Ministry of Higher Education and Scientific Research

Scientific supervision and evaluation Authority

Department of Quality Assurance and Academic Accreditation

Academic Program Description of College Mechanical Engineering Year 2023-2024

University Name: University of Anbar

College Name: Engineering

File filling date: 20/11/2023

Head of the Mech. Eng. Dept.
Asst. Prof. Saad M Jalil
Date: 22 /11/2023

Assistant for Scientific Affairs
Asst. Prof. Mohamed A Ahmed
Date: 22/11/2023

Dean of the College
Prof. Amir A Hilal
Date: /11/2023

Academic Program Description Form

Reviewing the performance of higher education institutions ((academic program review))

This academic program description provides a necessary summary of the most important characteristics of the program and the learning outcomes that the student is expected to achieve, demonstrating whether he or she has made the most of the available opportunities. It is accompanied by a description of each course within the program

1.	Educational institution	University of Anbar
2.	University department/center	Engineering/Mechanics
3.	Name of the academic program	Bachelor's
4.	Name of the final certificate	Bachelor of Engineering
5.	School system	Quarterly
6.	Accredited accreditation program	
7.	Other external influences	
8.	Date the description was prepared	20/11/2023

9- Objectives of the academic program:

1. Preparing graduates with high theoretical and practical skills to meet the needs of industry, technological development and community service in the field of mechanical engineering.
2. Providing graduates with the applied practical skills and engineering background necessary in accordance with scientific developments in methodological vocabulary and modern teaching methods to pursue postgraduate studies in various mechanical engineering specializations.

3. Preparing graduates to participate effectively in building and rebuilding the country and achieving economic and social benefits for society.

10. Required learning outcomes and teaching, learning and assessment methods

1. A. Knowledge and understanding:

- The student will have the ability to know and understand the physical, theoretical and fundamentals of mechanical engineering.
- The student will have the ability to master the most important modern and advanced scientific topics in the field of mechanical engineering.
- The student will be able to understand mathematics and the equipment required to study his specialty.
- The student will be able to solve engineering problems, design mechanical parts, and establish the theoretical foundations of their applications.
- The student will be able to understand the operation of laboratory equipment that is used in the examination and evaluation of mechanical parts

. Methods of assessing knowledge and understanding

- Monthly written exams.
- rapid exams (Quizzes).
- Homework (HomeWorks).
- Writing scientific reports.

. Teaching and learning methods:

- Daily theoretical lectures:
- Practical lectures in laboratories.
- Graduation projects for final stage students and their discussion.

B. Subject-specific skills

thinking skills:

- Description and analysis of mechanical applications.
- Analyze problems related to mechanical engineering and discuss possible solutions.
- Using mechanical engineering computer programs to analyze these problems.

Professional and practical skills:

- Preparing engineering designs for mechanical parts and systems.
- Analyzing and discussing the results of engineering tests for use in design and evaluation processes.
- The ability to write and draft engineering technical reports on the results of practical examinations

9. Program structure

First Year (Freshman)														
Semester I							Semester II							
Course Code	Category	Course Title	Weekly Hours			Credit Hours	Course Code	Category	Course Title	Weekly Hours			Credit Hours	
			Theoretical	Tutorial	Practical					Theoretical	Tutorial	Practical		
ENG 003	CR	Calculus I	3	1	-	3	ENG 004	CR	Calculus II	3	1	-	3	
ENG 006	CR	Engineering Mechanics I (Static)	3	1	-	3	MEC 002	DR	Engineering Mechanics-II(Dynamics)	2	1	-	2	
MEC 001	DR	Principles of Manufacturing Process	2	2	2	3	ENG 007	CR	Engineering Drawing	2	2	2	3	
UOA 004	UR	Computer Science	1	-	2	2	ENG 002	CR	Chemistry	3	-	2	4	
UOA 002	UR	Human Rights and Democracy	2	-	-	2	UOA 003	UR	English Language	2	-	-	2	
ENG 001	CR	Physics	3	-	2	4	ENG 005	CR	Fundamentals of Electrical Engineering	2	1	2	3	
UOA 001	UR	Arabic Language	2	-	-	2	MEC 003	DR	Computer Programming	1	-	2	2	
Total Hours and Credit Hours			16	4	6	19	Total Hours and Credit Hours			15	5	8	19	
			26							28				

Second Year (Sophomore)

Semester I

Course Code	Category	Course Title	Weekly Hours			Credit Hours
			Theoretical	Tutorial	Practical	
ME 2201	CR	Calculus-III	3	1	-	3
ME 2301	DR	Fluid Mechanics-I	2	1	2	3
ME 2302	DR	Strength of Materials-I	2	1	2	3
ME 2303	DR	Thermodynamics-I	2	1	2	3
ME 2101	UR	English Language-II	2	-	-	2
ME 2309	DR	Mechanical drawing	2	1	2	3
ME 2311	DR	Electrical Machines	2	-	2	3
UOA 006	UR	The Crimes of Baath Regime in Iraq	2	-	-	2
Total Hours and Credit Hours			17	5	10	22
			32			

Semester II

Course Code	Category	Course Title	Weekly Hours			Credit Hours
			Theoretical	Tutorial	Practical	
ME 2308	DR	Engineering Mechanics-II(Dynamics)	2	1	-	2
ME 2202	CR	Calculus-IV	3	1	-	3
ME 2304	DR	Engineering Metallurgy	2	1	2	3
ME 2305	DR	Fluid Mechanics-II	2	1	2	3
ME 2306	DR	Strength of Materials-II	2	1	2	3
ME 2307	DR	Thermodynamics-II	2	1	2	3
ME 2310	DR	Computer Programming	2	-	2	3
Total Hours and Credit Hours			15	6	10	20
			26			

Third Year (Junior)

Semester I

Course Code	Category	Course Title	Weekly Hours			Credit Hours
			Theoretical	Tutorial	Practical	
ME 3101	UR	English Language-III	2	-	-	2
ME 3201	CR	Engineering Statistics	3	-	-	3
ME 3202	CR	Engineering Numerical Methods	2	1	2	3
ME 3302	DR	Heat Transfer-I	2	1	2	3
ME 3303	DR	Theory of Machines-I	2	1	2	3
ME 3304	DR	Internal Combustion Engines	2	2	-	2
ME 3102	UR	Ethics and Leadership Skills	2	0	-	2
Total Hours and Credit Hours			15	5	6	18
			26			

Semester II

Course Code	Category	Course Title	Weekly Hours			Credit Hours
			Theoretical	Tutorial	Practical	
ME 3309	DR	Gas Dynamics	2	2	-	2
ME 3301	DR	Engineering Analysis	2	2	-	2
ME 3305	DR	Manufacturing Processes	2	1	-	2
ME 3306	DR	Research Methodology	1	-	-	1
ME 3307	DR	Heat Transfer-II	2	1	2	3
ME 3308	DR	Theory of Machines-II	2	1	2	3
ME 3310	DR	Industrial Engineering and Economic Analysis	2	1	-	2
Total Hours and Credit Hours			13	8	4	15
			25			

Fourth Year (Senior)

Semester I

Course Code	Category	Course Title	Weekly Hours			Credit Hours
			Theoretical	Tutorial	Practical	
ME 4301	DR	Design of Machine Elements-I	3	1	-	3
ME 4302	DR	Air Conditioning	2	1	2	3
ME 4303	DR	Power Plants	2	1	-	2
ME 4304	DR	Mechanical Vibrations	2	1	2	3
ME 4308	DR	Engineering Materials	2	1	-	2
ME 4303 E	DR	Finite Element Method (FEM)	2	-	-	2
ME 4305	DR	Final Year Project-I	2	1	2	3
Total Hours and Credit Hours			15	6	6	18
			27			

Semester II

Course Code	Category	Course Title	Weekly Hours			Credit Hours
			Theoretical	Tutorial	Practical	
ME 4101	UR	English Language-IV	2	-	-	2
ME 4306	DR	Design of Machine Elements-II	3	1	-	3
ME 4307	DR	Refrigeration	2	1	2	3
ME 4309	DR	Control Systems	2	2	-	2
ME 4302 E	DR	Renewable Energy	2	-	-	2
ME 4304 E	DR	Computational Fluid Dynamics (CFD)	2	-	-	2
ME 4310	DR	Final Year Project-II	2	1	2	3
Total Hours and Credit Hours			15	5	4	17
			24			

10. Planning for personal development
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11. Admission standard (establishing regulations related to admission to the college or institute)
- Approval of student admission conditions in accordance with the regulations of the Ministry of Higher Education and Scientific Research (central admission).
- To pass the department's personal interview.
- Must be fit for medical examination.
- High school average.
- The absorptive capacity of the college.
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12. The most important sources of information about the program
- Market needs
- Local trends of the governorate
- Studies and questionnaires

A plan for Curriculum skills																		
Please situation Signal in Squares the interview for outputs Learning Individuality from the program Submissive For evaluation																		
				Learning Outputs required from the program														
the year / the level	Module name	Module Code	Basic or elective	Knowledge And understanding				Private Skills With the topic				Thinking skills				Skills the public and movable (or) skills the other Related Capable recruitment And evolution Personal			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4	D1	D2	D3	D4
The first	Calculus-I	ME 1201	Basic	√	√			√				√							
	Physics-I	ME 1202	Basic	√	√			√				√							
	Computer Science	ME 1204	Basic	√	√			√				√							
	Chemistry	ME 1203	Basic	√	√			√				√							
	Fundamentals of Electrical Engineering	ME 1303	Basic	√	√			√	√			√	√						
	Calculus-II	ME 1205	Basic	√				√				√							

	Physics-II	**ME 1206**	**Basic**	√	√			√				√							
	Engineering Mechanics (Static)	**ME 1301**	**Basic**	√	√			√				√							
	Engineering Drawing	**ME 1207**	**Basic**	√				√											
	Principles of manufacturing process	**ME 1302**	**Basic**	√				√											
	English Language-II	**ME 1102**	**Elective**	√				√											
	Democracy	**ME 2308**	**Elective**	√	√			√	√			√							
	English Language-I	**ME 1101**	**Elective**	√				√											
	Humanrights	**ME 1103**	**Elective**	√				√											
the second				**a1**	**a2**	**a3**	**a4**	**B1**	**B2**	**B3**	**B4**	**C1**	**C2**	**C3**	**C4**	**Dr 1**	**Dr 2**	**Dr 3**	**Dr4**
	Calculus-III	ME2201	**Basic**	√	√			√	√			√							
	Fluid Mechanics-I	ME2301	**Basic**	√				√	√			√	√						

	Strength of materials-I	ME2302	**Basic**	√				√				√	√						
	Thermodynamics-I	ME2303	**Basic**	√				√				√	√						
	Engineering Mechanics (Dynamics)	ME2308	**Basic**	√				√				√	√						
	Computer Programming	ME2310	**Basic**	√	√			√	√	√		√							
	Mechanical drawing	ME2309	**Basic**	√	√			√	√	√		√	√	√					
	Calculus-IV	ME2202	**Basic**	√	√			√	√			√	√						
	Fluid Mechanics-II	ME2305	**Basic**	√	√			√	√			√	√						
	Strength of materials-II	ME2306	**Basic**	√	√			√	√	√		√							
	Thermodynamics-II	ME2307	**Basic**	√	√			√	√	√		√	√	√					
	Engineering Metallurgy	ME2304	**Basic**	√	√			√	√			√	√						

	Mechanical Engineering	ME3310	**Basic**	**√**	**√**			**√**	**√**			**√**	√					
Third				**a1**	**a2**	**a3**	**a4**	**B1**	**B2**	**B3**	**B4**	**C1**	**C2**	**C3**	**C4**	**Dr 1**	**Dr 2**	**Dr 3**	**Dr4**
	Engineering Analysis	ME 3301	**Basic**					√	√			√	√			√	√		
	Heat Transfer-I	ME 3302	**Basic**					√	√			√	√			√	√		
	Theory of Machines-I	ME 3303	**Basic**					√	√			√	√			√	√		
	Internal Combustion Engines	ME 3304	**Basic**						√	√			√	√			√	√	
	Engineering Statistics	ME 3201	**Basic**							√	√			√	√			√	√
	Engineering Economy	ME 3203	**Basic**							√	√			√	√			√	√
	Electrical Machines	ME 3310	**Basic**							√	√			√	√			√	√
	Engineering Numerical Methods	ME 3202	**Basic**							√	√			√	√			√	√

	Heat Transfer-II	ME 3307	**Basic**								√	√			√	√			√	√
	Theory of Machines-II	ME 3308	**Basic**								√	√			√	√			√	√
	Manufacturing Processes	ME 3305	**Basic**								√	√			√	√			√	√
	Gas Dynamics	ME 3309	**Basic**								√	√			√	√			√	√
	Research Methodology	**ME 3306**	**Basic**								√	√			√	√			√	√
	Ethics & leadership skills	**ME 3101**	**Basic**								√	√			√	√			√	√
	Engineering Analysis	ME 3301	**Basic**								√	√			√	√			√	√
Fourth				**a1**	**a2**	**a3**	**a4**	**B1**	**B2**	**B3**	**B4**	**C1**	**C2**	**C3**	**C4**	**Dr 1**	**Dr 2**	**Dr 3**	**Dr4**	
	Design of Machine Elements-I	**ME 4301**	**Basic**								√	√			√	√			√	√

	Air conditioning	**ME 4302**	**Basic**								√	√			√	√			√	√
	Power plants	**ME 4303**	**Basic**								√	√			√	√			√	√
	Mechanical Vibrations	**ME 4304**	**Basic**								√	√			√	√			√	√
	Engineering Materials	**ME 4309**	**Basic**								√	√			√	√			√	√
	CAD-CAM	**ME 4303E**	**Basic**								√	√			√	√			√	√
	Final year project-I	**ME 4306**	**Basic**								√	√			√	√			√	√
	Design of Machine Elements-II	**ME 4307**	**Basic**								√	√			√	√			√	√
	Refrigeration	**ME 4308**	**Basic**								√	√			√	√			√	√
	Control Engineering & Measurements	**ME 4310**	**Basic**								√	√			√	√			√	√

	Industrial Engineering & Safety	ME 4305	**Basic**								√	√			√	√			√	√
	Corrosion Engineering	**ME 4306E**	**Basic**								√	√			√	√			√	√
	Operation research	**ME 4310**E	**Basic**								√	√			√	√			√	√
	Final year project-II	ME 4311	**Basic**								√	√			√	√			√	√
	Design of Machine Elements-I	**ME 4301**	**Basic**								√	√			√	√			√	√
	Air conditioning	**ME 4302**	**Basic**								√	√			√	√			√	√

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Course Description Form

Reviewing the performance of higher education institutions ((academic program review))

This course description provides a succinct summary of the most important course characteristics and the learning outcomes the student is expected to achieve Demonstrating whether they have made the most of the learning opportunities available. It must be linked to a description the program.

1. Enterprise Educational	University of Anbar
2. Section University / Center	Mechanical Engineering Department
3. Name / Code The decision	MEC 403/ Mechanical Vibrations
4. Programs that Enter In which	Mechanical Engineering Program
5. shapes the audience Available	Presence (practical)+ Electronic (theoretical)
6. The Course / the year	The second Academic Course
7. number hours Scholarship (total)	45 theoretical +15 solutions Issues +15 practical
8. date Preparation this description	10/3/2023

9. Goals of the decision:

The course describes the fundamental laws (e.g., Newton's laws of motion, energy method, Lagrange's method) can be applied to derive, compute and analyses the mechanical vibrations systems. These include natural frequencies, modes of vibrations, resonance phenomenon, effect of damping factor for single and multi-degree of freedom systems. The calculation of these values provides practical

solutions to avoid excessive vibrations to mechanical systems. Thus, students will be able to model mathematical relations, derivation/solution of equations of motion. The course also will reinforce the skills students relating to how to utilize experimental techniques of vibration measurement.

10. Outputs Learning and methods of Education

1. Derive the equations of motion for single degree of freedom (SDOF) and multi-degree of freedom systems (MDOF).
2. Understand the goal of damping systems in mechanical vibrating systems.
3. Model, calculate and interpret the response of vibrating of single degree of freedom (SDOF) and multi-degree of freedom systems (MDOF).
4. Analyse the vibratory behaviour of different mechanical vibration systems subjected to harmonic force or impulsive force.
5. Design model systems that minimize the transmission of vibration to mechanical or structural systems.

A. **Methods education and learning**

1. Lectures for the theory
2. Using engineering software
3. Experiences Laboratory immanence

B. Methods Evaluation

1. Exams Short
2. Exams Monthly
3. Reports Laboratory

C- Thinking Skills

1. Accreditation on Curriculum of the decision with sources and other Like books and Internet.
2. Solution Issues and duties at home includes ideas and applications.
4. Applied fundamentals of Engineering theory on Experiments Laboratory.
5. Ability on finding new methods and designs during expansion domain and think.

D- Skills the public and movable (Skills The other Related Capable recruitment and evolution Personal).

1. Ability on to set the problem and solve it.
2. Ability on using engineering software to solve mathematical equations and interpret the results in modeling systems.
3. Ability on finding better designs.
4. Ability on evaluation all designs and compare them with jealousy.

11. Module structure

week	hours	Outputs Learning required	Unit name / Course or the topic	Education method	Evolution method
1	**4**	Derive the equations of motion for single degree of freedom (SDOF) and multi-degree of freedom systems (MDOF).	Fundamentals of Vibration	(Lectures + tutorials + Lab)	Quiz Exam Report
2	**4**	Derive the equations of motion for single degree of freedom (SDOF) and multi-degree of freedom systems (MDOF).	Modeling Vibration / Harmonic motion	(Lectures + tutorials + Lab)	Quiz Exam Report
3	**4**	Derive the equations of motion for single degree of freedom (SDOF) and multi-degree of freedom systems (MDOF).	Free vibration of undamped SDOF systems (Newton's laws, Energy Method)	(Lectures + tutorials + Lab)	Quiz Exam Report
4	**4**	Derive the equations of motion for single degree of freedom (SDOF) and multi-degree of freedom systems (MDOF).	Longitudinal and torsional vibrations of bars or Shafts	(Lectures + tutorials + Lab)	Quiz Exam Report

5	**4**	Understand the goal of damping systems in mechanical vibrating systems.	Free vibration of viscously damped SDOF systems	(Lectures + tutorials + Lab)	Quiz Exam Report
6	**4**	Understand the goal of damping systems in mechanical vibrating systems.	Free vibration of damped SDOF systems with Coulomb and hysteretic damping	(Lectures + tutorials + Lab)	Quiz Exam Report
7	**4**	Model, calculate and interpret the response of vibrating of single degree of freedom (SDOF) and multi-degree of freedom systems (MDOF).	Harmonically forced SDOF systems (rotating imbalance, vibration isolation)	(Lectures + tutorials + Lab)	Quiz Exam Report
8	**4**	Model, calculate and interpret the response of vibrating of single degree of freedom (SDOF) and multi-degree of freedom systems (MDOF).	Harmonically forced SDOF systems (support motion,whirling of shafts)	(Lectures + tutorials + Lab)	Quiz Exam Report
9	**4**	Model, calculate and interpret the response of vibrating of single degree of freedom (SDOF) and multi-degree of freedom systems (MDOF).	Free vibration of 2 DOF systems	(Lectures + tutorials + Lab)	Quiz Exam Report
10	**4**	Model, calculate and interpret the response of vibrating of single degree of freedom (SDOF) and multi-degree of freedom systems (MDOF).	Free vibration of 2 DOF systems	(Lectures + tutorials + Lab)	Quiz Exam Report
11	**4**	Analyse the vibratory behaviour of different mechanical vibration systems subjected to harmonic force or impulsive force.	Eigenvalue problem for free vibration of 2 DOF	(Lectures + tutorials + Lab)	Quiz Exam Report
12	**4**	Analyse the vibratory behaviour of different mechanical vibration systems subjected to harmonic force or impulsive force.	Forced vibration of 2 DOF systems	(Lectures + tutorials + Lab)	Quiz Exam Report

13	**4**	Design model systems that minimize the transmission of vibration to mechanical or structural systems.	Equations of motion for MDOF systems	(Lectures + tutorials + Lab)	Quiz Exam Report
14	**4**	Design model systems that minimize the transmission of vibration to mechanical or structural systems.	Forced vibrations of MDOF systems using modal analysis	(Lectures + tutorials + Lab)	Quiz Exam Report
15	**4**		Progress Exam	(Lectures + tutorials + Lab)	Quiz Exam Report

12. Infrastructure Structure	
Readings required : ▪ The module. ▪ books ▪ Other	▪ Rao, S. S., & Yap, F. F. (1995). Mechanical vibrations (Vol. 4, pp. 75-848). New York: Addison-wesley ▪ Thomson, W. T. (2018). Theory of vibration with applications. CrC Press.
requirements especially	Nothing
Services Social (Include on way Example Lectures Guests And training Professional And studies Field)	Nothing

13. Admissions	
Requirements Previous	MEC 308 - Theory of Machines-II MEC 102 - Engineering Mechanics II (Dynamics)
less number from Students	12
Larger number from Students	55

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2	**4**	Derive the equations of motion for single degree of freedom (SDOF) and multi-degree of freedom systems (MDOF).	Modeling Vibration / Harmonic motion	(Lectures + tutorials + Lab)	Quiz Exam Report
3	**4**	Derive the equations of motion for single degree of freedom (SDOF) and multi-degree of freedom systems (MDOF).	Free vibration of undamped SDOF systems (Newton's laws, Energy Method)	(Lectures + tutorials + Lab)	Quiz Exam Report
4	**4**	Derive the equations of motion for single degree of freedom (SDOF) and multi-degree of freedom systems (MDOF).	Longitudinal and torsional vibrations of bars or Shafts	(Lectures + tutorials + Lab)	Quiz Exam Report

5	**4**	Understand the goal of damping systems in mechanical vibrating systems.	Free vibration of viscously damped SDOF systems	(Lectures + tutorials + Lab)	Quiz Exam Report
6	**4**	Understand the goal of damping systems in mechanical vibrating systems.	Free vibration of damped SDOF systems with Coulomb and hysteretic damping	(Lectures + tutorials + Lab)	Quiz Exam Report
7	**4**	Model, calculate and interpret the response of vibrating of single degree of freedom (SDOF) and multi-degree of freedom systems (MDOF).	Harmonically forced SDOF systems (rotating imbalance, vibration isolation)	(Lectures + tutorials + Lab)	Quiz Exam Report
8	**4**	Model, calculate and interpret the response of vibrating of single degree of freedom (SDOF) and multi-degree of freedom systems (MDOF).	Harmonically forced SDOF systems (support motion,whirling of shafts)	(Lectures + tutorials + Lab)	Quiz Exam Report
9	**4**	Model, calculate and interpret the response of vibrating of single degree of freedom (SDOF) and multi-degree of freedom systems (MDOF).	Free vibration of 2 DOF systems	(Lectures + tutorials + Lab)	Quiz Exam Report
10	**4**	Model, calculate and interpret the response of vibrating of single degree of freedom (SDOF) and multi-degree of freedom systems (MDOF).	Free vibration of 2 DOF systems	(Lectures + tutorials + Lab)	Quiz Exam Report
11	**4**	Analyse the vibratory behaviour of different mechanical vibration systems subjected to harmonic force or impulsive force.	Eigenvalue problem for free vibration of 2 DOF	(Lectures + tutorials + Lab)	Quiz Exam Report
12	**4**	Analyse the vibratory behaviour of different mechanical vibration systems subjected to harmonic force or impulsive force.	Forced vibration of 2 DOF systems	(Lectures + tutorials + Lab)	Quiz Exam Report

13	**4**	Design model systems that minimize the transmission of vibration to mechanical or structural systems.	Equations of motion for MDOF systems	(Lectures + tutorials + Lab)	Quiz Exam Report
14	**4**	Design model systems that minimize the transmission of vibration to mechanical or structural systems.	Forced vibrations of MDOF systems using modal analysis	(Lectures + tutorials + Lab)	Quiz Exam Report
15	**4**		Progress Exam	(Lectures + tutorials + Lab)	Quiz Exam Report

12. Infrastructure Structure	
Readings required : ▪ The module. ▪ books ▪ Other	▪ Rao, S. S., & Yap, F. F. (1995). Mechanical vibrations (Vol. 4, pp. 75-848). New York: Addison-wesley ▪ Thomson, W. T. (2018). Theory of vibration with applications. CrC Press.
requirements especially	Nothing
Services Social (Include on way Example Lectures Guests And training Professional And studies Field)	Nothing

13. Admissions	
Requirements Previous	MEC 308 - Theory of Machines-II MEC 102 - Engineering Mechanics II (Dynamics)
less number from Students	12
Larger number from Students	55

Course Description Form

Reviewing the performance of higher education institutions ((academic program review))

This course description provides a succinct summary of the most important course characteristics and the learning outcomes the student is expected to achieve Demonstrating whether they have made the most of the learning opportunities available. It must be linked to a description the program.

1. Enterprise Educational	University of Anbar
2. Section University / Center	Mechanical Engineering Department
3. Name / Code The decision	MEC 408/ Control Systems
4. Programs that Enter In which	Mechanical Engineering Program
5. shapes the audience Available	Presence (practical)+ Electronic (theoretical)
6. The Course / the year	The second Academic Course
7. number hours Scholarship (total)	45 theoretical +15 solutions Issues +15 practical
8. date Preparation this description	3/11/2023

9. Goals of the decision:

Engineering control is the study of the analysis and regulation of the output behaviors of dynamical systems subject to input signals. It involves the design of engineering products or systems where a requirement is to accurately control some quantity. It is essential for students pursuing degrees in electrical, mechanical, aerospace, biomedical, or chemical engineering. Control systems are found in a broad range of applications within these disciplines, from aircraft and spacecraft to robots and process control systems.

10. Outputs Learning and methods of Education

1. Identify open and closed loop control system and formulate mathematical model of physical systems.
2. Compute the characteristics of trainset responses and stability of various control systems and use these states to design a desired control system
3. Use Evans root locus and Frequency response methods in control design for real world systems
4. Learn the measurement systems, errors of measurement, as well as explain working principles of sensors and transducers.

A. **Methods education and learning**

1. Lectures for the theory
2. Using engineering software
3. Experiences Laboratory immanence

B. Methods Evaluation

1. Exams Short
2. Exams Monthly
3. Reports Laboratory

C- Thinking Skills

1. Accreditation on Curriculum of the decision with sources and other Like books and Internet.
2. Solution Issues and duties at home includes ideas and applications.
4. Applied fundamentals of Engineering theory on Experiments Laboratory.
5. Ability on finding new methods and designs during expansion domain and think.

D- Skills the public and movable (Skills The other Related Capable recruitment and evolution Personal).

1. Ability on to set the problem and solve it.
2. Ability on using engineering software to solve mathematical equations and interpret the results in modeling systems.
3. Ability on finding better designs.
4. Ability on evaluation all designs and compare them with jealousy.

11. Module structure

week	hours	Outputs Learning required	Unit name / Course or the topic	Education method	Evolution method
1	**4**	Identify open and closed loop control system and formulate mathematical model of physical systems.	Introduction to automatic control	(Lectures + tutorials + Lab)	Quiz Exam Report
2	**4**	Identify open and closed loop control system and formulate mathematical model of physical systems.	Representation of control components	(Lectures + tutorials + Lab)	Quiz Exam Report
3	**4**	Compute the characteristics of trainset responses and stability of various control systems and use these states to design a desired control system	Representation of control systems	(Lectures + tutorials + Lab)	Quiz Exam Report
4	**4**	Compute the characteristics of trainset responses and stability of various control systems and use these states to design a desired control system	Mass, spring damper system	(Lectures + tutorials + Lab)	Quiz Exam Report
5	**4**	Compute the characteristics of trainset responses and stability of various control systems and use these states to design a desired control system	Hydraulic system	(Lectures + tutorials + Lab)	Quiz Exam Report
6	**4**	Compute the characteristics of trainset responses and stability of various control systems and use these states to design a desired control	Pneumatic system	(Lectures + tutorials + Lab)	Quiz Exam Report

		system			
7	**4**	Use Evans root locus and Frequency response methods in control design for real world systems	Steady-state operation	(Lectures + tutorials + Lab)	Quiz Exam Report
8	**4**	Use Evans root locus and Frequency response methods in control design for real world systems	Laplace transformer	(Lectures + tutorials + Lab)	Quiz Exam Report
9	**4**	Use Evans root locus and Frequency response methods in control design for real world systems	The characteristic function	(Lectures + tutorials + Lab)	Quiz Exam Report
10	**4**	Learn the measurement systems, errors of measurement, as well as explain working principles of sensors and transducers.	Transient and steady-state responses	(Lectures + tutorials + Lab)	Quiz Exam Report
11	**4**	Learn the measurement systems, errors of measurement, as well as explain working principles of sensors and transducers.	Steady-state operation	(Lectures + tutorials + Lab)	Quiz Exam Report
12	**4**	Learn the measurement systems, errors of measurement, as well as explain working principles of sensors and transducers.	Laplace transformer	(Lectures + tutorials + Lab)	Quiz Exam Report
13	**4**	To solve various practical applications	Transient and steady-state responses	(Lectures + tutorials + Lab)	Quiz Exam Report
14	**4**	To solve various practical applications	Steady-state errors in control systems	(Lectures + tutorials + Lab)	Quiz Exam Report
15	**4**		Stability of control systems	(Lectures + tutorials + Lab)	Quiz Exam Report

12. Infrastructure Structure

Readings required : ▪ The module. ▪ books ▪ Other	▪ Automatic Control Engineering, First Edition 1961, by Francis H. Raven, McGraw Hill . ▪ Modern Control Systems, Twelfth Edition 2011, by Richard C. Dorf and Robert H. Bishop, Prentice Hall.
requirements especially	Nothing
Services Social (Include on way Example Lectures Guests And training Professional And studies Field)	Nothing

13. Admissions	
Requirements Previous	MEC 308 - Theory of Machines-II MEC 403 - Mechanical Vibrations
less number from Students	12
Larger number from Students	55

Course description form

Reviewing the performance of higher education institutions ((academic program review))

This course description provides a succinct summary of the most important course characteristics and the learning outcomes the student is expected to achieve Demonstrating whether they have made the most of the learning opportunities available. It must be linked to a description the program.

1. Enterprise Educational	University of Anbar
2. Section University / Center	Engineering Mechanical
3. name / Code The decision	Air conditioning /ME4302
4. Programs that Enters In which	Bachelor's
5. shapes the audience Available	Presence actual
6. the chapter / the year	the chapter Academic the first/2024-2023
7. number hours Scholarship (total)	60
8. date Preparation this the description	12/10/2023
9. Goals The decision :	

1- Knowing the properties of moist air and how to find each property
2- Gaining the ability to use the psychometric chart to find the properties of air and draw air conditioning operations.

3- Learn how to calculate heating and cooling loads.

4- Identify the types of air conditioning systems.

5- Teaching students how to calculate the sizes of air ducts, as well as calculate the pressure loss in the air distribution system.

10. Outputs Learning And methods education And learning And evaluation

In end of the Academic course will be able to:
1. Application Concepts the basic For dynamics Thermal And Use Scheme to calculate Properties Air Wet And also acting Operations conditioning Air on it.
2- Account Loads The heating And cooling And also to set conditions the design Interior And external.
3. Comparison between Systems conditioning Air different.
4. Design sewers Air For systems Air conditioning And determine drop the pressure Total For a system sewers Air.

Methods education and learning

.
Lectures the theory + Experiments Laboratory

Methods Evaluation

Exams The short one. Exams Monthly And finality. Duties Home. Reports Laboratory.

C- Skills Thinking

1- Development capacity requester on performance Duties And delivered within an appointment specific.

2- Try application Concepts With a solution Species Different from matters.

3- Development requester in side Dialogue And discussion .

Methods education And learning

- Theoretical lectures
- Homework
- Laboratory experiments

Methods Evaluation

1- Short exams and monthly exams
2- Homework assignments
3- Laboratory reports
4- Final exam

D- Skills the public And movable (Skills The other Related Capable recruitment And evolution Personal).

1- Development capacity requester on Dealing with Problems Engineering.

2- Ability requester on completion the accounts Design Private With systems conditioning Air.

3- Development capacity requester on Dialogue And discussion.

11. The module structure

week	hours	Learning Outputs required	Unit name / Course or the topic	Education method	Evaluation method
1	3	knowledge date development science conditioning Air	Introduction to air conditioning	Lectures theory	Questions General, discussion
3,2	6+3	to learn How account Properties Air Wet using Laws.	Calculating the properties of moist air.	Lectures Theory, experiment practical	Duties Home, exam, report
4, 5	6+3	to learn Use Scheme And draw Operations conditioning Air on him	Resource planning and resource operations.	Lectures Theory, experiment practical	Duties Home, exam, report
6,7	6+3	to learn meaning Comforts Thermal And Schemes Comforts And how to choose Circumstances Design.	Thermal comfort and interior and exterior design conditions	Lectures theory	Questions General, discussion
8, 9, 10, 11	12+3	to learn style account Loads The heating And cooling.	Heating load and cooling load calculations	Lectures theory	Duties Home, exam
12, 13, 14,15	12+3	to learn design Systems distribution Air And knowledge	Air conditioning systems and air distribution systems	Lectures Theory, experiment practical	Duties Home, exam, report

		Types different For systems conditioning Air			

12. Structure Infrastructure	
Readings required : ▪ books of The module ▪ Other	**Sources are placed** *Refrigeration and air conditioning*by Ahmedul Ameen, Prentice-Hall of India, New Delhi, 2007 *Refrigeration and air conditioning*by*SNSapali.*
requirements especially	Nothing
Services Social (Include on way Example Lectures Guests And training Professional And studies Field)	Nothing

13. admissions	
Requirements Previous	ME 2303, ME 2307, ME 2301, ME 2305, ME 3302, ME 3307
less number from Students	30
Larger number from Students	50

Course description form

Reviewing the performance of higher education institutions ((academic program review))

This course description provides a succinct summary of the most important course characteristics and the learning outcomes the student is expected to achieve Demonstrating whether they have made the most of the learning opportunities available. It must be linked to a description the program.

1. Enterprise Educational	University of Anbar
2. Section University / Center	Mechanics
3. name / Code The decision	Computer Programming ME 2310
4. Programs that Enters In which	Mechanical Engineering Program
5. shapes the audience Available	My presence inside the hall + online presence
6. the chapter / the year	The chapter Academic the second
7. number hours Scholarship (total)	45
8. date Preparation this the description	21/10/2023
9. Goals The decision :	
1. To solve problems through writing FORTRAN programs.	

2. To be able to develop FORTRAN programs from specifications and document those program.
3. To understand the useful of control structures, data types, input and output process.
4. To know how to verify that the programs are running correctly.
5. To write FORTRAN programs for engineering applications.

10. Outputs Learning And methods education And learning And evaluation

1. Write simple program modules to implement single numerical methods and
2. algorithms.
3. Calculate solutions to mechanical engineering problems using standard numerical
4. methods.
5. Test program output for accuracy using hand calculations and debugging techniques.
6. Analyze the applicability and accuracy of numerical solutions to diverse mechanical
7. engineering problems.
8. Synthesize multiple program modules into larger program packages.
9. Detail numerical results into a readable format that answers specific mechanical engineering analysis and design question
10.

11. Methods education And learning

- ✓ Lectures the theory
- ✓ Exercises and activities in hall the lesson.
- ✓ Reports the operation.
- ✓ Guidance students to some sources that maybe benefit of which.

12. Methods Evaluation

- ✓ Quizzes
- ✓ Monthly and final exams
- ✓ Homework
- ✓ Laboratory reports

13. skills Thinking

- ✓ The ability to distinguish, identify, define, formulate, and solve engineering problems by applying principles of engineering, science and mathematics.
- ✓ The ability to perceive the continual necessity for professional knowledge growth and how to find, assess, assemble and apply it properly.
- ✓ Analyze the applicability and accuracy of numerical solutions to diverse mechanical engineering problems.
- ✓ Controlling the approved curriculum first and then dealing with other sources.

14. Skills the public and movable (Skills the other Related Capable recruitment and evolution Personal).

- ✓ Developing the student's ability to Write Programming structures, variables/data types, read /write/print statements,
- ✓ Developing the student's ability to Programs for Engineering Applications
- ✓ Developing the student's ability to IF Statements
- ✓ Developing the student's ability to work Matrices Program

15. The Module structure					
the week	**hours**	**Learning Outputs required**	**name Unit / Course or the topic**	**Education method**	**Evaluation method**
1,2	6	1- Ability to write simple program modules to implement single numerical methods and algorithms.	Programming structures, variables/data types, read /write/print statements,	Lectures and tutorials	Quiz Exam HW
3,4,5	9	2- Ability to calculate solutions to mechanical engineering problems using standard numerical methods	IF Statements. & Do Loops.	Lectures and tutorials	Quiz Exam HW
6	3	3- Test program output for accuracy using hand calculations and debugging techniques applications.	File Input and output and formatting	Lectures and tutorials	Quiz Exam HW
7	3	CLO 1&CLO2& CLO3	EXAM1		
8 , 9	6	4- The ability to analyze the applicability and accuracy of numerical solutions to diverse mechanical engineering problems	Arrays and Matrices	Lectures and tutorials	Quiz Exam HW
10	3	5- Synthesize multiple program modules into larger program packages	Subroutines and Functions	Lectures and tutorials	Quiz Exam HW
11,12, 13,14	12	6- Detail numerical results into a readable format that answers specific mechanical engineering analysis and design questions	Programs for Engineering Applications	Lectures and tutorials	Quiz Exam HW
15	3	CLO 4&CLO5& CLO6	EXAM2		

1,2	6	1- Ability to write simple program modules to implement single numerical methods and algorithms.	Programming structures, variables/data types, read /write/print statements,	Lectures and tutorials	Quiz Exam HW
3,4,5	9	2- Ability to calculate solutions to mechanical engineering problems using standard numerical methods	IF Statements. & Do Loops.	Lectures and tutorials	Quiz Exam HW
6	3	3- Test program output for accuracy using hand calculations and debugging techniques applications.	File Input and output and formatting	Lectures and tutorials	Quiz Exam HW
7	3	CLO 1&CLO2& CLO3	EXAM1		
8 , 9	6	4- The ability to analyze the applicability and accuracy of numerical solutions to diverse mechanical engineering problems	Arrays and Matrices	Lectures and tutorials	Quiz Exam HW
10	3	5- Synthesize multiple program modules into larger program packages	Subroutines and Functions	Lectures and tutorials	Quiz Exam HW

11,12, 13,14	12	6- Detail numerical results into a readable format that answers specific mechanical engineering analysis and design questions	Programs for Engineering Applications	Lectures and tutorials	Quiz Exam HW
15	3	CLO 4&CLO5& CLO6	EXAM2		

16. Structure Infrastructure	
Readings required : ▪ books The module ▪ Other	1. . University of DuhramITS,"An Introduction to Programming in FORTRAN90",2007 1. J.Adams,"Fortran 90 Handbook",Mc-Graw Hill Book Company 1992. 2. Ian D.Chivers," Introduction to Programming with Fortran",Springer ,2006.
requirements especially	Nothing
Services Social (Include on way Example Lectures Guests And training Professional And studies Field)	Nothing

17. admissions	
Requirements Previous	ME 1209 Computer Science
less number from Students	20
Larger number from Students	30

Course description form

Reviewing the performance of higher education institutions ((academic program review))

This course description provides a succinct summary of the most important course characteristics and the learning outcomes the student is expected to achieve Demonstrating whether they have made the most of the learning opportunities available. It must be linked to a description the program.

1. Enterprise Educational	University of Anbar
2. Section University / Center	Mechanics
3. name / Code The decision	ME 2311–Electrical Machines
4. Programs that Enters In which	Mechanical Engineering Program
5. shapes the audience Available	My presence inside the hall
6. the chapter / the year	The chapter Academic the first
7. number hours Scholarship (total)	45
8. date Preparation this the description	2/10/2023
9. Goals The decision :	
1. Study the DC machines construction (Generator and Motor) and principle of operation.	
2. Understand the various energy losses and efficiencies (mechanical and electrical) of DC Generators.	
3. Understand the various energy losses and efficiencies (mechanical and electrical) as well as the speed control of a DC motor.	
4. Explain the basic construction and operation of different types of transformers with the various energy loss and efficiencies as well as the basic electrical power transmission.	
10. Outputs Learning And methods education And learning And evaluation	
1. Identify the constructions and principles of operation of DC machines (Generator and Motor). 2. Apply the basic principles to determine the various energy losses and efficiencies (mechanical and electrical) of DC Generators. 3. Apply the basic principles to determine the various energy losses and efficiencies (mechanical and electrical) as well as the speed control of a DC motor. 4. Identify the basic construction and operation of different types of transformers with the applying of basic principles to estimate the various energy loss and efficiencies as well as the electrical power transmission	
11. Methods education And learning	
✓ Lectures the theory ✓ Exercises and activities in hall the lesson. ✓ Reports the operation. ✓ Guidance students to some sources that maybe benefit of which.	
12. Methods Evaluation	

- ✓ Quizzes
- ✓ Monthly and final exams
- ✓ Homework
- ✓ Laboratory reports

13. skills Thinking
- ✓ The ability to Identify the constructions and principles of operation of DC machines (Generator and
- ✓ The ability to Apply the basic principles to determine the various energy losses and efficiencies

14. Skills the public and movable (Skills the other Related Capable recruitment and evolution Personal).
- ✓ Developing the student's ability to solve electrical engineering
- ✓ Developing the student's ability to the basic principles to determine the various energy losses and efficiencies (mechanical and electrical) as well as the speed control of a DC motor.

15. The Module structure

the week	hours	Learning Outputs required	name Unit / Course or the topic	Education method	Evaluation method
1	3	Identify the constructions and principles of operation of DC machines (Generator and Motor).	DC machines construction	(Lectures+ Tutorials)	Quizzes, Exams and HW
2	3	Apply the basic principles to determine the various energy losses and efficiencies (mechanical and electrical) of DC Generators.	Principle of operation of DC generators	(Lectures+ Tutorials)	Quizzes, Exams and HW
3	3	Apply the basic principles to determine the various energy losses and efficiencies (mechanical and electrical) as well as the speed control of a DC motor.	Types of DC generators	(Lectures+ Tutorials)	Quizzes, Exams and HW
4	3	Identify the basic construction and operation of different types of transformers with the applying of basic principles to estimate the various energy loss and efficiencies as well as the electrical power transmission.	Losses and efficiency of DC generators	(Lectures+ Tutorials)	Quizzes, Exams and HW
5	3	Apply the basic principles to determine the various energy losses and efficiencies (mechanical and electrical) as well as the speed control of a DC motor.	Parallel operation of DC generators	(Lectures+ Tutorials)	Quizzes, Exams and HW
6	3	Identify the basic construction and operation of different types of transformers with the applying of basic principles to estimate the various energy loss and efficiencies	Principle of DC motors	(Lectures+ Tutorials)	Quizzes, Exams and HW

		as well as the electrical power transmission.			
7	3	Identify the constructions and principles of operation of DC machines (Generator and Motor).	Types of DC motors	(Lectures+ Tutorials)	Quizzes, Exams and HW
8	3	Apply the basic principles to determine the various energy losses and efficiencies (mechanical and electrical) of DC Generators.	DC motors losses, efficiency	(Lectures+ Tutorials)	Quizzes, Exams and HW
9	3	Apply the basic principles to determine the various energy losses and efficiencies (mechanical and electrical) as well as the speed control of a DC motor.	Speed control of DC motors	(Lectures+ Tutorials)	Quizzes, Exams and HW
10	3	Identify the basic construction and operation of different types of transformers with the applying of basic principles to estimate the various energy loss and efficiencies as well as the electrical power transmission	Transformer construction	(Lectures+ Tutorials)	Quizzes, Exams and HW
11	3	Identify the constructions and principles of operation of DC machines (Generator and Motor).	principle of operation of transformer	(Lectures+ Tutorials)	Quizzes, Exams and HW
12	3	Apply the basic principles to determine the various energy losses and efficiencies (mechanical and electrical) of DC Generators.	Types of transformers ordinary, all-day, and auto	(Lectures+ Tutorials)	Quizzes, Exams and HW
13	3	Identify the constructions and principles of operation of DC machines (Generator and Motor).	Losses and efficiencies	(Lectures+ Tutorials)	Quizzes, Exams and HW
14	3	Apply the basic principles to determine the various energy losses and efficiencies (mechanical and electrical) of DC Generators.	The basic principles of electrical power transmission.	(Lectures+ Tutorials)	Quizzes, Exams and HW
15	3			(Lectures+ Tutorials)	Final Exam

16. Structure Infrastructure	
Readings required : ▪ books The module ▪ Other	1. Electrical Technology by Theraja. 2. Electric Machinery Fundamentals by S. Chapman.
requirements especially	Nothing
Services Social (Include on way Example Lectures Guests And training Professional And studies Field)	Nothing

17. admissions	
Requirements Previous	
less number from Students	20
Larger number from Students	40

Course description form

Reviewing the performance of higher education institutions ((academic program review))

This course description provides a succinct summary of the most important course characteristics and the learning outcomes the student is expected to achieve Demonstrating whether they have made the most of the learning opportunities available. It must be linked to a description the program.

1. Enterprise Educational	University of Anbar
2. Section University / Center	Mechanics
3. name / Code The decision	ME 2311–Electrical Machines
4. Programs that Enters In which	Mechanical Engineering Program
5. shapes the audience Available	My presence inside the hall
6. the chapter / the year	The chapter Academic the first
7. number hours Scholarship (total)	45
8. date Preparation this the description	2/10/2023
9. Goals The decision :	

1. Study the DC machines construction (Generator and Motor) and principle of operation.
2. Understand the various energy losses and efficiencies (mechanical and electrical) of DC Generators.
3. Understand the various energy losses and efficiencies (mechanical and electrical) as well as the speed control of a DC motor.
4. Explain the basic construction and operation of different types of transformers with the various energy loss and efficiencies as well as the basic electrical power transmission.
5.

10. Outputs Learning And methods education And learning And evaluation

1. Identify the constructions and principles of operation of DC machines (Generator and Motor).
2. Apply the basic principles to determine the various energy losses and efficiencies (mechanical and electrical) of DC Generators.
3. Apply the basic principles to determine the various energy losses and efficiencies (mechanical and electrical) as well as the speed control of a DC motor.
4. Identify the basic construction and operation of different types of transformers with the applying of basic principles to estimate the various energy loss and efficiencies as well as the electrical power transmission

11. Methods education And learning

- ✓ Lectures the theory
- ✓ Exercises and activities in hall the lesson.
- ✓ Reports the operation.
- ✓ Guidance students to some sources that maybe benefit of which.

12. Methods Evaluation

- ✓ Quizzes
- ✓ Monthly and final exams
- ✓ Homework
- ✓ Laboratory reports

13. skills Thinking

- ✓ The ability to Identify the constructions and principles of operation of DC machines (Generator and

✓ The ability to Apply the basic principles to determine the various energy losses and efficiencies
14. Skills the public and movable (Skills the other Related Capable recruitment and evolution Personal). ✓ Developing the student's ability to solve electrical engineering ✓ Developing the student's ability to the basic principles to determine the various energy losses and efficiencies (mechanical and electrical) as well as the speed control of a DC motor.

15. The Module structure

the week	hours	Learning Outputs required	name Unit / Course or the topic	Education method	Evaluation method
1	3	Identify the constructions and principles of operation of DC machines (Generator and Motor).	DC machines construction	(Lectures+ Tutorials)	Quizzes, Exams and HW
2	3	Apply the basic principles to determine the various energy losses and efficiencies (mechanical and electrical) of DC Generators.	Principle of operation of DC generators	(Lectures+ Tutorials)	Quizzes, Exams and HW
3	3	Apply the basic principles to determine the various energy losses and efficiencies (mechanical and electrical) as well as the speed control of a DC motor.	Types of DC generators	(Lectures+ Tutorials)	Quizzes, Exams and HW

4	3	Identify the basic construction and operation of different types of transformers with the applying of basic principles to estimate the various energy loss and efficiencies as well as the electrical power transmission.	Losses and efficiency of DC generators	(Lectures+ Tutorials)	Quizzes, Exams and HW
5	3	Apply the basic principles to determine the various energy losses and efficiencies (mechanical and electrical) as well as the speed control of a DC motor.	Parallel operation of DC generators	(Lectures+ Tutorials)	Quizzes, Exams and HW
6	3	Identify the basic construction and operation of different types of transformers with the applying of basic principles to estimate the various energy loss and efficiencies as well as the electrical power transmission.	Principle of DC motors	(Lectures+ Tutorials)	Quizzes, Exams and HW
7	3	Identify the constructions and principles of operation of DC machines (Generator and Motor).	Types of DC motors	(Lectures+ Tutorials)	Quizzes, Exams and HW
8	3	Apply the basic principles to determine the various energy losses and efficiencies (mechanical and electrical) of DC Generators.	DC motors losses, efficiency	(Lectures+ Tutorials)	Quizzes, Exams and HW
9	3	Apply the basic principles to determine the various energy losses and efficiencies (mechanical and electrical) as well as the speed control of a DC motor.	Speed control of DC motors	(Lectures+ Tutorials)	Quizzes, Exams and HW
10	3	Identify the basic construction and operation of different types of transformers with the applying of basic principles to estimate the various energy	Transformer construction	(Lectures+ Tutorials)	Quizzes, Exams and HW

		loss and efficiencies as well as the electrical power transmission			
11	3	Identify the constructions and principles of operation of DC machines (Generator and Motor).	principle of operation of transformer	(Lectures+ Tutorials)	Quizzes, Exams and HW
12	3	Apply the basic principles to determine the various energy losses and efficiencies (mechanical and electrical) of DC Generators.	Types of transformers ordinary, all-day, and auto	(Lectures+ Tutorials)	Quizzes, Exams and HW
13	3	Identify the constructions and principles of operation of DC machines (Generator and Motor).	Losses and efficiencies	(Lectures+ Tutorials)	Quizzes, Exams and HW
14	3	Apply the basic principles to determine the various energy losses and efficiencies (mechanical and electrical) of DC Generators.	The basic principles of electrical power transmission.	(Lectures+ Tutorials)	Quizzes, Exams and HW
15	3			(Lectures+ Tutorials)	Final Exam

16. Structure Infrastructure	
Readings required : ▪ books The module ▪ Other	1. Electrical Technology by Theraja. 2. Electric Machinery Fundamentals by S. Chapman.
requirements especially	Nothing
Services Social (Include on way Example Lectures Guests And training Professional And studies Field)	Nothing

17. admissions	
Requirements Previous	
less number from Students	20
Larger number from Students	30

Course description form

Reviewing the performance of higher education institutions ((academic program review))

This course description provides a succinct summary of the most important course characteristics and the learning outcomes the student is expected to achieve Demonstrating whether they have made the most of the learning opportunities available. It must be linked to a description the program.

1. Enterprise Educational	University of Anbar
2. Section University / Center	Mechanics
3. name / Code The decision	Engineering Analysis/ ME3301
4. Programs that Enters In which	To divide Engineering Mechanical/Bachelor's degree
5. shapes the audience Available	My presence inside the hall
6. the chapter / the year	The chapter Academic the first
7. number hours Scholarship (total)	45
8. date Preparation this the description	30/ 10/ 2023
9. Goals The decision :	
1. To enhance the student's ability to think logically and mathematically in modeling sys-	

tems.

2. To use ordinary differential equation for solving practical problems.
3. To knowledge the partial differential equations (PDEs) and how they can serve as models for physical processes such as mechanical vibrations, transport phenomena including diffusion, heat transfer, and advection, and electrostatics.
4. To use Fourier transforms and the convolution theorem to analyze and solve the heat equation.
5. Select and execute appropriate methods to achieve objectives.
6. Interpret and communicate the results.

10. Outputs Learning And methods education And learning And evaluation

1. Think logically and mathematically for solving practical problems such as mechanical vibrations, fluid flow problems, heat transfer problems.
2. Practice modelling and be able to translate engineering and physical situations into a mathematical model
3. To gain experience and further mastery of complete problem, solving fluency based on Fourier Series and Partial Differential Equations.
4. Use proper assumptions to describe the complex behaviour of practical problems and able to read and interpret problem objectives.

11. Methods education And learning

- ✓ Lectures the theory
- ✓ Exercises and activities in hall the lesson.
- ✓ Reports the operation.
- ✓ Guidance students to some sources that maybe benefit of which.

12. Methods Evaluation

- ✓ Quizzes
- ✓ Monthly and final exams
- ✓ Homework
- ✓ Laboratory reports

13. skills Thinking

- ✓ Monitoring effective implementation first and then controlling other sources.
- ✓ The ability to comprehend the approved material that includes several different topics
- ✓ The ability to solve differential equations

14. Skills the public and movable (Skills the other Related Capable recruitment and evolution Personal).

- ✓ Developing the student's ability to dialogue and discuss.
- ✓ Developing the student's ability to solve engineering problems by solving different types of engineering exercises.
- ✓ Developing the student's ability to deal with multiple media.
- ✓ Developing the student's ability to dialogue and discuss.

15. The Module structure

the week	hours	Learning Outputs required	name Unit / Course or the topic	Education method	Evaluation method
1	3	1	Modeling with Higher Order Linear Differential Equations.	(Lectures+ Tutorials)	Quizzes, Exams and HW
2	3	1	Modeling with Higher Order Linear Differential Equations.	(Lectures+ Tutorials)	Quizzes, Exams and HW
3	3	1	Modeling with Higher Order Linear Differential Equations.	(Lectures+ Tutorials)	Quizzes, Exams and HW
4	3	2	Systems of Differential Equations.	(Lectures+ Tutorials)	Quizzes, Exams and HW
5	3	2	Systems of Differential Equations.	(Lectures+ Tutorials)	Quizzes, Exams and HW
6	3	2	Applications of Ordinary Differential Equations.	(Lectures+ Tutorials)	Quizzes, Exams and HW
7	3	2	Applications of Ordinary Differential Equations.	(Lectures+ Tutorials)	Quizzes, Exams and HW
8	3	2	Fourier series	(Lectures+ Tutorials)	Quizzes, Exams and HW
9	3	3	Fourier series	(Lectures+ Tutorials)	Quizzes, Exams and HW
10	3	3	Partial Differential Equations.	(Lectures+ Tutorials)	Quizzes, Exams and HW

11	3	3	Partial Differential Equations.	(Lectures+ Tutorials)	Quizzes, Exams and HW
12	3	4	Partial Differential Equations.	(Lectures+ Tutorials)	Quizzes, Exams and HW
13	3	4	Functions of complex variables	(Lectures+ Tutorials)	Quizzes, Exams and HW
14	3	5	Functions of complex variables	(Lectures+ Tutorials)	Quizzes, Exams and HW
15	3	5	Functions of complex variables	(Lectures+ Tutorials)	Quizzes, Exams and HW
16			Final Exam		Exam

16. Structure Infrastructure	
Readings required : ▪ books The module ▪ Other	**Text Book(s):** 1- Erwin Kreyszig, Advanced Engineering Mathematics, 10th edition, 2011, John Wiley. 2- Mathematical Methods, by S. M. Yousuf **Recommended Readings:** 3- Zill, D., Wright, W. S., & Cullen, M. R. (2011). Advanced engineering mathematics. Jones & Bartlett Learning. 4-
requirements especially	Nothing
Services Social (Include on way Example Lectures Guests And training Professional And studies Field)	Nothing

17. admissions	
Requirements Previous	ME2202 Calculus IV
less number from Students	25
Larger number from Students	50

Course description form

Reviewing the performance of higher education institutions ((academic program review))

This course description provides a succinct summary of the most important course characteristics and the learning outcomes the student is expected to achieve Demonstrating whether they have made the most of the learning opportunities available. It must be linked to a description the program.

1. Enterprise Educational	University of Anbar
2. Section University / Center	Mechanical Engineering
3. name / Code The decision	English Language I /ME1101
4. Programs that Enters In which	Bachelor's
5. shapes the audience Available	Presence actual
6. the chapter / the year	the chapter Academic the first/2024-2023
7. number hours Scholarship (total)	30
8. date Preparation this the description	12/10/2023
9. Goals The decision : 1. Develop academic writing proficiency and critical thinking skills 2. Students are able to conduct effective searches of printed and electronic resources	

3. Students can use external sources to support ideas in an academic writing in mechanical engineering
4. Students can identify and explain the academic integrity (how to avoid plagiarism)
5. Students are familiar with the citation methods like the APA style
6. Students can participate in a classroom community that involves constructive exchange of ideas

10. Outputs Learning And methods education And learning And evaluation

In end of the Academic course will be able to:

1. Develop academic writing proficiency and critical thinking skills
2. Students are able to conduct effective searches of printed and electronic resources
3. Students can use external sources to support ideas in an academic writing in mechanical engineering
4. Students can identify and explain the academic integrity (how to avoid plagiarism)
5. Students are familiar with the citation methods like the APA style
6. Students can participate in a classroom community that involves constructive exchange of ideas

Methods education and learning

.
Lectures

Methods Evaluation

Exams The short one. Exams Monthly And finality. Duties Home.

C- Skills Thinking

1- Development capacity requester on performance Duties And delivered within an appointment specific.

2- Try application Concepts With a solution Species Different from matters.

3- Development requester in side Dialogue And discussion .

Methods education And learning

- Theoretical lectures
- Homework

Methods Evaluation

1- Short exams and monthly exams
2- Homework assignments
- Final exam

D- Skills the public And movable (Skills The other Related Capable recruitment And evolution Personal).

1- Development capacity requester on Dealing with English grammar
2- Ability to wright an English assay
3- Ability to make conversation

11. The module structure

week	hours	Learning Outputs required	Unit name / Course or the topic	Education method	Evaluation method
1	2	1-5	Am/ are/ is, my/ your, How are you?, What's this in English?, Plurals	Lectures	Questions General, discussion

3,2	4	1-5	Negatives and questions, The family	Lectures	Duties Home, exam,
4, 5	4	1-5	Sports/ food/ drinks Numbers and prices	Lectures	Duties Home, exam,
6,7	4	1-5	Question words Rooms and furniture Saying years	Lectures	Questions General, discussion
8, 9, 10, 11	8	1-5	Past simple- regular and irregular Can/ can't	Lectures	Duties Home, exam
12, 13, 14,15	8	1-5	I'd like- some/ any Signs all around	Lectures	Duties Home, exam,

12. Structure Infrastructure	
Readings required : ▪ books of The module ▪ Other	**Sources are placed** John & Liz Soars, "New Headway Plus- Beginner Student's Book", 10th ed 2014
requirements especially	Nothing
Services Social (Include on way Example Lectures Guests And training Professional And studies Field)	Nothing

13. admissions	
Requirements Previous	

less number from Students	20
Larger number from Students	25

Course description form

Reviewing the performance of higher education institutions ((academic program review))

This course description provides a succinct summary of the most important course characteristics and the learning outcomes the student is expected to achieve Demonstrating whether they have made the most of the learning opportunities available. It must be linked to a description the program.

1. Enterprise Educational	University of Anbar
2. Section University / Center	Mechanical Engineering
3. name / Code The decision	English Language II /ME2101
4. Programs that Enters In which	Bachelor's
5. shapes the audience Available	Presence actual
6. the chapter / the year	the chapter Academic the second/2024-2023
7. number hours Scholarship (total)	30
8. date Preparation this the description	12/10/2023
9. Goals The decision : 1. Develop academic essay writing proficiency 2. Promote reading skills	

3. Expand academic vocabulary through reading
4. Promote speaking ability through group discussions and debates
5. Promote critical thinking skills

10. Outputs Learning And methods education And learning And evaluation

In end of the Academic course will be able to:

1. Develop academic essay writing proficiency
2. Promote reading skills
3. Expand academic vocabulary through reading
4. Promote speaking ability through group discussions and debates
5. Promote critical thinking skills

Methods education and learning

.
Lectures

Methods Evaluation

Exams The short one. Exams Monthly And finality. Duties Home.

C- Skills Thinking
1- Development capacity requester on performance Duties And delivered within an appointment specific.
2- Try application Concepts With a solution Species Different from matters.
3- Development requester in side Dialogue And discussion .

Methods education And learning

- Theoretical lectures
- Homework

Methods Evaluation
1- Short exams and monthly exams 2- Homework assignments - Final exam
D- Skills the public And movable (Skills The other Related Capable recruitment And evolution Personal). 1- Development capacity requester on Dealing with English grammar 2- Ability to wright an English assay 3- Ability to make conversation

11. The module structure

week	hours	Learning Outputs required	Unit name / Course or the topic	Education method	Evaluation method
1	2	1-5	Tenses - Vocabulary (Jobs) - Question forms - Writing (informal letter) Present sim-ple - Present continu-ous - Have/have to	Lectures	Questions General, discussion

			- Writing (Linking words +Describing a person)		
3,2	4	1-5	Past simple - Past continuous - Have + noun - Writing (a story 1) - Count and un-count nouns - Expression of quantity - Articles - Vocabulary (clothes	Lectures	Duties Home, exam, report
4, 5	6	1-5	What … like? Present perfect	Lectures,	Duties Home, exam,
6,7.8	6	1-5	have to & got to Present simple or will	Lectures	Questions General, discussion
9, 10, 11	6	1-5	Verb patterns The passive form	Lectures	Duties Home, exam
12, 13, 14,15	6	1-5	Second conditional Writing (a story 2)	Lectures	Duties Home, exam,

12. Structure Infrastructure	
Readings required : ▪ books of The module ▪ Other	**Sources are placed** John & Liz Soars, "New Headway Plus- Beginner Student's Book", 10th ed 2014
requirements especially	Nothing
Services Social (Include on way Example Lectures Guests And training Professional And studies Field)	Nothing

13. admissions	
Requirements Previous	ME 1101
less number from Students	20
Larger number from Students	25

Course description form

Reviewing the performance of higher education institutions ((academic program review))

This course description provides a succinct summary of the most important course characteristics and the learning outcomes the student is expected to achieve Demonstrating whether they have made the most of the learning opportunities available. It must be linked to a description the program.

1. Enterprise Educational	University of Anbar
2. Section University / Center	Mechanics
3. name / Code The decision	Design of Machine Elements I / ME 4301
4. Programs that Enters In which	To divide Engineering Mechanical/Bachelor's degree
5. shapes the audience Available	My presence inside the hall
6. the chapter / the year	The first chapter Academic
7. number hours Scholarship (total)	60
8. date Preparation this the description	30/ 10/ 2023
9. Goals The decision :	
1. Cover the basics of machine design, including the design process,	

engineering mechanics and materials, failure prevention under static and variable loading, and characteristics of the principal types of mechanical elements
2. Offer a practical approach to the subject through a wide range of real-world applications and examples
3. Encourage students to link design and analysis
4. Encourage students to link fundamental concepts with practical component specification.
5. Illustrate to students the variety of mechanical components available and emphasize the need to continue learning.

10. Outputs Learning And methods education And learning And evaluation
1. Apply stress analysis theory and appropriate criteria of failure to the design of simple machine elements 2. Design shafts for static and variable stresses and estimate stress con-centration. 3. Design of Screws, Fasteners, and the Design of Nonpermanent Joints. 4. Design of welding, bonding and other permanent joints.
11. Methods education And learning
✓ Lectures the theory ✓ Exercises and activities in hall the lesson. ✓ Reports the operation. ✓ Guidance students to some sources that maybe benefit of which.
12. Methods Evaluation
✓ Quizzes ✓ Monthly and final exams ✓ Homework
13. skills Thinking ✓ 1. Controlling the approved curriculum first and then dealing with other sources. ✓ 2. The ability to comprehend the approved material, which includes six chapters. ✓ 3. The ability to understand the governing equations and how to deal with them. ✓ 4. The ability to distinguish between various questions for different topics and the mechanism for dealing with the laws specific to each

case theoretically.
✓ 5. The ability to deal with different tables and charts.

14. Skills the public and movable (Skills the other Related Capable recruitment and evolution Personal).

- ✓ Developing the student's ability to dialogue and discuss.
- ✓ Developing the student's ability to solve engineering problems by solving different types of engineering exercises.
- ✓ Developing the student's ability to deal with multiple media.
- ✓ Developing the student's ability to dialogue and discuss.

15. The Module structure

the week	hours	Learning Outputs required	name Unit / Course or the topic	Education method	Evaluation method
1	4	2	Fundamentals of mechanical engineering design	(Lectures+ Tutorials)	Quizzes, Exams and HW
2	4	2	Fundamentals of mechanical engineering design	(Lectures+ Tutorials)	Quizzes, Exams and HW
3	4	2	Failures Resulting from Static Loading	(Lectures+ Tutorials)	Quizzes, Exams and HW
4	4	2	Failures Resulting from Static Loading	(Lectures+ Tutorials)	Quizzes, Exams and HW
5	4	2	Failures Resulting from Static Loading	(Lectures+ Tutorials)	Quizzes, Exams and HW
6	4	2	Fatigue Failure Resulting from Variable Loading	(Lectures+ Tutorials)	Quizzes, Exams and HW
7	4	2	Fatigue Failure Resulting from Variable Loading	(Lectures+ Tutorials)	Quizzes, Exams and HW
8	4	2	Fatigue Failure Resulting from Variable Loading	(Lectures+ Tutorials)	Quizzes, Exams and HW
9	4	2	Shafts and Shaft Components	(Lectures+ Tutorials)	Quizzes, Exams and HW
10	4	2	Shafts and Shaft Components	(Lectures+ Tutorials)	Quizzes, Exams and HW

11	4	2	Screws, Fasteners, and the Design of Nonpermanent Joints	(Lectures+ Tutorials)	Quizzes, Exams and HW
12	4	2	Screws, Fasteners, and the Design of Nonpermanent Joints	(Lectures+ Tutorials)	Quizzes, Exams and HW
13	4	2	Welding, Bonding, and the Design of Permanent Joints	(Lectures+ Tutorials)	Quizzes, Exams and HW
14	4	2	Welding, Bonding, and the Design of Permanent Joints	(Lectures+ Tutorials)	Quizzes, Exams and HW
15	4	2	Fundamentals of mechanical engineering design	(Lectures+ Tutorials)	Quizzes, Exams and HW
16			Final Exam		Exam

16. Structure Infrastructure	
Readings required : ▪ books The module ▪ Other	▪ Mechanical Engineering Design By Shigley, 8th Edition,2008. ▪ Mechanical Engineering Design By Shigley, 9th Edition,2011. ▪ Machine Design By Khurmi, Fourteenth Edition,2005.
requirements especially	Nothing
Services Social (Include on way Example Lectures Guests And training Professional And studies Field)	Nothing

17. admissions	
Requirements Previous	
less number from Students	25
Larger number from Students	50

Course description form

Reviewing the performance of higher education institutions ((academic program review))

This course description provides a succinct summary of the most important course characteristics and the learning outcomes the student is expected to achieve Demonstrating whether they have made the most of the learning opportunities available. It must be linked to a description the program.

1. Enterprise Educational	University of Anbar
2. Section University / Center	Mechanics
3. name / Code The decision	Fluid Mechanics-I/ ME2301
4. Programs that Enters In which	To divide Engineering Mechanical/Bachelor's degree
5. shapes the audience Available	My presence inside the hall
6. the chapter / the year	The chapter Academic the first
7. number hours Scholarship (total)	45
8. date Preparation this the description	30/ 10/ 2023
9. Goals The decision :	
1. To understand the properties of the fluid.	

2. To understand hydrostatic forces on submerged plane surfaces.
3. To understand mass, Bernoulli, momentum analysis of flow systems and energy equations.
4. To understand the principle of dimensional homogeneity and dimensional analysis and modeling.
5. To understand the laminar flow regime in circular and non-circular pipes.

10. Outputs Learning And methods education And learning And evaluation

1. Characterize, define and explain fundamental concepts of fluid mechanics including: continuum, density, specific weight, viscosity, surface tension and capillary effect.
2. Derive, analyze and discuss the basic equation of static fluid to determine hydrostatic forces on submerged planar and curved surfaces, manometers and fluids in rigid-body motion.
3. Analyze and comprehend the mass, Bernoulli, momentum analysis of flow systems and energy equations.
4. Review the concepts of dimensions and units, analyze and discuss the dimensional analysis and modeling.
5. Perform and understand the viscous laminar flow regime through circular and non-circular pipes.

11. Methods education And learning

- ✓ Lectures the theory
- ✓ Exercises and activities in hall the lesson.
- ✓ Reports the operation.
- ✓ Guidance students to some sources that maybe benefit of which.

12. Methods Evaluation

- ✓ Quizzes
- ✓ Monthly and final exams
- ✓ Homework
- ✓ Laboratory reports

13. skills Thinking

- ✓ The ability to comprehend the approved material, which includes several different topics, such as identifying the types of flow and the dimensional numbers associated with each type, as well as the coefficient of friction.
- ✓ The ability to understand and understand flow applications in

pipeline networks and connection methods.

- ✓ Understand how to calculate flow rate through the use of flow velocity meters.
- ✓ Understand how to choose the pump type to suit the type of application.
- ✓ Logical analysis to find solutions to engineering problems in a broader and broader way than being limited to a specific field of study or work.
- ✓ Controlling the approved curriculum first and then dealing with other sources.

14. Skills the public and movable (Skills the other Related Capable recruitment and evolution Personal).

- ✓ Developing the student's ability to dialogue and discuss.
- ✓ Developing the student's ability to solve engineering problems by solving different types of engineering exercises.
- ✓ Developing the student's ability to deal with multiple media.
- ✓ Developing the student's ability to dialogue and discuss.

15. The Module structure

the week	hours	Learning Outputs required	name Unit / Course or the topic	Education method	Evaluation method
1	3	1	Introductory Concepts of Fluid Mechanics	(Lectures+ Tutorials)	Quizzes, Exams and HW
2	3	1	Thermodynamic Properties of Fluid	(Lectures+ Tutorials)	Quizzes, Exams and HW
3	3	1	Surface Tension and Capillary Effect	(Lectures+ Tutorials)	Quizzes, Exams and HW
4	3	2	Pressure Distribution in a Fluid	(Lectures+ Tutorials)	Quizzes, Exams and HW

5	3	2	Pressure Measurements	(Lectures+ Tutorials)	Quizzes, Exams and HW
6	3	2	Hydrostatic Forces on Submerged Plane Surfaces	(Lectures+ Tutorials)	Quizzes, Exams and HW
7	3	2	Hydrostatic forces on submerged curved surfaces	(Lectures+ Tutorials)	Quizzes, Exams and HW
8	3	2	Fluids in rigid-body motion and Rotation in a Cylindrical Container	(Lectures+ Tutorials)	Quizzes, Exams and HW
9	3	3	Fluid Flow Concepts (Definitions and Concepts)	(Lectures+ Tutorials)	Quizzes, Exams and HW
10	3	3	System and control volume of Fluid Flow	(Lectures+ Tutorials)	Quizzes, Exams and HW
11	3	3	The Bernoulli equation and Mechanical energy and efficiency	(Lectures+ Tutorials)	Quizzes, Exams and HW
12	3	4	Dimensional analysis and similarity	(Lectures+ Tutorials)	Quizzes, Exams and HW
13	3	4	Physical Modeling (Geometric, Kinematic and Dynamic Similarities)	(Lectures+ Tutorials)	Quizzes, Exams and HW
14	3	5	Laminar Flow in pipes (Definitions and Concepts)	(Lectures+ Tutorials)	Quizzes, Exams and HW
15	3	5	Laminar Flow in pipes (friction factor coefficient)	(Lectures+ Tutorials)	Quizzes, Exams and HW
16			Final Exam		Exam

16. Structure Infrastructure	
Readings required : ▪ books The module ▪ Other	1- Frank M. White, "Fluid Mechanics", WCB McGraw-Hill series in mechanical engineering, Fourth Edition, 2012. 2- Yunus A. Çengel and John M. Cimbala, "Fluid Mechanics: Fundamentals and Applications", McGraw-Hill series in mechanical engineering, 1st Edition, 2006. 3- Bruce R. Munson, Donald F. Young, Theodore H. Okiishi, and Wade W.Huebsch, "Fundamentals of Fluid Mechanics", John Wiley & Sons, 6th Edition, 2009. 4- Victor L. Streeter,E. Benjamin Wylie, Keith W. Bedford, "Fluid Mechanics", McGraw-Hill, 9th Edition, 2002.
requirements especially	Nothing
Services Social (Include on way Example Lectures Guests And training Professional And studies Field)	Nothing

17. admissions	
Requirements Previous	
less number from Students	70
Larger number from Students	90

Course description form

Reviewing the performance of higher education institutions ((academic program review))

This course description provides a succinct summary of the most important course characteristics and the learning outcomes the student is expected to achieve Demonstrating whether they have made the most of the learning opportunities available. It must be linked to adescriptionthe program.

1. Enterprise Educational	University of Anbar
2. Section University/ Center	Mechanics
3. name/ Code The decision	Gas dynamics /ME 3309
4. Programs that Enter In which	Program Engineering Mechanical
5. Shapes the audience Available	Class
6. the chapter/ the year	the chapter Academic the first
7. number hours Scholarship (total)	45
8. date Preparation this the description	3/11/2023
9. The Course Objectives:	
1. Understand the compressible flow fundamentals.	

2. Solve isentropic flow in variable area ducts.
3. Understand various shock wave situations and the use of gas tables.
4. Study the compressible flow with friction.
5. Study the compressible flow with heat transfer.
10. Learning outcomes and methods of Education and learning and evaluation
NGO1, NGO2
Methods education and learning electronic lectures
. The theoryLectures
MethodsEvaluation Quiz, Exam, Homework
Exams the short one. Monthly exams and finality. Home works
C- Thinking Skills 1- Develop the student's ability to perform assignments and deliver them on time 2-Attempt to apply concepts by solving different types of exercises 3-Developing the student on discussion and possibility.
Methods education and learning
MethodsEvaluation
Quiz, Exam, Homework

D-Skillsthe publicAnd movable(SkillsThe otherRelatedCapablerecruitmentAnd evolutionPersonal).

11. The module structure

week	hours	Required Learning Outcomes	Unit name/ Course or the topic	Education method	Evaluation method
1	3	Ability to solve the properties of compressible fluid flow, one Dimensional isentropic flow.	**Compressible fluid flow**	Lectures and tutorials	Quiz Exam HW
2,3,4	9	Ability to solve the properties of compressible fluid flow, one Dimensional isentropic flow.	**One Dimensional Isentropic flow**	Lectures and tutorials	Quiz Exam HW
5,6	6	Ability to solve and analysis of Normal and Oblique shock waves.	**Normal shock Waves**	Lectures and tutorials	Quiz Exam HW
7	3	CLO 1&CLO2	**EXAM**		

8,9	6	Ability to solve and analysis of Normal and Oblique shock waves.	**Oblique shock Waves**	Lectures and tutorials	Quiz Exam HW
10,11,12	9	The ability to determine the properties of the flow in constant area duct with friction (Fanno flow) and its applications.	**Flow in constant area duct with friction (Fanno flow)**	Lectures and tutorials	Quiz Exam HW
13,14,15	9	The ability to determine the properties of the flow in constant area duct with heat transfer (Rayleigh flow) and its applications	**Flow in constant area duct with heat transfer (Rayleigh flow)**	Lectures and tutorials	Quiz Exam HW

12. Structure Infrastructure	
Readingsrequired: ▪ booksThe module ▪ Other	**Sources are placed** 1. James E.A. John , Theo G. Keith ," Gas Dynamics, 3rd Edition,John-Wiely,2006 2. The Dynamics and Thermodynamics of Compressible Fluid Flow (Vol.1), by A.H. Shapiro, Ronald, 1953. 3. Power Plant Technology, by M.M. El-Wakil. 4. Steam Turbines Theory and Practice, by W.J. Keartin.
requirementsespecially	Nothing
ServicesSocial(IncludeonwayExample LecturesGuestsAnd trainingProfessionalAnd studiesField)	Nothing

13. admissions	
RequirementsPrevious	ME 2301Fluid Mechanics I ME 2303Thermodynamics I
Less number for Students	10
Large number for Students	60

Course description form

Reviewing the performance of higher education institutions ((academic program review))

This course description provides a succinct summary of the most important course characteristics and the learning outcomes the student is expected to achieve Demonstrating whether they have made the most of the learning opportunities available. It must be linked to a description the program.

1. Enterprise Educational	University of Anbar
2. Section University / Center	Mechanics
3. name / Code The decision	ME 3310 - Industrial Engineering and Economic Analysis
4. Programs that Enters In which	Mechanical Engineering Program
5. shapes the audience Available	My presence inside the hall
6. the chapter / the year	The chapter Academic the first
7. number hours Scholarship (total)	45
8. date Preparation this the description	3/11/2023

9. Goals The decision :

1. Understand the theoretical workings of the organization structures & types, Productivity, basic concepts, classification, measurement and improvement.
2. Understand the relationship between a facility layout location criterion, equipment and utilities layout, types of layout and Material handling systems.
3. To determine the direct cost, underact cost, and Productivity.
4. Solve demand forecasting, , material requirement planning MRP, Bill of material (BOM)
5. Understand the applications of, Inventory models and Just in time (JIT) technique, production planning, scheduling problems & models.
6. Learn Industrial safety and application.

10. Outcomes Learning And methods education And learning And evaluation

By the end of successful completion of this course, the student will be able to:
1. An ability to understand the theoretical workings of the organization structures & types, Productivity, basic concepts, classification, measurement and improvement.
2. An ability to planning of plant using the relationship between a Plant location criterion, equipment and utilities layout, types of layout and Material handling systems. Bill of material (BOM)
3. To gain experience and further mastery of complete problem solving fluency based on determine the fixed cost, variable cost, Productivity, forecasting, material requirement planning MRP.
4. An ability to applications of, Inventory models, Just in time (JIT) technique, ISO, production planning, scheduling problems & models.
5. Learn proper Industrial safety and application.

11. Methods education And learning

- ✓ Lectures the theory
- ✓ Exercises and activities in hall the lesson.
- ✓ Reports the operation.
- ✓ Guidance students to some sources that maybe benefit of which.

12. Methods Evaluation

- ✓ Quizzes
- ✓ Monthly and final exams
- ✓ Homework
- ✓ Laboratory reports

13. skills Thinking

- ✓ The ability to Identify the constructions and principles of operation of DC machines (Generator and
- ✓ The ability to Apply the basic principles to determine the various energy losses and efficiencies

14. Skills the public and movable (Skills the other Related Capable recruitment and evolution Personal).

- ✓ Developing the student's ability to solve electrical engineering
- ✓ Developing the student's ability to the basic principles to determine the various energy losses and efficiencies (mechanical and electrical) as well as the speed control of a DC motor.

15. The Module structure

the week	hours	Learning Outputs required	name Unit / Course or the topic	Education method	Evaluation method
1	3	1. Process of organization design	Product layout flow	(Lectures+ Tutorials)	Quizzes, Exams and HW
2	3	2. Product layout flow	Product layout flow	(Lectures+ Tutorials)	Quizzes, Exams and HW
3	3	3. Systematic layout planning	Product layout flow	(Lectures+ Tutorials)	Quizzes, Exams and HW
4	3	4. Flow process charts	Product layout flow	(Lectures+ Tutorials)	Quizzes, Exams and HW
5	3	5. Bill of material.	Material handling	(Lectures+ Tutorials)	Quizzes, Exams and HW
6	3	6. Material handling	Material handling	(Lectures+ Tutorials)	Quizzes, Exams and HW
7	3	7. Human engineering	Material handling	(Lectures+ Tutorials)	Quizzes, Exams and HW
8	3	8. Human engineering	Material handling	(Lectures+ Tutorials)	Quizzes, Exams and HW
9	3	Quality control and Inspection	Quality control and Inspection	(Lectures+ Tutorials)	Quizzes, Exams and HW

10	3	Control chart for attributes	Quality control and Inspection	(Lectures+ Tutorials)	Quizzes, Exams and HW
11	3	Control chart for attributes	Quality control and Inspection	(Lectures+ Tutorials)	Quizzes, Exams and HW
12	3	Industrial safety	Industrial safety	(Lectures+ Tutorials)	Quizzes, Exams and HW
13	3	Industrial safety	Industrial safety	(Lectures+ Tutorials)	Quizzes, Exams and HW
14	3	Industrial safety	Industrial safety	(Lectures+ Tutorials)	Quizzes, Exams and HW
15	3				Final Exam

16. Structure Infrastructure	
Readings required : ▪ books The module ▪ Other	1. Electrical Technology by Theraja. 2. Electric Machinery Fundamentals by S. Chapman.
requirements especially	Nothing
Services Social (Include on way Example Lectures Guests And training Professional And studies Field)	Nothing

17. admissions	
Requirements Previous	
less number from Students	20
Larger number from Students	40

Course description form

Reviewing the performance of higher education institutions ((academic program review))

This course description provides a succinct summary of the most important course characteristics and the learning outcomes the student is expected to achieve Demonstrating whether they have made the most of the learning opportunities available. It must be linked to a description the program.

1. Enterprise Educational	University of Anbar
2. Section University / Center	College of Engineering/Mechanics
3. name / Code The decision	Engineering Materials ME 4308
4. Programs that Enters In which	Mechanical Engineering Program
5. shapes the audience Available	My presence inside the hall
6. the chapter / the year	quarterly
7. number hours Scholarship (total)	45
8. date Preparation this the description	2023-2024
9. Goals The decision :	

1. Understand the practical concepts of engineering materials and their properties and applications.
2. Apply the knowledge of material properties and material selection foundations that are related to mechanical Engineering program.

10. Outputs Learning And methods education And learning And evaluation

1. Obtain important information of the mechanical properties of materials.
2. Classified the materials
3. Select the optimal material for each application
4. Analyze any type of failure and find the reasons of failure
5. know the developments of new materials.

11. Methods education And learning

- ✓ Lectures the theory
- ✓ Exercises and activities in hall the lesson.
- ✓ Reports the operation.
- ✓ Guidance students to some sources that maybe benefit of which.

12. Methods Evaluation

- ✓ Quizzes
- ✓ Monthly and final exams
- ✓ Homework
- ✓ Laboratory reports

13. skills Thinking

- ✓ The ability to know the developments of new materials.
- ✓ The ability to Analyze any type of failure and find the reasons of failure
- ✓ Controlling the approved curriculum first and then dealing with other sources.

14. Skills the public and movable (Skills the other Related Capable recruitment and evolution Personal).

Developing the student's ability to deal with the Internet

- ✓ Developing the student's ability to deal with multiple media

15. The Module structure					
the week	**hours**	**Learning Outputs required**	**name Unit / Course or the topic**	**Education method**	**Evaluation method**
1	**3**	Knowledge And understanding	Material Properties	lecture	Exam daily
2	**3**	Knowledge	Mechanical Properties	lecture	Exam daily
3	**3**	Knowledge And understanding	Mechanical Properties	lecture	Exam daily
4	**3**	Knowledge	Temperature Effect	lecture	Exam daily
5	**3**	Knowledge And understanding	Physical Properties	lecture	Exam daily
6	**3**	Knowledge And understanding	Physical Properties	lecture	Exam daily
7	**3**	Knowledge And understanding	Engineering Materials (Ferrous Metal)	lecture	Exam daily

8	**3**	Knowledge And understanding	Engineering Materials (Ferrous Metal)	lecture	Exam daily
9	**3**	Knowledge And understanding	Engineering Materials (Nonferrous Metal)	lecture	Exam daily
10	**3**	Knowledge And understanding	Engineering Materials (Non-metallic)	lecture	Exam daily
11	**3**	Knowledge	Engineering Materials (Non-metallic)	lecture	Exam daily
12	**3**	Knowledge And understanding	Designation of the Engineering Materials	lecture	Exam daily
13	**3**	Knowledge And understanding	Selection of Materials	lecture	Exam daily

16. Structure Infrastructure	
Readings required : ▪ books The module ▪ Other	1. J T. Black, R. A. Kohser and E. P. Degarmo, " Materials and processes in manufacturing ", 10th Edition, 2008. ME HANDBOOK | 132 MECHANICAL ENGINEERING DEPARTMENT HANDBOOK 2022-2023 2. Materials Science and Engineering an Introduction William D. Callister, Jr. 3. Foundations of Materials Science and Engineering, by William F. smith & Javad Hashemi 4. Ceramic Science for Materials Technologist by T.J Mc-Calm 5. Engineering with polymers by P.C. Powel
requirements especially	Materials Science and Engineering an Introduction William D. Callister, Jr.
Services Social (Include on way Example Lectures Guests And training Professional And studies Field)	Example Lectures Guests

17. admissions	
Requirements Previous	
less number from Students	20
Larger number from Students	30

Course description form

Reviewing the performance of higher education institutions ((academic program review))

This course description provides a succinct summary of the most important course characteristics and the learning outcomes the student is expected to achieve Demonstrating whether they have made the most of the learning opportunities available. It must be linked to a description the program.

1. Enterprise Educational	University of Anbar
2. Section University / Center	Mechanics
3. name / Code The decision	Engineering Numerical Methods/ ME 3202
4. Programs that Enters In which	To divide Engineering Mechanical/Bachelor's degree
5. shapes the audience Available	My presence inside the hall
6. the chapter / the year	The chapter Academic the first
7. number hours Scholarship (total)	45
8. date Preparation this the description	30/ 10/ 2023
9. Goals The decision :	
By the end of successful completion of this course, the student will be able to:	

1. To gain experience in error analysis.
2. Understanding the different numerical methods to solve systems of linear and nonlinear equations.
3. Understanding the different numerical methods for differentiation, integration, and solving a set of ordinary differential equations.
4. Understanding how numerical methods can be implemented in MATLAB software.

10. Outputs Learning And methods education And learning And evaluation

To gain experience in error analysis.
.2 Understanding the different numerical methods to solve systems of linear and nonlinear equations.
.3 Understanding the different numerical methods for differentiation, integration, and solving a set of ordinary differential equations.
4. Understanding how numerical methods can be implemented in MATLAB software

11. Methods education And learning

- ✓ Lectures the theory
- ✓ Exercises and activities in hall the lesson.
- ✓ Reports the operation.
- ✓ Guidance students to some sources that maybe benefit of which.

12. Methods Evaluation

- ✓ Quizzes
- ✓ Monthly and final exams
- ✓ Homework
- ✓ Laboratory reports

13. skills Thinking

- ✓ Controlling the approved curriculum first and then dealing with other sources.
- ✓ The ability to comprehend the approved material that includes several different topics
- ✓ The ability to solve differential equations using numerical methods
- ✓ Understand how to create MATLAB Code to program numerical methods and solve them using a computer

14. Skills the public and movable (Skills the other Related Capable recruitment and evolution Personal).

- ✓ 1- Developing the student's ability to dialogue and discuss
- ✓ 2- Developing the student's ability to solve engineering problems by solving different types of engineering exercises
- ✓ 3- The ability to distinguish between the different energies

generated in various practical applications, while analyzing and deducing the most efficient methods of production.

15. The Module structure

the week	hours	Learning Outputs required	name Unit / Course or the topic	Education method	Evaluation method
1	3	1	Error Analysis	(Lectures+ Tutorials)	Quizzes, Exams and HW
2	3	1	Error Analysis	(Lectures+ Tutorials)	Quizzes, Exams and HW
3	3	1	Roots of equations	(Lectures+ Tutorials)	Quizzes, Exams and HW
4	3	2	Roots of equations	(Lectures+ Tutorials)	Quizzes, Exams and HW
5	3	2	Roots of equations	(Lectures+ Tutorials)	Quizzes, Exams and HW
6	3	2	Solving system of linear equations	(Lectures+ Tutorials)	Quizzes, Exams and HW
7	3	2	Solving system of linear equations	(Lectures+ Tutorials)	Quizzes, Exams and HW
8	3	2	Integration and differentiation	(Lectures+ Tutorials)	Quizzes, Exams and HW
9	3	3	Integration and differentiation	(Lectures+ Tutorials)	Quizzes, Exams and HW
10	3	3	Integration and differentiation	(Lectures+ Tutorials)	Quizzes, Exams and HW
11	3	3	Integration and differentiation	(Lectures+ Tutorials)	Quizzes, Exams and HW
12	3	4	Ordinary differential equations	(Lectures+ Tutorials)	Quizzes, Exams and HW

13	3	4	Ordinary differential equations	(Lectures+ Tutorials)	Quizzes, Exams and HW
14	3	5	Ordinary differential equations	(Lectures+ Tutorials)	Quizzes, Exams and HW
15	3	5	Ordinary differential equations	(Lectures+ Tutorials)	Quizzes, Exams and HW
16			Final Exam		Exam

16. Structure Infrastructure	
Readings required : ▪ books The module ▪ Other	▪ Numerical Methods for Engineers, S. C. Chapra and R. P Canale, McGraw-Hill, 6th edition 2010. ▪ Hoffman, J. D., & Frankel, S. (2018). Numerical methods for engineers and scientists. CRC press.
requirements especially	Nothing
Services Social (Include on way Example Lectures Guests And training Professional And studies Field)	Nothing

17. admissions	
Requirements Previous	ME2202 Calculus IV
less number from Students	25
Larger number from Students	45

Course description form

Reviewing the performance of higher education institutions ((academic program review))

This course description provides a succinct summary of the most important course characteristics and the learning outcomes the student is expected to achieve Demonstrating whether they have made the most of the learning opportunities available. It must be linked to a description the program.

1. Enterprise Educational	University of Anbar
2. Section University / Center	Mechanics
3. name / Code The decision	Principles of Manufacturing Process/ ME1301
4. Programs that Enters In which	To divide Engineering Mechanical/Bachelor's degree
5. shapes the audience Available	My presence inside the hall
6. the chapter / the year	The chapter Academic the first
7. number hours Scholarship (total)	45
8. date Preparation this the description	30/ 10/ 2023
9. Goals The decision :	
The goals of this course are to enable students to:	

1. Students should understand of the principles of the major manufacturing processes.
2. Students should be able to recognize the standard processes used to produce products
3. Students should be able to select the optimal process to produce a product.

10. Outputs Learning And methods education And learning And evaluation
• 1. To understand the principle of manufacturing engineering. • 2. To obtain important information about the iron ores and how can obtain the different types of iron and steel. • 3. To classify materials and their improvement properties. • 4. To know the different types of machining processes
11. Methods education And learning
Lectures the theory ✓ Exercises and activities in hall the lesson. ✓ Reports the operation. ✓ Guidance students to some sources that maybe benefit of which. ✓
Methods Evaluation .12
Quizzes ✓ Monthly and final exams ✓ Homework ✓ Laboratory reports ✓
skills Thinking .13 students should be able to determine when each of the various topics ✓ we have covered is appropriate to use, and to apply them to practical ✓ engineering situations or problems. This course will cover techniques ✓ manufacturing and the production of metallic materials ferrous and nonferrous), manufacturing operations, basic -) ✓ plumbing, composition, hot, cold forming, manufacturing processes Secondary - welding, arrived ✓ ,metals , powder technology operating Absolutely. ✓ ✓

Skills the public and movable (Skills the other Related Capable recruitment and evolution Personal). .14

Developing the student's ability to dialogue and discuss.	✓
Developing the student's ability to solve engineering problems by solving different types of engineering exercises.	✓
Developing the student's ability to deal with multiple media.	✓
Developing the student's ability to dialogue and discuss.	✓

The Module structure .15

the week	hours	Learning Outputs required	name Unit / Course or the topic	Education method	Evaluation method
1	3	1	Engineering materials	(Lectures+ Tutorials)	Quizzes, Exams and HW
2	3	1	introduction to entrepreneurship,	(Lectures+ Tutorials)	Quizzes, Exams and HW
3	3	1	Manufacturing processes: casting, welding, forming, working ,joining processes.	(Lectures+ Tutorials)	Quizzes, Exams and HW
4	3	2	Hand work and hand tools,	(Lectures+ Tutorials)	Quizzes, Exams and HW
5	3	2	Concept of machining processes, turning, drilling milling, and grinding.	(Lectures+ Tutorials)	Quizzes, Exams and HW
6	3	2	Metrological concepts.	(Lectures+ Tutorials)	Quizzes, Exams and HW
7	3	2	Industrial safety.	(Lectures+ Tutorials)	Quizzes, Exams and HW
8	3	2	Engineering materials	(Lectures+ Tutorials)	Quizzes, Exams and HW
9	3	5	introduction to entrepreneurship,	(Lectures+ Tutorials)	Quizzes, Exams and HW
10	3	2	Manufacturing processes: casting, welding, forming, working ,joining	(Lectures+ Tutorials)	Quizzes, Exams and HW

			processes.		
11	3	5	Hand work and hand tools,	(Lectures+ Tutorials)	Quizzes, Exams and HW
12	3	6	Concept of machining processes, turning, drilling milling, and grinding.	(Lectures+ Tutorials)	Quizzes, Exams and HW
13	3	6	Turning process	(Lectures+ Tutorials)	Quizzes, Exams and HW
14	3	6	Milling process	(Lectures+ Tutorials)	Quizzes, Exams and HW
15	3	5	Engineering materials	(Lectures+ Tutorials)	Quizzes, Exams and HW
16			Final Exam		Exam

Structure Infrastructure .16	
Readings required : books The module ▪ Other ▪	1- Rajender Singh third Edition 2006 Introduction to manufacturing process and 2- Workshop Technology 3- .2Fundamentals of Modern Manufacturing by Groover 4- .3Manufacturing Engineering and Technology by Kalpakjian 5- .4Materials and Processes in Manufacturing by E.P Degarmo 6- .5Process and Materials of manufacture by F.A Lindberg.
requirements especially	Nothing
Services Social (Include on way Example Lectures Guests And training Professional And studies Field)	Nothing

admissions .17	
Requirements Previous	
less number from Students	70
Larger number from Students	90

Course description form

Reviewing the performance of higher education institutions ((academic program review))

This course description provides a succinct summary of the most important course characteristics and the learning outcomes the student is expected to achieve Demonstrating whether they have made the most of the learning opportunities available. It must be linked to a description the program.

1. Enterprise Educational	University of Anbar
2. Section University / Center	Engineering Mechanical
3. name / Code The decision	Refrigeration /ME4307
4. Programs that Enters In which	Bachelor's
5. shapes the audience Available	Presence actual
6. the chapter / the year	the chapter Academic the Second/2024-2023
7. number hours Scholarship (total)	60
8. date Preparation this the description	3/11/2023
9. Goals The decision :	

1- Understand the parts of the vapour compression cycle, and how to analyze and solve the elevant exercises..
2- Have knowledge of the refrigerants, and the most important properties which must be available in them.
3- Familiarize the students on how the vapour absorption cycles operate, as well as the procedure to analyze and solve the relevant exercises.
4- Identify the types of air refrigeration cycles, and how to analyze and solve the relevant exercises.
5- Have knowledge of the thermoelectric, vortex tube, and steam jet water vapour refrigeration systems.

10. Outputs Learning And methods education And learning And evaluation

In end of the Academic course will be able to:

1. Analysis the performance of the vapour compression cycles and understand the most important properties which must be available in the refrigerants.
2. Estimate the performance parameters of the lithium bromide-water absorption refrigeration cycles for a certain cooling load.
3. Apply the laws of thermodynamics on the air refrigeration cycles.
4. Explain the components and the principle of work of the thermoelectric, vortex tube, and steam jet water vapour refrigeration systems.

Methods education and learning

.
Lectures the theory + Experiments Laboratory

Methods Evaluation

Exams The short one. Exams Monthly And finality. Duties Home. Reports Laboratory.

C- Skills Thinking
1- Development capacity requester on performance Duties And delivered within an appointment specific.

2- Try application Concepts With a solution Species Different from matters. 3- Development requester in side Dialogue And discussion .
Methods education And learning
• Theoretical lectures • Homework • Laboratory experiments
Methods Evaluation
1- Short exams and monthly exams 2- Homework assignments 3- Laboratory reports 4- Final exam
D- Skills the public And movable (Skills The other Related Capable recruitment And evolution Personal). 1- Development capacity requester on Dealing with Problems Engineering. 2- Ability requester on completion the accounts Design Private With systems conditioning Air. 3- Development capacity requester on Dialogue And discussion.

11. The module structure

week	hours	Learning Outputs required	Unit name / Course or the topic	Education method	Evaluation method
1	3	Analysis the performance of the vapour compression cycles and understand the most important properties which must be available in the refrigerants.	Introduction and review of basic principles.	Lectures theory	Questions General, discussion
3,2	6+3	Analysis the performance of the vapour compression cycles and understand the most important properties which must be available in the refrigerants.	Vapour compression cycle and heat pumps.	Lectures Theory, experiment practical	Duties Home, exam, report
4, 5	6+3		Refrigerants.	Lectures Theory, experiment practical	Duties Home, exam, report
6,7	6+3	Estimate the performance parameters of the lithium bromide-water absorption refrigeration cycles for a certain cooling load.	Vapour absorption cycle.	Lectures theory	Questions General, discussion
8, 9, 10, 11	12+3	Apply the laws of thermodynamics on the air refrigeration cycles.	Air refrigeration systems.	Lectures theory	Duties Home, exam
12, 13, 14,15	12+3	Explain the components and the principle of work of the	Thermoelectric refrigeration. And other systems	Lectures Theory, experiment practical	Duties Home, exam, report

		thermoelectric, vor-tex tube, and steam jet water vapour refrigeration systems.			

12. Structure Infrastructure	
Readings required : ▪ books of The module ▪ Other	**Sources are placed** 1.Refrigeration and Air Conditioning by AhmadulAmeen. 2.Refrigeration and Air Conditioning by S.N. Sapali. 3.Refrigeration and Air Conditioning by C.P. Arora. 4.Refrigeration and Air Conditioning by Er. R.K. Rajput.
requirements especially	Nothing
Services Social (Include on way Example Lectures Guests And training Professional And studies Field)	Nothing

13. admissions	
Requirements Previous	ME 2307 Thermodynamics-II ME 3307 Heat Transfer-II
less number from Students	30
Larger number from Students	45

Course description form

Reviewing the performance of higher education institutions ((academic program review))

This course description provides a succinct summary of the most important course characteristics and the learning outcomes the student is expected to achieve Demonstrating whether they have made the most of the learning opportunities available. It must be linked to a description the program.

1. Enterprise Educational	University of Anbar
2. Section University / Center	Mechanics
3. name / Code The decision	Strength of materials I - **ME 2302**
4. Programs that Enter In which	program of Mechanical Engineering
5. shapes the audience Available	Class attendance
6. the chapter / the year	First semester
7. number hours Scholarship (total)	45
8. date Preparation this the description	3/11/2023

9. The decision Goals:

1. Calculate stresses on a member subjected to axial loads

2. Calculate stresses of a member subjected to shear force

3. Explain and compute the mechanical properties of materials.

4. Calculate angular rotation of a shaft subjected to torsional moment.

5. Compute forces, stresses, and bending moments in loaded beams.

10. Outputs Learning And methods Education And learning And evaluation

. Understand the effect of direct and shear force on mechanical parts and the difference between these forces.

2. Drawing the shear force and bending moment diagram and solve the problems that contain bending stress and shear stress.

3. Recognize the difference between direct shear and torsion. Also solving torsion problems in different mechanical parts.

A. Methods education And learning Electronic lectures:

1.The theory Lectures

2. Lab

B. Methods Evaluation

Quiz, Monthly Exam, Homework, Labs reports, Attendance, final exam.

C- Thinking Skills

1- Development capacity requested on performance Duties And delivered in the time Specified.

2-Try application Concepts from during Solution Species Different from Exercises.

3- Development requester on Possibility Discussion.

Methods education And learning

11. The module structure

week	hours	Learning Outputs required	Unit name / Course or the topic	Education method	Evaluation method
1	4	1	Introduction to Strengths of Materials/Statics Review	(Lectures + tutorials + Lab)	Quizzes Exams H.W. Reports
2	4	1	Introduction to Strengths of Materials/Statics Review	(Lectures + tutorials + Lab)	Quizzes Exams H.W. Reports
3	4	1	Simple stresses and strains	(Lectures + tutorials + Lab)	Quizzes Exams H.W. Reports
4	4	1	Simple stresses and strains	(Lectures + tutorials + Lab)	Quizzes Exams H.W. Reports
5	4	1.3	Bending moments and shearing forces	(Lectures + tutorials + Lab)	Quizzes Exams H.W. Reports
6	4	1.3	Bending moments and shearing forces	(Lectures + tutorials + Lab)	Quizzes Exams H.W. Reports
7	4	1.3	Bending moments and shearing forces	(Lectures + tutorials + Lab)	Quizzes Exams H.W. Reports
8	4	1.3	Bending stresses in beams	(Lectures + tutorials + Lab)	Quizzes Exams H.W. Reports

9	4	1.3	Bending stresses in beams	(Lectures + tutorials + Lab)	Quizzes Exams H.W. Reports
10	4	1,3	Shear stress in beams	(Lectures + tutorials + Lab)	Quizzes Exams H.W. Reports
11	4	1.3	Shear stress in beams	(Lectures + tutorials + Lab)	Quizzes Exams H.W. Reports
12	4	1,3	Torsion	(Lectures + tutorials + Lab)	Quizzes Exams H.W. Reports
13	4	1.3	Torsion	(Lectures + tutorials + Lab)	Quizzes Exams H.W. Reports
14	4	1.3	Principal stresses and strains	(Lectures + tutorials + Lab)	Quizzes Exams H.W. Reports
15	4	1.3	Principal stresses and strains	(Lectures + tutorials + Lab)	Quizzes Exams H.W. Reports
16		1.3	Final Exam	Multiple questions	Exam

12. Structure Infrastructure	
Readings required : ▪ books The module ▪ Other	**Sources are placed** 1. Mechanics of Materials I,II by E. J. Hearn **2.** Strength of materials by Beer
requirements especially	Nothing
Services Social (Include on way Example Lectures Guests And training Professional And studies Field)	Nothing

13. admissions	
Requirements Previous	ME 1301 Static
less number from Students	25
Larger number from Students	50

Course description form

Reviewing the performance of higher education institutions ((academic program review))

This course description provides a succinct summary of the most important course characteristics and the learning outcomes the student is expected to achieve Demonstrating whether they have made the most of the learning opportunities available. It must be linked to a description the program.

1. Enterprise Educational	University of Anbar
2. Section University / Center	Mechanics
3. name / Code The decision	Strength of materials 2 - **ME 2306**
4. Programs that Enter In which	program of Mechanical Engineering
5. shapes the audience Available	Class attendance
6. the chapter / the year	Second semester
7. number hours Scholarship (total)	45
8. date Preparation this the description	3/11/2023

9. The decision Goals:

1. Calculate stresses in thin and thick cylinders.

2. Calculate the deflection of determinate and indeterminate beams.

3. Explain and compute the combined stresses in different loading types.

4. Explain the difference between brittle and ductile material in term of failure mode.

5. Compute the factor of safety of different loading types

10. Outputs Learning And methods Education And learning And evaluation

. Understand the difference of stresses in thin and thick cylinders.

2. Recognize the difference between deflection of determinate and indeterminate beams..

3. Recognize the difference between the brittle and ductile material in term of failure mode.

4. Draw Mohr's stress circle and computing combine stress in different type of loading.

A. Methods education And learning Electronic lectures:

1.The theory Lectures

2. Lab

B. Methods Evaluation

Quiz, Monthly Exam, Homework, Labs reports, Attendance, final exam.

C- Thinking Skills

1- Development capacity requested on performance Duties And delivered in the time Specified.

2-Try application Concepts from during Solution Species Different from Exercises.

3- Development requester on Possibility Discussion.

Methods education And learning

11. The module structure

week	hours	Learning Outputs required	Unit name / Course or the topic	Education method	Evaluation method
1	4	1	Deflection of determinate beams	(Lectures + tutorials + Lab)	Quizzes Exams H.W. Reports
2	4	1	Deflection of determinate beams	(Lectures + tutorials + Lab)	Quizzes Exams H.W. Reports
3	4	1	Deflection of indeterminate beams	(Lectures + tutorials + Lab)	Quizzes Exams H.W. Reports
4	4	1	Deflection of indeterminate beams	(Lectures + tutorials + Lab)	Quizzes Exams H.W. Reports
5	4	1.3	Deflection of indeterminate beams	(Lectures + tutorials + Lab)	Quizzes Exams H.W. Reports
6	4	1.3	Thin cylinders	(Lectures + tutorials + Lab)	Quizzes Exams H.W. Reports
7	4	1.3	Thin cylinders	(Lectures + tutorials + Lab)	Quizzes Exams H.W. Reports
8	4	1.3	Thick cylinders	(Lectures + tutorials + Lab)	Quizzes Exams H.W. Reports

9	4	1.3	Thick cylinders	(Lectures + tutorials + Lab)	Quizzes Exams H.W. Reports
10	4	1,3	Thick cylinders	(Lectures + tutorials + Lab)	Quizzes Exams H.W. Reports
11	4	1.3	combined stress	(Lectures + tutorials + Lab)	Quizzes Exams H.W. Reports
12	4	1,3	combined stress	(Lectures + tutorials + Lab)	Quizzes Exams H.W. Reports
13	4	1.3	combined stress	(Lectures + tutorials + Lab)	Quizzes Exams H.W. Reports
14	4	1.3	Theories of failure	(Lectures + tutorials + Lab)	Quizzes Exams H.W. Reports
15	4	1.3	Theories of failure	(Lectures + tutorials + Lab)	Quizzes Exams H.W. Reports
16		1.3	Final Exam	Multiple questions	Exam

12. Structure Infrastructure	
Readings required : ▪ books The module ▪ Other	**Sources are placed** 1. Mechanics of Materials I,II by E. J. Hearn **2.** Strength of materials by Beer
requirements especially	Nothing
Services Social (Include on way Example Lectures Guests And training Professional And studies Field)	Nothing

13. admissions	
Requirements Previous	ME 2302 Strength of materials I
less number from Students	25
Larger number from Students	50

Course description form

Reviewing the performance of higher education institutions ((academic program review))

This course description provides a succinct summary of the most important course characteristics and the learning outcomes the student is expected to achieve Demonstrating whether they have made the most of the learning opportunities available. It must be linked to a description the program.

1. Enterprise Educational	University of Anbar
2. Section University / Center	Mechanics
3. name / Code The decision	ME 3303- Theory of machines I
4. Programs that Enters In which	To divide Engineering Mechanical/Bachelor's degree
5. shapes the audience Available	My presence inside the hall
6. the chapter / the year	The chapter Academic the first
7. number hours Scholarship (total)	60
8. date Preparation this the description	24/ 09/ 2023
9. Goals The decision :	

1. To give basic knowledge on kinematics and kinetics of machine elements.
2. Understand the principles of power transmission.
3. To teach students both graphical and analytical methods of motion analysis and design of planar mechanisms.
4. Gain the basic knowledge to analyze displacement, velocity and acceleration in mechanisms.
5. Understand theory of Hooke's joint, gyroscope, governors, and flywheel.

10. Outputs Learning And methods education And learning And evaluation

1. To gain basic knowledge of kinematics and kinetics for planar mechanisms.
2. Formulate and solve for distance, velocity and acceleration analysis of planar linkages.
3. Successfully practice the concepts of power transmission and steering gear mechanisms.
4. Understand the importance of gyroscopic couple, flywheel, and governors in real time practice.

11. Methods education And learning

- ✓ Lectures the theory
- ✓ Exercises and activities in hall the lesson.
- ✓ Reports the operation.
- ✓ Guidance students to some sources that maybe benefit of which.

12. Methods Evaluation

- ✓ Quizzes
- ✓ Monthly and final exams
- ✓ Homework
- ✓ Laboratory reports

13. skills Thinking

- ✓ 1. Controlling the approved curriculum first and then dealing with other sources.
- ✓ 2. The ability to comprehend the approved material, which includes four chapters.

- ✓ 3. The ability to determine the type of system and its governing equations.
- ✓ 4. The ability to design and solve equations of motion for the moving parts of internal combustion engines.

14. Skills the public and movable (Skills the other Related Capable recruitment and evolution Personal).

- ✓ 1. The ability to identify problems and ways to solve them according to the concept of machine theory1.
- ✓ 2. The ability to apply the laws of motion to different practical situations and combine them.
- ✓ 3. Analysis of the efficiency of using the energy tank in internal combustion engines.
- ✓ 4. The ability to use various laboratory devices to measure speeds, forces, and torques in the moving parts of internal combustion engines.

15. The Module structure

the week	hours	Learning Outputs required	name Unit / Course or the topic	Education method	Evaluation method
1	3	1	Velocity diagrams	(Lectures + tutorials + Lab)	Quizzes Exams H.W. Reports
2	3	1	Velocity diagrams	(Lectures + tutorials + Lab)	Quizzes Exams H.W. Reports
3	3	1	Velocity diagrams	(Lectures + tutorials + Lab)	Quizzes Exams H.W. Reports
4	3	1, 2	Acceleration diagrams	(Lectures + tutorials + Lab)	Quizzes Exams H.W. Reports

5	3	1,2	Acceleration diagrams	(Lectures + tutorials + Lab)	Quizzes Exams H.W. Reports
6	3	1,2	Acceleration diagrams	(Lectures + tutorials + Lab)	Quizzes Exams H.W. Reports
7	3	3	Hook's Joint	(Lectures + tutorials + Lab)	Quizzes Exams H.W. Reports
8	3	3	Hook's Joint	(Lectures + tutorials + Lab)	Quizzes Exams H.W. Reports
9	3	3	Steering mechanisms	(Lectures + tutorials + Lab)	Quizzes Exams H.W. Reports
10	3	3	Steering mechanisms	(Lectures + tutorials + Lab)	Quizzes Exams H.W. Reports
11	3	4	Gyroscopic couple	(Lectures + tutorials + Lab)	Quizzes Exams H.W. Reports
12	3	4	Gyroscopic couple	(Lectures + tutorials + Lab)	Quizzes Exams H.W. Reports
13	3	4	Flywheel diagrams	(Lectures + tutorials + Lab)	Quizzes Exams H.W. Reports
14	3	4	Flywheel diagrams	(Lectures + tutorials + Lab)	Quizzes Exams H.W. Reports
15	3	4	Governors.	(Lectures + tutorials + Lab)	Quizzes Exams H.W. Reports
16			Final Exam		Exam

16. Structure Infrastructure	
Readings required : ▪ books The module ▪ Other	**Text Books:** 1. Mechanics of Machines: Elementary theory and examples. By: J. Hannah and R.C. Stephens. 2. Mechanics of Machines: Advanced theory and examples. By: J. Hannah and R.C. Stephens. **Recommended Readings:** 3. Theory of Machine. By: R.S. Khurmi and J. K. Gupta. 4. Kinematics and Dynamics of Machines. By: G.H. Martin.
requirements especially	Nothing
Services Social (Include on way Example Lectures Guests And training Professional And studies Field)	Nothing

17. admissions	
Requirements Previous	
less number from Students	25
Larger number from Students	60

Course description form

Reviewing the performance of higher education institutions ((academic program review))

This course description provides a succinct summary of the most important course characteristics and the learning outcomes the student is expected to achieve Demonstrating whether they have made the most of the learning opportunities available. It must be linked to a description the program.

1. Enterprise Educational	University of Anbar
2. Section University / Center	Mechanics
3. name / Code The decision	ME 3308- Theory of machines II
4. Programs that Enters In which	To divide Engineering Mechanical/Bachelor's degree
5. shapes the audience Available	My presence inside the hall
6. the chapter / the year	The chapter Academic the second
7. number hours Scholarship (total)	60
8. date Preparation this the description	24/ 09/ 2023
9. Goals The decision :	

1. To give basic knowledge on kinematics and kinetics of machine elements.
2. Understand the principles of power transmission.
3. To teach students both graphical and analytical methods of motion analysis and design of planar mechanisms.
4. Understand of techniques for studying angular and linear motion of rotating machines.
5. By the end of this course student will be able to achieve complete analysis of mechanism including (cams, gears, gear trains, and belt drive)

10. Outputs Learning And methods education And learning And evaluation

1. To gain basic knowledge of kinematics and kinetics for planar mechanisms.
2. Apply the kinematic analysis in subsequent courses in the design and analysis of various machine components.
3. Identify gear and gear train parameters and perform analysis and kinematical design of gear trains.
4. To learn the analysis and design of cam system and perform static and dynamic balancing of rotating machinery.

11. Methods education And learning

- ✓ Lectures the theory
- ✓ Exercises and activities in hall the lesson.
- ✓ Reports the operation.
- ✓ Guidance students to some sources that maybe benefit of which.

12. Methods Evaluation

- ✓ Quizzes
- ✓ Monthly and final exams
- ✓ Homework
- ✓ Laboratory reports

13. skills Thinking

- ✓ 1. Controlling the approved curriculum first and then dealing with other sources.

- ✓ 2. The ability to comprehend the approved material, which includes four chapters.
- ✓ 3. The ability to determine the type of system and its governing equations.
- ✓ 4. The ability to design and solve equations of motion for the moving parts of internal combustion engines.

14. Skills the public and movable (Skills the other Related Capable recruitment and evolution Personal).

- ✓ 1. The ability to identify problems and ways to solve them according to the concept of theory of machines 2.
- ✓ 2. The ability to apply the laws of motion to different practical situations and combine them.
- ✓ 3. Analysis of the efficiency of using the energy tank in internal combustion engines.
- ✓ 4. The ability to use various laboratory devices to measure speeds, forces, and torques in the moving parts of internal combustion engines.

15. The Module structure

the week	hours	Learning Outputs required	name Unit / Course or the topic	Education method	Evaluation method
1	3	1, 2	Balancing of rotating masses	(Lectures + tutorials + Lab)	Quizzes Exams H.W. Reports
2	3	1, 2	Balancing of rotating masses	(Lectures + tutorials + Lab)	Quizzes Exams H.W. Reports
3	3	1, 2	Balancing of rotating masses	(Lectures + tutorials + Lab)	Quizzes Exams H.W. Reports

4	3	3	Spur gearing	(Lectures + tutorials + Lab)	Quizzes Exams H.W. Reports
5	3	3	Spur gearing	(Lectures + tutorials + Lab)	Quizzes Exams H.W. Reports
6	3	3	Spur gearing	(Lectures + tutorials + Lab)	Quizzes Exams H.W. Reports
7	3	4	Gear trains	(Lectures + tutorials + Lab)	Quizzes Exams H.W. Reports
8	3	4	Gear trains	(Lectures + tutorials + Lab)	Quizzes Exams H.W. Reports
9	3	4	Gear trains	(Lectures + tutorials + Lab)	Quizzes Exams H.W. Reports
10	3	4	Belt drive	(Lectures + tutorials + Lab)	Quizzes Exams H.W. Reports
11	3	4	Belt drive	(Lectures + tutorials + Lab)	Quizzes Exams H.W. Reports
12	3	4	Belt drive	(Lectures + tutorials + Lab)	Quizzes Exams H.W. Reports
13	3	4	Belt drive	(Lectures + tutorials + Lab)	Quizzes Exams H.W. Reports
14	3	4	Cams	(Lectures + tutorials + Lab)	Quizzes Exams H.W. Reports
15	3	1, 2	Balancing of rotating masses	(Lectures + tutorials + Lab)	Quizzes Exams H.W. Reports
16			Final Exam		Exam

16. Structure Infrastructure	
Readings required : ▪ books The module ▪ Other	**Text Books:** 1. Mechanics of Machines: Elementary theory and examples. By: J. Hannah and R.C. Stephens. 2. Mechanics of Machines: Advanced theory and examples. By: J. Hannah and R.C. Stephens. **Recommended Readings:** 3. Theory of Machine. By: R.S. Khurmi and J. K. Gupta. 4. Kinematics and Dynamics of Machines. By: G.H. Martin.
requirements especially	Nothing
Services Social (Include on way Example Lectures Guests And training Professional And studies Field)	Nothing

17. admissions	
Requirements Previous	
less number from Students	25
Larger number from Students	60

Course description form

Reviewing the performance of higher education institutions ((academic program review))

This course description provides a succinct summary of the most important course characteristics and the learning outcomes the student is expected to achieve Demonstrating whether they have made the most of the learning opportunities available. It must be linked to a description the program.

1. Enterprise Educational	University of Anbar
2. Section University / Center	Mechanics
3. Name / The module Code	Calculus-IV / ME 2202
4. Programs that Enter In which	Mechanical Engineering Program
5. shapes the audience Available	My presence inside the hall
6. Semester / Year	Second Semester / Second Year
7. Number of Credit Hours (Total)	45
8. date Preparation this the description	3/11/2023
9. The module Goals:	
1.Recognize double integrals over the rectangle and non-rectangle regions	

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2. Determine transformation of a double integral, solve double integral in polar form and identify triple integral.

3.Identify the main definitions and properties of Laplace and inverse Laplace transforms.

4.Discover rules of partial fractions and special functions.

5.Determine system of Linear Differential Equations and solving systems by Laplace transforms

Discover and use Series Solutions.6

7 Format and solve Partial Differential Equations.

10. Learning Outcomes, education methods, learning and evaluation

1. To understand the formation of Differential equation from the given physical problems and to solve first order ordinary differential equation by various methods.
2. To be able to apply the knowledge of first order ordinary differential equation in different engineering applications.
3. To find the Fourier series representation of a function of one variable and to find half-range Fourier series for even/odd functions.
4. To understand the Laplace, transform and its properties.
5. Apply the Laplace transform to solve differential equations.
6. To understand the convergence and divergence of infinite series and to evaluate successive differentiation.
7. be able to understand and use Green's Theorem, Stokes' Theorem, and the Divergence Theorem.

Education and learning methods

. Theory Lectures

Evaluation Methods

Quiz, Exam, Homework

Thinking Skills

1) An ability to distinguish, identify, define, formulate, and solve engineering problems by applying principles of engineering, science and mathematics.

Education and learning methods
Evaluation Methods
The general and transferred Skills (The other Skills Related to capable recruitment and Personal evolution).

11. The module structure					
week	**hours**	**learning outcomes required**	**Unit name/ Course or the topic**	**Educated method**	**Evaluation method**
1	4	Recognize double integrals over the rectangle and non-rectangle regions	Properties of double integrals.	Lectures and tutorials	Quiz Exam HW
2	4		Double integrals over rectangle regions.	Lectures and tutorials	Quiz Exam HW
3	4	Determine transformation of a double integral, solve double integral in polar form and identify triple integral.	Double integrals over the non-rectangle region: areas of non-rectangle regions in the plane, areas of non-rectangle regions in space.	Lectures and tutorials	Quiz Exam HW
4	4		Transformation of a double integral, Double integral in polar form		
5	4		Triple Integrals	Lectures and tutorials	Quiz Exam HW
6	4	Identify the main definitions and properties of Laplace and inverse Laplace transforms.	Main definitions and properties: linearity, shifting, derivative, integral, multiplication, division, the initial and final value. Solving initial value problems	Lectures and tutorials	Quiz Exam HW
7	4		Laplace transforms some basic functions. Inverse Laplace transforms, rules of partial fractions.	Lectures and tutorials	Quiz Exam HW
8	4	Discover rules of partial fractions and special functions.	Special functions: Heavy side unit step function, Periodic function, Dirac delta function,	Lectures and tutorials	Quiz Exam HW
9	4		Convolution theorem	Lectures and tutorials	Quiz Exam HW
10	4	Determine system of Linear Differential Equations and solving systems by	Definitions, Elimination method, Application of Linear Algebra.	Lectures and tutorials	Quiz Exam HW

		Laplace transformsvariables functions and some applications			
11	4	.Discover and use Series Solutions	Homogeneous linear systems, solving systems by Laplace transforms.	Lectures and tutorials	Quiz Exam HW
12	4		Cauchy-Euler equations, Solutions about ordinary points, Solutions about singular points.	Lectures and tutorials	Quiz Exam HW
13	4	Format and solve Partial Differential Equations	Method of Frobenius, Second solutions and Logarithm terms	Lectures and tutorials	Quiz Exam HW
14	4		Some mathematical models, Method of separation of variables.	Lectures and tutorials	Quiz Exam HW
15	4		The D'Alembert solution, Fourier series solutions, Applications.	Lectures and tutorials	Quiz Exam HW

13. Module Infrastructure	
Readings required: ▪ books of the module ▪ Other :	**Sources are placed** Calculus, by Thomas, GB, Finney, RL, Weir, MD and Giordano, FR, 2003.
especially requirements	Nothing
Services Social (Include on way Example Lectures Guests And training Professional and studies Field)	Nothing

12. admissions	
Prerequisite	Calculus III / ME 2201
less number from Students	10
Larger number from Students	100