Publications in Scopus and Web of Science.	YES

Module 3

Module Information			
Module Title	Electrical Machines I		Module Delivery
Module Type	Core		■ Theory □ Lecture ■ Lab ■ Tutorial □ Practical □ Seminar
Module Code	ELMA203		
ECTS Credit	5		
SWL	125		
Module level	1	Semester of Delivery	
Module Leader	Abduljabbar.O.Hanfesh	College	Electromechanical Eng. Dept.
Module Leader Academic Title	Prof. Assistance	e-mail	eme@uotechnology.edu.iq
Module Tutor	-	Module Leader's Qualification	PhD. in Electrical
Peer Reviewer Name	-	e-mail	Abduljabbar.O.Hanfesh@uotechnology.edu.iq
Scientific Committee Approval Date	-	e-mail	-
-	-	Version Number	-

Relation with other Modules			
Prerequisite Module	-	Semester	-
Co-requisite Module	-	Semester	-

Module Aims, Learning Outcomes and Inductive Contents	
Module Aims	The main aims of this course are • provide learners with knowledge and an understanding of the working

	principle, and constructional features of DC machines. • Functionality of DC generators and DC Motors with their classification • evaluate efficiency of the DC machines under different load operation conditions.
Module Learning Outcomes	**At the end of this course students will demonstrate the ability to** • Understand the concept of energy conversion from electrical form to mechanistical form and vice versa. • Understand the principle operating of both DC generator and DC motor • Analysis the armature reaction in DC machine • Explain commutator process in DC machines • Evaluate DC generator EMF, efficiency for different load conditions • Evaluate different types of DC generators based on their performance characteristics • Analysis back-EMF and torque of the DC motor • Mention different speed control methods for DC motor based on the speed equation. • Summarize losses that would be occurred on the dc machines and classified them.
Inductive Contents	1-Introduction, Basics of electrotechnical energy conversion. 2- Construction of DC machine and operating principle of DC generation. 3- EMF equation of dc generator. 4- armature reaction and commutator process in DC machines 5- classification of DC generator and mathematical model of each type. 6- Voltage build up process in self-excited DC generator.

	7- Characteristics of DC generator. 8- Torque equation of DC motor and back-EMF. 9- Speed control methods of DC motor. 10- Performance characteristics of DC motor 11- losses and efficiency of DC machine.

Learning and Teaching Strategies	
Strategies	The branch use a problem based learning which new and student active method. The method help the student getting the program outcomes.

Student Workload (SWL)			
Structured SWL (h/sem)	63	Structured SWL (h/w)	4.00
Unstructured SWL (h/sem)	62	Unstructured SWL (h/w)	4.13
Total SWL (h/sem)	125		

Module Evaluation					
		Time/No.	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative Assessment	Quizzes	1	10%	5	LO # 1, 2
	Assignments	1	10%	7	LO # 3, 4
	Projects / Lab.	-	-	-	-
	Report	-	10%	-	-
Summative Assessment	Midterm Exam	1.5 hr	20%	10	LO # 1 – 4
	Final Exam	3 hr	50%	17	All
Total assessment			100%	-	-

Delivery Plan (Weekly Syllabus)

	Materials Covered
Week 1	Dc Machines construction
Week 2	Armature windings
Week 3	Armature reaction
Week 4	Types of Dc Generators
Week 5	Mathematical model of DC generator types
Week 6	Characteristics of DC generators
Week 7	Losses and efficiency
Week 8	Operating principle of DC motor
Week 9	Types of DC motor
Week 10	Mid-term Exam
Week 11	Mathematical model of DC motor types
Week 12	Characteristics of DC motor
Week 13	Speed control of DC motor
Week 14	Starting of DC motor
Week 15	Losses and efficiency of DC motor
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources		
	Text	Available in the library
Required Texts	P. C. Sen, "Principles of electric machines and power electronics", John Willy and Sons Inc., 1997.	-
Recommended Texts		-
Websites	-	-

Module 4

Module Information			
Module Title	Electrical Circuits		Module Delivery
Module Type	Core		■ Theory
Module Code	ELCI204		□ Lecture
ECTS Credit	5		■ Lab
SWL	125		□ Tutorial
			□ Practical
			Sem□ar
Module level	1	Semester of Delivery	1
Module Leader	JenanAyadNamuq	College	Electromechanical Eng. Dept.
Module Leader Academic Title	Lec.	e-mail	@uotechnology.edu.iq
Module Tutor	-	Module Leader's Qualification	PhD. Elec. Eng.
Peer Reviewer Name	-	E-mail	jinan.a.namuq@uotechnology.edu.iq
Scientific Committee Approval Date	-	E-mail	-
-	-	Version Number	-

Relation with other Modules			
Prerequisite Module	-	Semester	-
Co-requisite Module	-	Semester	-

Module Aims, Learning Outcomes and Inductive Contents	
Module Aims	Students successfully completing this course should be able to perform the following tasks with minimum degree of difficulty: 1. To develop an understanding of the fundamental laws and elements of electrical circuits. 2. To learn the energy properties of electric elements and the techniques to measure voltage and current. 3. To develop the ability to apply circuit analysis to DC and AC circuits 4. . To understand transient and steady-state response of RLC circuits and to understand advanced mathematical methods such as Laplace transforms for solving circuit problems. 5. . To provide an exposure to P-Spice. .
Module Learning	These are sample Strategies; which teachers can use to

Outcomes	accelerate the attainment of the various course outcomes. 1. Lecturer method (L) needs not to be only traditional lecture method, but alternative effective teaching methods could be adopted to attain the outcomes. 2. Use of Video/Animation to explain functioning of various concepts. 3. Encourage collaborative (Group Learning) Learning in the class. 4. Ask at least three HOT (Higher order Thinking) questions in the class, which promotes critical thinking. 5. Adopt Problem Based Learning (PBL), which fosters students' Analytical skills, develop design thinking skills such as the ability to design, evaluate, generalize, and analyses information rather than simply recall it. 6. Introduce Topics in manifold representations. 7. Show the different ways to solve the same problem with different circuits/logic and encourage the students to come up with their own creative ways to solve them. 8. Discuss how every concept can be applied to the real world - and when that's possible, it helps improve the students' understanding.
Inductive Contents	1- Natural and Step Responses of First and Second Order Circuits 2- Natural Responses of a Series and a Parallel RLC Circuits 3- Step Responses of a Series and a Parallel RLC Circuits 4- Balanced Three-Phase Voltages-part1 5- Balanced Three-Phase Voltages- part2 6- Resonance Circuits- part1 7- Resonance Circuits- part2 8- Two-Port Networks-part1 9-Two-Port Networks part2 10- Two-Port Networks part3 11- mini-project. 12- Review

Learning and Teaching Strategies	
Strategies	The branch use a problem based learning which new and student active method. The method help the student getting the program outcomes.

Student Workload (SWL)			
Structured SWL (h/sem)	63	Structured SWL (h/w)	4.0
Unstructured SWL (h/sem)	62	Unstructured SWL (h/w)	

Total SWL (h/sem)	125	-	-

Module Evaluation					
		Time/No.	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative Assessment	Quizzes		10%		
	Assignments		10%		
	Projects / Lab.	1.5/ 2	-	7, 10	LO # 1-7
	Report		10%		
Summative Assessment	Midterm Exam	1.5 hr	20%	12	All
	Final Exam	3 hr	50%	15	All
Total assessment			100%	-	-

Delivery Plan (weekly lab. Syllabus)	
	Materials Covered
Week 1	Natural and Step Responses of First and Second Order Circuits
Week 2	Natural and step responses of an RL circuit 1
Week 3	Natural and step responses of an RC circuit.1
Week 4	Natural and step responses of a Parallel RLC circuit
Week 5	Natural and step responses of a Series RLC circuit
Week 6	Balanced Three-Phase Circuits
Week 7	Balanced 3-phase voltages, Balanced WYE-WYE connection
Week 8	Balanced WYE- Delta connection
Week 9	Balanced Delta - Delta connection.
Week 10	Mid-term Exam
Week 11	Power in balanced 3-phase system
Week 12	Modifying and Maneuvering.
Week 13	Resonance circuits
Week 14	Series resonance, Parallel resonance, Transfer function, Decibel scale, Bode plots
Week 15	Two-Port Networks: (Impedance parameters, Admittance parameters, Hybrid parameters, Transmission parameters)
Week 16	Preparatory week before the final Exam -

Learning and Teaching Resources		
	Text	Available in the

		library
Required Texts	Basic AC circuits, John Clayton Rawlins.2nd Edition, 2000.	-
Recommended Texts		-
Websites	-	-

Module 5

Module Information			
Module Title	Thermodynamics		Module Delivery
Module Type	Core		■ Theory □ Lecture ■ Lab □ Tutorial □ Practical □ Seminar
Module Code	THDY205		
ECTS Credit	4		
SWL	100		
Module level	1	Semester of Delivery	1
Module Leader	Hashim A. Hussain	College	Electromechanical Eng. Dept.
Module Leader Academic Title	prof.	e-mail	**eme@uotechnology.edu.iq**
Module Tutor	-	Module Leader's Qualification	PhD. in Mech. Eng.
Peer Reviewer Name	-	E-mail	50005@uotechnology.edu.iq
Scientific Committee Approval Date	-	E-mail	-
	-	Version Number	-

Relation with other Modules			
Prerequisite Module	-	Semester	-
Co-requisite Module	-	Semester	-

Module Aims, Learning Outcomes and Inductive Contents	
Module Aims	The goal of this course in engineering thermodynamic is study how the student improves the efficiency of a process for the transformation between energy and work. To study energy conservation and to study energy the entropy of a system.

Module Learning Outcomes	Students learn how to apply the basic principles from engineering thermodynamic to calculate the force and power developed or consumed in the thermodynamic. Students will also learn how to handle an open-ended design problem in the team project. The question asked at the beginning of this section can also be asked in a slightly different way. Why should a future engineer bother studying thermodynamic engineering?
Inductive Contents	Students learn how to apply the basic principles from engineering thermodynamic to calculate the pressure, volume, entropy and power developed by work cycles. Students will also learn how to handle an open-ended design problem in the team project

Learning and Teaching Strategies	
Strategies	The branch use a problem based learning which new and student active method. The method help the student getting the program outcomes.

Student Workload (SWL)			
Structured SWL (h/sem)	63	Structured SWL (h/w)	4.00
Unstructured SWL (h/sem)	37	Unstructured SWL (h/w)	4.13
Total SWL (h/sem)	100	-	-

Module Evaluation					
		Time/No.	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative Assessment	Quizzes	1	10%	5	LO # 1 , 2, 3
	Assignments	1	10%	7	LO # 4 , 5
	Projects / Lab.	1	-		LO # 3
	Report	-	10%	-	-
Summative Assessment	Midterm Exam	1.5 hr	20%	9	LO # 1 – 5

	Final Exam	3 hr	50%	17	All
Total assessment			100%	-	-

Delivery Plan (Weekly Syllabus)	
	Materials Covered
Week 1	THERMODYNAMICS DEFINITION
Week 2	INTRODUCTION AND TTHERMODYNAMIC PROPERTIES
Week 3	OUTLINE OF SOME DESCRIPTIVE SYSTEMS
Week 4	BASIC CONCEPTS OF THERMODYNAMICS
Week 5	PROPERTIES OF PURE SUBSTANCES
Week 6	FIRST LAW OF THERMODYNAMICS
Week 7	APPLICATIONS OF FIRST LAW OF THERMODYNAMICS
Week 8	SOLVED EXAMPLES Of FIRST LAW OF THERMODYNAMICS
Week 9	SECOND LAW OF THERMODYNAMICS
Week 10	ENTROPY AND THERMODYNAMIC PROPLEMS
Week 11	THERMODYNAMIC RELATIONS
Week 12	IDEAL AND REAL GASES
Week 13	APLICATIONS OF IDEAL AND REAL GASES
Week 14	SOLVED EXAMPLES Of SECOND LAW OF THERMODYNAMICS
Week 15	MIDTERM EXAMINATON
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources		
	Text	Available in the library
Required Texts	Thermodynamic an Engineering Approach, Yunus A. Cengel, Michael A. Boles, 5th edition 2004	-
Recommended Texts	Thermodynamic an Engineering Approach, Yunus A. Cengel, Michael A. Boles, 5th edition 2004	-
Websites	-	-

Module 6

Module Information			
Module Title	Strength of Materials		Module Delivery
Module Type	Core		■ Theory □ Lecture ■ Lab □ Tutorial □ Practical Sem□ar
Module Code	STMA206		
ECTS Credit	5		
SWL	125		
Module level	1	Semester of Delivery	1
Module Leader	Tariq.M.Hammza	College	Electromechanical Eng. Dept.
Module Leader Academic Title	Assist Prof.	e-mail	Tariq.M.Hammza@uotechnology.edu.iq
Module Tutor	-	Module Leader's Qualification	PhD. in Mech. Eng.
Peer Reviewer Name	-	e-mail	
Scientific Committee Approval Date	-	e-mail	-
	-	Version Number	-

Relation with other Modules			
Prerequisite Module	-	Semester	-
Co-requisite Module	-	Semester	-

Module Aims, Learning Outcomes and Inductive Contents	
Module Aims	• Introduces the fundamental concepts in mechanics of materials by study of the behavior of solid bodies under loads and deflections. • Study the simple bending theory for beams and the simple torsion theory for shafts (circular) and non-circular, deflection of beams, complex stresses, compounds beam. • Illustration and discussion the principles of free & forced vibrations and definition with and without damping.

	• Proceeding to the Student free & forced vibrations of single degree of freedom and two degree of freedom.
Module Learning Outcomes	This course will enable students; 1. To understand the basic concepts of the stresses and strains for different materials and strength of structural elements. 2. To know the development of internal forces and resistance mechanism for one dimensional and two dimensional structural elements. 3. To analyse and understand different internal forces and stresses induced due to representative loads on structural elements. 4. To analyse and understand principal stresses due to the combination of two dimensional stresses on an element and failure mechanisms in materials. 5. To evaluate the behavior of torsional members, columns and struts.
Inductive Contents	**Module (1): Simple Stresses and Strain:** Introduction, Definition and concept and of stress and strain. Hooke's law, Stress-Strain diagrams for ferrous and non-ferrous materials, factor of safety, Elongation of tapering bars of circular and rectangular cross sections, Elongation due to selfweight. Saint Venant's principle, Compound bars, Temperature stresses, Compound section subjected to temperature stresses, state of simple shear, Elastic constants and their relationship. **Module (2): Compound Stresses**: Introduction, state of stress at a point, General two dimensional stress system, Principal stresses and principal planes. Mohr's circle of stresses Thin and Thick Cylinders: Introduction, Thin cylinders subjected to internal pressure; Hoop stresses, Longitudinal stress and change in volume. Thick cylinders subjected to both internal and external pressure; Lame's equation, radial and hoop stress distribution.

	Module (3): Bending and Shear Stresses in Beams: Introduction, pure bending theory, Assumptions, derivation of bending equation, modulus of rupture, section modulus, flexural rigidity. Expression for transverse shear stress in beams, Bending and shear stress distribution diagrams for circular, rectangular, 'I', and 'T' sections. Shear centre(only concept). **Module (4): Torsion in Circular Shaft:** Introduction, pure torsion, Assumptions, derivation of torsion equation for circular shafts, torsional rigidity and polar modulus Power transmitted by a shaft, combined bending and torsion.

Learning and Teaching Strategies	
Strategies	The branch use a problem based learning which new and student active method. The method help the student getting the program outcomes.

Student Workload (SWL)			
Structured SWL (h/sem)	63	Structured SWL (h/w)	4.0
Unstructured SWL (h/sem)	62	Unstructured SWL (h/w)	4.13
Total SWL (h/sem)	125	--	-

Module Evaluation					
		Time/No.	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative Assessment	Quizzes	1	10%	5	LO # 1 , 2, 3
	Assignments	1	10%	7	LO # 4 , 5
	Projects / Lab.	1	-		LO # 3
	Report	-	10%	-	-
Summative Assessment	Midterm Exam	1.5 hr	20%	9	LO # 1 – 5
	Final Exam	3 hr	50%	17	All
Total assessment			100%	-	-

Delivery Plan (Weekly Syllabus)	
	Introduction to dynamic.
Week 1	**Introduction:** Equilibrium of a deformable body
Week 2	**Stress:** Average normal Stress In an axially loaded bar
Week 3	**Stress:** Average Shear Stress, Bearing Stress, allowable Stress design
Week 4	**Strain:** Normal Strain, Shear Strain, Cartesian Strain Components.
Week 5	**Mechanical Properties of Materials:** The Tension and compression test, The stress–strain diagram, Behavior of ductile and Brittle materials
Week 6	**Mechanical Properties of Materials:** The shear stress–strain diagram, Poisson's ratio.
Week 7	**Axial Load:** Elastic Deformation of an Axially Loaded Member
Week 8	**Midterm Exam**
Week 9	**Axial Load:** Statically Indeterminate Axially Loaded Members, Thermal Stress
Week 10	**Torsion:** Torsional Deformation of a Circular shaft, The Torsion formula, Power Transmission
Week 11	**Torsion:** Angle of Twist, statically indeterminate Torque-loaded members
Week 12	**Bending:**Shear and Moment diagrams
Week 13	**Bending:** Graphical method for constructing shear and moment diagrams
Week 14	**Bending:**Bending deformation of a Straight Member, the flexure formula
Week 15	**Bending:**Composite Beams
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources		
	Text	Available in the library
Required Texts	● Mechanics of Materials I., E. J. HEARN, THIRD EDITION, 2007. ● Strength of materials, G. G. Jon, 2009. Mechanical vibration by S.S. Rao.	-
Recommended Texts		-
Websites	-	-

Module 7

Module Information			
Module Title	Computer II		Module Delivery
Module Type	Supplement		■ Theory ☐ Lecture ■ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	COMP208		
ECTS Credit	3		
SWL	75		
Module level	1	Semester of Delivery	1
Module Leader	Asifa M Mohammed	College	Electromechanical Eng. Dept.
Module Leader Academic Title	Prof. Assistance	e-mail	eme@uotechnology.edu.iq
Module Tutor	-	Module Leader's Qualification	Msc. Mech. Eng.
Peer Reviewer Name	-	e-mail	50009@uotechnology.edu.iq
Scientific Committee Approval Date	-	e-mail	--
-	-	Version Number	

Relation with other Modules			
Prerequisite Module	Computer course in the first stage	Semester	SemesterFirstStage
Co-requisite Module	-	Semester	-

Module Aims, Learning Outcomes and Inductive Contents	
Module Aims	The student can learn about the principles of the programming language The student can use the language program The student has the ability to apply computer programs and use the C++ program
Module Learning Outcomes	to able be will student the, course the completing A a1. Recognize the fundamental programming concepts such as variables, Selection, Iteration, and arrays using C++.

	b1. Create programs using C++ programming language. b2. Develop a detailed algorithmic solution to a well-defined problem. c1. Apply C++ programming language syntax to programming problems d1. Work effectively both in a team and independently. 9.
Inductive Contents	1. What is programming 2. What are programming languages 3. Codeblocks 4. C++ programming on mobile 5. Definition of variables 6. Rules and conditions for naming variables 7. Data types 8. Calculations 9. Boolean operations 10. If condition cases 11. Multiple condition cases If else 12. Multiple condition cases If else If 13. Switch case conditions 14. Difference between switch and if condition states 15. Write comments in programming 16. While Loop 17. Duplicates do while

Learning and Teaching Strategies	
Strategies	1. Knowledge andUnderstandingCILOs (teaching strategies) a) lectures b) discussion c) practical classes d) independent study e) case study f) brainstorm 2. Alignment of Intellectual Skills CILOs

	a) Lectures, b) tutorials, c) group discussions, d) practical classes, e) brainstorming, independent study

Student Workload (SWL)			
Structured SWL (h/sem)	63	Structured SWL (h/w)	4.00
Unstructured SWL (h/sem)	12	Unstructured SWL (h/w)	0.80
Total SWL (h/sem)	75	-	-

Module Evaluation					
		Time/No.	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative Assessment	Quizzes	1	10%	5	LO # 1 , 2, 3
	Assignments	1	10%	7	LO # 4 , 5
	Projects / Lab.	-	-	-	-
	Report	-	10%	-	-
Summative Assessment	Midterm Exam	1.5 hr	20%	10	LO # 1 – 6
	Final Exam	3 hr	50%	17	All
Total assessment			100%	-	-

Delivery Plan (Weekly Syllabus)	
	Materials Covered
Week 1	C++ programming basic
Week 2	the introduction
Week 3	numeric data types arithmetic
Week 4	Identifythetypes of mathematical operations and the tools used in them
Week 5	Learn about input and output tools
Week 6	Understanding the basic variables and declaring them
Week 7	Using types of variables and how to write them
Week 8	Conditional tools and writing a program about if
Week 9	Termination toolblocks
Week 10	Writing if/else clauses with a computer application
Week 11	Using the switch conditional tool with examples

Week 12	Writing a program for a while loop with examples
Week 13	Write a program about the for loop
Week 14	How to use continue statesmen With practical examples
Week 15	Use the mathematical function library
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources		
	Text	Available in the library
Required Texts	PROGRAMMING WITH C++, JOHN R. HUBBARD, SCHAUM'S OUTLINE SERIES, McGRAW-HILL, 2000.	YES
Recommended Texts	-	-
Websites	-	-

Second Semester

Module 1

Module Information			
Module Title	Sport		Module Delivery
Module Type	Support		■ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	SPRT209		
ECTS Credit	2		
SWL	50		
Module level	1	Semester of Delivery	1
Module Leader	MuaidWaleed	College	Electromechanical Eng. Dept.
Module Leader Academic Title	Asst. Prof.	e-mail	10755@uotechnology.edu.iq
Module Tutor	-	Module Leader's Qualification	MsC.
Peer Reviewer Name	-	E-mail	10755@uotechnology.edu.iq
Scientific Committee Approval Date	-	E-mail	-
	-	Version Number	-

Relation with other Modules			
Prerequisite Module	-	Semester	-
Co-requisite Module	-	Semester	-

Module Aims, Learning Outcomes and Inductive Contents	
Module Aims	Develop the ability of the students to understand the main sport activities
Module Learning Outcomes	In this course, students will learn: 1- Football 2- Basketball
Inductive Contents	• Football • Basketball
Learning and Teaching Strategies	
Strategies	The branch use a problem based learning which new and student active method. The method help the student getting the program outcomes.

Student Workload (SWL)			
Structured SWL (h/sem)	33	Structured SWL (h/w)	2.0
Unstructured SWL (h/sem)	17	Unstructured SWL (h/w)	1.13
Total SWL (h/sem)	50	-	-

Module Evaluation					
		Time/No.	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative Assessment	Quizzes	-	10%	-	-
	Assignments	1	10%	7	LO # 1, 2, 3
	Projects / Lab.	-	-	-	-
	Report	1	10%	12	LO# 1, 2, 3, 4, 5, 6, 7
Summative Assessment	Midterm Exam	1.5 hr	20%	11	LO # 1 - 5
	Final Exam	3 hr	50%	17	All
Total assessment			100%	-	-

Delivery Plan (Weekly Syllabus)

	Materials Covered
Week 1	Sports - concept, benefits and types
Week 2	Fitness - the concept and elements of fitness
Week 3	Football - concept + history
Week 4	Football - basic soccer skills
Week 5	Football Law - Article 1, 2
Week 6	Football Law - Articles 3, 4, 5
Week 7	Basketball - concept + history
Week 8	Basketball - basic basketball skills
Week 9	Anatomy
Week 10	The skeleton
Week 11	Circulatory system
Week 12	Muscular system - concept + muscle injuries
Week 13	Scouting - concept + stages + scouting law
Week 14	Biorhythm - concept + benefits + historical overview
Week 15	Biorhythm cycles
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources		
	Text	Available in the library
Required Texts	Volleyball (history - skills - plans - game management - and training) Series/basketball basics Sports training and future prospects Applications in sensory education Rapid methods and techniques of sports training Football law	Pdf
Recommended Texts	-	-
Websites	-	-

Module 2

Module Information			
Module Title	Advanced Mathematics II		Module Delivery
Module Type	Basic		■ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	ADMT210		
ECTS Credit	6		
SWL	150		
Module level	1	Semester of Delivery	1
Module Leader	FatenNoaman Abdullah	College	Electromechanical Eng. Dept.
Module Leader Academic Title	Assistance Prof	E-mail	eme@uotechnology.edu.iq
Module Tutors	-	Module Leader's Qualification	Phd. Mech. Eng
Peer Reviewer Name	-	E-mail	50241@uotechnology.edu.iq
Scientific Committee Approval Date	-	E-mail	-
-	-	Version Number	-

Relation with other Modules			
Prerequisite Module	-	Semester	-
Co-requisite Module	-	Semester	-

Module Aims, Learning Outcomes and Inductive Contents	
Module Aims	The students will learn the second part of the basic math and principle of statistics.
Module Learning Outcomes	In this course, for students will learn 9. Differentiation (Derivative Definition, Techniques of Derivative, Applications) 10. Differentiation (Parametric Equations, Implicit Differentiation) 11. Integration (Definite Integrals, Properties, Relation Between Indefinite & definite Integrals) 12. Differential Equations D.E. 1st degree equation 13. Differential Equations D.E. 2 nddegree equation 14. Vector. 15. Random variable and probability distribution

	16. Engineering Statistic.
Inductive Contents	In this course, students will learn: • Differentiation (Derivative Definition, Techniques of Derivative, Applications) • Area between Curve and y-axis, Area Between Two Curves) • Differential Equations D.E, 1st degree equation: • (1-Variable Separable, 2- reduction into separable, 3- Linear differential equation, 4- non linear differential equation 5- exact differential equation 6- Bernoulli's Equations 7- reduction into exact) • Differential Equations D.E. 2nd degree equation: • Vector • Definition of random variable, discrete and continuous random variables • Types of statistics (mean, variance, and standard deviation).

Learning and Teaching Strategies	
Strategies	The branch use a problem based learning which new and student active method. The method help the student getting the program outcomes.

Student Workload (SWL)			
Structured SWL (h/sem)	63	Structured SWL (h/w)	4.0
Unstructured SWL (h/sem)	87	Unstructured SWL (h/w)	5.8
Total SWL (h/sem)	150	-	-

Module Evaluation					
		Time/No.	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative Assessment	Quizzes	1	10%	5	LO # 1, 2, 3
	Assignments	1	10%	7	LO # 4, 5, 6
	Projects / Lab.	-	-	-	-
	Report	-	10%	-	-
Summative Assessment	Midterm Exam	1.5 hr	20%	9	LO # 1 – 6
	Final Exam	3 hr	50%	17	All

Total assessment	100%	-	-

Delivery Plan (Weekly Syllabus)	
	Materials Covered
Week 1	Introduction to sequence, convergence of sequence
Week 2	Introduction to series, testing rule for series
Week 3	Taylor series
Week 4	Binomial series
Week 5	Fourier series
Week 6	Introduction to Laplace transform
Week 7	Laplace properties
Week 8	Inverse Laplace transform
Week 9	Introduction to Solution of inverse Laplace transform
Week 10	Mid-term Exam
Week 11	Examples of solution of inverse Laplace transform
Week 12	Introduction to solution of differential equation using Laplace transform
Week 13	Examples of solution of differential equation using Laplace transform
Week 14	Introduction to double integral
Week 15	Examples of double integral
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources		
-	Thomas' Calculus Early Transcendentals Thirteenth Edition	Available in the library
Required Texts	Advancing Differentiation: Thinking and Learning by Richard M. Cash, Ed.D. 2017	YES
Recommended Texts	-	-
Websites	ALL academic Publications in Scopus and Web of Science.	-

Module 3

Module Information			
Module Title	Electrical Machines II		Module Delivery
Module Type	Core		■ Theory □ Lecture ■ Lab ■ Tutorial □ Practical Sem□ar
Module Code	ELMA211		
ECTS Credit	5		
SWL	125		
Module level	1	Semester of Delivery	1
Module Leader	Ahlam L. Shuraiji	College	Electromechanical Eng. Dept.
Module Leader Academic Title	Assistance Prof	e-mail	Ahlam L. Shuraiji@uotechnology.edu.iq
Module Tutor	-	Module Leader's Qualification	PhD. in Mech. Eng.
Peer Reviewer Name	-	e-mail	
Scientific Committee Approval Date	-	e-mail	-
	-	Version Number	-

Relation with other Modules			
Prerequisite Module	-	Semester	-
Co-requisite Module	-	Semester	-

Module Aims, Learning Outcomes and Inductive Contents	
Module Aims	The main aims of this course are • provide learners with knowledge and an understanding of the working principle, and constructional features of transformer and three-phase induction motor. • introduce the concept of equivalent electrical circuit for both transformer and induction motor • evaluate efficiency of the machines under different load operation conditions.
Module Learning Outcomes	**At the end of this course students will demonstrate the ability to** • Understand the basic construction and working principle of transformer. • Mathematically predicted the transformer performance through the equivalent circuit of the transformer. • Explain different connection of three-phase winding transformer. • Evaluate transformer efficiency at different loading conditions. • Understand the basic construction and working principle of three-phase

	induction motor • Understand the concept of synchronous speed, slip, rotor voltage and its frequency • Predicate the motor equivalent circuit parameters using open and short circuit tests. • Analysis torque equation for different operation states. • Understand the power flow in the 3-phase induction motor and predicate the motor efficiency.
Inductive Contents	As types of an AC electrical machine, transformer and three-phase induction motor are playing essential part in our life regarding power transmission and consuming, this course deals with transformer and three-phase induction motor. It is essentially providing knowledge of the transformer and three-phase induction motor construction, working principle. It is also introducing performance analysis of the transformer based on its equivalent circuit. Moreover, it deals with prediction of the motor equivalent circuit parameters in order to analysis the motor performance including torque and efficiency.

Learning and Teaching Strategies	
Strategies	Theoretical lectures (give the lecture to students in person) Practical lectures (work in the laboratory to achieve the practical aspect)

Student Workload (SWL)

Structured SWL (h/sem)	63	Structured SWL (h/w)	4.0
Unstructured SWL (h/sem)	62	Unstructured SWL (h/w)	4.13
Total SWL (h/sem)	125	--	-

Module Evaluation					
		Time/No.	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative Assessment	Quizzes	1	10%	5	LO # 1 , 2, 3
	Assignments	1	10%	7	LO # 4 , 5
	Projects / Lab.	1	-		LO # 3
	Report	-	10%	-	-
Summative Assessment	Midterm Exam	1.5 hr	20%	9	LO # 1 – 5
	Final Exam	3 hr	50%	17	All
Total assessment			100%	-	-

Delivery Plan (Weekly Syllabus)	
	Introduction to dynamic.
Week 1	Transformer construction and operating principle
Week 2	EMF equation of the transformer
Week 3	Equivalent circuit of transformer
Week 4	Rules for referring
Week 5	Transformer tests

Week 6	Transformer efficiency
Week 7	Auto transformer
Week 8	Three-phase transformer
Week 9	Midterm exam
Week 10	Three phase induction motor
Week 11	Operating principle of induction motor
Week 12	Effect of slip in rotor current, impedance and power factor
Week 13	Torque equation of induction motor
Week 14	Equivalent circuit of induction motor
Week 15	Power diagram of three phase induction motor

Module 4

Module Information			
Module Title	Electronics Circuits		Module Delivery
Module Type	Core		■ Theory
Module Code	ELCI212		☐ Lecture
ECTS Credit	5		■ Lab
SWL	125		☐ Tutorial
			☐ Practical
			☐ Seminar
Module level	1	Semester of Delivery	1
Module Leader	JenanAyadNamuq	College	Electromechanical Eng. Dept.
Module Leader Academic Title	Lec	e-mail	@uotechnology.edu.iq
Module Tutor	-	Module Leader's Qualification	Dr.
Peer Reviewer Name	-	E-mail	jinan.a.namuq@uotechnology.edu.iq
Scientific Committee Approval Date	-	E-mail	-
	-	Version Number	-

Relation with other Modules			
Prerequisite Module	-	Semester	-
Co-requisite Module	-	Semester	-

Module Aims, Learning Outcomes and Inductive Contents	
Module Aims	Students successfully completing this course should be able to perform the following tasks with minimum degree of difficulty: ● . The ability to compute Simplified Structure and Mode of operation BJTS transistors circuits ● . an understanding the basic structure- Characterizing BJT amplifier- CE amplifier- BC amplifier Multistage amplifier- Differential amplifier; ● . an introduction to field effect transistor Characteristic of JEFT and biasing circuits, COSFET, DMONSFET, MOS-FET, C/CS of transistor MOSFET, amplifying circuits, Equivalent circuit, amplifier types CS, CD, CG; ● . the ability to evaluate power amplifiers class A, class B, class AB, class C; ● . the ability to use oscillator Feedback loop and the oscillator criterion, the oscillator circuits, Oscillator circuits, LC-oscillator circuits, crystal oscillators.
Module Learning Outcomes	Most students will be able to calculate BJTS transistors circuits with a reasonable degree of skill. • Students should be able to use the basic structure- Characterizing BJT amplifier- CE amplifier- BC amplifier- Multistage amplifier- Differential amplifier. • Students should be made an introduction to field effect transistor Characteristic of JEFT and biasing circuits, COSFET, D-MONSFET,

	MOS-FET, C/CS of transistor MOSFET, amplifying circuits, Equivalent circuit, amplifier types CS, CD, CG. • The students should be made aware of the resonance circuits interpretation. • The students should be able to evaluate power amplifiers class A, class B, class AB, class C. • The students should be able to use oscillator Feedback loop and the oscillator criterion, the oscillator circuits, RC- oscillator circuits, LC-oscillator circuits, crystal oscillators.
Inductive Contents	1- Fundamentals of DC Circuit. 2- Diodes. 3- Introduction to the Transistor 4- The Transistor Switch 5- Fundamentals of AC Circuits 6- Filters 7- Resonant Circuits 8- Transistor Amplifiers 9- Oscillators 10- The Transformer 11- Power Supply Circuits

Learning and Teaching Strategies	
Strategies	The branch use a problem based learning which new and student active method. The method help the student getting the program outcomes.

Student Workload (SWL)			
Structured SWL (h/sem)	63	Structured SWL (h/w)	4.0
Unstructured SWL (h/sem)	62	Unstructured SWL (h/w)	
Total SWL (h/sem)	100	-	-

Module Evaluation					
		Time/No.	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative	Quizzes	-	10%	-	-

Assessment	Assignments	1	10%	7	LO # 1, 2, 3
	Projects / Lab.	-	-	-	-
	Report	1	10%	12	LO# 1, 2, 3, 4, 5, 6, 7
Summative Assessment	Midterm Exam	1.5 hr	20%	11	LO # 1 – 5
	Final Exam	3 hr	50%	17	All
Total assessment			100%	-	-

Delivery Plan (Weekly Syllabus)	
	Materials Covered
Week 1	Bipolar junction Transistors (BJTS)
Week 2	Simplified Structure and Mode of operation
Week 3	Type of transistor Connection
Week 4	characteristic curve- load line-connection analysis of each type of connection
Week 5	The BJT as an amplifier an as a switch
Week 6	Biasing in BJT amplifier circuits, BJT amplifier: The basic structure
Week 7	Characterizing BJT amplifier-CE amplifier- BC amplifier- Multistage amplifier-Differential amplifier
Week 8	Field Effect transistor (FET), Characteristic of JEFT and biasing circuits
Week 9	COSFET, D-MONSFET,MOS-FET, C/CS of transistor MOSFET
Week 10	amplifying circuits, Equivalent circuit, amplifier types CS, CD, CG
Week 11	Power Amplifiers: class A, class B, class AB, class C
Week 12	Oscillator: Feedback loop and the oscillator criterion
Week 13	the oscillator circuits, RC
Week 14	oscillator circuits, LC- oscillator circuits
Week 15	crystal oscillators
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources		
	Text	Available in the library
Required Texts	Electronic Devices, Thomas L. Floyd, 10th Edition, 2018	Pdf
Recommended Texts	-	-
Websites	-	-

Module 5

Module Information			
Module Title	Fluid Mechanics		Module Delivery
Module Type	Core		■ Theory ☐ Lecture ■ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	FLMA213		
ECTS Credit	5		
SWL	125		
Module level	1	Semester of Delivery	
Module Leader	Hashim A. Hussain	College	Electromechanical Eng. Dept.
Module Leader Academic Title	Prof.	e-mail	50005@uotechnology.edu.iq
Module Tutor	-	Module Leader's Qualification	PhD. Mech. Eng.
Peer Reviewer Name	-	E-mail	-
Scientific Committee Approval Date	-	E-mail	-
	-	Version Number	-

Relation with other Modules			
Prerequisite Module	-	Semester	-
Co-requisite Module	-	Semester	-

Module Aims, Learning Outcomes and Inductive Contents	
Module Aims	Students learn how to apply the basic principles from fluid mechanics to calculate the force and power developed or consumed in the thermodynamic engineer
Module Learning Outcomes	Students learn how to apply the basic principles from fluid mechanics to calculate the force and power developed or consumed in the Fluids. Students will also learn how to handle an open-ended design problem in the team project. The question asked at the beginning of this section can also be asked in a slightly different way.
Inductive Contents	Students learn how to apply the basic principles from fluid mechanics to calculate the pressure, velocity, and mass flow rates developed fluid flow in pipes. Students will also learn how to handle an open-ended design problem in the team project.

Learning and Teaching Strategies

Strategies	The branch use a problem based learning which new and student active method. The method help the student getting the program outcomes.

Student Workload (SWL)			
Structured SWL (h/sem)	63	Structured SWL (h/w)	4.0
Unstructured SWL (h/sem)	62	Unstructured SWL (h/w)	4.13
Total SWL (h/sem)	125		-

Module Evaluation					
		Time/No.	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative Assessment	Quizzes	1	10%	5	LO # 1, 2
	Assignments	1	10%	7	LO # 3, 4
	Projects / Lab.	1	-	14	LO # 5
	Report	-	10%	-	-
Summative Assessment	Midterm Exam	1.5 hr	20%	10	LO # 1 – 5
	Final Exam	3 hr	50%	17	All
Total assessment			100%	-	-

Delivery Plan (Weekly Syllabus)	
	Materials Covered
Week 1	FLUID MECHANICS DEFINITION
Week 2	INTRODUCTION
Week 3	PHYSICAL PROPERTIES OF FLUIDS
Week 4	NEWTONIAN^{S} LAW IN VISCOSITY AND MOMENTUM TRANSFER
Week 5	STATIC FLUIDS
Week 6	SOLVED EXAMPLES OF STAFIC FLUID WITH APPLICATIONS
Week 7	FLUID MEASUREMENTS DEVICES
Week 8	APPLICATIONS OF FLUID MEASUREMENTS DEVICES
Week 9	DYNAMIC FLUIDS WITH APPLICATIONS
Week 10	APPLICATIONS OF DYNAMIC FLUIDS
Week 11	BERNOULLI'S EQUATION
Week 12	APPLICATIONS OF DYNAMIC FLUIDS

Week 13	CONTINUITY EQUATION AND RENOLD NUMBER APPLICATIONS
Week 14	SOLVED EXAMPLES OF DYNAMIC FLUIDs
Week 15	MID EXAMINATION

Learning and Teaching Resources		
	1-Basic Fluid Mechanics Zoeb HusainPrincipal Hi-Point College of Engineering and Technology Hyderabad. 2009	Available in the library
Required Texts	2-Rood, E. P., and D. P. Telionis, "JFE Policy on Reporting Uncertainties in Experimental Measurements and Results," Transactions of ASME, Journal of Fluids Engineering, 1991	-
Recommended Texts		-
Websites	-	-

Module 6

Module Information			
Module Title	Heat Transfer		Module Delivery
Module Type	Core		■ Theory □ Lecture ■ Lab □ Tutorial □ Practical □ Seminar
Module Code	HETR214		
ECTS Credit	5		
SWL	125		
Module level	1	Semester of Delivery	
Module Leader	AbduljabbarMuttair Ahmed	College	Electromechanical Eng. Dept.
Module	Lecture	e-mail	Abduljabbar.M.Ahmed@uotechnology.edu.iq

Leader Academic Title			
Module Tutor	-	Module Leader's Qualification	PhD. Mech. Eng.
Peer Reviewer Name	-	E-mail	-
Scientific Committee Approval Date	-	E-mail	-
	-	Version Number	-

Relation with other Modules			
Prerequisite Module	-	Semester	-
Co-requisite Module	-	Semester	-

Module Aims, Learning Outcomes and Inductive Contents	
Module Aims	• Defining the heat transfer modes concepts. • Defining the theoretical basics of the conduction heat transfer coincided with a laboratory experiment. • Defining the theoretical basics of the forced and free convective heat transfer coincided with a laboratory experiment. • Defining the theoretical basics of the radiation heat transfer. • Defining the theoretical basics of the heat exchangers coincided with a laboratory experiment. • Defining the theoretical basics of the mixed modes of heat transfer.
Module Learning Outcomes	Anability to identify, fundamental,formulate, and solve heat transferproblems by applying principles of engineering, science, and mathematics.
Inductive Contents	Attendant Scientific lectures with method of problem- based learning (Pbl) and lectures video

Learning and Teaching Strategies	
Strategies	The teaching of heat transfer as theory and mathematically, the Conduction heat transfer, heat transfer through fins, two dimensional steady state heat conduction, one and two dimensional unsteady state heat conduction, convective heat transfer, forced and natural convection, thermal radiation, and heat exchangers. The Exams (Mid. exam, quizzes, and other activities for evaluation, Lab with exam, and three hours final exam).

Student Workload (SWL)			
Structured SWL (h/sem)	63	Structured SWL (h/w)	4.0
Unstructured SWL (h/sem)	62	Unstructured SWL (h/w)	4.13
Total SWL (h/sem)	125		-

Module Evaluation					
		Time/No.	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative Assessment	Quizzes	1	10%	5	LO # 1, 2
	Assignments	1	10%	7	LO # 3, 4
	Projects / Lab.	1	-	14	LO # 5
	Report	-	10%	-	-
Summative Assessment	Midterm Exam	1.5 hr	20%	10	LO # 1 – 5
	Final Exam	3 hr	50%	17	All
Total assessment			100%	-	-

Delivery Plan (Weekly Syllabus)	
	Materials Covered
Week 1	Introduction of heat transfer modes.
Week 2	Steady state conduction: thermal resistance of the plane wall and radial system.
Week 3	Conduction – convection system: fins.
Week 4	Heat transfer from fine.
Week 5	Unsteady state conduction.
Week 6	Convection: (laminar) boundary layer for plate and pipe.

Week 7	Convection: (turbulent) boundary layer for plate and pipe.
Week 8	Force convection (laminar) for pipe and tube low.
Week 9	Force convection (turbulent) for pipe and tube low.
Week 10	Free convection vertical plate.
Week 11	Free convection horizontal plate.
Week 12	Radiation heat transfer of black body.
Week 13	Radiation heat transfer of nonblack body.
Week 14	Heat exchanger: the overall heat transfer coefficient and types of heat exchanger.
Week 15	The Log Mean Temperature Difference and effectiveness of heat exchanger.

Learning and Teaching Resources		
	Heat Transfer J.P Holman. Tenth Edition, McGraw-Hill, 2010	Available in the library
Required Texts	• Heat and Mass Transfer: A Practical Approach, Yunus A. Çengel, Third Edition, McGraw-Hill, 2006. • International Journal of Heat and Mass Transfer.	-
Recommended Texts	ALL academic Publications in Scopus and Web of Science.	-
Websites	-	-

Module 7

Module Information		
Module Title	English Language II	Module Delivery
Module Type	Support	■ Theory
Module Code	ENLA207	□ Lecture
ECTS Credit	2	□ Lab

SWL	50		☐ Tutorial ☐ Practical ☐ Seminar
Module level	1	Semester of Delivery	1
Module Leader	Mohammed KadhimEdan	College	Electromechanical Eng. Dept.
Module Leader Academic Title	Prof.	e-mail	eme@uotechnology.edu.iq
Module Tutor	-	Module Leader's Qualification	PhD. in Elec. Eng.
Peer Reviewer Name	-	E-mail	
Scientific Committee Approval Date	-	E-mail	-
-	-	Version Number	-

Relation with other Modules			
Prerequisite Module	-	Semester	-
Co-requisite Module	-	Semester	-

Module Aims, Learning Outcomes and Inductive Contents	
Module Aims	• Defining the grammar writing skills • Defining verbal presentation skills • Defining of the content that needs to be presented • Organization of the content to make it easy to be followed. • Data presentation in such audience is easily able to grasp significance
Module Learning Outcomes	Students will learn: • Tense types, and parts of speech. • Sentence structure, affixes & prefixes, and Engineering Vocabulary. • Punctuations, and the differences between British and American English. • Writing skills (essay and Email) • Reading Skills (how to be an effective reader).

	• Presentation Skills and discussion skills.
Inductive Contents	□ Part of speech, and Sentence Structure □ Tense types, and Passive Voice □ Transitions Words □ How to Write an Email □ How to write an essay □ Reading Skills □ Vocabulary, Punctuation, and the way to Vocabulary Development. □ Discussion Skills, and How to give a good presentation □ Affixes, Prefixes , and Differences between British and American English.

Learning and Teaching Strategies	
Strategies	The branch use a problem based learning which new and student active method. The method help the student getting the program outcomes.

Student Workload (SWL)			
Structured SWL (h/sem)	33	Structured SWL (h/w)	2.0
Unstructured SWL (h/sem)	17	Unstructured SWL (h/w)	-
Total SWL (h/sem)	50	-	-

Module Evaluation					
		Time/No.	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative Assessment	Quizzes	1	10%	5	LO # 1, 2
	Assignments	1	10%	7	LO # 3, 4
	Projects / Lab.	-	-	-	-
	Report	-	10%	-	-
Summative Assessment	Midterm Exam	1.5 hr	20%	10	LO # 1 – 4
	Final Exam	3 hr	50%	17	All
Total assessment			100%	-	-

Delivery Plan (Weekly Syllabus)

	Materials Covered
Week 1	Parts of speech
Week 2	Sentence Structure: Sentence Types
Week 3	Tenses
Week 4	Transitions Words
Week 5	How to Write an Email in English
Week 6	Discussion Skills
Week 7	How to write an essay
Week 8	How to be an effective reader
Week 9	Classroom Language
Week 10	Engineering Vocabulary
Week 11	Vocabulary Development
Week 12	Punctuation
Week 13	Presentation Language
Week 14	Affixes & Prefixes
Week 15	Differences between British and American English
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources		
	Text	Available in the library
Required Texts		-
Recommended Texts		-
Websites	-	-