Academic Program Description Form

University: Al-Kitab University
College/Institute: College of Engineering Technology
Scientific Department: Department of Mechatronics
Academic or professional program: Bachelor of Mechatronics
Name of the final certificate: Bachelor's degree in Mechatronics
Academic system: Yearly System
Description preparation date: 20/1/2025
Date of filing the file: 20/1/2025

Asst. Prof. Abdulsalam Salim
2/11/2025

signature: Dr. Faris Hassan
Name of scientific assistant:
the date : 4/11/2025

The file has been checked from
Quality Assurance and University Performance
Name of the manager of the University Quality Assurance and Performance:
the date
the signature

Dean's Name:
signature:
4/11/2025

Republic of Iraq
Ministry of Higher Education & Scientific Research
Supervision and Scientific Evaluation Directorate
Quality Assurance and Academic Accreditation
International Accreditation Dept.

Academic Program Specification Form for the Academic Year 2025-2026

2025-2026

Introduction:

The educational program is a coordinated and structured package of courses that include procedures and experiences that are organized in the form of a vocabulary of study whose main purpose is to build and refine the skills of graduates to make them qualified to meet the requirements of the labor market, which is reviewed and evaluated annually through internal or external audit procedures and programs such as the external examiner program.

The description of the academic program provides a brief summary of the main features of the program and its courses, indicating the skills that are worked on to acquire students based on the objectives of the academic program, and the importance of this description is evident because it represents the cornerstone of obtaining program accreditation and is co-written by the teaching faculties under the supervision of the scientific committees in the scientific departments.

This manual, in its second edition, includes a description of the academic program after updating the vocabulary and paragraphs of the previous guide in light of the developments and developments of the educational system in Iraq, which included the description of the academic program in its traditional form (annual and quarterly), as well as the adoption of the description of the academic program circulated under the letter of the Department of Studies M3/2906 on 3/5/2023 regarding the programs that adopt the Bologna track as the basis for their work.

In this regard, we can only stress the importance of writing descriptions of academic programs and courses to ensure the smooth functioning of the educational process.

Concepts and Terms:

Academic Programme Description:

Provides a concise summary of the programme's vision, mission, and objectives, including a precise description of the intended learning outcomes according to specified learning strategies.

Course Description:

Provides a brief summary of the main characteristics of the course and the expected learning outcomes that students should achieve, demonstrating whether they have benefited from the learning opportunities provided. It is derived from the academic programme description.

Programme Vision:
An ambitious image of the future of the academic programme — one that is progressive, inspiring, motivating, realistic, and achievable.
Programme Mission:
Outlines the objectives and the necessary activities required to achieve them concisely, defining the development paths and directions of the programme.
Programme Objectives:
Statements describing what the academic programme intends to achieve within a specific time frame. These objectives should be measurable and observable.
Curriculum Structure:
All study courses (modules) included in the academic programme, in accordance with the adopted learning system (semester, annual, or Bologna Pathway). It includes mandatory courses (required by the ministry, university, faculty, or academic department) along with their credit units.
Learning Outcomes:
A coherent set of knowledge, skills, and values acquired by the student after successfully completing the academic programme. Each course must define its learning outcomes in a way that aligns with the programme objectives.
Teaching and Learning Strategies:
The strategies used by academic staff to enhance student learning. These are planned approaches designed to achieve the learning objectives, encompassing all classroom and extracurricular activities that contribute to the learning outcomes of the programme.

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1. Program Vision

Excellence and quality in performance, achieving leadership and excellence in all aspects of refrigeration, academic and professional air conditioning, community service, and providing study programs and research activities in the field of refrigeration and air conditioning.

2. Program Mission

Providing the labor market with mechatronics engineers according to international academic standards. Able to keep pace with accelerated technological advancement, and produce research.

3. Program Objectives

- To successfully adapt to the situations that arise during the career paths within the global labor market, by using the basic information and background of the mechatronics technology engineering specialization in the fields of electrical and electronics sciences, computer science, heat and fluid sciences, materials science, machine design and production engineering, robotics, communications, artificial intelligence, and automatic control. Or by obtaining postgraduate degrees.
- Apply design methodology in relation to engineering mechatronics techniques, by incorporating the use of design criteria and realistic constraints and taking into account the economic , environmental and social impact of the design.
- Participation in professional service such as participation in professional communities, application and ongoing support of professional ethics.
- Constant interest in professional development through continuous learning activities, self-confidence, creativity, and leadership.

4. Program Accreditation

AICBA

5. Other External Influences

Laboratories, Library

6. Program Structure				
Reviews*	Percentage	Study Unit	Number of Courses	Program Structure
Essential	9%	4	1	Enterprise Requirements
Essential	11%	21	6	College Requirements
Essential	60%	111	23	Department Requirements
			2	Summer Training
				Other

*All these values are true of the Department of Mechatronics Technology, College of Engineering Technology, Central Technical University-Baghdad, as we are the university that is compatible with them.

7. **Program Description**								
Number of Units	Number of Credit Hours					Course Name	Course Code	Semester
	Semn (hr/w)	Tut (hr/w)	Pr (hr/w)	Lab (hr/w)	CL (hr/w)			
2.00	1	0	0	0	1	Human Rights and Democracy	UOKTB1MC101	First Stage First Semester
8.00	0	2	0	0	4	Math	UOKTB1MC104	
8.00	0	1	0	0	4	Engineering Mechanics	UOKTB1MC102	
6.00	0	0	1	2	3	Engineering Drawing with AutoCAD	UOKTB1MC103	
6.00	1	0	2	2	2	Electricity Basics	UOKTB1MC105	
6.00	1	0	2	2	2	Measuring Instruments	UOKTB1MC106	
Number of Units	Number of Credit Hours					Course Name	Course Code	Semester
	Sem (hr./w)	Tut (hr./w)	Pr (hr./w)	Lab (hr./w)	CL (hr./w)			
6.00	1	0	0	1	2	Digital Logic Design I	UOKTB1MC107	First Stage Second Semester
4.00	1	0	0	0	2	Applied Mathematics	UOKTB1MC108	
5.00	1	0	0	1	2	Electronics 1	UOKTB1MC109	
4.00	0	0	0	6	0	Workshops & Laboratories	UOKTB1MC110	
4.00	1	0	0	1	2	Smart Materials Technologies	UOKTB1MC111	
4.00	1	0	0	1	2	Engineering Materials	UOKTB1MC112	

3.00	1	0	0	1	0	Computer Systems & Programming	UOKTB1MC113	
2.00	1	0	0	0	1	Arabic Language	UOKTB1MC114	
2.00	1	0	0	0	1	English I	UOKTB1MC115	
Number of Units	Number of Credit Hours					Course Name	Course Code	Semester
	Semn (hr/w)	Tut (hr/w)	Pr (hr/w)	Lab (hr/w)	CL (hr/w)			
2.00	1	0	0	0	1	English II	UOKTB1MC201	Second Stage First Semester
2.00	1	0	0	0	1	Baath crimes	UOKTB1MC202	
6.00	0	0	0	0	2	Advanced Mathematics	UOKTB1MC203	
5.00	1	0	0	2	2	Fluid Mechanics	UOKTB1MC204	
6.00	0	0	2	2	2	Electronic Instrumentation	UOKTB1MC205	
6.00	0	0	2	2	2	Electrical Circuits	UOKTB1MC206	
3.00	1	0	0	2	2	MATLAB programming language	UOKTB1MC207	
6.00	1	0	0	2	2	Digital Logic Design II	UOKTB1MC208	
Number of Units	Number of Credit Hours					Course Name	Course Code	Semester
	Semn (hr/w)	Tut (hr/w)	Pr (hr/w)	Lab (hr/w)	CL (hr/w)			
5.00	0	0	1	2	2	Electronics II	UOKTB1MC209	Second Stage Second Semester
5.00	0	0	1	2	2	Electronic Circuit Design	UOKTB1MC210	
5.00	0	0	0	1	2	Manufacturing Techniques	UOKTB1MC211	
2.00	0	0	0	1	2	Arabic Language	UOKTB1MC212	
6.00	0	0	0	2	2	Thermodynamics	UOKTB1MC213	
6.00	0	0	1	2	2	Material resistance	UOKTB1MC214	
6.00	0	0	0	2	2	Pneumatic and hydraulic systems	UOKTB1MC215	
Number of Units	Number of Credit Hours					Course Name	Course Code	Semester
	Semn (hr/w)	Tut (hr/w)	Pr (hr/w)	Lab (hr/w)	CL (hr/w)			
6.00	0	0	0	2	2	Theory of Machines	UOKTB1MC301	Third Stage First Semester
6.00	0	0	1	2	2	Control Theory	UOKTB1MC302	
6.00	0	0	0	2	2	PLC Programmer Logic Control	UOKTB1MC303	

4.00	0	0	0	2	2	AI/ Programming	UOKTB1MC304	
4.00	0	0	1	2	2	Data Acquisition	UOKTB1MC305	
6.00	0	0	0	2	2	Communications I	UOKTB1MC306	
2.00	0	0	0	0	2	English III	UOKTB1MC307	
Number of Units	Number of Credit Hours					Course Name	Course Code	Semester
	Semn (hr/w)	Tut (hr/w)	Pr (hr/w)	Lab (hr/w)	CL (hr/w)			
6.00	1	0	0	2	2	Communications II	UOKTB1MC308	Third Stage Second Semester
4.00	1	0	0	1	2	Regulations & Signals	UOKTB1MC309	
4.00	1	0	0	1	2	Image Processing	UOKTB1MC310	
6.00	1	0	0	1	2	Automated Control Engineering	UOKTB1MC311	
6.00	1	0	0	1	2	Microprocessor	UOKTB1MC312	
4.00	1	0	0	1	2	Power Electronics	UOKTB1MC313	
4.00	1	0	0	1	2	Heat Transfer	UOKTB1MC314	

8. Expected Learning Outcomes of the Program

Knowledge

Learning Outcomes Statement B1 – Qualifying the student to practice the teaching profession and assume the responsibility of education B2 – Enabling the student to keep pace with the methods of teaching mechatronics. B3 – Providing the student with the necessary skills in dialogue and discussion B4 – Enabling students to prepare analytical statements and lists enhances their skills in mechatronics techniques.	1- Graduating engineering cadres with an integrated leadership personality and high professional skills and ethics that meet the needs of Civil and military state institutions relevant to the jurisdiction. 2. The ability to analyze engineering and think scientifically by applying laws in science, mathematics, and engineering, adhering to guidelines and instructions, implementing a project or facing an engineering problem, solving and evaluating it, and submitting a proposal or plan, reformulating it, translating or interpreting it. 3- The student should be able to speak and write in an effective scientific and engineering style in Arabic and English. 4- Motivating students to participate effectively in the renaissance and progress of society through holding seminars, conferences, continuing education, and providing academic consultations in the fields of mechatronics, technology engineering. 5- The student should be able to produce the highest scientific and applied research in the engineering fields for the purpose of solving industrial and service problems in society. 6- Effective participation in the renaissance and progress of society through holding seminars, conferences, continuing education, and providing academic consultations in the fields of mechatronics, technology engineering.
Skills	
Learning Outcomes Statement 2 Enables the student to write scientific research The student was able to teach mechatronics subjects.	B. Subject-specific skills 1 – Ability to use scientific and technological tools to engineer mechatronics techniques 2 – Analyzing technical problems to find appropriate solutions for them. 3- Using scientific investigation and evaluation to solve engineering problems.
Learning Outcomes Statement 3	Learning Outcomes 3

Enables the student to know the basics of mechatronics engineering	Acquire the necessary skills in dialogue and discussion
Values	
Learning Outcomes Statement 4 Raising the student to love the profession of mechatronics engineering	A. Objective Tests: The purpose of the test is to measure the student's ability to recognize and comprehend engineering facts. This is done using the following: - - True and false questions. - Multiple choice questions. - Interview questions (blank questions). - Completion questions. B. Engineering Tests: The purpose of the test is to measure the student's ability to understand the scientific material and engineering principles, the ability to recall, connect, and interpret, in addition to the ability to analyze data and use it in diagnosing and solving engineering problems. This is done using the following: -Connection testing/open-ended questions. - Questions that have a specific answer. C. Other tests: They are as follows: - Seminars. - Scientific lectures, oral dialogue, semester and final theoretical exams, in addition to the practical exam. - Writing reports. - For field visits
Learning Outcomes Statement 5	Learning Outcomes 5
Introduction to Mechatronics Techniques and Arts	Providing the student with the skills to master the art of mechatronics techniques

9. Teaching and Learning Strategies

1) Thinking Strategy According to the Student's Ability
2) High Thinking Skill Strategy
3) Critical Thinking Strategy in Learning
4) Brainstorming

10. Evaluation Methods

Homework

Class assignments
Free discussions

11.Faculty

Faculty Members					
Preparing the teaching staff		Special requirements/skills (if applicable)	Specialization		Academic Rank
lecturer	employee		special	year	
	employee		Mechatronics	Electrical and Electronics Engineering	Assoc. Prof. Dr. Abdel Salam Taha Hussein
	employee		Mechatronics	Electrical and Electronics Engineering	Dr. Shawkat Abdulrahman Ahmed
	employee		Mechanical Engineering	Mechanical Engineering	Dr. Sinan Mazen Hazem
	employee		Industrial Engineering	Manufacturing Engineering	Dr. Najdat Hamid
	employee		software	Computer Engineering	Eng. Mostafa Mahmoud Yahya
	employee		Computer Engineering	Computer Engineering	Eng. Yousef Yacoub Youssef
	employee		Mechatronics	Mechatronics Engineering	Eng. Abbas Hussein Hammoud

Professional Development
Mentoring new faculty members
Training and Development of Professors: By providing training programs and workshops for faculty members to develop their teaching skills and update their academic knowledge in the field of mechatronics. This enhances the quality of teaching and learning in the specialty.
Faculty Professional Development
The professional development of faculty members is important to enhance their efficiency and improve their performance in the field of teaching. Faculty can enhance their skills by attending workshops and training courses, as well as participating in educational seminars and conferences. They can also share knowledge and experiences with their colleagues in the field, and use

technology to improve the teaching process. This helps them innovate and improve the quality of education they provide to students.

12. Admission Criteria

Students in the Department of Mechatronics Engineering are admitted from graduates of the preparatory study in its scientific branch with an average of 60%, and the graduation requirements are:

1) Perform 136 course hours over the course of the year
2) Pass the scheduled exams with an average of 50% or above
3) Perform summer training before the final stage.
4) Submission of a graduate research in a subject of specialization.

13. Key sources of information about the program

Iraqi Public Universities and International Universities Related to the Specialization

14. Program Development Plan

Current Situation Analysis: By evaluating the current curriculum and analyzing its strengths and weaknesses. Look for opportunities for improvement and identify areas that need improvement.
Setting Goals: Setting the main goals for the development of the academic curriculum is one of the most important steps in the development of any program, as the goals can include increasing the quality of education, improving the student experience, and promoting academic development and personal development.
Continuous Assessment and Review: By conducting periodic evaluation and review of the curriculum and teaching methods and communicating with students and professors to gather feedback and feedback. Use these notes to improve and enhance the academic curriculum.

Curriculum Skills Chart														
Learning Outcomes Required from the Program														
Thinking skills				Subject-specific skills		Knowledge and Understanding				fundamental Or optional	Course Name	Course Code	Year/Level	
C4	C3	C2	A1	B2	B1	A4	A3	A2	A1					
														Phase I – Bologna System
		√	√		√	√	√	√	√	Basic	Human Rights and Democracy	UOKTB1MC101	First Stage First Semester	
	√	√	√	√	√	√	√	√	√	Basic	Math	UOKTB1MC104		
√	√	√	√	√	√	√	√	√	√	Supporter	Engineering Mechanics	UOKTB1MC102		
	√	√	√	√	√	√	√	√	√	Home	Engineering Drawing with AutoCAD	UOKTB1MC103		
		√	√	√	√	√	√	√	√	Home	Electricity Basics	UOKTB1MC105		
		√	√	√	√	√	√	√	√	elective	Measuring Instruments	UOKTB1MC106		
		√	√		√	√	√	√	√	President	Digital Logic Design I	UOKTB1MC107	First Stage Second Semester	Phase I – Bologna

	√	√	√	√	√	√	√	√	√	Supporter	Applied Mathematics	UOKTB1MC108		
√	√	√	√	√	√	√	√	√	√	President	Electronics 1	UOKTB1MC109		
	√	√	√	√	√	√	√	√	√	Basic	Workshops & Laboratories	UOKTB1MC110		
		√	√	√	√	√	√	√	√	elective	Smart Materials Technologies	UOKTB1MC111		
										elective	Engineering Materials	UOKTB1MC112		
	√	√	√	√	√		√	√		Basic	Computer Systems & Programming	UOKTB1MC113		
										President	Arabic Language	UOKTB1MC114		
	√	√	√	√	√	√	√	√	√	President	English I	UOKTB1MC115		
	√	√	√	√	√	√	√	√	√	Basic	English II	UOKTB1MC201	Second Stage First Semester	

√	√	√	√	√	√	√	√	√	√	Basic	Baath crimes	UOKTB1MC202	
		√	√	√	√	√	√	√	√	President	Advanced Mathematics	UOKTB1MC203	
		√	√	√	√	√	√	√	√	President	Fluid Mechanics	UOKTB1MC204	
	√	√	√	√	√	√	√	√	√	elective	Electronic Instrumentation	UOKTB1MC205	
		√	√	√	√	√	√	√	√	elective	Electrical Circuits	UOKTB1MC206	
√	√	√	√	√	√	√	√	√	√	Basic	MATLAB programming language	UOKTB1MC207	
√	√	√	√	√	√	√	√	√	√	President	Digital Logic II Design	UOKTB1MC208	
										President	Electronics II	UOKTB1MC209	Second Stage Second Semester
		√	√	√	√	√	√	√	√	elective	Electronic Circuit Design	UOKTB1MC210	
			√	√	√	√	√	√	√	elective	Manufacturing Techniques	UOKTB1MC211	
√	√	√	√	√	√			√	√	Essential	Arabic Language	UOKTB1MC212	
	√	√	√	√	√	√	√	√	√	President	Thermodynamics	UOKTB1MC213	

	√	√	√	√	√		√	√	√	President	Material resistance	UOKTB1MC214	
		√	√	√	√	√	√	√	√	President	Pneumatic and hydraulic systems	UOKTB1MC215	
√	√	√	√	√	√	√	√	√	√	President	Theory of Machines	UOKTB1MC301	Third Stage First semester
√	√	√	√	√	√			√	√	President	Control Theory	UOKTB1MC302	
	√	√	√	√	√	√	√	√	√	President	PLC Programmer Logic Control	UOKTB1MC303	
√	√	√	√	√	√			√	√	elective	AI/ Programming	UOKTB1MC304	
	√	√	√	√	√	√	√	√	√	elective	Data Acquisition	UOKTB1MC305	
√	√	√	√	√	√			√	√	Supporter	Communications I	UOKTB1MC306	
√	√	√	√	√	√			√	√	Supporter	English III	UOKTB1MC307	
	√	√	√	√	√	√	√	√	√	Supporter	Communications II	UOKTB1MC308	Third Stage Second Semester
	√	√	√	√	√	√			√	elective	Regulations & Signals	UOKTB1MC309	
		√	√	√	√	√	√	√	√	elective	Image Processing	UOKTB1MC310	

	√	√	√	√	√	√			√	President	Automated Control Engineering	UOKTB1MC311	
		√	√	√	√	√	√	√	√	President	Microprocessor	UOKTB1MC312	
	√	√	√	√	√	√			√	President	Power Electronics	UOKTB1MC313	
	√	√	√	√	√	√			√	President	Heat Transfer	UOKTB1MC314	
	√	√	√	√	√	√	√	√	√	Basic	Professional Ethics	UOKTB1MC401	Fourth Stage First Semester
	√	√	√	√	√	√			√	President	Artificial Intelligence	UOKTB1MC402	
		√	√	√	√	√	√	√	√	President	Mechatronics I	UOKTB1MC403	
	√	√	√	√	√	√			√	Supporter	Project I	UOKTB1MC404	
		√	√	√	√	√	√	√	√	elective	Modeling and Simulation	UOKTB1MC405	
	√	√	√	√	√	√			√	elective	Vibrations	UOKTB1MC406	
	√	√	√	√	√	√			√	President	Machinery Design	UOKTB1MC407	
	√	√	√	√	√	√	√	√	√	Supporter	English IIII	UOKTB1MC408	

Please indicate the boxes corresponding to the individual learning outcomes from the program being evaluated

الكلية التقنية الهندسية
هندسة تقنيات الميكاترونكس
توزيـع مفردات الدراسية على الاسابيع للعام الدراسي
للمرحلة الاولى – فصل الاول

Module Information معلومات المادة الدراسية		
Module Title	**حقوق الانسان والديمقراطية**	**Module Delivery**
Module Type	**Basic**	☒ Theory ☒ Lecture Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	**UOKTB1MC101**	
ECTS Credits	**2**	
SWL (hr/sem)	**60**	

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي العملي	
weeks	**Material Covered**
1	حقوق الانسان . تعريفها . اهدافها حقوق الإنسان في الحضارات القديمة وفي الشرائع السماوية
2	حقوق الإنسان في التاريخ المعاصر والحديث: الاعتراف بحقوق الإنسان منذ الحرب العالمية ألاولى وعصبة الأمم المتحدة الاعتراف الإقليمي بحقوق الإنسان اللاتفاقيةالأوربية لحقوق الإنسان 1950 الاتفاقية الأمريكية لحقوق الانسان 1969 الميثاق الإفريقي لحقوق الإنسان 1981. الميثاق العربي لحقوق الإنسان 1994
3	المنظمات الغير حكومية وحقوق الانسان (1- اللجنة الدولية للصليب الاحمر، 2- منظمة العفو الدولية منظمة مراقبة حقوق الانسان ، المنظمات الوطنية لحقوق الانسان حقوق الانسان في الدستور العراقي (ا لحقوق والحريات في دستور جمهورية العراق لسنة 2005)
4	العلاقة بين حقوق الانسان والحريات العامة في الاعلان العالمي لحقوق الانسان في الإعلان العالمي لحقوق الإنسان في المواثيق الاقليمية والدساتير الوطنية حقوق الانسان الاقتصادية والاجتماعية والبيئية والثقافية والتنموية وحقوق الانسان المدنية والسياسية.
5	حقوق الانسان الحديثة (الحق في التنمية ، الحق في البيئة النظيفة ، الحق في التضامن ، الحق في الدين) ضمانات احترام وحماية حقوق الانسان على الصعيد الوطني . الضمانات في الدستور والقوانين الضمانات في مبدا سيادة القانون الضمانات في الرقابة الدستورية الضمانات في حرية الصحافة والراي العام دور المنظمات الغير حكومية في احترام وحماية حقوق الانسان
6	ضمانات احترام وحماية حقوق الانسان على الصعيد الدولي

دور الامم المتحدة ووكالاتها المختصة في توفير الضمانات دور المنظمات الاقليمية (الجامعة العربية ، الاتحاد الاوربي ، الاتحاد الافريقي ، منظمة الدول الامريكية) دور المنظمات الدولية الاقليمية غير الحكومية والراي العام في احترام وحماية حقوق الانسان النظرية العامة للحريات ،اصل الحقوق والحريات ، موقف الشرع من الحقوق والحريات المعلنة ،استخدام مصطلح الحريات العامة	
دولة القانون وضمانات دولة القانون تنظيم الحريات العامة من قبل السلطات العامة	7
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Module Information معلومات المادة الدراسية		
Module Title	**Mathematics**	**Module Delivery**
Module Type	**Core**	☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**
Module Code	UOKTB1MC104	
ECTS Credits	**6**	
SWL (hr/sem)	**180**	

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Determinants, properties,Grammar's rule, application of determinant
Week 2	Vectors, vectors in space, unit vector,Scalar product, vector product
Week 3	Trigonometric functions& relation,Graphing of functions, Trigonometric equations
Week 4	Function of limits, Algebraic limit,Trigonometric limit, Infinity as limit
Week 5	Derivative rule, Algebraic& Trigonometric derivative ,Chain rule, velocity& acceleration
Week 6	Inverse trigonometric functions& its derivative , Logarithm& Exponential functions& its derivative
Week 7	Hyperbolic functions& its derivative, Inverse hyperbolic functions& its derivative
Week 8	Integration, integrals of trigonometric& inverse functions , Integrals of logarithm& Exponential functions
Week 9	Integrals of logarithm& Exponential functions, Integrals of hyperbolic functions& its derivative,L'Hopitals's rules
Week 10	Integration methods; Integration by parts,Integration by partial fraction
Week 11	Integration by trigonometric substitution,Integration of ax2 + bx + c
Week 12	Application of Integration,Area under the curve& between two curves
Week 13	Surface area generated,Length of the curve
Week 14	Volume generated by rotation of curve,Simple differential equations
Week 15	Simpson rule for area,Trapezoidal rule for area, applications
Week 16	**Preparatory week before the final Exam**

Module Information معلومات المادة الدراسية		
Module Title	**Engineering Mechanics**	**Module Delivery**
Module Type	**Core**	☒ **Theory** ☒ **Lecture** ☐ **Lab**
Module Code	**UOKTB1MC102**	

ECTS Credits	**8**	☐ **Tutorial** ☒ **Practical** ☒ **Seminar**
SWL (hr/sem)	**240**	

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Fundamental Concepts, Vectors Quantities and Forces Analysis
Week 2	Moment
Week 3	Force Resultants
Week 4	Equilibrium of the Forces System
Week 5	Equilibrium of Bodies
Week 6	Friction
Week 7	Center of Mass and Centroid
Week 8	Mid-term Exam
Week 9	The Moment of Inertia
Week 10	Introduction to Dynamics
Week 11	Kinematics of a Particle: Rectilinear Motion
Week 12	Kinematics of a Particle: Curvilinear Motion
Week 13	Kinetics of a Particle: Force and Acceleration
Week 14	Kinetics of a Particle: Work and Energy
Week 15	Kinetics of a Particle: Impulse and momentum
Week 16	**Preparatory week before the final Exam**

Module Information معلومات المادة الدراسية		
Module Title	**Engineering Drawing with AutoCAD**	**Module Delivery**
Module Type	**Core**	☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☒ Practical ☒ Seminar
Module Code	**UOKTB1MC103**	
ECTS Credits	**8**	
SWL (hr/sem)	**240**	

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Define the Engineering Drawing the Tool used in Engineering drawing-Types of drawing Sheets, types of lines
Week 2	Geometric Construction, types of lines and arc-Geometric Construction , types of regular polygons, Quadrilateral-Geometric Construction, types of circles and ellipse
Week 3	Isometric Views
Week 4	Dimensions - Exercises-Center translation
Week 5	Theory of Projection
Week 6	Drawing the three projection views
Week 7	Theory of Section
Week 8	Screw drawing
Week 9	Nuts drawing
Week 10	Assembly drawing
Week 11	Disassembly drawing
Week 12	Bearing drawing
Week 13	Gears drawing
Week 14	Cam and Rollers drawing
Week 15	Full parts assembly drawing-Full parts projection
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Define the Engineering Drawing the Tool used in Engineering drawing-Types of drawing Sheets, types of lines
Week 2	Geometric Construction, types of lines and arc-Geometric Construction , types of regular polygons, Quadrilateral-Geometric Construction, types of circles and ellipse
Week 3	Isometric Views
Week 4	Dimensions - Exercises-Center translation
Week 5	Theory of Projection
Week 6	Drawing the three projection views
Week 7	Theory of Section
Week 8	Screw drawing
Week 9	Nuts drawing
Week 10	Assembly drawing

Week 11	Disassembly drawing
Week 12	Bearing drawing
Week 13	Gears drawing
Week 14	Cam and Rollers drawing
Week 15	Full parts assembly drawing-Full parts projection

Module Information معلومات المادة الدراسية		
Module Title	**Electrical Fundamentals**	**Module Delivery**
Module Type	**Core**	☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**
Module Code	UOKTB1MC105	
ECTS Credits	**6**	
SWL (hr/sem)	**180**	

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Systems of Units, Charge and Current, Voltage, Power and Energy, The Resistance, Ohm's law, Effect of Temperature on Resistance, Conductance and Conductivity
Week 2	Reading Resistor Colour Code, Nodes, Branches, Loops, and Kirchhoff's Current Law (KCL)
Week 3	Kirchhoff's Voltage Law (KVL), Series Resistors and Voltage Division, and Parallel Resistors and Current Division
Week 4	Wye-Delta Transformations: Delta to Wye Conversion; Wye to Delta Conversion
Week 5	Methods of Analysis Nodal Analysis; Nodal Analysis with Voltage Sources
Week 6	Methods of Analysis: Mesh Analysis; Mesh Analysis with Current Sources, supposition theorem
Week 7	Source Transformation; Thevenin's Theorem
Week 8	Norton's Theorem; Maximum Power Transfer
Week 9	Capacitors and Inductors: Capacitors; Capacitors in series; Capacitors in Parallel
Week 10	Capacitors and Inductors: Indictors; Inductors in series; Inductors in Parallel
Week 11	Sinusoids and Phasors
Week 12	Phasor Relationships for Circuit Elements (Resistance, Inductance and Capacitor)
Week 13	Impedance and Admittance; Impedance Combinations (Series and Parallel)
Week 14	AC Power Analysis: Instantaneous and Average Power; Maximum Average Power Transfer
Week 15	AC Power Analysis: Apparent Power and Power Factor; Complex Power; Power Factor Correction
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Introduction to Electrical Laboratory: Lab Safety, Tools, DC Sources, Metering, Resistors Color Code, Groups Arrangement and Report Preparing
Week 2	Ohm's Law
Week 3	Resistance connected in series
Week 4	Resistance connected in parallel
Week 5	Resistance connected in series and parallel
Week 6	Kirchhoff's Current Law
Week 7	Kirchhoff's Voltage Law
Week 8	Current Divider Rule and Voltage Divider Rule
Week 9	Nodal Analysis
Week 10	Mid Semester Lab. Exam
Week 11	Thevenin's Theorem
Week 12	Norton's Theorem
Week 13	RLC in series
Week 14	RLC in Paralell
Week 15	Final Semester Lab. Exam

الكلية التقنية الهندسية
هندسة تقنيات الميكاترونكس
توزيع مفردات الدراسية على الاسابيع للعام الدراسي
للمرحلة الاولى – فصل الثاني

Module Information معلومات المادة الدراسية		
Module Title	**Digital Logic Design I**	**Module Delivery**
Module Type	**Core**	☒ **Theory** ☐ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☒ **Seminar**
Module Code	UOKTB1MC107	
ECTS Credits	**6.00**	
SWL (hr/sem)	**150**	

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري محتوى كل اسبوع يجب ان يغطي الوقت المحدد	
	Material Covered
Week 1	Introduction
Week 2	Number Systems and Conversions
Week 3	Arithmetic with number systems
Week 4	Signed and unsigned number systems and their arithmetic
Week 5	Binary Codes
Week 6	Boolean Postulates & Theorems
Week 7	Boolean Functions and their Complements
Week 8	Sum of Product Terms & Product of Sum Terms
Week 9	Standard forms & Canonical Forms
Week 10	Digital logic gates
Week 11	MID EXAM
Week 12	Karnaugh maps
Week 13	Multi-variable (2,3,4,5) K-maps
Week 14	Don't care conditions
Week 15	Digital Circuits using Basic and Universal Gates
Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Instructions to Logic design Lab, devices, groups, report preparing
Week 2	Introduction to logic gates and different digital ICs
Week 3	NOT, AND, OR Gates
Week 4	NAND, NOR Gates

Week 5	XOR gate
Week 6	Exam 1
Week 7	Truth tables and simplification using Boolean algebra
Week 8	Truth tables and K-maps
Week 9	Construction of adders, subtractors, magnitude comparators using basic gates
Week 10	Construction of BCD adder and Adder/Subtractor circuit Objective
Week 11	Exam 2
Week 12	Multiplexers
Week 13	Decoders
Week 14	Preparing to Final Exam
Week 15	Final EXAM

Module Information معلومات المادة الدراسية		
Module Title	**Applied mathmatics**	**Module Delivery**
Module Type	**Supply**	☒**Theory** ☐**Lecture** ☐**Lab** ☐**Tutorial** ☐**Practical** ☒**Seminar**
Module Code	**UOKTB1MC108**	
ECTS Credits	**4**	
SWL (hr/sem)	**100**	

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	definition of special function
Week 2	examples and application
Week 3	bessel polynomial
Week 4	examples and application
Week 5	legendre polynomial
Week 6	Hermite polynomial
Week 7	chebycheve polynomial
Week 8	lagurre polynomial
Week 9	gamma and beta functions
Week 10	mid exam
Week 11	fourier series
Week 12	examples and applications
Week 13	fourier transform
Week 14	examples and applications

Module Information
معلومات المادة الدراسية

Module Title	**Electronic I**	**Module Delivery**
Module Type	**Core**	☒Theory ☒Lecture ☒Lab ☐Tutorial
Module Code	**UOKTB1MC109**	
ECTS Credits	**5**	
SWL (hr/sem)	**125**	

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Semiconductor physics
Week 2	PN-junction
Week 3	Diodes
Week 4	Characteristics of different diodes
Week 5	Diodes applications
Week 6	Diodes applications
Week 7	Photo cell, Photo diode
Week 8	Light emitting diode
Week 9	Bipolar transistor
Week 10	Biasing of bipolar transistor
Week 11	Biasing of bipolar transistor
Week 12	Modeling and analysis of FET transistor
Week 13	Small signal model of transistor
Week 14	Small signal amplifier
Week 15	Input and output impedance
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus)
المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	To obtain V-I characteristics of PN junction diode
Week 2	Half wave rectifier
Week 3	Half wave rectifier with filter
Week 4	Bridge rectifier with filter
Week 5	Clipping circuits
Week 6	Clamping circuits
Week 7	Zener diode characteristic
Week 8	Photo diode
Week 9	Common base Transistor
Week 10	Self-biasing
Week 11	Voltage divider biasing
Week 12	Finding H-parameter
Week 13	Finding input / output impedance
Week 14	Small signal amplifier

Module Information
معلومات المادة الدراسية

Module Title	**Workshops**	**Module Delivery**
Module Type	**Basic**	☐ **Theory** ☐ **Lecture** ☐ **Lab** ☐ **Tutorial** ☒ **Practical** ☐ **Seminar**
Module Code	**UOKTB1MC109**	
ECTS Credits	**4**	
SWL (hr/sem)	**100**	

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Foundry workshop: -
Week 2	Metal casting and its importance, purpose of using casts in industry, casting work shop equipment's, industrial safety regulation in works shop, making sand mold for one piece pattern and cores types, resources of sand and mold properties, additives materials, mixing processes and percentage of quality, using sand mixing, sand treatment and sand handling equipment's, making manual sand mold for one piece cast.
Week 3	Making sand mold for one piece cast with runner and risers, cast cleaning make core and baking it in baking furnace, make sand mold for two pieces pattern with core.
Week 4	Making sand mold with core, melting the metal, pouring the metal. take out the cast from the mold, cleaning the cast,
Week 5	Melting furnaces of metals: types, specifications, its uses (rotary, crucible) heat treatment and cat inspection, visual surface defects and its causes.
Week 6	Measuring cast dimension and insure equal to original dimension.
Week 7	Filing Workshop: -
Week 8	Vernier types, measuring methods , measuring height and depth, sketching process on sheet metal plate, tools used, scratching pointer, strip divider, bended edge divider, 90 degree square ruler, bended rulers,
Week 9	Files, files and filling process: filing types and its specifications, clamp vices types, processes of fixing work piece on it, the uses of different types of fillings, filing cleaning process, filling methods, exercises on scratching method and simple file.
Week 10	Saw cutting, hand saw, saw blade, fixing the saw blade, the saw blade condition available for sawing process, exercises for saw cutting process.
Week 11	Lath Workshop: -
Week 12	Lathe machine, specifications its uses, accessory lathe parts , lathe operation, lathe cutting tools types , uses of measuring instruments.
Week 13	Turning Processes: -
Week 14	Facing , simple steps, learning using measuring instruments.
Week 15	Internal and external taper turning, making exercises for both methods.

Module Information معلومات المادة الدراسية		
Module Title	**Smart material technology**	**Module Delivery**
Module Type	**E**	☒ **Theory** ☐ **Lecture** ☐ **Lab** ☐ **Tutorial** ☒ **Practical** ☒ **Seminar**
Module Code	UOKTB1MC111	
ECTS Credits	**4**	
SWL (hr/sem)	**100**	

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري محتوى كل اسبوع يجب ان يغطي الوقت المحدد	
	Material Covered
Week 1	Introduction to Materials Engineering, bonds and crystal structures of materials,
Week 2	theoretical density Crystal lattice, dislocation, point defect,
Week 3	solidification and dendrite (The microstructures of metals under microscope)
Week 4	Scanning electron microscope (microstructures of metals)
Week 5	The mechanical properties of materials (tensile, Impact, Hardness
Week 6	Phase diagrams of 2 metals (revers lever rule) Solubility of metals (Phase diagrams)
Week 7	Eutectic structures
Week 8	Iron- Carbon phase diagram ,Microstructure of steel and cast iron
Week 9	Classification of steel (steel, stainless steel)
Week 10	Heat treatment of steel (annealing, quenching, normalizing, tempering)
Week 11	Aluminum and it's alloys, copper and it's alloys
Week 12	Light alloys Mg Ti
Week 13	introduction to manufacturing processes,
Week 14	casting of metals (sand casting, centrifuge casting, die casting…etc)
Week 15	cutting of metals (lathe milling drilling ,broaching)

Module Information معلومات المادة الدراسية		
Module Title	**Computer Systems and Programming**	**Module Delivery**
Module Type	**Core**	☐**Theory** ☐**Lecture** ☐**Lab** ☐**Tutorial** ☒**Practical** ☒**Seminar**
Module Code	**UOKTB1MC113**	
ECTS Credits	**3**	
SWL (hr/sem)	**75**	

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	An Overview of Microcomputer Systems
Week 2	The System Unit
Week 3	Peripheral Devices
Week 4	Memory Fundamentals
Week 5	Types of Storage Devices
Week 6	Communication and Network Fundamentals
Week 7	Microprocessors Architecture
Week 8	High Level Language
Week 9	Introduction to C++ Programming Language
Week 10	Variables and Data Types
Week 11	Integers and Integer Representations
Week 12	Arrays in C++
Week 13	Compiler Basics
Week 14	Control Flow I
Week 15	Control Flow II
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Introduction to C ++ Programming Language
Week 2	Lab 2: Condition Statements in C++
Week 3	Lab 3: Condition Statements in C++
Week 4	Lab 4: Control Flow Statements in C++
Week 5	Lab 5: Control Flow Statements in C++
Week 6	Lab 6: Arrays in C++
Week 7	Lab 7: Designing Projects

Module Information معلومات المادة الدراسية		
Module Title	**Arabic Language**	**Module Delivery**
Module Type	**UOKTB1MC114**	✓ **Theory** ✓ **Lecture** **Lab** **Tutorial** **Practical** ✓ **Seminar**
Module Code		
ECTS Credits	**2**	
SWL (hr/sem)	**50**	

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	مقدمة عن الأخطاء اللغوية
Week 2	التاء المربوطة والتاء المفتوحة
Week 3	همزة الوصل والقطع
Week 4	الهمزة المتوسطة والمتطرفة
Week 5	قواعد كتابة الالف الممدودة والمقصورة
Week 6	الحروف الشمسية والقمرية
Week 7	الضاد والظاء
Week 8	العـــدد
Week 9	المفاعيل
Week 10	أقسام الكلام
Week 11	معاني حروف الجر
Week 12	تطبيقات الأخطاء اللغوية الشائعة
Week 13	النون والتنوين
Week 14	مقدمة عن الأخطاء اللغوية
Week 15	الامتحان النهائي

Module Information معلومات المادة الدراسية		
Module Title	**English I**	**Module Delivery**
Module Type	**B**	☒Theory ☐ Lecture ☐ Lab ☐Tutorial ☐ Practical ☒Seminar
Module Code	**MECT 114**	
ECTS Credits	**2**	
SWL (hr/sem)	**25**	

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Unit one :hello, Am/are/is, my/your, This is with practice in work
Week 2	Unit two :your world, He/she/they, his/her, Questions
Week 3	Unit three: all about
Week 4	Unit four :family and friends, Possessive adjectives, Possessive's, Has/have, Adjective+ noun
Week 5	Unit Five :the way 1 live, Present simple I/you/we/they, A and an
Week 6	Adjective + noun
Week 7	Unit six : every day, Present simple he/she, Questions and negatives
Week 8	Adverbs of frequency
Week 9	Unit seven :my favorites, Question words, Pronouns, This and that
Week 10	Unit eight :where 1 live, There is /are..., Prepositions
Week 11	Unit nine :times past, Was /were born, Past simple -irregular verbs
Week 12	Unit ten: we had a great time!, Past simple -regular & irregular, Question, Negatives, Ago
Week 13	Unit eleven: 1 can do that!, Can /can't, Adverbs, Requests
Week 14	Unit twelve: please and thank you, I'd like.., Some and any, Like and would like
Week 15	Unit thirteen: here and now, Present continuous, Present simple & present continuous
Week 16	**Preparatory week before the final Exam**

الكلية التقنية الهندسية
هندسة تقنيات الميكاترونكس
توزيع مفردات الدراسية على الاسابيع للعام الدراسي
للمرحلة الثانية – فصل الاول

Module Information معلومات المادة الدراسية		
Module Title	**English II**	**Module Delivery**
Module Type	**Support**	☒Theory ☒Lecture ☐ Lab ☐Tutorial ☐ Practical ☐ Seminar
Module Code	**UOKTB1MC201**	
ECTS Credits	**2**	
SWL (hr/sem)	**60**	

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Unit one :getting to know you tenses Questions, Questions words
Week 2	Unit two :the way we live, Present tenses, Present simple
Week 3	Unit three: it all went wrong, Past tenses, Past simple, Past continuous
Week 4	Unit four :let's go shopping Quantity Much and many, Some and any Something, anyone, nobody, everywhere, A few, a little, a lot of Articles
Week 5	Unit five ,what do You want to do, Past tenses Verb patterns'\ Future intentions
Week 6	Going to and will
Week 7	Unit six: tell me! What's it like? What's it like? Comparative and superlative, Adjectives
Week 8	Unit seven :fame, Present perfect and past simple, For and since
Week 9	Tense revision
Week 10	Unit eight: do's and don'ts, Have(got) to, Should, must
Week 11	Unit nine: going places, Time and conditional clauses what if..?
Week 12	Unit ten: scared to death, Verbs patterns, Infinitives, What ,etc. Infinitive, Something ,etc. Infinitive
Week 13	Unit eleven .'things that changed the world, Passives
Week 14	Unit twelve :dreams and reality, Second conditional might
Week 15	Unit thirteen: earning living, Present perfect continuous, Present perfect simple versus, Continuous
Week 16	**Preparatory week before the final Exam**

Module Information معلومات المادة الدراسية		
Module Title	**جرائم نظام البعث في العراق**	**Module Delivery**
Module Type	B	**Theory** **Lecture** **Seminar**
Module Code	**UOKTB1MC202**	
ECTS Credits		
SWL (hr/sem)		

ت	الاسبوع	المفردات
1	الاسبوع الاول	مقدمة تعريفية (مفهوم الجريمة) - اقسام الجريمة
2	الاسبوع الثاني	جرائم نظام البعث وفق توثيق قانون المحكمة الجنائية العراقية العليا 2005
3	الاسبوع الثالث	القرارات الصادرة من المحكمة الجنائية العليا (جريمة مجزرة الدجيل + الانفال + حلبجة)
4	الاسبوع الرابع	جريمة قمع الانتفاضة الشعبانية + احداث صلاة الجمعة + تصفية الاحزاب الدينية + جريمة تهجير الكرد الفيليين
5	الاسبوع الخامس	الجرائم النفسية (الاليات) واثارها
6	الاسبوع السادس	الجرائم الاجتماعية
7	الاسبوع السابع	انتهاكات القوانين العراقية + قرارات الانتهاكات السياسية والعسكرية لنظام البعث
8	الاسبوع الثامن	جرائم البيئة لنظام حزب البعث في العراق + البصرة + حلبجة
9	الاسبوع التاسع	جريمة تجفيف الاهوار + جريمة تجريف بساتين النخيل والاشجار والمزروعات
10	الاسبوع العاشر	جرائم المقابر الجماعية + احداث مقابر الادارة الجماعية المرتكبة من النظام البعثي في العراق
11	الاسبوع الحادي عشر	احداث عام 1987 – 1988 وعلاقتها بالمقابر الجماعية
12	الاسبوع الثاني عشر	التصنيف الزمني لمقابر الابادة الجماعية في العراق للمدة 1963 – 2003
13	الاسبوع الثالث عشر	مقابر الابادة الجماعية للاكراد البرزانيين عام 1983
14	الاسبوع الرابع عشر	مقابر الابادة الجماعية لضحايا الانتفاضة الشعبانية عام 1991
15	الاسبوع الخامس عشر	موقع مقابر الجماعية (طريق التنومة – كباسي) + موقع مقابر الجماعية (شهداء السلام)

Module Information معلومات المادة الدراسية		
Module Title	**Advanced Mathematics**	**Module Delivery**
Module Type	**Core**	☒ **Theory** ☒ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☒ **Seminar**
Module Code	**UOKTB1MC203**	
ECTS Credits	**6.00**	
SWL (hr/sem)	**180**	

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري محتوى كل اسبوع يجب ان يغطي الوقت المحدد	
	Material Covered
Week 1	General review of calculus and properties of integrals and finite integrals.
Week 2	Introduction to vectors in space, multiplying the intersecting and triple point vectors, the equations of the straight line and the plane in space, the vector function.
Week 3	Introduction to complex numbers, polar formula for complex numbers, Demoffer's law, Eller's equation, powers and roots of complex numbers, complex functions, Cochi-Riemann formulas.
Week 4	Functions with two or more variables, representation of functions in the manner of flattening curves, ends and continuity, partial derivatives, chain rule and Jacobian rule for partial derivatives, applications in partial derivative (critical points and limits, regression, straight line equation and tangent plane equation of the function, directional function.
Week 5	Functions with two or more variables, representation of functions in the manner of flattening curves, ends and continuity, partial derivatives, chain rule and Jacobian rule for partial derivatives, applications in partial derivative (critical points and limits, regression, straight line equation and tangent plane equation of the function, directional function.
Week 6	Polar coordinates in the plane and their relationship with Cartesian coordinates, cylindrical and spherical coordinates, drawing functions in polar coordinates.
Week 7	Binary Integrations and Binary Integration Theory, Reversal of Binary Integration, Polar Coordinates in Binary Integration, Geometric and Physical Applications in Binary Integration.
Week 8	Binary Integrations and Binary Integration Theory, Reversal of Binary Integration, Polar Coordinates in Binary Integration, Geometric and Physical Applications in Binary Integration.
Week 9	Triple integration and the theory of triple integration, cylindrical and spherical coordinates in triple integration, engineering and physical applications in triple integration.

Week 10	Linear Integration Theorem, Linear Integration in Open Path and Closed Path, Crane's Theorem, Planar Areas in Linear Integration.
Week 11	Sequences, finite and infinite series, types of series, concept of divergence and convergence in series, methods and techniques for finding divergence and convergence, Tyler and McClurin series, applications in series.
Week 12	Sequences, finite and infinite series, types of series, concept of divergence and convergence in series, methods and techniques for finding divergence and convergence, Tyler and McClurin series, applications in series.
Week 13	Sequences, finite and infinite series, types of series, concept of divergence and convergence in series, methods and techniques for finding divergence and convergence, Tyler and McClurin series, applications in series.
Week 14	Introduction to differential equations, equations of the first and second order and methods of solutions, applications in first and second order differential equations.
Week 15	Introduction to differential equations, equations of the first and second order and methods of solutions, applications in first and second order differential equations.

Module Information معلومات المادة الدراسية		
Module Title	**Fluid Mechanics**	**Module Delivery**
Module Type	**Core**	☐ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☒ **Seminar**
Module Code	UOKTB1MC**204**	
ECTS Credits	**6**	
SWL (hr/sem)	**180**	

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري محتوى كل اسبوع يجب ان يغطي الوقت المحدد	
	Material Covered
Week 1	Dimensions and units –types of fluid –properties of fluids – density – specific weight – specific volume – specific gravity - compressibility of fluid
Week 2	Viscosity – Newton' s law of viscosity – variation of viscosity with temperature -Examples
Week 3	Viscosity – Newton' s law of viscosity – variation of viscosity with temperature -Examples
Week 4	Pressure variation in a fluid at rest – Absolute, gage, atmospheric and vaccum pressures – measurement of pressure - Examples
Week 5	Hydrostatic forces on surfaces – total pressure and center of pressure –vertical plane surface submerged in fluid – horizontal plane surface submerged- Examples
Week 6	Equation of motion – Euler's equation of motion – Bernoulli equation -Examples
Week 7	Bernoulli ' s equation for real fluid – practical applications of Bernoulli's equation -Examples
Week 8	Bernoulli ' s equation for real fluid – practical applications of Bernoulli's equation -Examples
Week 9	Momentum equation –force exerted by a flowing fluid on a pipe –bend -Examples
Week 10	Laminar flow and turbulent flow – Reynold's number – shear and velocity distribution - law of fluid friction –Hagen poiseulle formula -Examples
Week 11	Flow between parallel plates –flow through long tubes – hydro dynamically smooth and rough flows - Examples
Week 12	Closed conduit flow – Darcy weisbanch equation –miner losses –pipes in series –pipes in parallel – variation of friction factor with Reynold's number- major losses-Moody 's chart –pipe network problems -Examples
Week 13	Closed conduit flow – Darcy weisbanch equation –miner losses –pipes in series –pipes in parallel – variation of friction factor with Reynold's number- major losses-Moody 's chart –pipe network problems -Examples
Week 14	Measurement of flow – pilot tube- venture meter – orifice meter- Examples
Week 15	Time of emptying a tank through an orifice at it's bottom –time of emptying a circular horizontal tank- Examples

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Falling ball viscometer
Week 2	U tube manometer
Week 3	Inclined manometer
Week 4	Bourden gage
Week 5	Reynoldes number demonstration
Week 6	Venturi meter
We ek 7	Volumetric flow rate
Week 8	Hydrostatic pressure apparatus
Week 9	Friction factor of a pipe
Week 10	Friction factor of a pipe
Week 11	Coefficient for minor losses
Week 12	Coefficient for minor losses
Week 13	Verification of Bernoulli's equation
Week 14	Verification of Bernoulli's equation
Week 15	Orifice meter

Module Information معلومات المادة الدراسية		
Module Title	**Electric Circuits**	**Module Delivery**
Module Type	**Core**	☐ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**
Module Code	**UOKTB1MC206**	
ECTS Credits	**6**	
SWL (hr/sem)	**180**	

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري محتوى كل اسبوع يجب ان يغطي الوقت المحدد	
	Material Covered
Week 1	Basics of magnetic Circuits
Week 2	Mutual Inductance
Week 3	Introduction to Two Port Networks Two Port Networks (Z Parameters)
Week 4	Two Port Networks (Y Parameters) Two Port Networks (H Parameters)
Week 5	Two Port Networks (T Parameters) Interconnection Between Two port Networks
Week 6	Introduction to Three Phase Networks Three Phase Networks (Examples)
Week 7	Analysis of Electric circuits using Fourier series
Week 8	Transients in Electrical Circuits 1st order Examples for 1st order transient in Electrical circuits
Week 9	Transients in Electrical Circuits 2nd order (Over damped) Transients in Electrical Circuits 2nd order (Under damped)
Week 10	Transients in Electrical Circuits 2nd order (Critically damped)
Week 11	The Laplace Transform in Circuit Analysis
Week 12	Network Functions for Simple Circuits Network Functions of Circuits Containing Dependents Sources Network Functions for Circuits Containing Op Amps
Week 13	Analysis of Electric circuits using Fourier Transform
Week 14	Poles and Zeros
Week 15	Bode Plot

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	The equivalent resistor of a circuit
Week 2	The equivalent resistor of a circuit
Week 3	Measuring Voltage, Current and Power and transferring max. power (DC Circuit)
Week 4	Using the Oscilloscope to measure the voltae (DC and AC)
Week 5	Two port networks (Z Parameters)
Week 6	Two port networks (Y Parameters)
Week 7	Two port networks (H Parameters)
Week 8	Two port networks (T Parameters)
Week 9	AC circuit (RL)
Week 10	AC circuit (RC)
Week 11	AC circuit (RLC)
Week 12	AC circuit (Series parallel RLC)
Week 13	Trainset Circuit
Week 14	Trainset Circuit
Week 15	Power Factor Correction

Module Information معلومات المادة الدراسية		
Module Title	**Computer Systems and Programming II**	**Module Delivery**
Module Type	**Elective**	☐ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☒ **Seminar**
Module Code	**UOKTB1MC207**	
ECTS Credits	**3**	
SWL (hr/sem)	**180**	

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري محتوى كل اسبوع يجب ان يغطي الوقت المحدد	
	Material Covered
Week 1	Introduction to Matlab
Week 2	Mathematical Functions
Week 3	Vectors & Matrices
Week 4	Vectors & Matrices
Week 5	Introduction to Programming in MATLAB
Week 6	Control flow
Week 7	Control flow
Week 8	Debugging
Week 9	Mathematical Equations
Week 10	Graph Plot
Week 11	GUI
Week 12	GUI
Week 13	Image Processing
Week 14	Simulink
Week 15	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Introduction to Matlab and Mathematical Functions
Week 2	Lab 2: Vectors & Matrices
Week 3	Lab 3: Control flow
Week 4	Lab 4: Mathematical Equations
Week 5	Lab 5: GUI
Week 6	Lab 6: Image Processing
Week 7	Lab 7: Simulink

Module Information معلومات المادة الدراسية		
Module Title	**Digital Logic Design II**	**Module Delivery**
Module Type	**Core**	☐ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☒ **Practical** ☒ **Seminar**
Module Code	**UOKTB1MC208**	
ECTS Credits	**8.00**	
SWL (hr/sem)	**240**	

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري محتوى كل اسبوع يجب ان يغطي الوقت المحدد	
	Material Covered
Combinational Logic Circuits	
Week 1	Analysis and Design, Code Converters
Week 2	Adders & its types
Week 3	Subtractors, Multiplier
Week 4	Magnitude Comparator
Week 5	Multiplexers, Demultiplexers
Week 6	Decoders and Encoders
Sequential Circuits	
Week 7	Latches (SR Latch, D Latch)
Week 8	Flip Flops (D Flip Flop, JK Flip Flop, T Flip Flop)
Week 9	Design and Analysis of Clocked Sequential Circuits (State Equations, State Tables, State Diagrams)
Registers & Counters	
Week 10	Asynchronous Counters
Week 11	Synchronous Counters
Week 12	Simple registers
Week 13	Registers with parallel Load
Week 14	Shift Registers/Serial to parallel Convertors
Week 15	Universal Shift Register

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Instructions to Logic design Lab, devices, groups, report preparing
Week 2	Adder
Week 3	Subtractor
Week 4	Multiplexers
Week 5	Demultiplexers
Week 6	Comparators
Week 7	Flip-Flops
Week 8	Asynchronous up counter
Week 9	Asynchronous down counter
Week 10	Shift Register
Week 11	RING Counter
Week 12	JOHNSON Counter
Week 13	7-Segment Decoder
Week 14	Preparing to Final Exam
Week 15	Final EXAM

الكلية التقنية الهندسية
هندسة تقنيات الميكاترونكس
توزيع مفردات الدراسية على الاسابيع للعام الدراسي
للمرحلة الثانية – فصل الثاني

Module Information معلومات المادة الدراسية		
Module Title	**Electronic II**	**Module Delivery**
Module Type	**Core**	☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	**UOKTB1MC209**	
ECTS Credits	**8**	
SWL (hr/sem)	**180**	

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Differential Amplifier circuit configuration
Week 2	single I/p Balanced and Unbalanced output Differential Amplifier
Week 3	Dual I/p Balanced and Unbalanced output Differential Amplifier
Week 4	DC analysis
Week 5	AC analysis
Week 6	Constant current bias and current mirror circuit
Week 7	Cascaded Differential Amplifier and level translator
Week 8	frequency response , slew rate
Week 9	linear application : DC and AC amplifier
Week 10	Summer, integrator, differentiator . instrumentation Amplifier
Week 11	voltage to current and current to voltage convertor
Week 12	nonlinear application of OP – Amp
Week 13	Half wave and Full wave Rectifier
Week 14	Log / antilog amplifier clippers and clampers
Week 15	555 timer and applications
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Introduction to operation amplifier
Week 2	Lab 2: types of operation amplifier
Week 3	Lab 3: A/ D converter
Week 4	Lab 4: D/ A converter
Week 5	Lab 5: Frequency Response of RLC Circuits
Week 6	Lab 6: 555 timer
Week 7	Lab 7: Filters

Module Information معلومات المادة الدراسية		
Module Title	**Thermodynamics**	**Module Delivery**
Module Type	**Elective**	☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☒ **Seminar**
Module Code	UOKTB1MC**213**	
ECTS Credits	**6**	
SWL (hr/sem)	**180**	

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري محتوى كل اسبوع يجب ان يغطي الوقت المحدد	
	Material Covered
Week 1	Introductions, references, units , pressure, force, work, Temperature, unit of temperature and conversion, temperature measurements. Zeorith law of Thermodynamics. Energy, types of energy, positional, kinetic, internal and flow energy energies. Heat and work, power, enthalpy.
Week 2	First law of thermodynamics, Steady flow energy equation for open system, non-flow energy equation
Week 3	Ideal gas, Boyle's law and Charles law and equation of state
Week 4	Specific heat at constant pressure and constant volume, closed system Processes using ideal gas. Isometric and isobaric processes
Week 5	
Week 6	Isothermal and adiabatic processes, Polytropic processes, Control volume processes
Week 7	Vapour, phase of substance, Phase change curve on P-V diagram. Dryness fraction, liquid and vapour lines, wet vapour
Week 8	
Week 9	Steam tables and Examples on steam tables, Super-heated vapour, tables of super-heated tables
Week 10	
Week 11	Processes using two phase system, processes on P-V diagram
Week 12	Second law of thermodynamics and heat engine, heat pump
Week 13	Clausius in equality for second law, Entropy on T-S and entropy calculations.
Week 14	Entropy for vapour, Entropy for system and surroundings, Isentropic efficiency
Week 15	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Measurement and instruments
Week 2	Types of temperature measurements
Week 3	Measuring the velocity of air
Week 4	Calibration of thermocouple
Week 5	Joule experiment
Week 6	Boyle Experiment
Week 7	Measuring of C.V of fuel
Week 8	Measuring specific heats
Week 9	Finding the law of expansion
Week 10	Measuring the latent heat of evaporation
Week 11	Heat pump
Week 12	finding of the degree of superheating
Week 13	Performance of simple compression cycle
Week 14	Actual vapour compression cycle

Module Information
معلومات المادة الدراسية

Module Title	**Strength of Materials**	**Module Delivery**
Module Type	**Basic**	☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	**UOKTB1MC214**	
ECTS Credits	**6**	
SWL (hr/sem)	**180**	

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to strength of materials
Week 2	Simple stress and Strain
Week 3	Compound Bars
Week 4	Thermal stresses
Week 5	Shearing force and bending moment diagrams
Week 6	Bending of beam
Week 7	Slope and deflection of beams
Week 8	Shear stresses in beam
Week 9	Torsion of shaft
Week 10	Thin cylinders and shells
Week 11	Complex stresses
Week 12	Mohr's stress circle
Week 13	Buckling of column
Week 14	Strain Energy
Week 15	Theories of Elastic failure
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus)
المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Tensile
Week 2	Tensile
Week 3	Torsion
Week 4	Torsion
Week 5	Impact
Week 6	Impact
Week 7	Hardness
Week 8	Hardness
Week 9	Effect of heat treatment on steel hardness
Week 10	Effect of heat treatment on steel hardness
Week 11	Bending
Week 12	Bending
Week 13	Compression
Week 14	Compression
Week 15	Buckling

Module Information معلومات المادة الدراسية		
Module Title	**Arabic Language**	**Module Delivery**
Module Type	B	✓ **Theory** ✓ **Lecture** **Lab** **Tutorial** **Practical** ✓ **Seminar**
Module Code	UOKTB1MC212	
ECTS Credits	**2**	
SWL (hr/sem)	**50**	

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	مقدمة عن الأخطاء اللغوية
Week 2	التاء المربوطة والتاء المفتوحة
Week 3	همزة الوصل والقطع
Week 4	الهمزة المتوسطة والمتطرفة
Week 5	قواعد كتابة الالف الممدودة والمقصورة
Week 6	الحروف الشمسية والقمرية
Week 7	الضاد والظاء
Week 8	العـــدد
Week 9	المفاعيل
Week 10	أقسام الكلام
Week 11	معاني حروف الجر
Week 12	تطبيقات الأخطاء اللغوية الشائعة
Week 13	النون والتنوين
Week 14	مقدمة عن الأخطاء اللغوية
Week 15	الامتحان النهائي

Module Information معلومات المادة الدراسية		
Module Title	**Pneumatic and Hydraulic Systems**	**Module Delivery**
Module Type	**Core**	☐ **Theory** ☐ **Lecture** ☒ **Lab** ☐ **Tutorial** ☒ **Practical** ☒ **Seminar**
Module Code	UOKTB1MC215	
ECTS Credits	**6**	
SWL (hr/sem)	**180**	

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري محتوى كل اسبوع يجب ان يغطي الوقت المحدد	
	Material Covered
Week 1	Fluid power system, advantage , disadvantage, hydraulic system component , Hydraulic pumps ,pumping theory, pump selection, vane pump, piston pump , gear pump
Week 2	Pump performance , overall efficiency, volumetric efficiency, mechanical efficiency with examples - Hydraulic actuators ,classification and symbols
Week 3	Cylinder force, velocity, power ,types of cylinder , Hydraulic motor, gear motors, vane motors , piston motors, Hydraulic directional control valve, condition of spool valves, construction, classification, valve operating method
Week 4	Pressure control valve , pressure relief valve , pressure reducing valve, unloading valve, sequence valve, counterbalance valve , Flow control valve, throttle valve , throttle with check valve
Week 5	Hydraulics accessories , Control of single acting and double acting cylinder circuit design & analysis
Week 6	Meter in and meter out circuits, regenerative circuits, counter valve application , pump unloading circuits, reciprocating fail safe circuit
Week 7	Basics of pneumatics system, application & basic requirements of pneumatics , comparison between hydraulic and pneumatic system
Week 8	Air compressors, types of air compressors, piston, reciprocating & rotary vane compressors , Liquid cooled rotary compressor, liquid ring compressor, twin loop compressor, screw compressor ,double acting compressor
Week 9	Selection criteria for compressors, characteristics of single acting &double acting cylinder, air receiver , Air treatment, filters, cooler, air filter and water trap, refrigerated dryers, chemical dryers, absorption dryers
Week 10	Lubricators, pressure regulation , relief valve, non-relieving, pressure regulator, service units, Actuators , single acting cylinder, double acting cylinder, cylinder end cushions
Week 11	Rotary actuator, gear motor, vane motor, vane motor ,limited rotation actuators, speed control, Types of pneumatic valves, direction control valves, valve position ,basic construction of valves
Week 12	Overlapping controlling method, control techniques, flow control valve, non-return flow control valve ,check valve, exhaust valve , Time delay valve, shuttle valve twin pressure valve, solenoid valve ,cascade systems, basic pneumatic circuits
Week 13	Symbols, control of a single acting &double acting cylinder
Week 14	Impulse operation speed control of a cylinder, sequencing of motion, Automatic cylinder reciprocating
Week 15	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)
المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	The basic of hydraulic systems
Week 2	The basic of pneumatic systems
Week 3	Operating a single acting cylinder
Week 4	Operating a single acting cylinder
Week 5	Operating double acting cylinder
Week 6	Operating double acting cylinder
Week 7	Logic control two pressure valve and shuttle valve
Week 8	Logic control two pressure valve and shuttle valve
Week 9	Indirect control valve of hydraulic speed regulation
Week 10	Meter –in circuit
Week 11	Meter – out circuit
Week 12	Bleed of circuit
Week 13	Coordination motion and sequence control
Week 14	Electrical control of pneumatic systems
Week 15	Electrical control of pneumatic systems

الكلية التقنية الهندسية
هندسة تقنيات الميكاترونكس
المناهج الدراسية للمرحلة الثالثة – فصل الاول

Module Information معلومات المادة الدراسية					
Module Title	**Engineering AI/ Programming (lisp/prolog)**			**Module Delivery**	
Module Type	**Basic**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UOKTB1MC301**				
ECTS Credits	**4**				
SWL (hr/sem)	**120**				
Module Level	3		**Semester of Delivery**	5	
Administering Department	MECT		**College**	TEC	
Module Leader	Safaa Khudair Leabi		**e-mail**	dr.safakhudair@mtu.edu.iq	
Module Leader's Acad. Title	Lecturer		**Module Leader's Qualification**	PhD	
Module Tutor	None		**e-mail**	E-mail	
Peer Reviewer Name	Revan zuhair mansoor		**e-mail**	Revan.hindo@mtu.edu.iq	
Scientific Committee Approval Date	06/06/2023		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims	1. To describe the evolution of artificial intelligence programming. 2. To describe the difference between the AI programming languages. 3. To provide the skills of programming using prolog language. 4. To provide the skills of programming using common-lisp language. 5. To provide the skills to program artificial intelligence search algorithms.
Module Learning Outcomes	Upon completion of the course, students should be able to: 1. Have a background about computer system basics. 2. Have a historical background about prolog programming languages. 3. Learn characteristics and applications of prolog language. 4. Describe prolog language program structure. 5. Have a historical background about common-lisp programming languages. 6. Learn features and applications of common-lisp language. 7. Describe data and functions in clisp language. 8. Learn the defining functions in clisp language. 9. Describe the internal representation of data in computer system.
Indicative Contents	Indicative content includes the following. Historical background of computer system basics and programming languages. [3 hrs] Development of prolog programming language. [3 hrs] Prolog program structure, facts, rules, and query. [3 hrs] Prolog goals, internal goals, and external goals. [3 hrs] Characteristics and applications of prolog language. [3 hrs] Prolog program structure, domains section, predicates section, and clauses section. [3hrs] Data types in prolog language. [3 hrs] Arithmetic in prolog language, arithmetic operators, relational operators. [3 hrs] Arithmetic functions and predicates, bit-functions. [3 hrs] Cut and Fail instructions, recursion, lists. [3 hrs] Historical background of common lisp language, features and applications. [3 hrs] Data in clisp, numbers, s-expression, lists. [3 hrs] Arithmetic in clisp, atoms, lists, extracting parts of lists, CAR, CDR, combination of CAR and CDR. [3 hrs] Constructing list structure, CONS, APPEND, REVERSE, LENGTH. [3 hrs] Substitution SUBST, evaluation EVAL, function definition DEFUN. [3 hrs] Dot-notation, s-expression, empty list, EQUAL. [3 hrs] FIRST, SECOND, THIRD, and REST, predicates, NOT, AND, OR. [3 hrs] Local and global variables, LET, LET*, COND statements. [3 hrs] Functions with optional parameters, functions with keyword parameters. [3 hrs] Membership testing, association lists, recursion and conditionals, relational operators. [3 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Assessment is based on hand-in assignments, written exam, Case study, Quizzes, seminars, Practical testing, and Online testing.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem)	61	**Structured SWL (h/w)**	4
Unstructured SWL (h/sem)	59	**Unstructured SWL (h/w)**	4
Total SWL (h/sem)	120		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	4, 8	LO #1, 2, .. 8
	Assignments	2	10% (10)	3, 7	LO # 1-7
	Projects / Lab.	2	10% (10)	3, 7	LO # 1-7
	Report	1	10% (10)	8	LO # 1-9
Summative assessment	**Midterm Exam**	2 hr	10% (10)	8	LO # 1-9
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري محتوى كل اسبوع يجب ان يغطي الوقت المحدد	
	Material Covered
Week 1	Prolog Language, Introduction, Data objects
Week 2	Facts, Rules, Syntax
Week 3	Operators (Group and Types of Operators), Arithmetic, Matching
Week 4	Programs development using data structures, Defining relationships, Unification mechanism
Week 5	Back tracking, using cut operates, Negation as failure
Week 6	Declaration and procedural meaning of programs, Built in functions
Week 7	IDE (Domain, Predicate, Clause, Goal Section)

Week 8	Lisp Language, Introduction, Symbolic expression, Atom as S-expression, List as S-expression
Week 9	Dotted pair S-expression, Machine representation as S-expression, Significance of NIL, Equivalence between lists and dotted pairs
Week 10	Functional forms in LISP, CONS, CAR, CDR, Combination of CAR & CDR, QUOTE, SET, and SET Q, COND, DEFUN, PROG, EVAL and Apply
Week 11	h-MAPCAR, PUTPROP, and GET, LAMBDA Expression, Defining functions using recursions
Week 12	Applications using Auto lisp / AutoCAD
Week 13	Search algorithms (applications of AI programming), Introduction
Week 14	Space of states, Breadth First Search
Week 15	Depth First Search Heuristic Search, Best First Search

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Introduction to prolog language layout face. Data types in prolog, Facts and rules
Week 2	Lab 2: Operators, Arithmetic, add, subtract, multiply, divide, mode. Relational operators, Data structures, Relationships.
Week 3	Lab 3: Unification, Back tracking, Cut operator, Fail operator.
Week 4	Lab 4: Procedural programs, Built in functions, IDE
Week 5	Lab 5: Introduction to CLisp language layout. List and s-expression, Machine representation of s-expression.
Week 6	Lab 6: NIL list, CONS, CAR, CDR, SET, and SETQ, COND, DEFUN, PROG, EVAL, GET, LAMBDA Expression.
Week 7	Lab 7: Recursions, Applications, Search algorithms, Search algorithms basics, Space of states. Breadth First Search, Depth First Search Heuristic Search, Best First Search.

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Recommended Texts	➢ "Turbo Prolog Owners Handbook", 1987, Borland Inc. ➢ "Common Lisp", Davide S. Tourtzky	No

Module Information
معلومات المادة الدراسية

Module Title	**Automatic Control Engineering**	**Module Delivery**	
Module Type	**Core**	☒**Theory** ☒**Lecture** ☒**Lab** ☐**Tutorial** ☐**Practical** ☐**Seminar**	
Module Code	**UOKTB1MC302**		
ECTS Credits	**8**		
SWL (hr/sem)	**180**		

Module Level	UGx11 3	**Semester of Delivery**	2
Administering Department	Mechatronics	**College**	Engineering Technical College – Baghdad
Module Leader	Revan zuhair mansoor	**e-mail**	Revan.hindo@mtu.edu.iq
Module Leader's Acad. Title	Assist lecture	**Module Leader's Qualification**	M.Sc.
Module Tutor		**e-mail**	
Peer Reviewer Name		**e-mail**	
Scientific Committee Approval Date		**Version Number**	

Relation with other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module	Control theory	**Semester**	1
Co-requisites module		**Semester**	

Module Aims, Learning Outcomes and Indicative Contents
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	This course gives a solid theoretical foundation for understanding feedback control system analysis, design and application and is suitable for general engineering students.

Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Content covers standard analysis tools such as root-loci, Bode diagrams, Nyquist diagrams. The latter part of the course focuses on the design of common feedback strategies using these analysis tools and students will undertake indicative designs and reinforce learning through application to laboratory using MATLAB and simulink software.
Indicative Contents المحتويات الإرشادية	

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل		**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل		**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل			

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes and Assignments**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Projects / Lab.	1	20% (20)	Continuous	
Summative assessment	**Midterm Exam**	2hr	20% (20)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Stability of control system, complex plane,
Week 2	poles and zeros, characteristic equation
Week 3	Definition of stability
Week 4	Routh's stability criterion
Week 5	Root locus analysis 1
Week 6	Root locus analysis 2
Week 7	Frequency response analysis
Week 8	Nyquist plot
Week 9	Nyquist stability criterion
Week 10	Bode diagram 1
Week 11	Bode diagram 2
Week 12	Control systems design by the root locus method
Week 13	Lead compensation
Week 14	lag compensation
Week 15	Lag-Lead compensation
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Stability of control system, complex plane,
Week 2	poles and zeros, characteristic equation
Week 3	Root locus analysis 1
Week 4	Root locus analysis 2
Week 5	Frequency response analysis
Week 6	Nyquist plot
Week 7	Bode diagram

Week 8	Effect of addition of poles on the root-locus plot 1
Week 9	Effect of addition of poles on the root-locus plot 2
Week 10	Effect of addition of zeros on the root-locus plot 1
Week 11	Effect of addition of zeros on the root-locus plot 2
Week 12	**Lead** compensation techniques based on the root-locus approach 1
Week 13	**Lead** compensation techniques based on the root-locus approach 2
Week 14	**lag** compensation techniques based on the root-locus approach 1
Week 15	**lag** compensation techniques based on the root-locus approach 2

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	References: Modern Control Engineering - Ogata - E4	Yes
Recommended Texts		
Websites		

Module Information
معلومات المادة الدراسية

Module Title	**Communication 1**	**Module Delivery**	
Module Type	**Elective**	☒**Theory** ☒**Lecture** ☒**Lab** ☐**Tutorial** ☐**Practical** ☐**Seminar**	
Module Code	**UOKTB1MC303**		
ECTS Credits	**6**		
SWL (hr/sem)	**180**		

Module Level	UG11 4	**Semester of Delivery**	1
Administering Department	Type Dept. Code	**College**	Technical Engineering college
Module Leader	Alaa K. Khuder	**e-mail**	Oday-asam@mtu.edu.iq
Module Leader's Acad. Title		**Module Leader's Qualification**	
Module Tutor	Name (if available)	**e-mail**	E-mail
Peer Reviewer Name	Name	**e-mail**	E-mail
Scientific Committee Approval Date	01/06/2023	**Version Number**	1.0

Relation with other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. This course aims to provide a good platform to communication engineering students to understand, model and appreciate concept of communication system 2. Introducing the student to the basic principles of calculus and integration and its various applications to develop and develop his mental abilities when solving

	exercises and linking data with his information to reach a solution to the problem and to benefit from it in other practical subjects. 3. To prepare them to carry out experimental investigation and analysis at later stages of graduation.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. To apply the knowledge of mathematics, science and engineering fundamentals to study communication systems 2. To identify and formulate communication laws of Communication engineering. 3. To instill upon to envisage appropriate experiments related to communication systems
Indicative Contents المحتويات الإرشادية	-

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	-

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	93	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	87	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	180		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	

	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to Communications and Systems : Basic elements of a communication system
Week 2	Introduction to Communications and Systems : Basic elements of a communication system
Week 3	Mathematical background
Week 4	Mathematical background
Week 5	Fourier series transformation power and energy.
Week 6	Fourier series transformation power and energy.
Week 7	Amplitude Modulation : Normal AM, Single Side Band, Double Side Band Suppressed Carrier
Week 8	Amplitude Modulation : Normal AM, Single Side Band, Double Side Band Suppressed Carrier
Week 9	Super Heterodyne Transmitter and Receiver
Week 10	Super Heterodyne Transmitter and Receiver
Week 11	Normal AM, Single Side Band, Double Side Band Suppressed Carrier, Super Heterodyne Transmitter and Receiver.
Week 12	Angular Modulation : Frequency Modulation , Phase Modulation.
Week 13	Pulse Amplitude Modulation, Pulse Width Modulation, Pulse Position Modulation, Pulse Code Modulation , Sampling Theory.
Week 14	Pulse Amplitude Modulation, Pulse Width Modulation, Pulse Position Modulation, Pulse Code Modulation , Sampling Theory.
Week 15	Transmission Line Concepts and S/N Ratio
Week 16	**Preparatory week before the final Exam**
Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Introduction to Communications and Systems : Basic elements of a communication system
Week 2	Introduction to Communications and Systems : Basic elements of a communication system
Week 3	Basic elements of a communication system
Week 4	Basic elements of a communication system

Week 5	Fourier series transformation power and energy.
Week 6	Fourier series transformation power and energy.
Week 7	Amplitude Modulation : Normal AM, Single Side Band, Double Side Band Suppressed Carrier
Week 8	Amplitude Modulation : Normal AM, Single Side Band, Double Side Band Suppressed Carrier
Week 9	Transmitter and Receiver
Week 10	Normal AM, Single Side Band, Double Side Band Suppressed Carrier, Super Heterodyne Transmitter and Receiver.
Week 11	Angular Modulation : Frequency Modulation , Phase Modulation.
Week 12	Angular Modulation : Frequency Modulation , Phase Modulation.
Week 13	Pulse Amplitude Modulation, Pulse Width Modulation, Pulse Position Modulation, Pulse Code Modulation , Sampling Theory.
Week 14	Pulse Amplitude Modulation, Pulse Width Modulation, Pulse Position Modulation, Pulse Code Modulation , Sampling Theory.
Week 15	Transmission Line Concepts and S/N Ratio

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	Introduction to communication systems / by : Mustafa Sayed Ali	No
Recommended Texts	-	-
Websites		

Module Information معلومات المادة الدراسية					
Module Title	**PLC**			**Module Delivery**	
Module Type	**Core**			☐ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☒ **Seminar**	
Module Code	**UOKTB1MC304**				
ECTS Credits	**6**				
SWL (hr/sem)	**180**				
Module Level		UGx1 2	**Semester of Delivery**		1
Administering Department		MECHATRONICS	**College**	TCM	
Module Leader	Dr. Basil Al-Mahdawi		**e-mail**	basil.mn@mtu.edu.iq	
Module Leader's Acad. Title		Lecturer	**Module Leader's Qualification**		**Ph.D.**
Module Tutor	Dr. Basil Al-Mahdawi		**e-mail**	basil.mn@mtu.edu.iq	
Peer Reviewer Name		Dr. Mazin Ismael	**e-mail**	Dr.mazin.ismael@mtu.edu.iq	
Scientific Committee Approval Date		20/05/2023	**Version Number**		1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Digital Logic Design	**Semester**	C 33
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims	1. This course familiarizes the student with the principles of programmed control in the field of automation. 2. On completing the module, the student will have developed a clearer understanding of the application of PLC and will also be aware of safety requirements and the peripherals associated with the PLC in automated plants.
Module Learning Outcomes	10. Describe the basic parts of any programmable logic controller (PLC). 11. Explain how a PLC program is different from a PC program. 12. Explain the PLC scan cycle processes when the PLC processor scans its program.

	13. Explain the function and addresses of an input and output modules and describe the circuitry used to complete this function. 14. Identify the input and output instructions for a PLC. 15. Explain the operation of PLC ON & OFF-delay timers. 16. Explain the operation of a PLC up counter and down counter.

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	Assessment is based on hand-in assignments, written exam, Case study, Quizzes, seminars, Practical testing and Online testing.

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem)	87	**Structured SWL (h/w)**	4
Unstructured SWL (h/sem)	93	**Unstructured SWL (h/w)**	7
Total SWL (h/sem)	180		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	4	20% (20)	3,5,6,10	LO #1,2,…..10
	Assignments	2	10% (10)	7, 8	LO # 8
	Seminar	1	10% (10)	11	LO # 11
Summative assessment	**Midterm Exam**	2 hr	10% (10)	12	LO # 1-12
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري محتوى كل اسبوع يجب ان يغطي الوقت المحدد

	Material Covered
Week 1	Introduction and Architecture of PLC.
Week 2	I/O Configurations and Properties of PLC.
Week3	Input/ Output field devices.
Week 4	Sourcing, Sinking and Processor Scan mechanisms.

Week 5	Electrical ladder circuit diagrams and Ladder logic language.
Week 6	Basic rules of Ladder Programming and Function blocks Languages.
Week 7	Addresses used in PLCs and LD Design problems.
Week 8	Programming Timers Instructions, On-Delay Timer Instruction.
Week 9	Off-Delay Timer Instruction, Retentive and Cascading Timer Instruction.
Week 10	Timers Design problems.
Week 11	Programming Counters Instructions, Up-Counter, Down-Counter.
Week 12	Combining Counter and Timer design problems..
Week 13	Program Control Instructions and A/D PLC interface.
Week 14	A/D PLC applications.
Week 15	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Description of Festo learning automation stations and installing the software Step 7 "Tia Portal v14"
Week 2	PLC Ladder Logic design from Hardware circuit and Boolean expression
Week 3	Distribution station sequence automation practice.
Week 4	Testing station sequence automation practice.
Week 5	Handling station sequence automation practice.
Week 6	Sorting station sequence automation practice.
Week 7	Practice of Counter and Timer designs.

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Recommended Texts	➢ "Programmable Logic Controllers" by W. Bolton ➢ "Programmable Logic Controllers" by Frank D. Petruzella	No

Module Information معلومات المادة الدراسية					
Module Title	**Theory of Machines**			**Module Delivery**	
Module Type	**Core**			☒**Theory** ☐**Lecture** ☒**Lab** ☒**Tutorial** ☐**Practical** ☐**Seminar**	
Module Code	**UOKTB1MC305**				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level		3	**Semester of Delivery**		1
Administering Department		**Power Mechanics**	**College**	Engineering Technical College - Baghdad	
Module Leader	**Wisam A. Ajlan**		**e-mail**	waahwisam@gmail.com	
Module Leader's Acad. Title		**Lecturer**	**Module Leader's Qualification**		M.Sc.
Module Tutor	None		**e-mail**	E-mail	
Peer Reviewer Name		Asst. Prof. Dr. Hassan Hamoodi Mahdi	**e-mail**	dr_hassan1961@mtu.edu.iq	
Scientific Committee Approval Date		5/06/2023	**Version Number**		1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Mechanical Engineering Strength of Materials	Semester	1st Stage / 2nd Semester 2nd Stage / 1st Semester
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims	6. To identify and enumerate different link based mechanisms with basic understanding of motion. 7. To understand and illustrate various power transmission mechanisms using suitable method. 8. The knowledge of this subject is very essential for an engineer in designing thevarious parts of a machine.
Module Learning Outcomes	Upon completion of the course, students should be able to: 1. Balance the rotating masses to reduce (or even eliminating) the unbalanced forces and couples in a mechanical system. 2. Learn and understand how the motion can be transmitted by two or more toothed wheels. 3. Learn that there are many types of governors and the main function of a governor is to regulate the mean speed of an engine within certain limits, when there are variations in the load. 4. The student will learn how the belts or ropes are used to transmit power from one shaft to another by means of pulleys which rotate at the same speed or at different speeds. 5. Learn to calculate the braking torque for different types of brake, and learn how to dealing with the braking of a vehicle. 6. Learn general information about the cam, and also learn the type of motion of follower.
Indicative Contents	Indicative content includes the following. Balancing of a Single Rotating Mass by a Single Mass Rotating in the Same Plane, balancing of a Single Rotating Mass by Two Masses Rotating in Different Planes, Balancing of Several Masses Rotating in the Same Plane Using Analytical and Graphical Methods, Balancing of Several Masses Rotating in Different Planes. [4 hrs] Classification of Gears, Spur Gears, Velocity Ratio (Gear Ratio), Center to Center Distance, Gear Trains, Velocity Ratio of Simple Gear Trains, Velocity Ratio of Compound Gear Trains, Epicyclic Gear Trains, Simple Epicyclic Gear Trains, Compound Epicyclic Gear Trains. [4 hrs] Types of Governors, Watt Governor, Porter Governor, Proell Governor, Hartnell Governor. [4 hrs] Types of Belts, Types of Flat Belt Drive, Selection of Belt Drive, Velocity Ratio of Open Belt Drive, Effect of Belt Thickness on Velocity Ratio, Slip of the Belt, Velocity Ratio of a Compound Belt Drive, Length of Open and Cross Belt, Ratio of Driving Tension for Flat Belts, Determination of Angle of Contact for Open and Cross belt., Power Transmitted by a Belt, Centrifugal Tension, Maximum Tension in the Belts, Initial Tension in the Belt, V – Belt Drive and Rope Drive. [4 hrs] Types of Brakes, Simple Block or Shoe Brake (Single and Double Block), Band Brake (Simple and Differential Band Brake), Band and Block Brake, The Braking of a Vehicle. [4 hrs]

	Types of Followers, Nomenclatures for Cam Profile, Motions of the Follower, Uniform Motion or Uniform Velocity of a Follower, Simple Harmonic Motion of Follower, Uniform Acceleration and Uniform Retardation, Cam profile construction. [4 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Assessment is based on hand-in assignments, written exam, Quizzes, Practical testing.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem)	72	**Structured SWL (h/w)**	5.1
Unstructured SWL (h/sem)	78	**Unstructured SWL (h/w)**	5.5
Total SWL (h/sem)	150		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	3	10% (10)	2, 5, 12	LO # 1-15
	Assignments				
	Practical / Lab	2	20% (20)	Continuous	
	Report / Lab	1	10% (10)	14	LO # 1-7
Summative assessment	**Midterm Exam**	2 hr	10% (10)		LO # 1-7
	Final Exam	3hr	50% (50)		All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري محتوى كل اسبوع يجب ان يغطي الوقت المحدد

	Material Covered
Week 1	Balancing of Rotating Masses Balancing of a Single Rotating Mass by a Single Mass Rotating in the Same Plane Balancing of a Single Rotating Mass by Two Masses Rotating in Different Planes Balancing of Several Masses Rotating in the Same Plane

	(a) Analytical Method (b) Graphical Method
Week 2	Balancing of Several Masses Rotating in Different Planes Solve Problems
Week 3	Classification of Gears Spur Gears Velocity Ratio (Gear Ratio) Center to Center Distance Gear Trains Velocity Ratio of Simple Gear Trains Velocity Ratio of Compound Gear Trains Solve Problems
Week 4	Epicyclic Gear Trains Simple Epicyclic Gear Trains Compound Epicyclic Gear Trains
Week 5	Solved Problems
Week 6	Types of Governors Watt Governor Porter Governor (a) Equilibrium Method (b) Instantaneous Center Method Solve Problems
Week 7	Proell Governor Hartnell Governor Solve Problems
Week 8	Types of Belts Types of Flat Belt Drive Selection of Belt Drive Velocity Ratio of Open Belt Drive Effect of Belt Thickness on Velocity Ratio Slip of the Belt Velocity Ratio of a Compound Belt Drive Length of Belt (a) Open Belt (b) Cross Belt Ratio of Driving Tension for Flat Belts
Week 9	Determination of Angle of Contact (a) Open Belt (b) Cross Belt Power Transmitted by a Belt Centrifugal Tension (T_c) Maximum Tension in the Belts (T_{max}) Condition for the Transmission of Maximum Power Initial Tension in the Belt (T_o) V – Belt Drive and Rope Drive
Week 10	Solve Problems
Week 11	Types of Brakes Simple Block or Shoe Brake (a) Single Block or Shoe Brake (b) Double Block or Shoe Brake Band Brake (a) Simple Band Brake

	Differential Band Brake
Week 12	Band and Block Brake Internal Expanding Shoe Brake The Braking of a Vehicle (a) Value of Retardation When the Brakes are Applied to Rear Wheels Only (b) Value of Retardation When the Brakes are Applied to Front Wheels Only (c) Value of Retardation When the Brakes are Applied to All the Wheels Solve Problems
Week 13	Types of Followers Nomenclatures for Cam Profile Motions of the Follower (a) Uniform Motion or Uniform Velocity of a Follower
Week 14	(b) Simple Harmonic Motion of Follower (c) Uniform Acceleration and Uniform Retardation Cam profile construction
Week 15	Solve Problems

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: How to balance rotating masses.
Week 2	Lab 2: How to get force equilibrium.
Week 3	Lab 3: Explain the principle work of gear and gear train.
Week 4	Lab 4: Explain the principle work of governor.
Week 5	Lab 5: How plane surface friction calculated.
Week 6	Lab 6: Explain friction of flat belt.
Week 7	Lab 7: How frictional clutch operate.

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Recommended Texts	➢ "Theory of Machines", Burasia Publishing House (PVT.) Ltd, 1988, by Khurmi R. S. and Gupta J. K. ➢ "Theory of Machines", Laxmi Publications (P) Ltd, 2004, by Brar J. S. and Bansal R. K. ➢ "Theory of Machines", S. Chand & Company Ltd, 2005, Khurmi R. S. and Gupta J. K.	Yes

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.