Academic Program Description Form

University Name: ...University of Babylon...

Faculty/Institute: .....College of Engineering.....

Scientific Department: .....Mechanical Engineering.....

Academic or Professional Program Name: .....Bachelor of engineering.....

Final Certificate Name: .... Bachelor's degree in mechanical engineering....

Academic System: ...Semester ....

Description Preparation Date:

File Completion Date: 21/3/2024

Signature:

Head of Department Name:

Asst. Prof .Dr.Ali Hassoon Nahhab

Date:

Signature:

Scientific Associate Name:

Asst. Prof .Dr.Rehab Noor Mohammed Al-Kaby

Date:

The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date:

Signature:

جامعة بابل
كلية الهندسة
مكتب العميد

Approval of the Dean

Ministry of Higher Education and Scientific Research
Scientific Supervision and Scientific Evaluation Apparatus
Directorate of Quality Assurance and Academic Accreditation
Accreditation Department

Academic Program and Course Description Guide

2024

Introduction:

The educational program is a well-planned set of courses that include procedures and experiences arranged in the form of an academic syllabus. Its main goal is to improve and build graduates' skills so they are ready for the job market. The program is reviewed and evaluated every year through internal or external audit procedures and programs like the External Examiner Program.

The academic program description is a short summary of the main features of the program and its courses. It shows what skills students are working to develop based on the program's goals. This description is very important because it is the main part of getting the program accredited, and it is written by the teaching staff together under the supervision of scientific committees in the scientific departments.

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

In this regard, we can only emphasize the importance of writing an academic programs and course description to ensure the proper functioning of the educational process.

Concepts and terminology:

Academic Program Description: The academic program description provides a brief summary of its vision, mission and objectives, including an accurate description of the targeted learning outcomes according to specific learning strategies.

Course Description: Provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the students to achieve, proving whether they have made the most of the available learning opportunities. It is derived from the program description.

Program Vision: An ambitious picture for the future of the academic program to be sophisticated, inspiring, stimulating, realistic and applicable.

Program Mission: Briefly outlines the objectives and activities necessary to achieve them and defines the program's development paths and directions.

Program Objectives: They are statements that describe what the academic program intends to achieve within a specific period of time and are measurable and observable.

Curriculum Structure: All courses / subjects included in the academic program according to the approved learning system (quarterly, annual, Bologna Process) whether it is a requirement (ministry, university, college and scientific department) with the number of credit hours.

Learning Outcomes: A compatible set of knowledge, skills and values acquired by students after the successful completion of the academic program and must determine the learning outcomes of each course in a way that achieves the objectives of the program.

Teaching and learning strategies: They are the strategies used by the faculty members to develop students' teaching and learning, and they are plans that are followed to reach the learning goals. They describe all classroom and extra-curricular activities to achieve the learning outcomes of the program.

Academic Program Description Form

University Name: University of Babylon

Faculty/Institute: College of Engineering

Scientific Department: Mechanical Engineering

Academic or Professional Program Name: Bachelor of engineering

Final Certificate Name: Bachelor's degree in mechanical engineering

Academic System: Annual

Description Preparation Date:

File Completion Date: 31/3/2024

Signature:	**Signature:**
Head of Department Name:	**Scientific Associate Name:**
Date:	**Date:**

The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date:

Signature:

Approval of the Dean

1. **Program Vision**
Program vision is written here as stated in the university's catalogue and website.

2. **Program Mission**
Program mission is written here as stated in the university's catalogue and website.

3. **Program Objectives**
General statements describing what the program or institution intends to achieve.

4. **Program Accreditation**
Does the program have program accreditation? And from which agency?

5. **Other external influences**
Is there a sponsor for the program?

6. **Program Structure**				
Program Structure	**Number of Courses**	**Credit hours**	**Percentage**	**Reviews***
Institution Requirements				
College Requirements				

Department Requirements				
Summer Training				
Other				

* This can include notes whether the course is basic or optional.

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
			theoretical	practical

8. Expected learning outcomes of the program

Knowledge	
Learning Outcomes 1	Learning Outcomes Statement 1
Skills	
Learning Outcomes 2	Learning Outcomes Statement 2
Learning Outcomes 3	Learning Outcomes Statement 3
Ethics	
Learning Outcomes 4	Learning Outcomes Statement 4
Learning Outcomes 5	Learning Outcomes Statement 5

9. Teaching and Learning Strategies

Teaching and learning strategies and methods adopted in the implementation of the program in general.

10. Evaluation methods

Implemented at all stages of the program in general.

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer

Professional Development

Mentoring new faculty members

Briefly describes the process used to mentor new, visiting, full-time, and part-time faculty at the institution and department level.

Professional development of faculty members

Briefly describe the academic and professional development plan and arrangements for faculty such as teaching and learning strategies, assessment of learning outcomes, professional development, etc.

12. Acceptance Criterion

(Setting regulations related to enrollment in the college or institute, whether central admission or others)

13. The most important sources of information about the program

State briefly the sources of information about the program.

14. Program Development Plan

Program Skills Outline															
				Required program Learning outcomes											
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4

- **Please tick the boxes corresponding to the individual program learning outcomes under evaluation.**

Course Description Form

1. Course Name:
Turbomachine
2. Course Code:
356
3. Semester / Year:
3
4. Description Preparation Date:
31/3/2024
5. Available Attendance Forms:
In person
6. Number of Credit Hours (Total) / Number of Units (Total)
ECTS credit = 5
7. Course administrator's name (mention all, if more than one name)
Name: Farooq Hassan Ali Email: eng.farooq.h assan@uoba bylon.edu.iq ....
8. Course Objectives

Course Objectives	1. This module aims to teach engineering students about the concept of Turbo-machinery. 2. Students have knowledge about the types of impellers, compressors and turbines. 3. This module also teaches the student the basic related calculations in different types of impellers, compressors and turbines. 4. This module also aims to introduce important information on the basic designs consideration of impellers, compressors and turbines. 5. This module helps students to improve their higher-level thinking skills, including critical thinking and creativity and solving calculated problems precisely without mistakes. 6. This module improves students' skills in solving the calculations of turbomachinery

	problems to be ready to study the subject of Power plants (ENME483) in the eighth semester of study. This module provides important information to prepare the mechanical engineer for actual applications of turbine machines.

9. Teaching and Learning Strategies

Strategy	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and show the video scenes explaining the manufacturing process and method of work.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
First	3	Students have knowledge in turbomachines and its classifications.	Introduction and classification of turbomachines	The method depends on explaining the main principles of this analysis and the importance of using it in our daily lives by giving a set of examples and asking some questions.	**The evaluation is done through class activities to solve a set of questions**
Second	3	Students have knowledge about the basic concept of Euler's equation for turbomachinery.	Euler's equation for turbomachinery	Precisely explaining the material, clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	**The evaluation is done through class activities to solve a set of questions, and then the students are asked to solve a homework assignment related to the lesson**
Third	3	Students have ability to find the inlet and outlet velocity vector triangles and efficiency.	Inlet and outlet velocity vector triangles, Concepts of efficiency.	Precisely explaining the material, clarifying its importance, and	**The evaluation is done through class activities to solve a set of questions, and**

				presenting a set of examples that are solved first by the teacher and then with the participation of the students	**then the students are asked to solve a homework assignment related to the lesson**
Fourth	3	Students have knowledge about the centrifugal compressor; performance map, preliminary design of impeller and diffuser.	Centrifugal compressor; performance map, preliminary design of impeller and diffuser.	Precisely explaining the material, clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	**The evaluation is done through class activities to solve a set of questions, and then the students are asked to solve a homework assignment related to the lesson**
Fifth	3	Students able to find the slip factor and impeller back sweep	Slip factor, impeller back sweep	The method depends on explaining the general form of this transformation and the importance of using it in our daily lives by giving a set of examples and asking some questions.	**The evaluation is done through class activities to solve a set of questions, and then the students are asked to solve a homework assignment related to the lesson**
Sixth	3	Students have knowledge about the Radial turbine and performance map.	Radial turbine; performance map.	Precisely explaining the material, clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	**The evaluation is done through class activities to solve a set of questions, and then the students are asked to solve a homework assignment related to the lesson**
Seventh	3	Students have knowledge about the basic concept of Preliminary design of rotor and nozzle	Preliminary design of rotor and nozzle	Precisely explaining the material, clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the	**The evaluation is done through class activities to solve a set of questions, and then the students are asked to solve a homework assignment**

				participation of the students	**related to the lesson**
Eighth	3	Students have knowledge about the nominal design condition, velocity ratio, mechanical and material considerations.	Nominal design condition, velocity ratio, mechanical and material considerations.	Precisely explaining the material, clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	**The evaluation is done through class activities to solve a set of questions, and then the students are asked to solve a homework assignment related to the lesson**
Ninth	3	Students are able to find the isentropic and polytropic efficiency.	Isentropic and polytropic efficiency.	Precisely explaining the material, clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	**The evaluation is done through class activities to solve a set of questions, and then the students are asked to solve a homework assignment related to the lesson**
Tenth	3	Students have knowledge about the cascade airfoil geometry and the flow characteristics and performance of the cascade.	Cascade airfoil geometry. Cascade testing, flow characteristics and performance	Precisely explaining partial differential equations, clarifying the method of separation of variables, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	**The evaluation is done through class activities to solve a set of examples**
Eleventh	3	Students have knowledge about the axial turbines & compressors and how to find the velocity triangles,	Axial turbines & compressors – velocity triangles.	Explaining the material, clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	**The evaluation is done through class activities to solve a set of questions, and then the students are asked to solve a homework assignment related to the lesson**
Twelveth	3	Students have knowledge about the	Stage design parameters, repeating stages, losses &	Explaining the material,	**The evaluation is done through**

		basic concept of the stage design parameters, repeating stages and how to find the losses & efficiency.	efficiency	clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	**class activities to solve a set of questions, and then the students are asked to solve a homework assignment related to the lesson**
Thirteen	3	Students have knowledge about the Reaction, Smith chart, transonic compressors, stall and surge.	Reaction, Smith chart, transonic compressors, stall and surge.	Explaining the material, clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	**The evaluation is done through class activities to solve a set of questions, and then the students are asked to solve a homework assignment related to the lesson**
Fourteen	3	Students have knowledge about the introduction of cavitation.	Introduction to cavitation	Explaining the material, clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	**The evaluation is done through class activities to solve a set of questions, and then the students are asked to solve a homework assignment related to the lesson**

11. Course Evaluation

Quizzes 10%, Assignments 10%, Report 10%, Midterm Exam 10%, and Final Exam 60%
Then the total is 100%

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Required Textbooks	Gas Turbine Theory 6th Ed, Saravanamuttoo, Rogers, Cohen and Straznicky, ISBN-10: 0132224372
	Fluid Mechanics and Thermodynamics of Turbomachinery 7th Edition, Dixon and Hall, Elsevier Science & Technology, ISBN: 978-0-12-415954-9
	A Text Book of Fluid Machinery
Recommended Texts	1- Fluid Mechanics and Machinery: https://india.oup.com/product/fluid-mechanics-and-machinery-9780195699630 2- Fluid Mechanics and Machinery 1st Edition: https://www.amazon.com/Fluid-Mechanics-Machinery-C-S-P-Ojha/dp/0195699637 **3. Fluid mechanics and hydraulic machines**: https://mechanicalbasics.com/fluid-mechanics-and-hydraulic-machines/

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Academic Program Description Form

University Name: .... University of Babylon...**.....**

Faculty/Institute: ..... College of Engineering**.....**

Scientific Department: ..... Mechanical Engineering**.....**

Academic or Professional Program Name: .... Bachelor of engineering**.....**

Final Certificate Name: .... Bachelor's degree in mechanical engineering**.....**

Academic System: Semester

Description Preparation Date:

File Completion Date:2024\3\31

Signature:

Head of Department Name:

Date:

Signature:

Scientific Associate Name:

Date:

The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date:

Signature:

Approval of the Dean

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Does the program have program accreditation? And from which agency?

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Program Structure	**Number of Courses**	**Credit hours**	**Percentage**	**Reviews***
Institution Requirements				
College Requirements				

Department Requirements				
Summer Training				
Other				

* This can include notes whether the course is basic or optional.

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
			theoretical	practical

8. Expected learning outcomes of the program

Knowledge	
Learning Outcomes 1	Learning Outcomes Statement 1
Skills	
Learning Outcomes 2	Learning Outcomes Statement 2
Learning Outcomes 3	Learning Outcomes Statement 3
Ethics	
Learning Outcomes 4	Learning Outcomes Statement 4
Learning Outcomes 5	Learning Outcomes Statement 5

9. Teaching and Learning Strategies

Teaching and learning strategies and methods adopted in the implementation of the program in general.

10. Evaluation methods

Implemented at all stages of the program in general.

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer

Professional Development

Mentoring new faculty members

Briefly describes the process used to mentor new, visiting, full-time, and part-time faculty at the institution and department level.

Professional development of faculty members

Briefly describe the academic and professional development plan and arrangements for faculty such as teaching and learning strategies, assessment of learning outcomes, professional development, etc.

12. Acceptance Criterion

(Setting regulations related to enrollment in the college or institute, whether central admission or others)

13. The most important sources of information about the program

State briefly the sources of information about the program.

14. Program Development Plan

Program Skills Outline															
				Required program Learning outcomes											
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4

- **Please tick the boxes corresponding to the individual program learning outcomes under evaluation.**

Course Description Form

1. Course Name:
Gas Dynamic
2. Course Code:
223
3. Semester / Year:
3
4. Description Preparation Date:
31\3\2024
5. Available Attendance Forms:
In person
6. Number of Credit Hours (Total) / Number of Units (Total)
ECTS credit = 5
7. Course administrator's name (mention all, if more than one name)
Name: Farooq Hassan Ali Email:eng.far ooq.hassan@ uobabylon.ed u.iq
8. Course Objectives

Course Objectives	1- To introduce the fundamental concepts and governing equatïöñs of fluid mechanics, using mathematical techniques to analyses simple flow problems for an inviscid (frictionless) fluid. 2- This course is designed to introduce seniors and beginning graduate students in the fundamentals of compressible fluid flow, with an emphasis on a wide variety of steady, one-dimensional flow problems and a general understanding of the principles of multi-dimensional flow.

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

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
First	3	Students have clear knowledge about some of the basic mechanisms, thermodynamic analysis and fluid mechanics properties of gases; demonstrate a clear understanding of the use of the properties.	**Fluid properties and dimensional analysis, kinematics of fluid motion.**	The method depends on explaining the main principles of this analysis and the importance of using it to solve takes	The evaluation is done through class activities to solve a set of examples
Second		Students have knowledge about the mass, momentum and energy equations.	**Equations of mass Momentum and energy equations**	Precisely explaining the material, clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	The evaluation is done through class activities to solve a set of questions, and then the students are asked to solve a homework assignment related to the lesson
Third		Students have knowledge about the relations between vorticity and entropy generation, and the wave propagation in compressible flows.	**Relation between vorticity and entropy generation, wave propagation in compressible flows**	Precisely explaining the material, clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	The evaluation is done through class activities to solve a set of questions, and then the students are asked to solve a homework assignment related to the lesson
Fourth		Students have knowledge about what is the One-dimensional gas dynamics and the area-velocity relation.	**One-dimensional gas dynamics and Area-Velocity relation**	Precisely explaining the material, clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	The evaluation is done through class activities to solve a set of questions, and then the students are asked to solve a homework assignment related to the lesson
Fifth		Students have knowledge about the Isentropic flows.	**Isentropic flows**	The method depends on explaining the general form of	The evaluation is done through class activities to solve a set of

				this transformation and the importance of using it in our daily lives by giving a set of examples and asking some questions.	questions, and then the students are asked to solve a homework assignment related to the lesson
Sixth		Students are able to find the fluid properties in Normal shock flow.	**Choking and Normal shock**	Precisely explaining the material, clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	The evaluation is done through class activities to solve a set of questions, and then the students are asked to solve a homework assignment related to the lesson
Seventh		Students have knowledge about the flow in ducts and diffusers.	**Flows in ducts and nozzles**	Precisely explaining the material, clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	The evaluation is done through class activities to solve a set of questions, and then the students are asked to solve a homework assignment related to the lesson
Eighth		Students have knowledge about the flow with friction and heat transfer.	**Flow with friction and heat transfer**	Precisely explaining the material, clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	The evaluation is done through class activities to solve a set of questions, and then the students are asked to solve a homework assignment related to the lesson
Ninth		Students are able to find the fluid properties in Oblique shock waves.	**Oblique shocks**	Precisely explaining the material, clarifying its importance, and presenting a set of examples that are solved first by the teacher	The evaluation is done through class activities to solve a set of questions, and then the students are asked to solve a homework assignment

				and then with the participation of the students	related to the lesson
Tenth		Students have clear knowledge about some of the basic mechanisms, thermodynamic analysis and fluid mechanics properties of gases; demonstrate a clear understanding of the use of the properties.	**Small perturbation theory - Over and under expanded flows (Prandtl-Meyer expansions)**	Precisely explaining partial differential equations, clarifying the method of separation of variables, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	The evaluation is done through class activities to solve a set of questions
Eleventh		Students have knowledge about the small perturbation theory - Over and under expanded flows (Prandtl-Meyer expansions).	**Supersonic nozzles and diffusers**	Explaining the material, clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	The evaluation is done through class activities to solve a set of questions, and then the students are asked to solve a homework assignment related to the lesson
Twelfth		Students have knowledge about the flow characteristic in supersonic nozzles and diffusers.	**Nozzles for propulsion and wind tunnels, supersonic airfoils, and wave drag**	Explaining the material, clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	The evaluation is done through class activities to solve a set of questions, and then the students are asked to solve a homework assignment related to the lesson
Thirteenth		Students have knowledge about the Nozzles for propulsion and wind tunnels, supersonic airfoils, and wave drag.	**Flows with friction and heat transfer, and Fanno and Rayleigh lines**	Explaining the material, clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	The evaluation is done through class activities to solve a set of questions, and then the students are asked to solve a homework assignment related to the lesson
Fourteenth		Students have knowledge about how to find the results of flow with friction and heat	**Introduction to characteristic method.**	Precisely explaining partial differential equations,	The evaluation is done through class activities to solve a set of

		transfer, and in the subject of Fanno and Rayleigh lines.		clarifying the method of separation of variables, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	questions

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports.....etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Required Textbooks	مباديء ديناميك الغازات د. منذر الدروبي
	Compressible Fluid Flow (2nd Edition) 2nd Edition by Michel A. Saad
	https://link.springer.com/book/10.2991/978-94-6239-195-6
Recommended Texts	1- Benedict, Robert P. 1982. *Fundamentals of Gas Dynamics*. New York: John Wiley & Sons. [Available at the Circulation Collection (QC 168. B448 1983), UPRM General Library] (**) **2.** Zucker R.D., O. Biblarz. 2002. *Fundamentals of Gas Dynamics*. New York: John Wiley & Sons. (**) **3.** Liepmann H.W. and Roshko A. 2002. *Elements of Gas Dynamics*, New York: Dover Publications. **4.** Kreith, Frank. 1999. *CRC Handbook of Thermal Engineering*. Florida: CRC Press. http://dx.doi.org/10.1201/9781420050424 . [Available via MechanicalENGINEERING netBASE, UPRM General Library Databases] (*)

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2024

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Academic Program Description Form

University Name: Babylon
Faculty/Institute: Engineering
Scientific Department: Mechanical
Academic or Professional Program Name: Vibration 1
Final Certificate Name: .....
Academic System: .....
Description Preparation Date:
File Completion Date:

Signature:
Head of Department Name:

Date:

Signature:
Scientific Associate Name:

Date:

The file is checked by:
Department of Quality Assurance and University Performance
Director of the Quality Assurance and University Performance Department:
Date:
Signature:

Approval of the Dean

1. **Program Vision**
Program vision is written here as stated in the university's catalogue and website.

2. **Program Mission**
Program mission is written here as stated in the university's catalogue and website.

3. **Program Objectives**
General statements describing what the program or institution intends to achieve.

4. **Program Accreditation**
NO

5. **Other external influences**
NO

6. **Program Structure**				
Program Structure	**Number of Courses**	**Credit hours**	**Percentage**	**Reviews***
Institution Requirements				
College Requirements				

Department Requirements				
Summer Training				
Other				

* This can include notes whether the course is basic or optional.

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
			theoretical	practical

8. Expected learning outcomes of the program

Knowledge	
Learning Outcomes 1	Learning Outcomes Statement 1
Skills	
Learning Outcomes 2	Learning Outcomes Statement 2
Learning Outcomes 3	Learning Outcomes Statement 3
Ethics	
Learning Outcomes 4	Learning Outcomes Statement 4
Learning Outcomes 5	Learning Outcomes Statement 5

9. Teaching and Learning Strategies

Teaching and learning strategies and methods adopted in the implementation of the program in general.

10. Evaluation methods

Implemented at all stages of the program in general.

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer

Professional Development

Mentoring new faculty members

Briefly describes the process used to mentor new, visiting, full-time, and part-time faculty at the institution and department level.

Professional development of faculty members

Briefly describe the academic and professional development plan and arrangements for faculty such as teaching and learning strategies, assessment of learning outcomes, professional development, etc.

12. Acceptance Criterion

(**Setting regulations related to enrollment in the college or institute, whether central admission or others**)

13. The most important sources of information about the program

State briefly the sources of information about the program.

14. Program Development Plan

Program Skills Outline															
				Required program Learning outcomes											
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
4	EnMeMv4543(2)	Mechanical Vibrations I	BASIC	\	\	\		\	\	\		\	\	\	

- **Please tick the boxes corresponding to the individual program learning outcomes under evaluation.**

Course Description Form

1. Course Name: Mechanical Vibrations I

2. Course Code: **EnMeMv4543(2)**

3. Semester / Year: Semester

4. Description Preparation Date: 2023-2024

5. Available Attendance Forms:

6. Number of Credit Hours (45) / Number of Units (2)

7. Course administrator's name (mention all, if more than one name)

Name:
Email:

8. Course Objectives

Study and analysis of free and forced vibrations that induced in mechanical and structural parts under action of different cases of dynamic excitations.	The aims of this course are to provide students with the basic knowledge and skills of analysis and/or use of computer software of various mechanical systems ; such as Matlab, and formulation of mathematical models of problems in vibrations. This course will also provide students with the ability to select and design the appropriate isolation, absorption, and control system of vibration for the application of various mechanical systems.

9. Teaching and Learning Strategies

Strategy	• Lectures, • Tutorials, • Self-Learning Assignments • Seminars • Computer Laboratory, and • Project class room activity

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	a2, b1	Introdction	Lecture	activity
2,3	3	a1, a2,b1,b2	Discrete structure:	Lecture ,	Self-Learning

			Generelized Coordinates.	Tutorials	Assignments, project
4	3	a1, a2,b1,b2	Discrete Mass Considerations.	Lecture , Tutorials	Self-Learning Assignments
5,6	3	a1, a2,b1,b2	Discrete stiffness Considerations.	Lecture , Tutorials	Self-Learning Assignments
7	3	a1, a2,b1,b2	Discrete damper Considerations.	Lecture , Tutorials	Self-Learning Assignments
8,9	3	a1, a2,b1,b2	Occurance of free vibration	Lecture , Tutorials	Self-Learning Assignments
10,11	3	a1, a2,b1,b2, c1	Modal analysis of discrete structures.	Lecture , Tutorials	Seminars, Tutorials
12,13	3	a1, a2,b1,b2, c1	Frequency analysis of discrete structures.	Lecture , Tutorials	Seminars, Tutorials
14		a1, a2,b1,b2	Response of forced vibration	Lecture , Tutorials	Self-Learning Assignments
15		a1, a2,b1,b2,c1, d1,d2.	Final Examination	Lecture , Tutorials	Writtien Exam, Computer Laboratory

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports.....etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Ministry of Higher Education and Scientific Research
Scientific Supervision and Scientific Evaluation Apparatus
Directorate of Quality Assurance and Academic Accreditation
Accreditation Department

Academic Program and Course Description Guide

2024

Introduction:

The educational program is a well-planned set of courses that include procedures and experiences arranged in the form of an academic syllabus. Its main goal is to improve and build graduates' skills so they are ready for the job market. The program is reviewed and evaluated every year through internal or external audit procedures and programs like the External Examiner Program.

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Program Vision: An ambitious picture for the future of the academic program to be sophisticated, inspiring, stimulating, realistic and applicable.

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Teaching and learning strategies: They are the strategies used by the faculty members to develop students' teaching and learning, and they are plans that are followed to reach the learning goals. They describe all classroom and extra-curricular activities to achieve the learning outcomes of the program.

Academic Program Description Form

University Name: Babylon
Faculty/Institute: Engineering
Scientific Department: Mechanical
Academic or Professional Program Name: Vibration 1
Final Certificate Name: .....
Academic System: .....
Description Preparation Date:
File Completion Date:

Signature:
Head of Department Name:

Date:

Signature:
Scientific Associate Name:

Date:

The file is checked by:
Department of Quality Assurance and University Performance
Director of the Quality Assurance and University Performance Department:
Date:
Signature:

Approval of the Dean

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4. **Program Accreditation**
NO

5. **Other external influences**
NO

6. **Program Structure**				
Program Structure	**Number of Courses**	**Credit hours**	**Percentage**	**Reviews***
Institution Requirements				
College Requirements				

Department Requirements				
Summer Training				
Other				

* This can include notes whether the course is basic or optional.

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
			theoretical	practical

8. Expected learning outcomes of the program

Knowledge	
Learning Outcomes 1	Learning Outcomes Statement 1
Skills	
Learning Outcomes 2	Learning Outcomes Statement 2
Learning Outcomes 3	Learning Outcomes Statement 3
Ethics	
Learning Outcomes 4	Learning Outcomes Statement 4
Learning Outcomes 5	Learning Outcomes Statement 5

9. Teaching and Learning Strategies

Teaching and learning strategies and methods adopted in the implementation of the program in general.

10. Evaluation methods

Implemented at all stages of the program in general.

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
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Mentoring new faculty members

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Briefly describe the academic and professional development plan and arrangements for faculty such as teaching and learning strategies, assessment of learning outcomes, professional development, etc.

12. Acceptance Criterion

(**Setting regulations related to enrollment in the college or institute, whether central admission or others**)

13. The most important sources of information about the program

State briefly the sources of information about the program.

14. Program Development Plan

Program Skills Outline															
				Required program Learning outcomes											
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
4	EnMeMv46211 (2)	Mechanical Vibrations 2	BASIC	\	\	\		\	\	\		\	\	\	

- **Please tick the boxes corresponding to the individual program learning outcomes under evaluation.**

Course Description Form

1. Course Name:
Mechanical Vibrations 2
2. Course Code:
EnMeMv46211(2)
3. Semester / Year:
Semester
4. Description Preparation Date:
2023-2024
5. Available Attendance Forms:
6. Number of Credit Hours (60) / Number of Units (3)
7. Course administrator's name (mention all, if more than one name)
Name: Hatem Hadi Obaid Email:eng.hatem.hadi@uobabylon.edu.iq
8. Course Objectives

Study and analysis of free and forced vibrations that induced in mechanical continuous and structural parts under action of different cases of dynamic excitations.	The aims of this course are to provide students with the basic knowledge and skills of analysis and/or use of computer software of various mechanical systems, such as Matlab, and formulation of mathematical models of problems in continuous member vibrations. This course will also provide students with the ability to select and design the appropriate isolation, absorption, and control system of vibration for the application of various mechanical systems.

9. Teaching and Learning Strategies	
Strategy	• Lectures, • Tutorials, • Self-Learning Assignments • Seminars • Computer Laboratory, and • Project class room activity

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	a2, b1	Introdction, Contineos structures	Lecture	activity

2	34	a1, a2,b1,b2	Rod Vibration, DE	Lecture , Tutorials	Self-Learning Assignments, project
3	34	a1, a2,b1,b2	Free vibration of rod	Lecture , Tutorials	Self-Learning Assignments
4	34	a1, a2,b1,b2	Forced vibration of rod	Lecture , Tutorials	Self-Learning Assignments
5	34	a1, a2,b1,b2	Twist Vibration of Shaft	Lecture , Tutorials	Self-Learning Assignments
6	34	a1, a2,b1,b2	Free vibration of Shaft	Lecture , Tutorials	Self-Learning Assignments
7	34	a1, a2,b1,b2, c1	Forced vibration of Shaft	Lecture , Tutorials	Seminars, Tutorials
8,9	34	a1, a2,b1,b2, c1	Beam Vibrations	Lecture , Tutorials	Seminars, Tutorials
10,11	34	a1, a2,b1,b2	Boundary conditions	Lecture , Tutorials	Self-Learning Assignments
12,13	34	a1, a2,b1,b2, c1	Free vibration of beam	Lecture , Tutorials	
14	4	a1, a2,b1,b2, c1	Forced vibration of beam	Lecture , Tutorials	
15	4	a1, a2,b1,b2,c1, d1,d2.	Final Examination	Lecture , Tutorials	Writtien Exam, Computer Laboratory

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports.....etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Ministry of Higher Education and Scientific Research
Scientific Supervision and Scientific Evaluation Apparatus
Directorate of Quality Assurance and Academic Accreditation
Accreditation Department

Academic Program and Course Description Guide

2024

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Academic Program Description Form

University Name: ...University of Babylon...

Faculty/Institute: .....College of Engineering.....

Scientific Department: .....Mechanical Engineering.....

Academic or Professional Program Name: …..Bachelor of engineering…..

Final Certificate Name: …. Bachelor's degree in mechanical engineering….

Academic System: …Semester ….

Description Preparation Date:

File Completion Date: 21/3/2024

Signature:

Head of Department Name:

Asst. Prof .Dr.Ali Hassoon Nahhab

Date:

Signature:

Scientific Associate Name:

Asst. Prof .Dr.Rehab Noor Mohammed Al-Kaby

Date:

The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date:

Signature:

Approval of the Dean

1. **Program Vision**
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2. **Program Mission**
Program mission is written here as stated in the university's catalogue and website.

3. **Program Objectives**
General statements describing what the program or institution intends to achieve.

4. **Program Accreditation**
Does the program have program accreditation? And from which agency?

5. **Other external influences**
Is there a sponsor for the program?

6. **Program Structure**				
Program Structure	**Number of Courses**	**Credit hours**	**Percentage**	**Reviews***
Institution Requirements				
College Requirements				

Department Requirements				
Summer Training				
Other				

* This can include notes whether the course is basic or optional.

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
			theoretical	practical

8. Expected learning outcomes of the program

Knowledge
Skills
Ethics

9. Teaching and Learning Strategies

10. Evaluation methods

Implemented at all stages of the program in general.

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer

Professional Development

Mentoring new faculty members

Briefly describes the process used to mentor new, visiting, full-time, and part-time faculty at the institution and department level.

Professional development of faculty members

Briefly describe the academic and professional development plan and arrangements for faculty such as teaching and learning strategies, assessment of learning outcomes, professional development, etc.

12. Acceptance Criterion

(**Setting regulations related to enrollment in the college or institute, whether central admission or others**)

13. The most important sources of information about the program

State briefly the sources of information about the program.

14. Program Development Plan

Program Skills Outline															
				Required program Learning outcomes											
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4

- **Please tick the boxes corresponding to the individual program learning outcomes under evaluation.**

Course Description Form

1. Course Name:
Numerical Analysis
2. Course Code:
219
3. Semester / Year:
3
4. Description Preparation Date:
2024
5. Available Attendance Forms:
In person
6. Number of Credit Hours (Total) / Number of Units (Total)
ECTS credit = 5
7. Course administrator's name (mention all, if more than one name)
Name: Rehab Noor Mohammed Email: Eng.rehab.mohammed@uobabylon.edu.iq
8. Course Objectives

Course Objectives

- Providing students with the fundamentals of numerical analysis by covering the principles of numerical methods and emphasizing the most essential methods that are used to solve problems in science and engineering fields.
- Enhancing students' programming skills using the MATLAB environment to implement algorithms and giving them the opportunity to develop and present their own projects to prepare them for future courses in their areas of specialization.
- Helping students to understand the new mathematical approaches for approximating the underlying problems involving interpolation, numerical solutions of linear systems, approximation of eigenvalues and eigenvectors, numerical solutions of initial value problems and ordinary differential equations, and numerical differentiation using finite difference approximation method.

9. Teaching and Learning Strategies	
Strategy	Explicit instruction provides a solid foundation for demonstrating lessons. Start by clearly stating the learning objectives and reminding students of what they already know. This connection helps them see the relevance and builds upon existing knowledge. Break down complex concepts into manageable steps, using visuals and clear language. Explicitly introduce Matlab, new vocabulary, and connect it to familiar terms. Show how math connects to everyday life or other disciplines, making the learning more meaningful. Throughout the explanation, ask questions

	to check for understanding and encourage participation. Activities and discussions further solidify learning. After the explanation, provide opportunities for guided and independent practice, allowing students to solidify their skills with support and then move towards independent work and Matlab programming. Finally, offer corrective feedback and chances for revision.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5	Students will understand the concept of this analysis and how to use MATLAB software	Background about numerical methods and MATLAB software	The method depends on explaining the main principles of this analysis and the importance of using it to solve takes	The evaluation is done through class activities to solve a set of examples
2	5	Students will learn how to do interpolation using Lagrange polynomials	Interpolation using Lagrange polynomials	Precisely explaining the material, clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	The evaluation is done through class activities to solve a set of questions, and then the students are asked to solve a homework assignment related to the lesson
3	5	Students will learn how to do interpolation using Newton's polynomial	Newton's interpolating polynomials	Precisely explaining the material, clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	The evaluation is done through class activities to solve a set of questions, and then the students are asked to solve a homework assignment related to the lesson
4	5	Students understand the linear spline interpolation	Linear spline interpolations	Precisely explaining the material, clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	The evaluation is done through class activities to solve a set of questions, and then the students are asked to solve a homework assignment related to the lesson

5	5	Students are prepared to solve problems dealing with quadratic spline interpolation	Quadratic spline interpolations	The method depends on explaining the general form of this transformation and the importance of using it in our daily lives by giving a set of examples and asking some questions.	The evaluation is done through class activities to solve a set of questions, and then the students are asked to solve a homework assignment related to the lesson
6	5	Students will understand this method	Gauss elimination method	Precisely explaining the material, clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	The evaluation is done through class activities to solve a set of questions, and then the students are asked to solve a homework assignment related to the lesson
7	5	Students are able to solve any problem deals with this area	Gauss-Jordan elimination method	Precisely explaining the material, clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	The evaluation is done through class activities to solve a set of questions, and then the students are asked to solve a homework assignment related to the lesson
8	5	Students are able to solve any problem deals with this area	Inverse of matrix method	Precisely explaining the material, clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	The evaluation is done through class activities to solve a set of questions, and then the students are asked to solve a homework assignment related to the lesson

9	5	Students will understand this technique and are able to solve any problem deals with this area	Gauss-Seidel iterative method	Precisely explaining the material, clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	The evaluation is done through class activities to solve a set of questions, and then the students are asked to solve a homework assignment related to the lesson
10	5	Students will be introduced to this method	Eigenvalues and eigenvectors method	Precisely explaining partial differential equations, clarifying the method of separation of variables, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	The evaluation is done through class activities to solve a set of questions
11	5	Students are able to solve any problem deals with this area	Modified Euler's method	Explaining the material, clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	The evaluation is done through class activities to solve a set of questions, and then the students are asked to solve a homework assignment related to the lesson
12	5	Students are able to solve any problem deals with this area	Runge-Kutta method	Explaining the material, clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	The evaluation is done through class activities to solve a set of questions, and then the students are asked to solve a homework assignment related to the lesson

13	5	Students are introduced to this method and are able to solve any problem deals with this area	Finite difference method	Explaining the material, clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	The evaluation is done through class activities to solve a set of questions, and then the students are asked to solve a homework assignment related to the lesson

11. Course Evaluation

Quizzes 10%, Assignments 10%, Report 10%, Lab 10%, Midterm Exam 10%, and Final Exam 50% Then the total is 100%

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Required Textbooks	- Griffiths, Smith, I. M., & Smith, I. M. (Ian M. (2006). *Numerical methods for engineers* (2nd ed.). Chapman & Hall/CRC. - Cheney, Kincaid, D., & Kincaid, D. (David R. (2004). *Numerical mathematics and computing* (5th ed.). Brooks/Cole-Thomson Learning.
Recommended Texts	- Esfandiari. (2013). *Numerical methods for engineers and scientists using MATLAB®* (First edition.). CRC Press, an imprint of Taylor and Francis. - Deuflhard, Deuflhard, P., & Hohmann, A. (2003). *Numerical analysis in modern scientific computing: an introduction* (Deuflhard & A. Hohmann, Eds.; Second Edition.). Springer.

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2024

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Academic Program Description Form

University Name: ...University of Babylon...

Faculty/Institute: .....College of Engineering.....

Scientific Department: .....Mechanical Engineering.....

Academic or Professional Program Name: …..Bachelor of engineering…..

Final Certificate Name: …. Bachelor's degree in mechanical engineering….

Academic System: …Annual….

Description Preparation Date:

File Completion Date: 21/3/2024

Signature:

Head of Department Name:

Date:

Signature:

Scientific Associate Name:

Date:

The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date:

Signature:

Approval of the Dean

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2. **Program Mission**
Program mission is written here as stated in the university's catalogue and website.

3. **Program Objectives**
General statements describing what the program or institution intends to achieve.

4. **Program Accreditation**
Does the program have program accreditation? And from which agency?

5. **Other external influences**
Is there a sponsor for the program?

6. **Program Structure**				
Program Structure	**Number of Courses**	**Credit hours**	**Percentage**	**Reviews***
Institution Requirements				
College Requirements				

Department Requirements				
Summer Training				
Other				

* This can include notes whether the course is basic or optional.

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
			theoretical	practical

8. Expected learning outcomes of the program

Knowledge
Skills
Ethics

9. Teaching and Learning Strategies

10. Evaluation methods

Implemented at all stages of the program in general.

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer

Professional Development

Mentoring new faculty members

Briefly describes the process used to mentor new, visiting, full-time, and part-time faculty at the institution and department level.

Professional development of faculty members

Briefly describe the academic and professional development plan and arrangements for faculty such as teaching and learning strategies, assessment of learning outcomes, professional development, etc.

12. Acceptance Criterion

(**Setting regulations related to enrollment in the college or institute, whether central admission or others**)

13. The most important sources of information about the program

State briefly the sources of information about the program.

14. Program Development Plan

Program Skills Outline															
				Required program Learning outcomes											
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4

- **Please tick the boxes corresponding to the individual program learning outcomes under evaluation.**

Course Description Form

1. Course Name:
Engineering Analysis
2. Course Code:
213
3. Semester / Year:
3
4. Description Preparation Date:
2024
5. Available Attendance Forms:
In person
6. Number of Credit Hours (Total) / Number of Units (Total)
ECTS credit = 6
7. Course administrator's name (mention all, if more than one name)
Name: Rehab Noor Mohammed Email: Eng.rehab.mohammed@uobabylon.edu.iq
8. Course Objectives

Course Objectives .....
.....
.....

- Providing a comprehensive illustration of advanced engineering mathematics to improve students' skills in solving practical problems that deal with mechanical engineering fields, such as mechanical vibrations, fluid flow, and heat transfer problems.
- Giving a background for periodic functions and infinite series to present the fundamental of a Fourier transform analysis and Fourier integrals and then diving deep into their applications for solving boundary value problems and eigenvalue-eigenfunction problems.
- Explaining the concept of Laplace transformation and its properties and applications for solving linear ordinary differential equations and related initial value problems.
- Demonstrating the partial differential equations and the most important kinds of them in physics and engineering, which include the wave equation, the heat equation, and the Laplace equation. In addition, explaining the separation of variables method to solve those kinds of equations in one and multi-dimension and under steady or unsteady state conditions.

9. Teaching and Learning Strategies	
Strategy	• Learning objectives are clearly stated, and students are reminded of what they already know. This helps students see the relevance of the topic and builds on prior knowledge. • Complex concepts are broken down into manageable steps, using visuals,

	clear language, and various mathematical examples. • New terminology is introduced and explained, along with its importance. • Connections are made between the topics of this course and everyday life or other disciplines, making learning more meaningful. • Questions are asked throughout the explanation to check for understanding and encourage student participation through a variety of classroom activities. • To ensure student comprehension of the presented material, students are required to complete homework assignments that align with the course content and take in-class quizzes and exams.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	Students will understand the concept of Fourier analysis	Basic concept of Fourier analysis	The method depends on explaining the main principles of this analysis and the importance of using it in our daily lives by giving a set of examples and asking some questions.	The evaluation is done through class activities to solve a set of questions
2	4	Students will know how to solve the half range sine and cosine problems	Half range sine and cosine expansions	Precisely explaining the material, clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	The evaluation is done through class activities to solve a set of questions, and then the students are asked to solve a homework assignment related to the lesson
3	4	Students are prepared to solve any task relating to this area.	Complex form of Fourier transform	Precisely explaining the material, clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	The evaluation is done through class activities to solve a set of questions, and then the students are asked to solve a homework assignment related to the lesson

4	4	Students understand the Fourier integral	Fourier integral	Precisely explaining the material, clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	The evaluation is done through class activities to solve a set of questions, and then the students are asked to solve a homework assignment related to the lesson
5	4	Students are prepared to solve problems dealing with Laplace transform	General form of Laplace transform	The method depends on explaining the general form of this transformation and the importance of using it in our daily lives by giving a set of examples and asking some questions.	The evaluation is done through class activities to solve a set of questions, and then the students are asked to solve a homework assignment related to the lesson
6	4	Students will understand this theorem	Linearity and first shifting theorem (s-shifting)	Precisely explaining the material, clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	The evaluation is done through class activities to solve a set of questions, and then the students are asked to solve a homework assignment related to the lesson
7	4	Students are able to solve any problem deals with this area	Transforms of derivatives and integrals	Precisely explaining the material, clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	The evaluation is done through class activities to solve a set of questions, and then the students are asked to solve a homework assignment related to the lesson

8	4	Students are able to solve any problem deals with this area	Unit step function and second shifting theorem (t-shifting)	Precisely explaining the material, clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	The evaluation is done through class activities to solve a set of questions, and then the students are asked to solve a homework assignment related to the lesson
9	4	Students will understand this theorem and are able to solve any problem deals with this area	Convolution theorem and Laplace transform of periodic functions	Precisely explaining the material, clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	The evaluation is done through class activities to solve a set of questions, and then the students are asked to solve a homework assignment related to the lesson
10	4	Students will be introduced to this type of equations and the method used to solve them	Solution of Partial differential equations by using separating variables method	Precisely explaining partial differential equations, clarifying the method of separation of variables, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	The evaluation is done through class activities to solve a set of examples
11	4	Students are able to solve any problem deals with this area	Modeling unsteady state one-dimensional problems in Cartesian coordinates	Explaining the material, clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	The evaluation is done through class activities to solve a set of questions, and then the students are asked to solve a homework assignment related to the lesson

12	4	Students are able to solve any problem deals with this area	Modeling unsteady state two-dimensional problems in Cartesian coordinates	Explaining the material, clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	The evaluation is done through class activities to solve a set of questions, and then the students are asked to solve a homework assignment related to the lesson
13	4	Students are able to solve any problem deals with this area	Modeling systems in polar coordinates	Explaining the material, clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	The evaluation is done through class activities to solve a set of questions, and then the students are asked to solve a homework assignment related to the lesson

11. Course Evaluation

Quizzes 10%, Assignments 10%, Report 10%, Midterm Exam 10%, and Final Exam 60%
Then the total is 100%

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Required Textbooks	Kreyszig, E., H. Kreyszig, and E.J. Norminton, *Advanced engineering mathematics*. 10th ed. ed. 2011, Hoboken, New Jersey: Wiley.
Recommended Texts	- Gustafson, Wilcox, C. H., & Wilcox, C. H. (Calvin H. (1998). *Analytical and computational methods of advanced engineering mathematics* (1st ed. 1998.). Springer Science. https://doi.org/10.1007/978-1-4612-0633-0. - Potter. (2019). *Engineering Analysis* (1st ed. 2019.). Springer International Publishing. https://doi.org/10.1007/978-3-319-91683-5.

Ministry of Higher Education and Scientific Research

Scientific Supervision and Scientific Evaluation Apparatus

Directorate of Quality Assurance and Academic Accreditation

Accreditation Department

Academic Program and Course Description Guide

Introduction:

The educational program is a well-planned set of courses that include procedures and experiences arranged in the form of an academic syllabus. Its main goal is to improve and build graduates' skills so they are ready for the job market. The program is reviewed and evaluated every year through internal or external audit procedures and programs like the External Examiner Program.

The academic program description is a short summary of the main features of the program and its courses. It shows what skills students are working to develop based on the program's goals. This description is very important because it is the main part of getting the program accredited, and it is written by the teaching staff together under the supervision of scientific committees in the scientific departments.

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

In this regard, we can only emphasize the importance of writing an academic programs and course description to ensure the proper functioning of the educational process.

Concepts and terminology:

Academic Program Description: The academic program description provides a brief summary of its vision, mission and objectives, including an accurate description of the targeted learning outcomes according to specific learning strategies.

Course Description: Provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the students to achieve, proving whether they have made the most of the available learning opportunities. It is derived from the program description.

Program Vision: An ambitious picture for the future of the academic program to be sophisticated, inspiring, stimulating, realistic and applicable.

Program Mission: Briefly outlines the objectives and activities necessary to achieve them and defines the program's development paths and directions.

Program Objectives: They are statements that describe what the academic program intends to achieve within a specific period of time and are measurable and observable.

Curriculum Structure: All courses / subjects included in the academic program according to the approved learning system (quarterly, annual, Bologna Process) whether it is a requirement (ministry, university, college and scientific department) with the number of credit hours.

Learning Outcomes: A compatible set of knowledge, skills and values acquired by students after the successful completion of the academic program and must determine the learning outcomes of each course in a way that achieves the objectives of the program.

Teaching and learning strategies: They are the strategies used by the faculty members to develop students' teaching and learning, and they are plans that are followed to reach the learning goals. They describe all classroom and extra–curricular activities to achieve the learning outcomes of the program.

Academic Program Description Form

University Name: .....University of Babylon.....

Faculty/Institute: .....Engineering.....

Scientific Department: .....Mechanical Engineering...

Academic or Professional Program Name:.. Mechanical Engineering.....

Final Certificate Name: .... Mechanical Engineering.....

Academic System: Mechanical Engineering

Description

Preparation Date:File

22/3/2024

Completion Date:

22/3/2024

Signature:

Head of Department Name:

Date:

Signature:

Scientific Associate Name:

Date:

The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:Date:

Signature:

1. Approval of the Dean **Program Vision**
Program Vision is written here as stated in the university's catalogue and website

2.Program Mission
Program Mission is written here as stated in the university's catalogue and website

3. Program Objectives
General Statements describing what the program or institution intends to achieve

4.program Accreditation
Does the program have program a accreditation? And from which agency ?

5.other external influences
Is there a sponsor for the program ?

6.program Structure				
program Structure	**Number of Courses**	**Credit hours**	**Percentage**	**Reviews**
Institution Requirements				
College Requirements				
Department Requirements				

Summer Training				
Other				

7. Program Description				
Year/Level	**Course Code**	**Course Name**	**Credit Hours**	
			theoretical	**practical**
Fourth/ First	MEC401	Power plant	2	1

8. Expected learning outcomes of the program	
Knowledge	
Learning Outcomes 1	Learning Outcomes Statement 1
Skills	
Learning Outcomes 2	Learning Outcomes Statement 2
Learning Outcomes 3	Learning Outcomes Statement 3
Ethics	
Learning Outcomes 4	Learning Outcomes Statement 4
Learning Outcomes 5	Learning Outcomes Statement 5

9. Teaching and Learning Strategies

Teaching and learning strategies and methods adopted in the implementation of the program in general.

10. Evaluation methods

Implemented at all stages of the program in general.

* This can include notes whether the course is basic or optional.

11. Faculty						
Faculty Members						
Academic Rank	**Specialization**		**Special Requirements/Skills (if applicable)**		**Number of the teaching staff**	
	General	**Special**			**Staff**	**Lecturer**
Prof. Dr. Riyadh Sabah Saleh	Mechanical Engineering	Power			yes	

Professional Development
Mentoring new faculty members
Briefly describes the process used to mentor new, visiting, full–time, and part–time faculty at the institution and department level.
Professional development of faculty members
Briefly describe the academic and professional development plan and arrangements for faculty such as teaching and learning strategies, assessment of learning outcomes, professional development, etc.

12. **Acceptance Criterion**
(**Setting regulations related to enrollment in the college or institute, whether central admission or others**)

13. **The most important sources of information about the program**
State briefly the sources of information about the program.

14 **Program development plan**

Program Skills Outline																
				Required program Learning outcomes												
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics				
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4	
Fourth/ First Level	MEC401	Power plant	Core													

- **Please tick the boxes corresponding to the individual program learning outcomes under evaluation.**

course Description Form

1. Course Name: Power plant
2. Course Code: MEC401
3. Semester / Year: First/ Fourth
4. Description Preparation Date: 22/3/2024
5. Available Attendance Forms: presence
6. Number of Credit Hours (Total) / Number of Units (Total)
7. Course administrator's name (mention all, if more than one name)
Name:Prof. Dr. Riyadh Sabah Saleh Email: eng.riyadh.sabah@uobabylon.edu.iq
8. Course Objectives

Course Objectives	Electrical power stations in the field of mechanical engineering is a very important field that requires in-depth knowledge of the components, how they work, and the mechanical parts that make up these stations.

9. Teaching and Learning Strategies	
Strategy	The strategy in the subject of power stations is divided into two axes: A- Knowledge and understanding 1- That the student understands the concepts of power stations 2- Understand how to connect stations and ways to calculate their capacity. 3- Understand the methods of calculating the efficiency of parts of stations and calculating the efficiency of stations as a whole. 4- Understanding practical methods to increase the efficiency of stations. B - Subject-specific skills 1 - The ability to visualize the work of the station and its parts. 2 - The ability to calculate the capacity of the station and estimate its

	performance.

10. Course Structure

week	Hours	Requarid Learing ooutcomes	Name unit or subject	Evaluation	Metod
Week 1	3	Acquiring skills - solving exercises - homework	Introdction	lecture	lecture
Week 2	3	Acquiring skills - solving exercises - homework	load curve, ideal and realized load curves, load variation, demand	lecture	lecture
Week 3	3	Acquiring skills - solving exercises - homework	steam generator(boiler), classification, steam formation and thermal	lecture	lecture
Week 4	3	Acquiring skills - solving exercises - homework	steam turbine types, principles of operation, types of steam turbine,	lecture	lecture
Week 5	3	Acquiring skills - solving exercises - homework	steam condensers, surface condensers advantages and	lecture	lecture
Week 6	3	Acquiring skills - solving exercises - homework	cooling towers, classification of cooling towers, classification on	lecture	lecture
Week 7	3	Acquiring skills - solving exercises - homework	steam power plant, vapor cycle, reversible and irreversible	lecture	lecture
Week 8	3	Acquiring skills - solving exercises - homework	superheating the steam to high temperatures ,reheat cycle, Rankine	lecture	lecture
Week 9	3	Acquiring skills - solving exercises - homework	Solve problem	lecture	lecture
Week 10	3	Acquiring skills - solving exercises - homework	gas turbine power plant, theory of operation Brayton cycle,	lecture	lecture
Week 11	3	Acquiring skills - solving exercises - homework	compressors, centrifugal compressor construction, diffusers,	lecture	lecture
Week 12	3	Acquiring skills - solving exercises - homework	gas turbine combustors combustion chamber design, flame	lecture	lecture
Week 13	3	Acquiring skills - solving exercises - homework	Brayton cycle(joule's cycle), thermodynamic analysis, thermal	lecture	lecture
Week 14	3	Acquiring skills - solving exercises - homework	different arrangement of gas turbine, closed cycle gas turbine,	lecture	lecture
Week 15	3	Acquiring skills - solving exercises - homework	Solve problem	lecture	lecture

11.Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports.....etc

Required textbooks (curricular books, if any)	/

Main references (sources)	1- Power plant theory and design (by Potter). 2- Power plant system design (by Kan and Priddly). 3- Power plant Engineering (by Morse) 4- Applied thermodynamics
Recommended books and references (scientific journals reports …) Electronic Rererences Websites	/

Ministry of Higher Education and Scientific Research
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Academic Program and Course Description Guide

2024

Introduction:

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Teaching and learning strategies: They are the strategies used by the faculty members to develop students' teaching and learning, and they are plans that are followed to reach the learning goals. They describe all classroom and extra-curricular activities to achieve the learning outcomes of the program.

Academic Program Description Form

University Name: University of Babylon

Faculty/Institute: Engineering

Scientific Department: Mechanical Engineering

Academic or Professional Program Name: Thermodynamics

Final Certificate Name: Bachelor degree in Engineering

Academic System:

Description Preparation Date:

File Completion Date:

Signature:

Head of Department Name:

Date:

Signature:

Scientific Associate Name:

Date:

The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date:

Signature:

Approval of the Dean

1. **Program Vision**

2. **Program Mission**

3. **Program Objectives**

4. **Program Accreditation**
Does the program have program accreditation? And from which agency?

5. **Other external influences**
Is there a sponsor for the program?

6. **Program Structure**				
Program Structure	**Number of Courses**	**Credit hours**	**Percentage**	**Reviews***

Institution Requirements				
College Requirements				

Department Requirements				
Summer Training				
Other				

* This can include notes whether the course is basic or optional.

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
			theoretical	**practical**

8. Expected learning outcomes of the program

Knowledge	
Learning Outcomes 1	
Learning Outcomes 2	
Learning Outcomes 3	Learning Outcomes Statement 3

9. Teaching and Learning Strategies

Learning Outcomes 5	Learning Outcomes Statement 5

10. Evaluation methods

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer

Professional Development

Mentoring new faculty members

Briefly describes the process used to mentor new, visiting, full-time, and part-time faculty at the institution and department level.

Professional development of faculty members

Briefly describe the academic and professional development plan and arrangements for faculty such as teaching and learning strategies, assessment of learning outcomes, professional development, etc.

12. Acceptance Criterion

(Setting regulations related to enrollment in the college or institute, whether central admission or others)

13. The most important sources of information about the program

14. Program Development Plan

Program Skills Outline															
				Required program Learning outcomes											
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4

- **Please tick the boxes corresponding to the individual program learning outcomes under evaluation.**

Course Description Form

1. Course Name:	
Thermodynamic	
2. Course Code:	
203	
3. Semester / Year:	
2	
4. Description Preparation Date:	
23/3/2024	
5. Available Attendance Forms:	
In person	
6. Number of Credit Hours (Total) / Number of Units (Total):60/5	
ECTS credit = 5	
7. Course administrator's name (mention all, if more than one name)	
Name: Email:	Sawsan abdulsettar Awadh Eng.sawsan.awadh@uobabylon.edu.iq
8. Course Objectives	
Course Objectives	This introductory course covers basic concepts of thermodynamics: Systems, property, state, path, process; Work and heat; Properties of pure substances; Tables of properties and equations of state; First law of thermodynamics; Analysis of closed and open systems; Second law of thermodynamics; Carnot cycle; Clausius inequality, entropy, irreversibility, isentropic efficiencies; Air-standard cycles; Vapour cycles. The main objectives of the program are: • cover the basic principles of thermodynamics. • present a wealth of real-world engineering examples to give students a feel for how thermodynamics is applied in engineering practice. • develop an intuitive understanding of thermodynamics by emphasizing the physics and physical arguments.
9. Teaching and Learning Strategies	
Strategy	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Understand the basic concepts of thermodynamics.	Introduction and basic concepts	Solving some examples related to the concepts	Quizzes
2	3	Introduce the first law of thermodynamics, energy balances, and mechanisms of energy transfer to or from a system.	Energy, energy transfer, and general energy analysis	Discuss the implications of energy conversion on the environment.	Quizzes
3	3	Demonstrate the procedures for determining thermodynamic properties of pure substances from tables of property data.	Phase-Change Processes of Pure Substances	Demonstrate the procedures for determining thermodynamic properties of pure substances from tables of property data.	Quizzes
4	3	Explain the phase diagram	Property Diagrams for Phase-Change Processes	Explain the phase change process on phase diagram	Quizzes
5	3	Define energy conversion efficiencies.	Energy Conversion and General Energy Analysis	Solving some examples related to the first law of thermodynamics	Quizzes

6	3	Introduce the first law of thermodynamics, energy balances, and mechanisms of energy transfer to or from a system.	The First Law of Thermodynamics	Solving some examples related to the first law of thermodynamics	Quizzes
7	3	Identify the first law of thermodynamics as simply a statement of the conservation of energy principle for closed (fixed mass) systems.	Energy Analysis of Closed Systems	Solving some examples related to the first law of thermodynamics for closed systems	Quizzes
8	3	Describe the hypothetical substance “ideal gas” and the ideal-gas equation of state.	Internal Energy, Enthalpy, and Specific Heats of Ideal Gases	applying the first law of thermodynamics on gases	Quizzes
9	3	Describe the specific heats of solids and liquids	Internal Energy, Enthalpy, and Specific Heat of Solids and Liquids	Applying the first law of thermodynamics on solids and liquids	Quizzes
10	3	Apply the first law of thermodynamics as the statement of the conservation of energy principle to control volumes.	Mass and Energy Analysis of Control Volumes	Applying the first law of thermodynamics on open systems	Quizzes
11	3	Solve energy balance problems for common steady-flow devices such as nozzles, compressors, turbines, throttling valves, mixers, heaters, and heat exchangers.	Energy Analysis of Steady-Flow Systems	Solve some examples on open systems	Quizzes

12	3	Introduce the second law of thermodynamics.	The Second Law of Thermodynamics	Applying the second law of thermodynamics	Quizzes
13	3	Determine the expressions for the thermal efficiencies for reversible heat engines.	Heat Engines	Solving some examples related to the heat engines	Quizzes
14	3	Determine the expressions for the coefficients of performance for reversible heat pumps, and refrigerators.	Refrigerators and Heat Pumps	Solving some examples related to theRefrigerators and Heat Pumps	Quizzes
15	3		Preparatory week before the final Exam		

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports.....etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Required Textbooks	Cengel, Yunus A., Michael A. Boles, and Mehmet Kanoğlu. *Thermodynamics: an engineering approach*.. New York: McGraw-hill, 2019.
Recommended Texts	Singh, Onkar. *Applied thermodynamics*. New Age International, 2009..

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2024

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Program Objectives: They are statements that describe what the academic program intends to achieve within a specific period of time and are measurable and observable.

Curriculum Structure: All courses / subjects included in the academic program according to the approved learning system (quarterly, annual, Bologna Process) whether it is a requirement (ministry, university, college and scientific department) with the number of credit hours.

Learning Outcomes: A compatible set of knowledge, skills and values acquired by students after the successful completion of the academic program and must determine the learning outcomes of each course in a way that achieves the objectives of the program.

Teaching and learning strategies: They are the strategies used by the faculty members to develop students' teaching and learning, and they are plans that are followed to reach the learning goals. They describe all classroom and extra-curricular activities to achieve the learning outcomes of the program.

Academic Program Description Form

University Name: University of Babylon

Faculty/Institute: Engineering

Scientific Department: Mechanical Engineering

Academic or Professional Program Name: Applied Thermodynamics

Final Certificate Name: Bachelor degree in Engineering

Academic System:

Description Preparation Date:

File Completion Date:

Signature:

Head of Department Name:

Date:

Signature:

Scientific Associate Name:

Date:

The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date:

Signature:

Approval of the Dean

1. Program Vision

This course aims to provide a good platform to mechanical engineering students to understand, model and appreciate concept of dynamics involved in thermal energy transformation.

2. Program Mission

3. Program Objectives

4. Program Accreditation

5. Other external influences

No

6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements				
College Requirements				

Department Requirements				
Summer Training				
Other				

* This can include notes whether the course is basic or optional.

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
			theoretical	practical

8. Expected learning outcomes of the program

Learning Outcomes 2	Learning Outcomes Statement 2
Learning Outcomes 4	Learning Outcomes Statement 4
Learning Outcomes 5	Learning Outcomes Statement 5

9. Teaching and Learning Strategies

10. Evaluation methods

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer

Professional Development

Mentoring new faculty members

Briefly describes the process used to mentor new, visiting, full-time, and part-time faculty at the institution and department level.

Professional development of faculty members

Briefly describe the academic and professional development plan and arrangements for faculty such as teaching and learning strategies, assessment of learning outcomes, professional development, etc.

12. Acceptance Criterion

(Setting regulations related to enrollment in the college or institute, whether central admission or others)

13. The most important sources of information about the program

14. Program Development Plan

Program Skills Outline															
				Required program Learning outcomes											
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4

- **Please tick the boxes corresponding to the individual program learning outcomes under evaluation.**

Course Description Form

1. Course Name:
Applied Thermodynamic
2. Course Code:
209
3. Semester / Year:
semester 2/year 2
4. Description Preparation Date:
23/3/2024
5. Available Attendance Forms:
In person
6. Number of Credit Hours (Total) / Number of Units (Total):60/5
ECTS credit = 5
7. Course administrator's name (mention all, if more than one name)
Name: Sawsan abdulsettar Awadh Email: Eng.sawsan.awadh@uobabylon.edu.iq
8. Course Objectives

Course Objectives	• To cover the basic principles of thermodynamics. • To present a wealth of real-world engineering examples to give students a feel for how thermodynamics is applied in engineering practice. • To develop an intuitive understanding of thermodynamics by emphasizing the physics and physical arguments.
9. Teaching and Learning Strategies	
Strategy	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Introduce the second law of thermodynamics	Entropy Change of Pure Substances	Solve some examples on The entropy change for pure substances	Quizzes
2	3	Apply the second law of thermodynamics to processes.	Isentropic Processes	Solve some examples on Isentropic Processes	Quizzes
3	3	Calculate the entropy changes that take place during processes for pure substances, incompressible substances, and ideal gases.	The Entropy Change of Ideal Gases	Solve some examples on The entropy change for Ideal Gases	Quizzes
4	3	Develop the isentropic efficiencies for various steady-flow devices.	Isentropic Efficiencies of Steady-Flow Devices	Solve some examples on the Isentropic Efficiencies of Steady-Flow Devices	Quizzes
5	3	Examine Carnot cycle	The Carnot Cycle and Its Value in Engineering	Solve some examples on Carnot cycles	Quizzes
6	3	Evaluate the performance of Otto cycle	Otto Cycle: The Ideal Cycle for Spark-Ignition Engines	Solve some examples on Otto cycles	Quizzes

7	3	Evaluate the performance of Diesel cycle	Diesel Cycle: The Ideal Cycle for Compression-Ignition engine	Solve some examples on Diesel cycles	Quizzes
8	3	Evaluate the performance of Brayton cycle	Brayton Cycle: The Ideal Cycle for Gas-Turbine Engines	Solve some examples on Brayton cycles	Quizzes
9	3	Evaluate the performance of Carnot Vapor cycle	The Carnot Vapor Cycle	Solve some examples on Carnot Vapor Cycle	Quizzes
10	3	Analyze vapor power cycles in which the working fluid is alternately vaporized and condensed.	Energy Analysis of the Ideal Rankine Cycle	Solve some examples on Ideal Rankine Cycle	Quizzes
11	3	Investigate the Ideal Reheat Rankine Cycle.	The Ideal Reheat Rankine Cycle	Solve some examples on Ideal Reheat Rankine Cycle	Quizzes
12	3	Investigate ways to modify the basic Rankine vapor power cycle to increase the cycle thermal efficiency.	How Can We Increase the Efficiency of the Rankine Cycle?	Solve some examples on improving the efficiency of Rankine Cycle	Quizzes
13	3	Analyze the ideal vapor-compression refrigeration cycle.	Refrigerators and Heat Pumps	Solve some examples on ideal Refrigerators and Heat Pumps	Quizzes

14	3	Analyze the actual vapor-compression refrigeration cycle.	Refrigerators and Heat Pumps	Solve some examples on actual Refrigerators and Heat Pumps	Quizzes
15	3	Predict the *P-v-T* behavior of gas mixtures based on Dalton's law of additive pressures and Amagat's law of additive volumes.	P-v-T Behavior of Gas Mixtures: Ideal and Real Gases	Solve some examples on mixtures of gases	Quizzes

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports.....etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Required Textbooks	Cengel, Yunus A., Michael A. Boles, and Mehmet Kanoğlu. *Thermodynamics: an engineering approach*.. New York: McGraw-hill, 2019.
Recommended Texts	Singh, Onkar. *Applied thermodynamics*. New Age International, 2009..

Ministry of Higher Education and Scientific Research
Scientific Supervision and Scientific Evaluation Apparatus
Directorate of Quality Assurance and Academic Accreditation Department

Academic Program and Course Description Guide

The educational program is a well-planned set of courses that include procedures and experiences arranged in the form of an academic syllabus. Its main goal is to improve and build graduates' skills so they are ready for the job market. The program is reviewed and evaluated every year through internal or external audit procedures and programs like the External Examiner Program.

Introduction:

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

Concepts and terminology:

Academic Program Description Form

University Name: ...University of Babylon...

Faculty/Institute: .....College of Engineering.....

Scientific Department: .....Mechanical Engineering.....

Academic or Professional Program Name: …..Bachelor of engineering…..

Final Certificate Name: …. Bachelor's degree in mechanical engineering….

Academic System: …Annual….

Description Preparation Date:

File Completion Date: 21/3/2024

Signature:

Head of Department Name:

Date:

Signature:

Scientific Associate Name:

Date:

The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date:

Signature:

Approval of the Dean

1. Program Vision

Program vision is written here as stated in the university's catalogue and website.

2. Program Mission

Program mission is written here as stated in the university's catalogue and website.

3. Program Objectives

General statements describing what the program or institution intends to achieve.

4. Program Accreditation

Does the program have program accreditation? And from which agency?

5. Other external influences

Is there a sponsor for the program?

Institution Requirements

6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*

Department Requirements				
Summer Training				
Other				

* This can include notes whether the course is basic or optional.

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
			theoretical	practical

8. Expected learning outcomes of the program

Knowledge
Skills
Ethics

9. Teaching and Learning Strategies

10. Evaluation methods

Implemented at all stages of the program in general.

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer

Professional Development

Mentoring new faculty members

Briefly describes the process used to mentor new, visiting, full-time, and part-time faculty at the institution and department level.

Professional development of faculty members

Briefly describe the academic and professional development plan and arrangements for faculty such as teaching and learning strategies, assessment of learning outcomes, professional development, etc.

12. Acceptance Criterion

(**Setting regulations related to enrollment in the college or institute, whether central admission or others**)

13. The most important sources of information about the program

State briefly the sources of information about the program.

14. Program Development Plan

Program Skills Outline															
				Required program Learning outcomes											
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4

- **Please tick the boxes corresponding to the individual program learning outcomes under evaluation.**

Course Description Form

1. Course Name:
Industrial engineering
2. Course Code:
3. Semester / Year:
3
4. Description Preparation Date:
2024
5. Available Attendance Forms:
In person
6. Number of Credit Hours (Total) / Number of Units (Total)
ECTS credit = 4
7. Course administrator's name (mention all, if more than one name)
Name: Abdul Kareem Jalil Kadhim Email: Eng.abdulkareem.jalil@uobabylon.edu.iq
8. Course Objectives
Course Objectives .... 1- Effectively practice Industrial Engineering in various functional areas of an organization. 2- Adapt Industrial Engineering practice to the changing needs of the society and achieve global competitiveness. 3- Ability to apply knowledge of mathematics and science to solve industrial engineering problems. 4- Ability to identify, formulate, and solve linear programming problems. 5- Ability to use techniques, skills, and modern engineering tools necessary for engineering practice. 6- Understanding of engineering and management principles as a member and leader in a team, to manage projects and in multidisciplinary environments.
9. Teaching and Learning Strategies

Strategy	• Learning objectives are clearly stated, and students are reminded o what they already know. This helps students see the relevance of th topic and builds on prior knowledge. • Complex concepts are broken down into manageable steps, usin visuals, clear language, and various mathematical examples. • New terminology is introduced and explained, along with it importance. • Connections are made between the topics of this course and everyda life or other disciplines, making learning more meaningful. • Questions are asked throughout the explanation to check fo understanding and encourage student participation through a variety o classroom activities. • To ensure student comprehension of the presented material, student are required to complete homework assignments that align with th course content and take in-class quizzes and exams.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	Students will understand the definition of Industrial Engineering:	Introduction to industrial engineering. Functions of organization, Elements of organization, Principles of organization,	The method depends on explaining the importance of using the industrial engineering by giving a set of examples and asking some questions.	The evaluation is done through class activities and to solve a set of questions,
2	4	Students will understand the concept of work study and time study	work study and time study	Precisely explaining work study and time study and presenting a set of examples and sketches	The evaluation is don through class activitie
3	4	Students will know the various types of production systems	Types of production systems	Precisely explaining the material, clarifying its importance, and presenting a set of examples with the aid of video films	The evaluation is don through class activitie to answer a set of questions, and then th students are asked to prepare a homework report assignment related to the lesson

4	4	Students will know how solve a problems in Linear programming By Graphical method	Operation research Linear programming Graphical method	Precisely explaining the material, clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	The evaluation is don through class activitie to answer a set of questions, and then th students are asked to solve a homework assignment related to the lesson
5	4	Students will know how solve a problems in Linear programming By simplex method	Operation research Linear programming simplex method	Precisely explaining the material, clarifying its importance, and presenting a set of examples that are first solved by the teacher and then with the participation of the students	The evaluation is don through class activitie to solve a set of questions, and then th students are asked to solve a homework assignment related to the lesson
6	4	Students will understand how process planning are done	Process planning	Precisely explaining the material, clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	The evaluation is don through class activitie to explain a set of questions
7	4	Students will understand how Computer aided Process planning are done	Computer aided Process planning	Precisely explaining the material, clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	The evaluation is don through class activitie to explain a set of questions,
8	4	Students are able to understand any subject deals with Computer aided design and manufacturing	CAD-CAM Computer aided design and manufacturing	Precisely explaining the material, clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	The evaluation is don through class activitie to explain a set of questions,
9	4	Students will understand a various types of Flexible manufacturing system	Flexible manufacturing system	Precisely explaining the material, clarifying its importance by presenting a set of examples of its application	The evaluation is don through class activitie to solve a set of questions,

10	4	Students will understand a various Quality Control Techniques	Quality Control Techniques	Precisely explaining the material, clarifying its importance by presenting a set of examples of its application	The evaluation is don through class activitie to explain a set of examples
11	4	Students are able to solve any problem deals with statistics	: engineering statistics	Explaining the material, clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	The evaluation is don through class activitie to solve a set of questions, and then th students are asked to solve a homework assignment related to the lesson
12	4	Students are able to understand Inventory control	Inventory control	Explaining the material, clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	The evaluation is don through class activitie to solve a set of questions,
13	4	Students are able to understand a various types of industrial automation	industrial automation	Explaining the material, clarifying its importance, and presenting a set of examples that are explained first by the teacher and then with the participation of the students	The evaluation is don through class activitie to solve a set of questions,

11. Course Evaluation

Assignments and Report 10%, Midterm Exam 30%, and Final Exam 60%
Then the total is 100%

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Required Textbooks	INTRODUCTION TO OPERATIONS RESEARCH, FREDERICK S. HILLIER, McGraw-Hill Series in Industrial Engineering and Management Science 2001
Recommended Texts	Industrial engineering and management ., C. NADHA MUNI REDD, Copyright © 2002 New Age International Ltd., Publishers

Ministry of Higher Education and Scientific Research
Scientific Supervision and Scientific Evaluation Apparatus
Directorate of Quality Assurance and Academic Accreditation Department

Academic Program and Course Description Guide

The educational program is a well-planned set of courses that include procedures and experiences arranged in the form of an academic syllabus. Its main goal is to improve and build graduates' skills so they are ready for the job market. The program is reviewed and evaluated every year through internal or external audit procedures and programs like the External Examiner Program.

2024

Introduction:

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

Academic Program Description Form

University Name: ...University of Babylon...

Faculty/Institute: .....College of Engineering.....

Scientific Department: .....Mechanical Engineering.....

Academic or Professional Program Name: …..Bachelor of engineering…..

Final Certificate Name: …. Bachelor's degree in mechanical engineering….

Academic System: …Annual….

Description Preparation Date:

File Completion Date: 21/3/2024

Signature:

Head of Department Name:

Date:

Signature:

Scientific Associate Name:

Date:

The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date:

Signature:

Approval of the Dean

1. Program Vision

Program vision is written here as stated in the university's catalogue and website.

2. Program Mission

Program mission is written here as stated in the university's catalogue and website.

3. Program Objectives

General statements describing what the program or institution intends to achieve.

4. Program Accreditation

Does the program have program accreditation? And from which agency?

5. Other external influences

Is there a sponsor for the program?

Institution Requirements

6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*

Department Requirements				
Summer Training				
Other				

* This can include notes whether the course is basic or optional.

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
			theoretical	practical

8. Expected learning outcomes of the program

Knowledge
Skills
Ethics

9. Teaching and Learning Strategies

10. Evaluation methods

Implemented at all stages of the program in general.

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer

Professional Development

Mentoring new faculty members

Briefly describes the process used to mentor new, visiting, full-time, and part-time faculty at the institution and department level.

Professional development of faculty members

Briefly describe the academic and professional development plan and arrangements for faculty such as teaching and learning strategies, assessment of learning outcomes, professional development, etc.

12. Acceptance Criterion

(**Setting regulations related to enrollment in the college or institute, whether central admission or others**)

13. The most important sources of information about the program

State briefly the sources of information about the program.

14. Program Development Plan

Program Skills Outline															
				Required program Learning outcomes											
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4

- **Please tick the boxes corresponding to the individual program learning outcomes under evaluation.**

Course Description Form

1. Course Name:
Manufacturing processes
2. Course Code:
3. Semester / Year:
3
4. Description Preparation Date:
2024
5. Available Attendance Forms:
In person
6. Number of Credit Hours (Total) / Number of Units (Total)
ECTS credit = 6
7. Course administrator's name (mention all, if more than one name)
Name: Abdul Kareem Jalil Kadhim Email: Eng.abdulkareem.jalil@uobabylon.edu.iq
8. Course Objectives
Course Objectives ....

1- To learn the theory of plasticity, the material characterization and the analytical methods, example applications like rolling, forging, cold forging bar extrusion.

2- To learn how to identify various manufacturing processes

3- To learn how to select a suitable process (or sequence of processes) for the manufacture of a given component .

4- To learn the fundamentals of forming technology and the corresponding forming machines .

5- To learn how to select engineering material for a required purpose.

6- To learn the fundamentals of sheet metal forming applications like bending, deep drawing, roll forming, incremental forming, hydroforming, hot sheet metal forming, impulse forming.

7- To gain a knowledge and experience of advanced processing and

manufacturing techniques.

8–To learn different types of rapid prototype technique.

9. Teaching and Learning Strategies

Strategy	• Learning objectives are clearly stated, and students are reminded o what they already know. This helps students see the relevance of the topic and builds on prior knowledge. • Complex concepts are broken down into manageable steps, using visuals, clear language, and various mathematical examples. • New terminology is introduced and explained, along with its importance. • Connections are made between the topics of this course and everyday life or other disciplines, making learning more meaningful. • Questions are asked throughout the explanation to check for understanding and encourage student participation through a variety o classroom activities. • To ensure student comprehension of the presented material, students are required to complete homework assignments that align with the course content and take in-class quizzes and exams.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	Students will understand the concept of Stress- strain and plasticity	Stress- strain and plasticity	The method depends on explaining the main principles of Stress-strain and plasticity and the importance of using them by giving a set of examples and asking some questions.	The evaluation is done through class activities and to solve a set of questions, and then the students are asked to solve a homework assignment related to the subject
2	4	Students will know how Hot and cold forming processes are performed	Hot and cold forming processes	Precisely explaining Hot and cold forming processes, and presenting a set of examples and films	The evaluation is don through class activitie
3	4	Students will know how Hot and cold rolling processes and its allied processes are performed	Rolling of metal	Precisely explaining the material, clarifying its importance, and presenting a set of examples that are presented first by the teacher and then with the participation of the	The evaluation is don through class activitie to answer a set of questions, and then th students are asked to solve a homework assignment related to the lesson

				students	
4	4	Students will know how Hot and cold extrusion and its allied process are performed	Extrusion process	Precisely explaining the material, clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	The evaluation is don through class activitie to answer a set of questions, and then th students are asked to solve a homework assignment related to the lesson
5	4	Students will know how Wire and tube drawing processes	Wire and tube drawing	Precisely explaining the material, clarifying its importance, and presenting a set of examples that are first solved by the teacher and then with the participation of the students	The evaluation is don through class activitie to solve a set of questions, and then th students are asked to solve a homework assignment related to the lesson
6	4	Students will understand how deep drawing for metal are done	Deep drawing	Precisely explaining the material, clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	The evaluation is don through class activitie to explain a set of questions
7	4	Students will understand how forging and its allied process are done	Forging	Precisely explaining the material, clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	The evaluation is don through class activitie to explain a set of questions,
8	4	Students are able to understand any subject deals with this area	Other metal forming processes (High energy rate forming)	Precisely explaining the material, clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	The evaluation is don through class activitie to explain a set of questions,

9	4	Students will understand a various types of rapid prototype technique and its applications	Rapid prototyping	Precisely explaining the material, clarifying its importance by presenting a set of examples of its application	The evaluation is don through class activitie to solve a set of questions, and then th students are asked to find a new field for rapid prototype application
10	4	Students will understand a various types of tool materials and its applications	Tool materials	Precisely explaining the material, clarifying its importance by presenting a set of examples of its application	The evaluation is don through class activitie to explain a set of examples
11	4	Students are able to solve any problem deals with this area	Mechanic of metal cutting and chip formation	Explaining the material, clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	The evaluation is don through class activitie to solve a set of questions, and then th students are asked to solve a homework assignment related to the lesson
12	4	Students are able to solve any problem deals with this area	Power and forces in metal cutting	Explaining the material, clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	The evaluation is don through class activitie to solve a set of questions, and then th students are asked to solve a homework assignment related to the lesson
13	4	Students are able to understand a various types of Non - conventional machining process	Non -conventional machining process	Explaining the material, clarifying its importance, and presenting a set of examples that are explained first by the teacher and then with the participation of the students	The evaluation is don through class activitie to solve a set of questions,

11. Course Evaluation

Assignments 10%, Report 10%, Midterm Exam 30%, and Final Exam 50%
Then the total is 100%

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Required Textbooks	Fundamentals of Modern Manufacturing ,Materials, Processes, and Systems, Fifth Edition , Mikell P. Groover, Wiley,2004
Recommended Texts	Introduction to Basic Manufacturing Processes and Workshop Technology ., RAJENDER SINGH, Copyright © 2006 New Age International (P) Ltd., Publishers

Ministry of Higher Education and Scientific Research

Scientific Supervision and Scientific Evaluation Apparatus

Directorate of Quality Assurance and Academic Accreditation

Accreditation Department

Academic Program and Course Description Guide

Introduction:

The educational program is a well-planned set of courses that include procedures and experiences arranged in the form of an academic syllabus. Its main goal is to improve and build graduates' skills so they are ready for the job market. The program is reviewed and evaluated every year through internal or external audit procedures and programs like the External Examiner Program.

The academic program description is a short summary of the main features of the program and its courses. It shows what skills students are working to develop based on the program's goals. This description is very important because it is the main part of getting the program accredited, and it is written by the teaching staff together under the supervision of scientific committees in the scientific departments.

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

In this regard, we can only emphasize the importance of writing an academic programs and course description to ensure the proper functioning of the educational process.

Concepts and terminology:

Academic Program Description: The academic program description provides a brief summary of its vision, mission and objectives, including an accurate description of the targeted learning outcomes according to specific learning strategies.

Course Description: Provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the students to achieve, proving whether they have made the most of the available learning opportunities. It is derived from the program description.

Program Vision: An ambitious picture for the future of the academic program to be sophisticated, inspiring, stimulating, realistic and applicable.

Program Mission: Briefly outlines the objectives and activities necessary to achieve them and defines the program's development paths and directions.

Program Objectives: They are statements that describe what the academic program intends to achieve within a specific period of time and are measurable and observable.

Curriculum Structure: All courses / subjects included in the academic program according to the approved learning system (quarterly, annual, Bologna Process) whether it is a requirement (ministry, university, college and scientific department) with the number of credit hours.

Learning Outcomes: A compatible set of knowledge, skills and values acquired by students after the successful completion of the academic program and must determine the learning outcomes of each course in a way that achieves the objectives of the program.

Teaching and learning strategies: They are the strategies used by the faculty members to develop students' teaching and learning, and they are plans that are followed to reach the learning goals. They describe all classroom and extra–curricular activities to achieve the learning outcomes of the program.

Academic Program Description Form

University Name: .....University of Babylon.....

Faculty/Institute: .....Engineering.....

Scientific Department: .....Mechanical Engineering...

Academic or Professional Program Name:.. Mechanical Engineering.....

Final Certificate Name: .... Mechanical Engineering.....

Academic System: Mechanical Engineering
Description

Preparation Date:File

22/3/2024

Completion Date:

22/3/2024

Signature:

Head of Department Name:

Date:

Signature:

Scientific Associate Name:

Date:

The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance

Department:Date:

Signature:

1. Approval of the Dean **Program Vision**
Program Vision is written here as stated in the university's catalogue and website

2.Program Mission
Program Mission is written here as stated in the university's catalogue and website

3. Program Objectives
General Statements describing what the program or institution intends to achieve

4.program Accreditation
Does the program have program a accreditation? And from which agency ?

5.other external influences
Is there a sponsor for the program ?

6.program Structure				
program Structure	**Number of Courses**	**Credit hours**	**Percentage**	**Reviews**
Institution Requirements				
College Requirements				
Department Requirements				
Summer Training				
Other				

7. Program Description				
Year/Level	**Course Code**	**Course Name**	**Credit Hours**	
			theoretical	**practical**
Second/ First	206	Strength of Materials I	4	2

8. Expected learning outcomes of the program	
Knowledge	
Learning Outcomes 1	Learning Outcomes Statement 1
Skills	
Learning Outcomes 2	Learning Outcomes Statement 2
Learning Outcomes 3	Learning Outcomes Statement 3
Ethics	
Learning Outcomes 4	Learning Outcomes Statement 4
Learning Outcomes 5	Learning Outcomes Statement 5

9. Teaching and Learning Strategies
Teaching and learning strategies and methods adopted in the implementation o the program in general.

10. Evaluation methods
Implemented at all stages of the program in general.

* This can include notes whether the course is basic or optional.

11. Faculty						
Faculty Members						
Academic Rank	**Specialization**		**Special Requirements/Skills (if applicable)**		**Number of the teaching staff**	
	General	**Special**			**Staff**	**Lecturer**
Prof. Dr. Mohammed Jawad Aubad	Mechanical Engineering	Applied			yes	

Professional Development

Mentoring new faculty members

Briefly describes the process used to mentor new, visiting, full–time, and part–time faculty at the institution and department level.

Professional development of faculty members

Briefly describe the academic and professional development plan and arrangements for faculty such as teaching and learning strategies, assessment of learning outcomes, professional development, etc.

12. Acceptance Criterion

(**Setting regulations related to enrollment in the college or institute, whether central admission or others**)

13. The most important sources of information about the program

State briefly the sources of information about the program.

14 Program development plan

Program Skills Outline																
				Required program Learning outcomes												
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics				
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4	
Second/ First Level	206	Strength of Materials I	Core													

- **Please tick the boxes corresponding to the individual program learning outcomes under evaluation.**

course Description Form

1. Course Name: Strength of Materials I	
2. Course Code: 206	
3. Semester / Year: First/ Second	
4. Description Preparation Date: 22/3/2024	
5. Available Attendance Forms: presence	
6. Number of Credit Hours (Total) / Number of Units (Total) 125	
7. Course administrator's name (mention all, if more than one name)	
Name:Prof. Dr. Mohammed Jawad Aubad Email: eng.mohammed.j.tarfa@uobabylon.edu.iq	
8. Course Objectives	
Course Objectives	1.To develop problem solving skills and understanding of strength of materials through the applications (bar, rod, pin, shaft, beam, ...) 2.To understand the relation between the stress and strain of materials 3.To understand how to find the normal, tensile, bearing and shear stresses of simple structures 4.To learn solving and analysis the problems of shafts and power transmission for circular and noncircular sections 5.To understand how to draw the shear and moment diagram of beams
9. Teaching and Learning Strategies	
Strategy	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be

	achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

10. Course Structure

week	Hours	Requarid Learing ooutcomes	Name unit or subject	Evaluation	Metod
Week 1	4	Acquiring skills - solving exercises - homework	**Introduction- Equilibrium of a Deformable Body**	lecture	lecture
Week 2	4	Acquiring skills - solving exercises - homework	**Stress- Average Normal Stress in an Axially Loaded Bar**	lecture	lecture
Week 3	4	Acquiring skills - solving exercises - homework	**Average Shear Stress+ Allowable Stress**	lecture	lecture
Week 4	4	Acquiring skills - solving exercises - homework	**Strain- Deformation**	lecture	lecture
Week 5	4	Acquiring skills - solving exercises - homework	**The Stress–Strain Diagram+ Stress–Strain Behavior of**	lecture	lecture
Week 6	4	Acquiring skills - solving exercises - homework	**Hooke's Law+ Poisson's Ratio**	lecture	lecture
Week 7	4	Acquiring skills - solving exercises - homework	**Statically Indeterminate Axially Loaded Member**	lecture	lecture
Week 8	4	Acquiring skills - solving exercises - homework	**Thermal Stress**	lecture	lecture
Week 9	4	Acquiring skills - solving exercises - homework	**Torsional Deformation of a Circular Shaft+ The Torsion Formula**	lecture	lecture
Week 10	4	Acquiring skills - solving exercises - homework	**Power Transmission+ Angle of Twist +Thin-Walled Tubes Having**	lecture	lecture
Week 11	4	Acquiring skills - solving exercises - homework	**Midterm Exam**	lecture	lecture
Week 12	4	Acquiring skills - solving exercises - homework	**Shear and Moment Diagrams- Graphical Method for**	lecture	lecture
Week 13	4	Acquiring skills - solving exercises - homework	**The Flexure Formula+ Curved Beams**	lecture	lecture
Week 14	4	Acquiring skills - solving exercises - homework	**The Shear Formula - Shear Flow in Built-Up Members +Shear Flow**	lecture	lecture
Week 15	4	Acquiring skills - solving exercises - homework	**Thin-Walled Pressure Vessels**	lecture	lecture

11.Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports.....etc

Required textbooks (curricular books, if any)	**Mechanics of Materials, eighth edition** **R. C. Hibbeler**
Main references (sources)	**Jörg Schröder · Wolfgang A. Wall and Javier Bonet**
Recommended books and references (scientific journals reports …) Electronic Rererences Websites	**Jörg Schröder · Wolfgang A. Wall and Javier Bonet**

Ministry of Higher Education and Scientific Research
Scientific Supervision and Scientific Evaluation Apparatus
Directorate of Quality Assurance and Academic Accreditation
Accreditation Department

Academic Program and Course Description Guide

2024

Introduction:

The educational program is a well-planned set of courses that include procedures and experiences arranged in the form of an academic syllabus. Its main goal is to improve and build graduates' skills so they are ready for the job market. The program is reviewed and evaluated every year through internal or external audit procedures and programs like the External Examiner Program.

The academic program description is a short summary of the main features of the program and its courses. It shows what skills students are working to develop based on the program's goals. This description is very important because it is the main part of getting the program accredited, and it is written by the teaching staff together under the supervision of scientific committees in the scientific departments.

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

In this regard, we can only emphasize the importance of writing an academic programs and course description to ensure the proper functioning of the educational process.

Concepts and terminology:

Academic Program Description: The academic program description provides a brief summary of its vision, mission and objectives, including an accurate description of the targeted learning outcomes according to specific learning strategies.

Course Description: Provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the students to achieve, proving whether they have made the most of the available learning opportunities. It is derived from the program description.

Program Vision: An ambitious picture for the future of the academic program to be sophisticated, inspiring, stimulating, realistic and applicable.

Program Mission: Briefly outlines the objectives and activities necessary to achieve them and defines the program's development paths and directions.

Program Objectives: They are statements that describe what the academic program intends to achieve within a specific period of time and are measurable and observable.

Curriculum Structure: All courses / subjects included in the academic program according to the approved learning system (quarterly, annual, Bologna Process) whether it is a requirement (ministry, university, college and scientific department) with the number of credit hours.

Learning Outcomes: A compatible set of knowledge, skills and values acquired by students after the successful completion of the academic program and must determine the learning outcomes of each course in a way that achieves the objectives of the program.

Teaching and learning strategies: They are the strategies used by the faculty members to develop students' teaching and learning, and they are plans that are followed to reach the learning goals. They describe all classroom and extra-curricular activities to achieve the learning outcomes of the program.

Academic Program Description Form

University Name: Babylon
Faculty/Institute: Engineering
Scientific Department: Mechanical
Academic or Professional Program Name: Vibration 1
Final Certificate Name: .....
Academic System: .....
Description Preparation Date:
File Completion Date:

Signature:
Head of Department Name:

Date:

Signature:
Scientific Associate Name:

Date:

The file is checked by:
Department of Quality Assurance and University Performance
Director of the Quality Assurance and University Performance Department:
Date:
Signature:

Approval of the Dean

1. **Program Vision**
Program vision is written here as stated in the university's catalogue and website.

2. **Program Mission**
Program mission is written here as stated in the university's catalogue and website.

3. **Program Objectives**
General statements describing what the program or institution intends to achieve.

4. **Program Accreditation**
NO

5. **Other external influences**
NO

6. **Program Structure**				
Program Structure	**Number of Courses**	**Credit hours**	**Percentage**	**Reviews***
Institution Requirements				
College Requirements				

Department Requirements				
Summer Training				
Other				

* This can include notes whether the course is basic or optional.

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
			theoretical	practical

8. Expected learning outcomes of the program

Knowledge	
Learning Outcomes 1	Learning Outcomes Statement 1
Skills	
Learning Outcomes 2	Learning Outcomes Statement 2
Learning Outcomes 3	Learning Outcomes Statement 3
Ethics	
Learning Outcomes 4	Learning Outcomes Statement 4
Learning Outcomes 5	Learning Outcomes Statement 5

9. Teaching and Learning Strategies

Teaching and learning strategies and methods adopted in the implementation of the program in general.

10. Evaluation methods

Implemented at all stages of the program in general.

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer

Professional Development

Mentoring new faculty members

Briefly describes the process used to mentor new, visiting, full-time, and part-time faculty at the institution and department level.

Professional development of faculty members

Briefly describe the academic and professional development plan and arrangements for faculty such as teaching and learning strategies, assessment of learning outcomes, professional development, etc.

12. Acceptance Criterion

(**Setting regulations related to enrollment in the college or institute, whether central admission or others**)

13. The most important sources of information about the program

State briefly the sources of information about the program.

14. Program Development Plan

Program Skills Outline															
				Required program Learning outcomes											
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
3	EnMeTmi3036022,(1)	Theory of machine I	BASIC	\	\	\		\	\	\		\	\	\	

- **Please tick the boxes corresponding to the individual program learning outcomes under evaluation.**

Course Description Form

1. Course Name:
Theory of machine I
2. Course Code:
EnMeTmi3036022,(1)
3. Semester / Year:
Semester
4. Description Preparation Date:
2023-2024
5. Available Attendance Forms:
6. Number of Credit Hours (60) / Number of Units (3)
7. Course administrator's name (mention all, if more than one name)
Name: Mohammed A Sahood eng.msaihood@uobabylon.edu.iq
8. Course Objectives

	The course aims to introduce the student to the mechanical parts involved in the assembly of machines, in addition to knowing the interconnection between these parts and the movement that results from them, in order to scientifically understand the principle of their work and the resulting mechanical movement, as well as studying the optimal position of the mechanical parts, such as friction, and the balance that the mechanical structure needs in order to Obtaining high efficiency in transmission. In addition to the presence of the practical side to support the theoretical side.

9. Teaching and Learning Strategies	
Strategy	• Lectures, • Tutorials, • Self-Learning Assignments • Seminars • Computer Laboratory, and • Project class room activity

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

1	3	a2, b1	Introduction	Lecture	activity
2	3	a1, a2,b1,b2	Instantaneous center	Lecture , Tutorials	Self-Learning Assignments, project
3	3	a1, a2,b1,b2	Velocity Diagram I	Lecture , Tutorials	Self-Learning Assignments
4	3	a1, a2,b1,b2	Velocity Diagram II	Lecture , Tutorials	Self-Learning Assignments
5	3	a1, a2,b1,b2	Acceleration diagram I	Lecture , Tutorials	Self-Learning Assignments
6	3	a1, a2,b1,b2	Acceleration diagram II	Lecture , Tutorials	Self-Learning Assignments
7	3	a1, a2,b1,b2, c1	Coriolis Acceleration Component	Lecture , Tutorials	Seminars, Tutorials
8	3	a1, a2,b1,b2, c1	Balancing of Rotating Masses I	Lecture , Tutorials	Seminars, Tutorials
9	3	a1, a2,b1,b2	Balancing of Rotating Masses II	Lecture , Tutorials	Self-Learning Assignments
10	3	a1, a2,b1,b2, c1	Balancing of Reciprocating Masses I	Lecture , Tutorials	Self-Learning Assignments
11	3	a1, a2,b1,b2, c1	Balancing of Reciprocating Masses II	Lecture , Tutorials	Self-Learning Assignments
12	3	a1, a2,b1,b2	Ratio of tension of Belts	Lecture , Tutorials	Self-Learning Assignments
13	3	a1, a2,b1,b2	Friction Clutches and Power Transmitted	Lecture , Tutorials	Self-Learning Assignments
14	3	a1, a2,b1,b2	Cone Clutches	Lecture , Tutorials	Self-Learning Assignments
15	3	a1, a2,b1,b2,c1, d1,d2.	Final Examination	Lecture , Tutorials	Writtien Exam, Computer Laboratory

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports.....etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

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Academic Program Description Form

University Name: Babylon
Faculty/Institute: Engineering
Scientific Department: Mechanical
Academic or Professional Program Name: Vibration 1
Final Certificate Name: .....
Academic System: .....
Description Preparation Date:
File Completion Date:

Signature:
Head of Department Name:

Date:

Signature:
Scientific Associate Name:

Date:

The file is checked by:
Department of Quality Assurance and University Performance
Director of the Quality Assurance and University Performance Department:
Date:
Signature:

Approval of the Dean

1. **Program Vision**
Program vision is written here as stated in the university's catalogue and website.

2. **Program Mission**
Program mission is written here as stated in the university's catalogue and website.

3. **Program Objectives**
General statements describing what the program or institution intends to achieve.

4. **Program Accreditation**
NO

5. **Other external influences**
NO

6. **Program Structure**				
Program Structure	**Number of Courses**	**Credit hours**	**Percentage**	**Reviews***
Institution Requirements				
College Requirements				

Department Requirements				
Summer Training				
Other				

* This can include notes whether the course is basic or optional.

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
			theoretical	practical

8. Expected learning outcomes of the program

Knowledge	
Learning Outcomes 1	Learning Outcomes Statement 1
Skills	
Learning Outcomes 2	Learning Outcomes Statement 2
Learning Outcomes 3	Learning Outcomes Statement 3
Ethics	
Learning Outcomes 4	Learning Outcomes Statement 4
Learning Outcomes 5	Learning Outcomes Statement 5

9. Teaching and Learning Strategies

Teaching and learning strategies and methods adopted in the implementation of the program in general.

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Implemented at all stages of the program in general.

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
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12. Acceptance Criterion

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13. The most important sources of information about the program

State briefly the sources of information about the program.

14. Program Development Plan

Program Skills Outline															
				Required program Learning outcomes											
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
3	EnMeTmi3036022,(2)	Theory of machine II	BASIC	\	\	\		\	\	\		\	\	\	

- **Please tick the boxes corresponding to the individual program learning outcomes under evaluation.**

Course Description Form

1. Course Name:
Theory of machine II
2. Course Code:
EnMeTmi3036022,(2)
3. Semester / Year:
Semester
4. Description Preparation Date:
2023-2024
5. Available Attendance Forms:
6. Number of Credit Hours (60) / Number of Units (3)
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Strategy	• Lectures, • Tutorials, • Self-Learning Assignments • Seminars • Computer Laboratory, and • Project class room activity

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2	3	a1, a2,b1,b2	Friction of Breaks	Lecture , Tutorials	Self-Learning Assignments, project
3	3	a1, a2,b1,b2	Inertia Force of Reciprocating Masses	Lecture , Tutorials	Self-Learning Assignments
4	3	a1, a2,b1,b2	Forces of Reciprocating parts	Lecture , Tutorials	Self-Learning Assignments
5	3	a1, a2,b1,b2	Velocity Ratio of Gears I	Lecture , Tutorials	Self-Learning Assignments
6	3	a1, a2,b1,b2	Velocity Ratio of Gears II	Lecture , Tutorials	Self-Learning Assignments
7	3	a1, a2,b1,b2, c1	Epicycle Gear Train I	Lecture , Tutorials	Seminars, Tutorials
8	3	a1, a2,b1,b2, c1	Epicycle Gear Train II	Lecture , Tutorials	Seminars, Tutorials
9	3	a1, a2,b1,b2	Turning Moment Diagram and flywheel	Lecture , Tutorials	Self-Learning Assignments
10	3	a1, a2,b1,b2, c1	Transmitted power by Hook joint	Lecture , Tutorials	Self-Learning Assignments
11	3	a1, a2,b1,b2, c1	Gyroscopic Effect	Lecture , Tutorials	Self-Learning Assignments
12	3	a1, a2,b1,b2	Governors	Lecture , Tutorials	Self-Learning Assignments
13	3	a1, a2,b1,b2	Cams and follower	Lecture , Tutorials	Self-Learning Assignments
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Directorate of Quality Assurance and Academic Accreditation
Accreditation Department

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2024

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Academic Program Description Form

University Name: .....

Faculty/Institute: .....

Scientific Department: .....

Academic or Professional Program Name: .....

Final Certificate Name: .....

Academic System: .....

Description Preparation Date:

File Completion Date:

Signature:	**Signature:**
Head of Department Name:	**Scientific Associate Name:**
Date:	**Date:**

The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date:

Signature:

Approval of the Dean

1. **Program Vision**
Program vision is written here as stated in the university's catalogue and website.

2. **Program Mission**
Program mission is written here as stated in the university's catalogue and website.

3. **Program Objectives**
General statements describing what the program or institution intends to achieve.

4. **Program Accreditation**
Does the program have program accreditation? And from which agency?

5. **Other external influences**
Is there a sponsor for the program?

6. **Program Structure**				
Program Structure	**Number of Courses**	**Credit hours**	**Percentage**	**Reviews***
Institution Requirements				
College Requirements				

Department Requirements				
Summer Training				
Other				

* This can include notes whether the course is basic or optional.

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
			theoretical	practical

8. Expected learning outcomes of the program

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Learning Outcomes 1	Learning Outcomes Statement 1
Skills	
Learning Outcomes 2	Learning Outcomes Statement 2
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Teaching and learning strategies and methods adopted in the implementation of the program in general.

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Implemented at all stages of the program in general.

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer

Professional Development

Mentoring new faculty members

Briefly describes the process used to mentor new, visiting, full-time, and part-time faculty at the institution and department level.

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Briefly describe the academic and professional development plan and arrangements for faculty such as teaching and learning strategies, assessment of learning outcomes, professional development, etc.

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(Setting regulations related to enrollment in the college or institute, whether central admission or others)

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Program Skills Outline															
				Required program Learning outcomes											
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
First/Second	UOBAB0102023	Engineering Mechanics Statics	Basic	●	●	●	●	●	●	●	●	●	●	●	●

- **Please tick the boxes corresponding to the individual program learning outcomes under evaluation.**

Course Description Form

1. Course Name:
Engineering Mechanics Statics
2. Course Code:
UOBAB0102023
3. Semester / Year:
Second/First
4. Description Preparation Date:
5. Available Attendance Forms:
6. Number of Credit Hours (Total) / Number of Units (Total)
7. Course administrator's name (mention all, if more than one name)
Name: Prof Dr. Mustafa Baqir Hunain And Lecture Leqaa Hameed Email: eng.mustafa.baqir@uobabylon.edu.iq
8. Course Objectives

Course Objectives	Principles of statistics are essential in mechanical engineering because it deals with the study of fixed or inanimate objects. These principles are used to analyze the forces acting on a body or machine, and to determine the internal stresses and strains that may arise due to those forces. This knowledge helps engineers design and develop reliable and safe machines and structures, ensuring their stability and structural integrity. Failure to consider statics in the design can lead to catastrophic failures, such as collapse of structures or breakdown of machinery. Therefore, understanding and applying the principles of statistics is crucial for mechanical engineers to ensure the proper functioning and safety of their designs

9. Teaching and Learning Strategies	
Strategy	During the school year, the student learns the skills of engineering mathematical laws. Understanding the engineering methods used in analyzing engineering systems and shapes. Learns how to think about programs used in engineering analysis. Students learn a lot of engineering mathematical operations.

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
first -second	6	Engineering Mechanics (Static)	**Introduction of Static** (Mechanics, Basic Concepts, Scalar and Vectors), Newton's Law , Units, Law of Gravitation , Problem solving in Static	Lectures written on paper and explained on the blackboard with example solutions	Daily discussions + monthly exams + homework
Third - fourth	6	Engineering Mechanics (Static)	**Two Dimensional Force System** (Introduction, Force, Rectangular Components, Moment, Couple, Resultants). **Three Dimensional Force System** (Moment and Couple)	Lectures written on paper and explained on the blackboard with example solutions	Daily discussions + monthly exams + homework
Fifth- sixth	6	Engineering Mechanics (Static)	**Equilibrium in Two Dimension** (Introduction , System Isolation the Free-Body Diagram, Equilibrium Conditions) **Equilibrium in Three Dimension** (Equilibrium Conditions)	Lectures written on paper and explained on the blackboard with example solutions	Daily discussions + monthly exams + homework
Seventh-Eighth	6	Engineering Mechanics (Static)	**Structure** (Introduction, Plane Trusses, Methods of Joints, Method of Sections, Space Trusses, Frames and Machines)	Lectures written on paper and explained on the blackboard with example solutions	Daily discussions + monthly exams + homework
Ninth-tenth	6	Engineering Mechanics (Static)	**Distributed Forces** (Center of Mass and Centroid, Special Topic)	Lectures written on paper and explained on the blackboard with example solutions	Daily discussions + monthly exams + homework
Eleventh-twelfth	6	Engineering Mechanics (Static)	**Friction** (Friction Phenomena, Type of Friction, Dry Friction)	Lectures written on paper and explained on the blackboard with example solutions	Daily discussions + monthly exams + homework

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports.....etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Ministry of Higher Education and Scientific Research
Scientific Supervision and Scientific Evaluation Apparatus
Directorate of Quality Assurance and Academic Accreditation
Accreditation Department

Academic Program and Course Description Guide

2024

Introduction:

The educational program is a well-planned set of courses that include procedures and experiences arranged in the form of an academic syllabus. Its main goal is to improve and build graduates' skills so they are ready for the job market. The program is reviewed and evaluated every year through internal or external audit procedures and programs like the External Examiner Program.

The academic program description is a short summary of the main features of the program and its courses. It shows what skills students are working to develop based on the program's goals. This description is very important because it is the main part of getting the program accredited, and it is written by the teaching staff together under the supervision of scientific committees in the scientific departments.

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In this regard, we can only emphasize the importance of writing an academic programs and course description to ensure the proper functioning of the educational process.

Concepts and terminology:

Academic Program Description: The academic program description provides a brief summary of its vision, mission and objectives, including an accurate description of the targeted learning outcomes according to specific learning strategies.

Course Description: Provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the students to achieve, proving whether they have made the most of the available learning opportunities. It is derived from the program description.

Program Vision: An ambitious picture for the future of the academic program to be sophisticated, inspiring, stimulating, realistic and applicable.

Program Mission: Briefly outlines the objectives and activities necessary to achieve them and defines the program's development paths and directions.

Program Objectives: They are statements that describe what the academic program intends to achieve within a specific period of time and are measurable and observable.

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Learning Outcomes: A compatible set of knowledge, skills and values acquired by students after the successful completion of the academic program and must determine the learning outcomes of each course in a way that achieves the objectives of the program.

Teaching and learning strategies: They are the strategies used by the faculty members to develop students' teaching and learning, and they are plans that are followed to reach the learning goals. They describe all classroom and extra-curricular activities to achieve the learning outcomes of the program.

Academic Program Description Form

University Name: ...University of Babylon...

Faculty/Institute: .....College of Engineering.....

Scientific Department: .....Mechanical Engineering.....

Academic or Professional Program Name: …..Bachelor of engineering…..

Final Certificate Name: …. Bachelor's degree in mechanical engineering….

Academic System: …Semester ….

Description Preparation Date:

File Completion Date: 21/3/2024

Signature:

Head of Department Name:

Date:

Signature:

Scientific Associate Name:

Date:

The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date:

Signature:

Approval of the Dean

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Does the program have program accreditation? And from which agency?

5. **Other external influences**
Is there a sponsor for the program?

6. **Program Structure**				
Program Structure	**Number of Courses**	**Credit hours**	**Percentage**	**Reviews***
Institution Requirements				
College Requirements				

Department Requirements				
Summer Training				
Other				

* This can include notes whether the course is basic or optional.

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
			theoretical	practical

8. Expected learning outcomes of the program

Knowledge
Skills
Ethics

9. Teaching and Learning Strategies

10. Evaluation methods

Implemented at all stages of the program in general.

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer

Professional Development

Mentoring new faculty members

Briefly describes the process used to mentor new, visiting, full-time, and part-time faculty at the institution and department level.

Professional development of faculty members

Briefly describe the academic and professional development plan and arrangements for faculty such as teaching and learning strategies, assessment of learning outcomes, professional development, etc.

12. Acceptance Criterion

(**Setting regulations related to enrollment in the college or institute, whether central admission or others**)

13. The most important sources of information about the program

State briefly the sources of information about the program.

14. Program Development Plan

Program Skills Outline															
				Required program Learning outcomes											
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4

- **Please tick the boxes corresponding to the individual program learning outcomes under evaluation.**

Course Description Form

1. Course Name:
Control Engineering
2. Course Code:
3. Semester / Year:
1
4. Description Preparation Date:
2024
5. Available Attendance Forms:
In person
6. Number of Credit Hours (Total) / Number of Units (Total)
ECTS credit =
7. Course administrator's name (mention all, if more than one name)
Name: Mustafa Turki Hussein Email: eng.mustafa.turky@uobabylon.edu.iq
8. Course Objectives
Course Objectives • Introduce students to the principles of modeling and analysis using mathematics for mechanical and electrical engineering systems and energy systems using the concepts and knowledge gained in the previous stages of study. • Teach students to convert systems and mathematical equations into transport equations and analyze the roots of these equations. • Deepen students' knowledge of error equations in engineering systems as well as provide students with design methods for control systems. • Study the stability of engineering systems and relate it to the design methods of control systems. • Provide students with the necessary knowledge of the practical concepts found in control engineering.
9. Teaching and Learning Strategies

Strategy	The topics of this course are presented in a detailed, clear and precise manner, during which the learning objectives of this course are presented by relying on the students' previous knowledge and linking it to the new information in the course. This linkage helps students to benefit from the material presented and link it to the student's pre-existing information. This curriculum relies on mathematics and boundary physics concepts in addition to various engineering programs. The topics presented are linked to real-life examples (examples from daily life as well as examples from industrial applications), which makes learning more meaningful. Discussions with students and asking questions during explanations are used to ensure understanding and encourage students to participate through a combination of in-class activities and customized activities to apply them in the control lab. Finally, to ensure that students understand the scientific material presented, students are asked to solve a homework assignment commensurate with the course material and to conduct some classroom and laboratory tests.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5	Define and understand the basics of the principles of engineering control science	Control Systems Introduction	Clarify the principles and explain the basics of the principles of control engineering through a historical overview in addition to explaining the basic parts of control systems.	Assessment through class discussions
2	5	Demonstrate the principles of representation using mathematical equations for mechanical systems	Mathematical Modeling of mechanical systems	The method is based on explaining the material thoroughly and explaining its importance while solving a number of examples using Newton's second law by the lecturer	Assessment is done through class activities to solve a set of questions and then asking students to do a homework assignment related to the topic
3	5	Demonstrate the principles of representation using mathematical equations for electrical systems	Mathematical representation of electrical systems	The method is based on explaining the material thoroughly and explaining its importance while solving a number of examples using Kirchhoff's electrical laws by the lecturer	Assessment is done through class activities to solve a set of questions and then asking students to do a homework assignment related to the topic

4	5	Demonstrate the principles of representation using mathematical equations for Electro_Mechanical systems	Mathematical Modeling of Electro_Mechanical systems	The method is based on explaining the material thoroughly and explaining its importance while solving a number of examples using Newton's second laws and Kirchhoff's electrical laws by the lecturer	Evaluation is done by doing class activities to solve a set of questions and then asking students to do homework related to the topic.
5	5	Demonstrate the principles of representation using mathematical equations for energy systems	Mathematical Modeling of energy systems	The method is based on explaining the material thoroughly and explaining its importance while solving a number of examples using the laws of fluids and the laws of thermal energy by the lecturer	Evaluation is done by doing class activities to solve a set of questions and then asking students to do homework related to the topic.
6	5	Introduce students to converting mathematical equations to transfer functions	Transfer Functions	The method is based on explaining the material precisely and explaining its importance while solving a number of examples using Laplace transforms by the lecturer	Evaluation is done by doing class activities to solve a set of questions and then asking students to do homework related to the topic.
7	5	Giving students the necessary knowledge on how to draw block diagrams for control engineering	Block Diagram Representation	The method is based on explaining the material precisely and explaining its importance while solving a number of examples by the lecturer	Evaluation is done by doing class activities to solve a set of questions and then asking students to do homework related to the topic.
8	5	Demonstrate knowledge of the engineering behavior of systems versus time	Time Response of Systems	The method is based on explaining the material precisely and explaining its importance while solving a number of examples by relying on the students' previous knowledge	Evaluation is done by doing class activities to solve a set of questions and then asking students to do homework related to the topic.

				of the principles of mathematics and Laplace transformations by the lecturer	
9	5	Teach students the stability principles of control systems	Systems Stability	The method is based on explaining the material thoroughly, explaining its importance, solving a number of examples and discussing with the students by the lecturer.	Evaluation is done by doing class activities to solve a set of questions and then asking students to do homework related to the topic.
10	5	Knowledge about the Routh stability principle	Routh Stability Criteria	The method is based on explaining the material clearly and explaining its importance while solving a number of examples by relying on the students' previous knowledge of the principles of mathematics and matrices by the lecturer	Evaluation is done by doing class activities to solve a set of questions and then asking students to do homework related to the topic.
11	5	Knowledge related to the root-locus principles of stabilization	Root-Locus Method	The method is based on explaining the material clearly and explaining its importance while solving a number of examples by relying on the students' previous knowledge of the principles of mathematics, Laplace transforms, and complex numbers by the lecturer	Evaluation is done by doing class activities to solve a set of questions and then asking students to do homework related to the topic.
12	5	Knowledge related to the principles of frequency response methods for stabilization	Bode-Diagram	The method is based on explaining the material clearly and explaining its importance while solving a number of examples by relying on the students'	Evaluation is done by doing class activities to solve a set of questions and then asking students to do homework

				previous knowledge of the principles of mathematics, Laplace transforms, and complex numbers by the lecturer	related to the topic.
13	5	Knowledge related to the principles of frequency response methods for stabilization	Nyquist Plot	The method is based on explaining the material clearly and explaining its importance while solving a number of examples by relying on the students' previous knowledge of the principles of mathematics, Laplace transforms, and complex numbers by the lecturer	Evaluation is done by doing class activities to solve a set of questions and then asking students to do homework related to the topic.

11. Course Evaluation

Quizzes 10%, Assignments 10%, Lab 10%, Midterm Exam 20%, and Final Exam 50%
Then the total is 100%

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Required Textbooks	- Franklin, Gene F., Powell, J. David, Emami-Naeini, Abbas, Feedback control of dynamic systems - Pearson (2019)
Recommended Texts	- Norman S. Nise , Control Systems Engineering , Wiley InterScience (2014) - Richard C. Dorf, Robert H. Bishop - Modern Control Systems, 13th Ed.-Pearson (2017)

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Academic Program and Course Description Guide

2024

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Academic Program Description Form

University Name: ...University of Babylon...

Faculty/Institute: .....College of Engineering.....

Scientific Department: .....Mechanical Engineering.....

Academic or Professional Program Name: …..Bachelor of Engineering…..

Final Certificate Name: …. Bachelor's degree in mechanical engineering….

Academic System: …Semester ….

Description Preparation Date:

File Completion Date: 21/3/2024

Signature:

Head of Department Name:

Date:

Signature:

Scientific Associate Name:

Date:

The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date:

Signature:

Approval of the Dean

1. **Program Vision**
Program vision is written here as stated in the university's catalogue and website.

2. **Program Mission**
Program mission is written here as stated in the university's catalogue and website.

3. **Program Objectives**
General statements describing what the program or institution intends to achieve.

4. **Program Accreditation**
Does the program have program accreditation? And from which agency?

5. **Other external influences**
Is there a sponsor for the program?

6. **Program Structure**				
Program Structure	**Number of Courses**	**Credit hours**	**Percentage**	**Reviews***
Institution Requirements				
College Requirements				

Department Requirements				
Summer Training				
Other				

* This can include notes whether the course is basic or optional.

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
			theoretical	practical

8. Expected learning outcomes of the program

Knowledge
Skills
Ethics

9. Teaching and Learning Strategies

10. Evaluation methods

Implemented at all stages of the program in general.

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer

Professional Development

Mentoring new faculty members

Briefly describes the process used to mentor new, visiting, full-time, and part-time faculty at the institution and department level.

Professional development of faculty members

Briefly describe the academic and professional development plan and arrangements for faculty such as teaching and learning strategies, assessment of learning outcomes, professional development, etc.

12. Acceptance Criterion

(**Setting regulations related to enrollment in the college or institute, whether central admission or others**)

13. The most important sources of information about the program

State briefly the sources of information about the program.

14. Program Development Plan

Program Skills Outline															
				Required program Learning outcomes											
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4

- **Please tick the boxes corresponding to the individual program learning outcomes under evaluation.**

Course Description Form

1. Course Name:
Engineering Programming
2. Course Code:
208
3. Semester / Year:
4/2
4. Description Preparation Date:
2024
5. Available Attendance Forms:
In person
6. Number of Credit Hours (Total) / Number of Units (Total)
ECTS credit = 4
7. Course administrator's name (mention all, if more than one name)
Name: Nawras Haidar Mostafa Email: eng.nawars.haidar@uobabylon.edu.iq
8. Course Objectives
Course Objectives 1. To develop student skills for solving most related mathematical problem in mechanical engineering by MATLAB. 2. To learn solving a set of linear equations. 3. To understand how to find the roots of linear and non-linear equations using different methods. 4. To learn solving the interpolation of data. 5. To learn fitting a numerical data. 6. To learn solving the ordinary differential equation. 7. To learn coding the numerical integration. 8. To learn 2D plotting techniques.
9. Teaching and Learning Strategies

Strategy	The main strategy that will be adopted in delivering this module is to encourage students' participation in the programming, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes and by computer lab.

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1	4	Student will learn solving any set of linear equations using Cramer's rule.	Cramer's rule	The method depends on explaining the main principles of this method and MATLAB code	The evaluation is done through class activities, quizzes, lab report, and homework
2	4	Students will learn how to find the roots of nonlinear equation using bisection method	Bisection method for solving linear and non-linear equations	The method depends on explaining the main principles of this method and MATLAB code	The evaluation is done through class activities, quizzes, lab report, and homework
3	4	Students will learn how to find the roots of nonlinear equation using Secant method	Secant method for solving linear and non-linear equations	The method depends on explaining the main principles of this method and MATLAB code	The evaluation is done through class activities, quizzes, lab report, and homework
4	4	Students will learn how to find the roots of nonlinear equation using Newton-Raphson method	Newton-Raphson method for solving linear and non-linear equations	The method depends on explaining the main principles of this method and MATLAB code	The evaluation is done through class activities, quizzes, lab report, and homework
5	4	Students will learn how to find the roots of nonlinear equation using fixed-point iteration method	Fixed-point iteration method for solving linear and non-linear equations	The method depends on explaining the main principles of this method and MATLAB code	The evaluation is done through class activities, quizzes, lab report, and homework
6	4	Students will learn how to do interpolation using built-in functions	Interpolation (built-in functions)	The method depends on explaining the main principles of this method and MATLAB code	The evaluation is done through class activities, quizzes, lab report, and homework

7	4	Students will learn how to do interpolation using Lagrange polynomial	Lagrange's interpolation	The method depends on explaining the main principles of this method and MATLAB code	The evaluation is done through class activities, quizzes, lab report, and homework
8	4	Students are able to fit any data using curve fitting	Curve fitting	The method depends on explaining the main principles of this method and MATLAB code	The evaluation is done through class activities, quizzes, lab report, and homework
9	4	Students will able to solve ordinary differential equation solvers	MATLAB ODE solvers + Euler method (initial value problems)	The method depends on explaining the main principles of this method and MATLAB code	The evaluation is done through class activities, quizzes, lab report, and homework
10	4	Students will be to use Euler method for solving the initial value problems	MATLAB ODE solvers + Euler method (initial value problems)	The method depends on explaining the main principles of this method and MATLAB code	The evaluation is done through class activities, quizzes, lab report, and homework
11	4	Students will be to use Taylor method for solving the initial value problems	Taylor series method (initial value problems)	The method depends on explaining the main principles of this method and MATLAB code	The evaluation is done through class activities, quizzes, lab report, and homework
12	4	Students are able to perform numerical integration using built-in functions	Numerical integration (built-in functions)	The method depends on explaining the main principles of this method and MATLAB code	The evaluation is done through class activities, quizzes, lab report, and homework
13	4	Students are able to perform numerical integration using Trapezoidal rule	Trapezoidal rule	The method depends on explaining the main principles of this method and MATLAB code	The evaluation is done through class activities, quizzes, lab report, and homework

14	4	Students are able to perform numerical integration using Simpson's rule	Simpson's rule	The method depends on explaining the main principles of this method and MATLAB code	The evaluation is done through class activities, quizzes, lab report, and homework
15	4	Students are able to plot 2D data and functions	2D plots	The method depends on explaining the main principles of this method and MATLAB code	The evaluation is done through class activities, quizzes, lab report, and homework

11. Course Evaluation

Quizzes 10%, Assignments 10%, Report 10%, Lab 10%, Midterm Exam 10%, and Final Exam 50%
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University Name: ...University of Babylon...

Faculty/Institute: .....College of Engineering.....

Scientific Department: .....Mechanical Engineering.....

Academic or Professional Program Name: …..Bachelor of Engineering…..

Final Certificate Name: …. Bachelor's degree in mechanical engineering….

Academic System: …Semester ….

Description Preparation Date:

File Completion Date: 21/3/2024

Signature:

Head of Department Name:

Date:

Signature:

Scientific Associate Name:

Date:

The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date:

Signature:

Approval of the Dean

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Program Structure	**Number of Courses**	**Credit hours**	**Percentage**	**Reviews***
Institution Requirements				
College Requirements				

Department Requirements				
Summer Training				
Other				

* This can include notes whether the course is basic or optional.

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
			theoretical	practical

8. Expected learning outcomes of the program

Knowledge
Skills
Ethics

9. Teaching and Learning Strategies

10. Evaluation methods

Implemented at all stages of the program in general.

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer

Professional Development

Mentoring new faculty members

Briefly describes the process used to mentor new, visiting, full-time, and part-time faculty at the institution and department level.

Professional development of faculty members

Briefly describe the academic and professional development plan and arrangements for faculty such as teaching and learning strategies, assessment of learning outcomes, professional development, etc.

12. Acceptance Criterion

(**Setting regulations related to enrollment in the college or institute, whether central admission or others**)

13. The most important sources of information about the program

State briefly the sources of information about the program.

14. Program Development Plan

Program Skills Outline															
				Required program Learning outcomes											
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4

- **Please tick the boxes corresponding to the individual program learning outcomes under evaluation.**

Course Description Form

1. Course Name:
Strength of Materials II
2. Course Code:
211
3. Semester / Year:
4/2
4. Description Preparation Date:
2024
5. Available Attendance Forms:
In person
6. Number of Credit Hours (Total) / Number of Units (Total)
ECTS credit = 5
7. Course administrator's name (mention all, if more than one name)
Name: Nawras Haidar Mostafa Email: eng.nawars.haidar@uobabylon.edu.iq
8. Course Objectives
Course Objectives 1. To learn transforming the stress components acting on an element at a point into components acting on a corresponding element having a different orientation. 2. To learn finding the maximum normal and maximum shear stress at 3. the point, and find the orientation of the elements upon which they act. 4. To learn the theories used to predict the failure of a material. 5. To learn designing of shafts based on their resistance to both internal bending and torsion. 6. To learn driving the elastic curve deflection and slope of beams and shafts using integration method and discontinuity functions. 7. To learn solving for the support reactions on a beam or shaft that is statically indeterminate. 8. To learn analyzing and solving for buckling behavior of a column subjected to axial and eccentric loads.
9. Teaching and Learning Strategies

Strategy	The main strategy that will be adopted in delivering this module is to encourage students' participation in the theoretical and practical aspects, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes and by strength of materials lab.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5	Students would have the ability to determine the stress at any element within the structure in different orientations	Plane-Stress Transformation	The method depends on explaining the main principles of this method and solving examples	The evaluation is done through class activities, quizzes, lab report, and homework
2	5	Students would have the ability to determine the stress at any element within the structure in different orientations	General Equations of Plane-Stress Transformation	The method depends on explaining the main principles of this method and solving examples	The evaluation is done through class activities, quizzes, lab report, and homework
3	5	Students would have the ability to determine the principal and maximum shear stresses	Principal Stresses and Maximum In-Plane Shear Stress	The method depends on explaining the main principles of this method and solving examples	The evaluation is done through class activities, quizzes, lab report, and homework
4	5	Students would have the ability to determine the stress at any element within the structure in different orientations Using Mohr's circle	Mohr's Circle - Plane Stress	The method depends on explaining the main principles of this method and solving examples	The evaluation is done through class activities, quizzes, lab report, and homework
5	5	Students intended to have the ability of predicting the failure of the structure	Theories of Failure	The method depends on explaining the main principles of this method and solving examples	The evaluation is done through class activities, quizzes, lab report, and homework

6	5	Students will understand how shafts are designed	Shaft Design	The method depends on explaining the main principles of this method and solving examples	The evaluation is done through class activities, quizzes, lab report, and homework
7	5	Students will learn how to determine the elastic beam deflection	Deflection of Beams and Shafts	The method depends on explaining the main principles of this method and solving examples	The evaluation is done through class activities, quizzes, lab report, and homework
8	5	Students will learn how to determine the elastic beam deflection	The Elastic Curve Equation	The method depends on explaining the main principles of this method and solving examples	The evaluation is done through class activities, quizzes, lab report, and homework
9	5	Students will learn how to determine the elastic beam deflection	Slope and Displacement by Integration	The method depends on explaining the main principles of this method and solving examples	The evaluation is done through class activities, quizzes, lab report, and homework
10	5	Students will learn how to determine the elastic beam deflection	Discontinuity Functions	The method depends on explaining the main principles of this method and solving examples	The evaluation is done through class activities, quizzes, lab report, and homework
11	5	Students will learn how to determine reactions of statically indeterminate beams	Statically Indeterminate Beams and Shafts-Method of Integration	The method depends on explaining the main principles of this method and solving examples	The evaluation is done through class activities, quizzes, lab report, and homework
12	5	Students will learn how to find the critical buckling load of columns	Critical Buckling Load of Columns	The method depends on explaining the main principles of this method and solving examples	The evaluation is done through class activities, quizzes, lab report, and homework

13	5	Students will learn how to find the critical buckling load of columns	Ideal Column with Pin Supports	The method depends on explaining the main principles of this method and solving examples	The evaluation is done through class activities, quizzes, lab report, and homework
14	5	Students will learn how to find the critical buckling load of columns	Columns Having Various Types of Supports	The method depends on explaining the main principles of this method and solving examples	The evaluation is done through class activities, quizzes, lab report, and homework

11. Course Evaluation

Quizzes 10%, Assignments 10%, Report 10%, Lab 10%, Midterm Exam 10%, and Final Exam 50% Then the total is 100%

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Required Textbooks	Mechanics of Materials Tenth Edition, 2018 R. C. HIBBELER
Recommended Texts	Mechanics of Materials First edition, 2007 Ansel C. Ugural

Ministry of Higher Education and Scientific Research
Scientific Supervision and Scientific Evaluation Apparatus
Directorate of Quality Assurance and Academic Accreditation
Accreditation Department

Academic Program and Course Description Guide

2024

Introduction:

The educational program is a well-planned set of courses that include procedures and experiences arranged in the form of an academic syllabus. Its main goal is to improve and build graduates' skills so they are ready for the job market. The program is reviewed and evaluated every year through internal or external audit procedures and programs like the External Examiner Program.

The academic program description is a short summary of the main features of the program and its courses. It shows what skills students are working to develop based on the program's goals. This description is very important because it is the main part of getting the program accredited, and it is written by the teaching staff together under the supervision of scientific committees in the scientific departments.

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

In this regard, we can only emphasize the importance of writing an academic programs and course description to ensure the proper functioning of the educational process.

Concepts and terminology:

Academic Program Description: The academic program description provides a brief summary of its vision, mission and objectives, including an accurate description of the targeted learning outcomes according to specific learning strategies.

Course Description: Provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the students to achieve, proving whether they have made the most of the available learning opportunities. It is derived from the program description.

Program Vision: An ambitious picture for the future of the academic program to be sophisticated, inspiring, stimulating, realistic and applicable.

Program Mission: Briefly outlines the objectives and activities necessary to achieve them and defines the program's development paths and directions.

Program Objectives: They are statements that describe what the academic program intends to achieve within a specific period of time and are measurable and observable.

Curriculum Structure: All courses / subjects included in the academic program according to the approved learning system (quarterly, annual, Bologna Process) whether it is a requirement (ministry, university, college and scientific department) with the number of credit hours.

Learning Outcomes: A compatible set of knowledge, skills and values acquired by students after the successful completion of the academic program and must determine the learning outcomes of each course in a way that achieves the objectives of the program.

Teaching and learning strategies: They are the strategies used by the faculty members to develop students' teaching and learning, and they are plans that are followed to reach the learning goals. They describe all classroom and extra-curricular activities to achieve the learning outcomes of the program.

Academic Program Description Form

University Name: .....

Faculty/Institute: .....

Scientific Department: .....

Academic or Professional Program Name: .....

Final Certificate Name: .....

Academic System: .....

Description Preparation Date:

File Completion Date:

Signature:	**Signature:**
Head of Department Name:	**Scientific Associate Name:**
Date:	**Date:**

The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date:

Signature:

Approval of the Dean

1. **Program Vision**
Program vision is written here as stated in the university's catalogue and website.

2. **Program Mission**
Program mission is written here as stated in the university's catalogue and website.

3. **Program Objectives**
General statements describing what the program or institution intends to achieve.

4. **Program Accreditation**
Does the program have program accreditation? And from which agency?

5. **Other external influences**
Is there a sponsor for the program?

6. **Program Structure**				
Program Structure	**Number of Courses**	**Credit hours**	**Percentage**	**Reviews***
Institution Requirements				
College Requirements				

Department Requirements				
Summer Training				
Other				

* This can include notes whether the course is basic or optional.

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
			theoretical	practical

8. Expected learning outcomes of the program

Knowledge	
Learning Outcomes 1	Learning Outcomes Statement 1
Skills	
Learning Outcomes 2	Learning Outcomes Statement 2
Learning Outcomes 3	Learning Outcomes Statement 3
Ethics	
Learning Outcomes 4	Learning Outcomes Statement 4
Learning Outcomes 5	Learning Outcomes Statement 5

9. Teaching and Learning Strategies

Teaching and learning strategies and methods adopted in the implementation of the program in general.

10. Evaluation methods

Implemented at all stages of the program in general.

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer

Professional Development

Mentoring new faculty members

Briefly describes the process used to mentor new, visiting, full-time, and part-time faculty at the institution and department level.

Professional development of faculty members

Briefly describe the academic and professional development plan and arrangements for faculty such as teaching and learning strategies, assessment of learning outcomes, professional development, etc.

12. Acceptance Criterion

(**Setting regulations related to enrollment in the college or institute, whether central admission or others**)

13. The most important sources of information about the program

State briefly the sources of information about the program.

14. Program Development Plan

Program Skills Outline															
				Required program Learning outcomes											
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4

- **Please tick the boxes corresponding to the individual program learning outcomes under evaluation.**

Course Description Form

1. Course Name: Machine Design II
2. Course Code: MEC308
3. Semester / Year: 1st Semester/Fourth
4. Description Preparation Date: 23/3/2024
5. Available Attendance Forms:
6. Number of Credit Hours (Total) / Number of Units (Total) 80hours/5units
7. Course administrator's name (mention all, if more than one name)
Name: Prof. Basim Ajeel Abass Email:eng.basim.ajeel@uobabylon.edu.iq Name: Prof. Esam Zuhair (Solid work Lab) Email:eng.esam.zuhair@uobabylo.edu.iq
8. Course Objectives

Course Objectives	•To teach the students how to apply the concepts of stress analysis, theories of failure, and material science to analyze, design, and/or select commonly used machine components. •To illustrate to students the variety of available mechanical components and emphasize the need to continue learning. •To teach students how to apply mechanical engineering design theory to identify and quantify machine elements in designing commonly used mechanical systems. • To teach students how to apply computer-based techniques in analyzing, designing, and/or selecting machine components (Solid Work Lab.)

9. Teaching and Learning Strategies	
Strategy	1. Read the course material/notes: This strategy aims to include the most important/most relevant, avoid missing something/including everything important, and identify what one should know/what is important. 2. Do practice problems: The motivations behind this strategy are to learn them, increase comprehension, 3. Study old exams: The motivations behind this strategy are to learn about the exam and to identify what one is supposed to know. 4. Study in a group: The motivations behind this strategy are to increase comprehension and learn better. 5. Quizzes: The motivation behind the strategy is good memory and

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1.	4	Learning the design principles of the power screw	Design of power screw	1,2,5	Quiz, mid-term Exam
2.	4	Learning the design and selection of the belts	Belts	1,2,5	
3.	4	Learning how to select wire ropes and chains.	Wire ropes and chains	1,2,5	
4.	4	Learning how to design spur gears.	Design of spur gears	1,2,5	
5.	4	Learning how to design Helical gears.	Design of Helical gears		
6.	4	Learning how to design Bevel gears.	Design of Bevel gears	1,2,5	
7.	4	Learning how to design worm gears.	Design of worm gears	1,2,5	
8.	4	Learning how to design sliding bearings	Design of sliding bearing	1,2,4,5	
9.	4	Learning how to use the design charts.	Selection of Sliding Bearings	1,2,4,5	
10.	4	Learning about different types of rolling bearings and their applications.	Selection of Rolling contact bearings	1,2,4,5	
11.	4	Learning how to select the required rolling bearing from the manufacturer catalog.	Selection of rolling contact bearings with applications	1,2,4,5	
12.	4	Learning how to design the different types of clutches.	Design of clutches	1,2,5	
13.	4	Learning how to design the short shoe brake.	Design of Brak	1,2,5	
14.	4	Learning how to design the long shoe brake.	Design of Brak	1,2,5	
15.			Exam		

11. Course Evaluation

30% written exam, 10% daily exams (Quizzes), 10% Solid work Lab, 50% Final Exam

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Required Textbook: Shigley's Mechanical Engineering Design, Richard G. Budynas, J. Keith Nisbett, 9th edition
Recommended Books: Design of Machine Elements, Third Edition, **V. B. Bhandari.**
Fundamentals of Machine Component Design, Robert C. Juvinall.

Ministry of Higher Education and Scientific Research
Scientific Supervision and Scientific Evaluation Apparatus
Directorate of Quality Assurance and Academic Accreditation
Accreditation Department

Academic Program and Course Description Guide

2024

Introduction:

The educational program is a well-planned set of courses that include procedures and experiences arranged in the form of an academic syllabus. Its main goal is to improve and build graduates' skills so they are ready for the job market. The program is reviewed and evaluated every year through internal or external audit procedures and programs like the External Examiner Program.

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Learning Outcomes: A compatible set of knowledge, skills and values acquired by students after the successful completion of the academic program and must determine the learning outcomes of each course in a way that achieves the objectives of the program.

Teaching and learning strategies: They are the strategies used by the faculty members to develop students' teaching and learning, and they are plans that are followed to reach the learning goals. They describe all classroom and extra-curricular activities to achieve the learning outcomes of the program.

Academic Program Description Form

University Name: .....

Faculty/Institute: .....

Scientific Department: .....

Academic or Professional Program Name: .....

Final Certificate Name: .....

Academic System: .....

Description Preparation Date:

File Completion Date:

Signature:	**Signature:**
Head of Department Name:	**Scientific Associate Name:**
Date:	**Date:**

The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date:

Signature:

Approval of the Dean

1. **Program Vision**
Program vision is written here as stated in the university's catalogue and website.

2. **Program Mission**
Program mission is written here as stated in the university's catalogue and website.

3. **Program Objectives**
General statements describing what the program or institution intends to achieve.

4. **Program Accreditation**
Does the program have program accreditation? And from which agency?

5. **Other external influences**
Is there a sponsor for the program?

6. **Program Structure**				
Program Structure	**Number of Courses**	**Credit hours**	**Percentage**	**Reviews***
Institution Requirements				
College Requirements				

Department Requirements				
Summer Training				
Other				

* This can include notes whether the course is basic or optional.

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
			theoretical	practical

8. Expected learning outcomes of the program

Knowledge	
Learning Outcomes 1	Learning Outcomes Statement 1
Skills	
Learning Outcomes 2	Learning Outcomes Statement 2
Learning Outcomes 3	Learning Outcomes Statement 3
Ethics	
Learning Outcomes 4	Learning Outcomes Statement 4
Learning Outcomes 5	Learning Outcomes Statement 5

9. Teaching and Learning Strategies

Teaching and learning strategies and methods adopted in the implementation of the program in general.

10. Evaluation methods

Implemented at all stages of the program in general.

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer

Professional Development

Mentoring new faculty members

Briefly describes the process used to mentor new, visiting, full-time, and part-time faculty at the institution and department level.

Professional development of faculty members

Briefly describe the academic and professional development plan and arrangements for faculty such as teaching and learning strategies, assessment of learning outcomes, professional development, etc.

12. Acceptance Criterion

(**Setting regulations related to enrollment in the college or institute, whether central admission or others**)

13. The most important sources of information about the program

State briefly the sources of information about the program.

14. Program Development Plan

Program Skills Outline															
				Required program Learning outcomes											
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4

- **Please tick the boxes corresponding to the individual program learning outcomes under evaluation.**

Course Description Form

1. Course Name: Measurements and Instrumentations
2. Course Code: MEC 402
3. Semester / Year: 2nd Semester/Fourth
4. Description Preparation Date: 30/3/2024
5. Available Attendance Forms: 3hours/week
6. Number of Credit Hours (Total) / Number of Units (Total) 45hours/3units
7. Course administrator's name (mention all, if more than one name)
Name: Prof. Basim Ajeel Abass Email:eng.basim.ajeel@uobabylon.edu.iq
8. Course Objectives

Course Objectives	• To cover the basic principles of mechanical Measurements and instrum • To present engineering examples explaining the importance of the subj ability to select suitable measuring devices for specific applications and • To develop the ability to analyze the experimental data collected during experimental work. • To develop a background in the most modern techniques in mecha measurement using different illustrating methods such as videos a different labs. • To develop the background for implementing the calibration proce different measuring instruments.

9. Teaching and Learning Strategies

Strategy	1. Read the course material/notes: The motivations behind this strategy are to include the most important/most relevant, avoid missing something/including everything important, and identify what one is supposed to know/what is important. 2. Do practice problems: The motivations behind this strategy are to learn them, increase comprehension, 3. Study old exams: The motivations behind this strategy are to learn about the exam, and to identify what one is supposed to know. 4. Study in a group: The motivations behind this strategy are to increase comprehension, and to learn in a better way. 5. Quizzes: The motivation behind the strategy is good memory and

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1.	3	Learning basic terms used in measurements.	Introduction	1,2,5	Quiz, mid-term Exam
2.	3	Learning the meaning of calibration and instrument error.	Introduction	1,2,5	
3.	3	Learning the Static and dynamic behavior of the measuring instruments	Static and dynamic characteristics of the measurement instruments	1,2,5	
4.	3	Learning the Static and dynamic behavior of the measuring instruments	Static and dynamic characteristics of the measurement instruments	1,2,5	
5.	3	Learning how to analyze the measurement data.	Uncertainty Analysis	1,2,5	
6.	3	Learning how to measure the fluid pressure.	Pressure measurements	1,2,5	
7.	3	Learning how to measure the temperature	Temperature measurements	1,2,5	
8.	3	Learning how to measure the Flow rate	Flow rate measurement	1,2,5	
9.	3	Learning how to measure the Acceleration	Acceleration Measurement	1,2,5	
10.	3	Learning how to measure the torque	Torque Measurement	1,2,5	
11.	3	Learning how to measure the Strain	Strain measurement.	1,2,5	
12.	3	Learning how to measure the Thermal conductivity	Measurement of thermal conductivity	1,2,5	
13.	3	Learning how to measure the viscosity.	Viscosity measurement	1,2,5	
14.	3	Learning how to measure the Force.	Force measurement	1,2,5	
15.		Exam			

11. Course Evaluation
30% Written Exams 10% Daily Exams and Activities 10% Measurements Lab 50% final Exam

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

1. Measurement Systems Application and Design, Ernest O. Dobelin , Fifth Edition
2. Theory and Design for Mechanical Measurements, Richard S. Figliola, Donald E. Beasley
3. Experimental Methods for Engineers, J. P. Holman, Eighth Edition

Ministry of Higher Education and Scientific Research
Scientific Supervision and Scientific Evaluation Apparatus
Directorate of Quality Assurance and Academic Accreditation
Accreditation Department

Academic Program and Course Description Guide

2024

Introduction:

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Learning Outcomes: A compatible set of knowledge, skills and values acquired by students after the successful completion of the academic program and must determine the learning outcomes of each course in a way that achieves the objectives of the program.

Teaching and learning strategies: They are the strategies used by the faculty members to develop students' teaching and learning, and they are plans that are followed to reach the learning goals. They describe all classroom and extra-curricular activities to achieve the learning outcomes of the program.

Academic Program Description Form

University Name: Babylon
Faculty/Institute: Engineering
Scientific Department: Mechanical
Academic or Professional Program Name: Vibration 1
Final Certificate Name: .....
Academic System: .....
Description Preparation Date:
File Completion Date:

Signature:
Head of Department Name:

Date:

Signature:
Scientific Associate Name:

Date:

The file is checked by:
Department of Quality Assurance and University Performance
Director of the Quality Assurance and University Performance Department:
Date:
Signature:

Approval of the Dean

1. **Program Vision**
Program vision is written here as stated in the university's catalogue and website.

2. **Program Mission**
Program mission is written here as stated in the university's catalogue and website.

3. **Program Objectives**
General statements describing what the program or institution intends to achieve.

4. **Program Accreditation**
NO

5. **Other external influences**
NO

6. **Program Structure**				
Program Structure	**Number of Courses**	**Credit hours**	**Percentage**	**Reviews***
Institution Requirements				
College Requirements				

Department Requirements				
Summer Training				
Other				

* This can include notes whether the course is basic or optional.

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
			theoretical	practical

8. Expected learning outcomes of the program

Knowledge	
Learning Outcomes 1	Learning Outcomes Statement 1
Skills	
Learning Outcomes 2	Learning Outcomes Statement 2
Learning Outcomes 3	Learning Outcomes Statement 3
Ethics	
Learning Outcomes 4	Learning Outcomes Statement 4
Learning Outcomes 5	Learning Outcomes Statement 5

9. Teaching and Learning Strategies

Teaching and learning strategies and methods adopted in the implementation of the program in general.

10. Evaluation methods

Implemented at all stages of the program in general.

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer

Professional Development

Mentoring new faculty members

Briefly describes the process used to mentor new, visiting, full-time, and part-time faculty at the institution and department level.

Professional development of faculty members

Briefly describe the academic and professional development plan and arrangements for faculty such as teaching and learning strategies, assessment of learning outcomes, professional development, etc.

12. Acceptance Criterion

(**Setting regulations related to enrollment in the college or institute, whether central admission or others**)

13. The most important sources of information about the program

State briefly the sources of information about the program.

14. Program Development Plan

Program Skills Outline															
				Required program Learning outcomes											
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
	I \ MEC204		BASIC	\	\	\		\	\	\		\	\	\	

- **Please tick the boxes corresponding to the individual program learning outcomes under evaluation.**

Course Description Form

1. Course Name:

Fluid Mechanics

2. Course Code:

I \ MEC204

3. Semester / Year:

Semester

4. Description Preparation Date:

2023-2024

5. Available Attendance Forms:

6. Number of Credit Hours (120) / Number of Units (3)

7. Course administrator's name (mention all, if more than one name)

Name: Hussein Mahmood
Email: eng.hussein.mahmood@uobabylon.edu.iq

8. Course Objectives

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the program specification.	....

9. Teaching and Learning Strategies

Strategy	• Lectures, • Tutorials, • Self-Learning Assignments • Seminars • Computer Laboratory, and • Project class room activity

10. Course Structure

11. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Me
1	4+2+2	Understand the subject	General introduction to fluid mechanics	Theoretical +experimental	Weekly +mont
2	4+2+2	Understand the subject	Fluid statics and pressure applications	Theoretical +experimental	Weekly +mont
3	4+2+2	Understand the subject	Forces and immersed bodies and surfaces	Theoretical +experimental	Weekly +mont
4	4+2+2	Understand the subject	Accelerated fluid and relative motion	Theoretical +experimental	Weekly +mont

5	4+2+2	Understand the subject	Equilibrium of floating bodies	Theoretical +experimental	Weekly +monthly quiz
6	4+2+2	Understand the subject	Introduction to fluid motion	Theoretical +experimental	Weekly +monthly quiz
7	4+2+2	Understand the subject	Continuity equation	Theoretical +experimental	Weekly +monthly quiz
8	4+2+2	Understand the subject	Equation of motion and their applications	Theoretical +experimental	Weekly +monthly quiz
9	4+2+2	Understand the subject	Dimensional analysis and similitude	Theoretical +experimental	Weekly +monthly quiz
10	4+2+2	Understand the subject	Motion of viscous fluids in conduits	Theoretical +experimental	Weekly +monthly quiz
11	4+2+2	Understand the subject	Definition of boundary layer	Theoretical +experimental	Weekly +monthly quiz
12	4+2+2	Understand the subject	Friction losses in pipes	Theoretical +experimental	Weekly +monthly quiz
13	4+2+2	Understand the subject	Measurements of fluid flow	Theoretical +experimental	Weekly +monthly quiz
14	4+2+2	Understand the subject	Analysis of piping system	Theoretical +experimental	Weekly +monthly quiz
15	4+2+2	Understand the subject	Introduction to lubrication	Theoretical +experimental	Weekly +monthly quiz

1. Munson, et. al.," Fundamentals of fluid mechanics " , six edition , 2010
2. Genick B. Meir , " Basics of fluid mechanics ", fifth edition , 2010
3. Massey , " Mechanics of fluids" , eight edition , 2006

nil

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports.....etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Ministry of Higher Education and Scientific Research
Scientific Supervision and Scientific Evaluation Apparatus
Directorate of Quality Assurance and Academic Accreditation
Accreditation Department

Academic Program and Course Description Guide

2024

Introduction:

The educational program is a well-planned set of courses that include procedures and experiences arranged in the form of an academic syllabus. Its main goal is to improve and build graduates' skills so they are ready for the job market. The program is reviewed and evaluated every year through internal or external audit procedures and programs like the External Examiner Program.

The academic program description is a short summary of the main features of the program and its courses. It shows what skills students are working to develop based on the program's goals. This description is very important because it is the main part of getting the program accredited, and it is written by the teaching staff together under the supervision of scientific committees in the scientific departments.

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

In this regard, we can only emphasize the importance of writing an academic programs and course description to ensure the proper functioning of the educational process.

Concepts and terminology:

Academic Program Description: The academic program description provides a brief summary of its vision, mission and objectives, including an accurate description of the targeted learning outcomes according to specific learning strategies.

Course Description: Provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the students to achieve, proving whether they have made the most of the available learning opportunities. It is derived from the program description.

Program Vision: An ambitious picture for the future of the academic program to be sophisticated, inspiring, stimulating, realistic and applicable.

Program Mission: Briefly outlines the objectives and activities necessary to achieve them and defines the program's development paths and directions.

Program Objectives: They are statements that describe what the academic program intends to achieve within a specific period of time and are measurable and observable.

Curriculum Structure: All courses / subjects included in the academic program according to the approved learning system (quarterly, annual, Bologna Process) whether it is a requirement (ministry, university, college and scientific department) with the number of credit hours.

Learning Outcomes: A compatible set of knowledge, skills and values acquired by students after the successful completion of the academic program and must determine the learning outcomes of each course in a way that achieves the objectives of the program.

Teaching and learning strategies: They are the strategies used by the faculty members to develop students' teaching and learning, and they are plans that are followed to reach the learning goals. They describe all classroom and extra-curricular activities to achieve the learning outcomes of the program.

Academic Program Description Form

University Name: University of Babylon

Faculty/Institute: College of Engineering

Scientific Department: Mechanical Department

Academic or Professional Program Name: Bachelor of Engineering

Final Certificate Name: Bachelor's degree in Mechanical Engineering

Academic System: Semester

Description Preparation Date:

File Completion Date: 21/3/2024

Signature:	**Signature:**
Head of Department Name:	**Scientific Associate Name:**
Date:	**Date:**

The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date:

Signature:

Approval of the Dean

1. **Program Vision**
Program vision is written here as stated in the university's catalogue and website.

2. **Program Mission**
Program mission is written here as stated in the university's catalogue and website.

3. **Program Objectives**
General statements describing what the program or institution intends to achieve.

4. **Program Accreditation**
Does the program have program accreditation? And from which agency?

5. **Other external influences**
Is there a sponsor for the program?

6. **Program Structure**				
Program Structure	**Number of Courses**	**Credit hours**	**Percentage**	**Reviews***
Institution Requirements				
College Requirements				

Department Requirements				
Summer Training				
Other				

* This can include notes whether the course is basic or optional.

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
			theoretical	practical

8. Expected learning outcomes of the program

Knowledge	
Learning Outcomes 1	Learning Outcomes Statement 1
Skills	
Learning Outcomes 2	Learning Outcomes Statement 2
Learning Outcomes 3	Learning Outcomes Statement 3
Ethics	
Learning Outcomes 4	Learning Outcomes Statement 4
Learning Outcomes 5	Learning Outcomes Statement 5

9. Teaching and Learning Strategies

Teaching and learning strategies and methods adopted in the implementation of the program in general.

10. Evaluation methods

Implemented at all stages of the program in general.

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer

Professional Development

Mentoring new faculty members

Briefly describes the process used to mentor new, visiting, full-time, and part-time faculty at the institution and department level.

Professional development of faculty members

Briefly describe the academic and professional development plan and arrangements for faculty such as teaching and learning strategies, assessment of learning outcomes, professional development, etc.

12. Acceptance Criterion

(**Setting regulations related to enrollment in the college or institute, whether central admission or others**)

13. The most important sources of information about the program

State briefly the sources of information about the program.

14. Program Development Plan

Program Skills Outline															
				Required program Learning outcomes											
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4

- **Please tick the boxes corresponding to the individual program learning outcomes under evaluation.**

Course Description Form

1. Course Name:
Heat Transfer I
2. Course Code:
MEC304
3. Semester / Year:
3
4. Description Preparation Date:
2024
5. Available Attendance Forms:
In person
6. Number of Credit Hours (Total) / Number of Units (Total)
5 (2 Th., 1 Tut., and 2 Lab.)
7. Course administrator's name (mention all, if more than one name)
Name: Rafel Hekmat Hameed Email: Eng.rafel.hekmat@uobabylon.edu.iq
8. Course Objectives

Course Objectives

1. Introduce the principles of heat transfer modes, conduction, convection, and radiation.
2. Enable the student to derive the differential equation that governs the heat equations in conduction modes under steady and unsteady state for Cartesian, radial, and spherical coordinates systems.
3. Enable the student to solve one-or two dimensional conduction problem numerically using finite difference method, and analytically using separation variables method.
4. Enable the student to understand the boundary conditions problems.
5. Enable the student to solve lumped system problems
6. Enable the student to classify electromagnetic radiation, and identify thermal radiation.
7. Enable the student to measure experimentally some materials properties, and to design and conduct experiments of heat transfer.

9. Teaching and Learning Strategies	
Strategy	Formulate and solve One dim. Steady state conduction in different coordinates systems. drive the extended surface relations depending upon different boundary conditions at steady state conduction . Using analytical method for solving steady state conduction (separation of variables), and also using numerical method (finite difference method) for solving problems at steady and unsteady state conduction. Solve problems of heat conduction at unsteady state using lumped system and heisler chart . Calculate the

	radiation properties and shape factor. Solve the radiation heat transfer between two surface, and the effect of shield on reduction radiation heat transfer. also draw the radiation network.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5	Introduction to heat transfer	Modes of heat transfer	• Lecture plan and in-class activities. • Each class will commence with a summary of the previous lecture. • Questions will be asked and the responses will be used to evaluate the students' understanding of the topics covered. Oral and power point presentations by the students are made to participate in the lecture.	• In-class questions and discussion. • Quizzes. • Homework and assignments. • Seminars. • Oral and ppt. presentations • Lab. Experiments.
2	5	One dim. Steady state conduction	Steady state conduction in different coordinates systems	explaining the main principles of heat transfer and presenting a set of examples that are solved first by the teacher and then with the participation of the students	• In-class questions and discussion. • Quizzes. • Homework and assignments.

3	5	One dim. Steady state conduction	Overall heat transfer coefficient , insulation & composite walls	Precisely explaining the force convection, clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	• In-class questions and discussion. • Quizzes. • Homework and assignments. • Seminars.
4	5	One dim. Steady state conduction	Critical thickness of insulation, thermal contact resistance, heat source system	Precisely explaining the subject, clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	• In-class questions and discussion. • Quizzes. • Homework and assignments.
5	5	One dim. Steady state conduction	Extended surface	Precisely explaining the subject, clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	• In-class questions and discussion. • Quizzes. • Homework and assignments. Lab. Experiments
6	5	Steady state multi dim. Conduction	Analytical solution (separation of variables)	Precisely explaining the subject, clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	• In-class questions and discussion. • Quizzes. • Homework and assignments. Lab. Experiments

7	5	Steady state multi dim. Conduction	Graphical analogy, shape factor, electrical analogy.	Lecture plan and in-class activities. and presenting a set of examples that are solved first by the teacher and then with the participation of the students	• In-class questions and discussion. • Homework and assignments. Lab. Experiments lesson
8	5	Steady state multi dim. Conduction	Numerical solution	Precisely explaining the topic, clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	• In-class questions and discussion. • Quizzes. • Homework and assignments. Lab. Experiments
9	5	Unsteady state conduction	Analytical solution, Biot no. , Semi-infinite body	Precisely explaining the transient conduction clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	• In-class questions and discussion. • Quizzes. • Homework and assignments. • Seminars.
10	5	Unsteady state conduction	Lumped heat capacity system, Heisler charts	Precisely explaining the subject, clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	• In-class questions and discussion. • Quizzes. • Homework and assignments. • Seminars. • Oral and ppt. presentations . Lab. Experiments

11	5	Unsteady state conduction	Numerical solution.	Strictly explaining the finite difference method, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	• In-class questions and discussion. • Quizzes. • Homework and assignments. • Seminars. • Oral and ppt. presentations . Lab. Experiments
12	5	Radiation	Introduction, physical mechanism	Strictly explaining the radiation	• In-class questions and discussion. • Quizzes. • Homework and assignments.. Lab. Experiments
13	5	Radiation	Radiation properties , shape factor tors	Strictly explaining the topic, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	• In-class questions and discussion. • Quizzes. • Homework and assignments. Lab. Experiments
14	5	Radiation	Heat exchange between nonblack body, infinite parallel planes	Strictly explaining the topic, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	• In-class questions and discussion. • Quizzes. • Homework and assignments. • Lab. Experiments
15	5	Radiation	Shield, , introduction to solar radiation	Strictly explaining the topic, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	• In-class questions and discussion. • Quizzes. • Homework and assignments. Lab. Experiments

11. Course Evaluation

Quizzes 5%, Home work 5%, Report Lab 10%, Midterm Exam 30%, and Final Exam 50%

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	-"Heat Transfer"; by J.P. Holman, Ninth Edition, Mc. Graw Hill , 2002 -"Heat Transfer"; by Chris Long and Naser Sayma, 2009. -"Heat and Mass Transfer Fundamentals and Applications"; by Yunus A. Gengel and Afshin J. Ghajar, Fourth Edition, Mc. Graw Hill , 2011.
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Ministry of Higher Education and Scientific Research
Scientific Supervision and Scientific Evaluation Apparatus
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2024

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Academic Program Description Form

University Name: University of Babylon

Faculty/Institute: College of Engineering

Scientific Department: Mechanical Department

Academic or Professional Program Name: Bachelor of Engineering

Final Certificate Name: Bachelor's degree in Mechanical Engineering

Academic System: Semester

Description Preparation Date:

File Completion Date: 21/3/2024

Signature:	**Signature:**
Head of Department Name:	**Scientific Associate Name:**
Date:	**Date:**

The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date:

Signature:

Approval of the Dean

1. **Program Vision**
Program vision is written here as stated in the university's catalogue and website.

2. **Program Mission**
Program mission is written here as stated in the university's catalogue and website.

3. **Program Objectives**
General statements describing what the program or institution intends to achieve.

4. **Program Accreditation**
Does the program have program accreditation? And from which agency?

5. **Other external influences**
Is there a sponsor for the program?

6. **Program Structure**				
Program Structure	**Number of Courses**	**Credit hours**	**Percentage**	**Reviews***
Institution Requirements				
College Requirements				

Department Requirements				
Summer Training				
Other				

* This can include notes whether the course is basic or optional.

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
			theoretical	practical

8. Expected learning outcomes of the program

Knowledge	
Learning Outcomes 1	Learning Outcomes Statement 1
Skills	
Learning Outcomes 2	Learning Outcomes Statement 2
Learning Outcomes 3	Learning Outcomes Statement 3
Ethics	
Learning Outcomes 4	Learning Outcomes Statement 4
Learning Outcomes 5	Learning Outcomes Statement 5

9. Teaching and Learning Strategies

Teaching and learning strategies and methods adopted in the implementation of the program in general.

10. Evaluation methods

Implemented at all stages of the program in general.

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer

Professional Development

Mentoring new faculty members

Briefly describes the process used to mentor new, visiting, full-time, and part-time faculty at the institution and department level.

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Briefly describe the academic and professional development plan and arrangements for faculty such as teaching and learning strategies, assessment of learning outcomes, professional development, etc.

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(**Setting regulations related to enrollment in the college or institute, whether central admission or others**)

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State briefly the sources of information about the program.

14. Program Development Plan

Program Skills Outline															
				Required program Learning outcomes											
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4

- **Please tick the boxes corresponding to the individual program learning outcomes under evaluation.**

Course Description Form

1. Course Name:
Heat Transfer II
2. Course Code:
MEC304
3. Semester / Year:
3
4. Description Preparation Date:
2024
5. Available Attendance Forms:
In person
6. Number of Credit Hours (Total) / Number of Units (Total)
5 (2 Th., 1 Tut., and 2 Lab.)
7. Course administrator's name (mention all, if more than one name)
Name: Rafel Hekmat Hameed Email: Eng.rafel.hekmat@uobabylon.edu.iq
8. Course Objectives

Course Objectives

1. Enable the student to understand the physical mechanism of convection and its classification.
2. Enable the student to derive the differential equations that govern convection on the basis of mass, momentum, and energy balances, and solve these equations for some simple cases such as laminar flow over a flat plate.
3. Enable the student to determine the pressure drop and the average heat transfer coefficient associated with flow across a tube bank for both in-line and staggered configuration.
4. Enable the student to analyze heating and cooling of a fluid flowing in a tube under constant surface temperature and constant surface heat flux conditions.
5. Enable the student to evaluate Nusselt number for both free and force convection associated with vertical, horizontal, and inclined plate as well as cylinder and spheres, in cases of external and internal flows.
6. Enable the student to recognize numerous types of heat exchanger, and classify them.
7. Enable the student to obtain the relations for the logarithmic mean temperature difference, and effectiveness of heat exchanger.
8. Enable the student to conduct experiments on convection and heat exchangers in the laboratory of heat transfer.

9. Teaching and Learning Strategies

Strategy	Understand the physical mechanism of convection and its classification, and gain a working knowledge of the dimensionless Reynolds, Prandtl, and Nusselt numbers to solve convection problems. Recognize numerous types of heat exchangers and classify them, know the primary consideration in the selection of heat exchanges. Design and conduct experiments of convection heat transfer and heat exchanger, as well as analyze, interpret data and apply the experimental results for the services. Work in groups and function on multi-disciplinary teams. Identify, formulate and solve engineering related heat transfer problems. Understand professional, social and ethical responsibilities. Use the techniques, skills, and modern engineering tools necessary for engineering practice in heat transfer applications.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5	Principles of convection	Introduction to Convection	explaining the main principles of convection	• In-class questions and discussion. • Quizzes. • Homework and assignments.
2	5	Principles of convection	Convection; Relation between fluid friction and heat transfer, laminar & turbulent tube flow	explaining the main principles of convection and presenting a set of examples that are solved first by the teacher and then with the participation of the students	• In-class questions and discussion. • Quizzes. • Homework and assignments.
3	5	Forced Convection	Introduction , empirical &practical relations	Precisely explaining the force convection, clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	• In-class questions and discussion. • Quizzes. • Homework and assignments. • Seminars.

4	5	Force convection	Empirical &practical relations , External flow across (flat plate, cylinder & sphere)	Precisely explaining the subject, clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	• In-class questions and discussion. • Quizzes. • Homework and assignments.
5	5	Force convection	External flow across tube banks	Precisely explaining the subject, clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	• In-class questions and discussion. • Quizzes. • Homework and assignments. Lab. Experiments
6	5	Force convection	internal flow (laminar & turbulent)	Precisely explaining the subject, clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	• In-class questions and discussion. • Quizzes. • Homework and assignments. Lab. Experiments
7	5	Natural convection	Introduction	Precisely explaining the free convection, clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	• In-class questions and discussion. • Homework and assignments. Lab. Experiments lesson

8	5	Natural convection	Empirical relations for free conv. for horizontal plane and cylinder	Precisely explaining the free convection, clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	• In-class questions and discussion. • Quizzes. • Homework and assignments. Lab. Experiments
9	5	Natural convection	Natural convection ; Inclined surface, enclosed surface	Precisely explaining the free convection, clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	• In-class questions and discussion. • Quizzes. • Homework and assignments. • Seminars.
10	5	Natural convection	Mixed convection	Precisely explaining the mixed convection, clarifying its importance, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	• In-class questions and discussion. • Quizzes. • Homework and assignments. • Seminars. • Oral and ppt. presentations . Lab. Experiments
11	5	Heat exchanger	introduction, Inner & outer over all heat transfer coefficient	Strictly explaining the heat exchanger, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	• In-class questions and discussion. • Quizzes. • Homework and assignments. • Seminars. • Oral and ppt. presentations . Lab. Experiments

12	5	Heat exchanger	Type of heat exchanger	Strictly explaining the type of heat exchanger,	• In-class questions and discussion. • Quizzes. • Homework and assignments.. Lab. Experiments
13	5	Heat exchanger	Fouling factors	Strictly explaining the topic, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	• In-class questions and discussion. • Quizzes. • Homework and assignments. Lab. Experiments
14	5	Heat exchanger	Analysis of heat exchanger by The log mean temperature differences	Strictly explaining the topic, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	• In-class questions and discussion. • Quizzes. • Homework and assignments. • Lab. Experiments
15	5	Heat exchanger	Analysis of heat exchanger by Effectiveness NTU method	Strictly explaining the topic, and presenting a set of examples that are solved first by the teacher and then with the participation of the students	• In-class questions and discussion. • Quizzes. • Homework and assignments. Lab. Experiments

11. Course Evaluation

Quizzes5%, Home work 5%, Report Lab 10%, Midterm Exam 30%, and Final Exam 50%

12. Learning and Teaching Resources

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Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

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2024

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Academic Program Description Form

University Name: University of Babylon

Faculty/Institute: Engineering College

Scientific Department: Mechanical Engineering

Academic or Professional Program Name: Bachelor of engineering

Final Certificate Name: Bachelor's degree in mechanical engineering

Academic System: Semester

Description Preparation Date:

File Completion Date: 23/3/2024

Signature:

Head of Department Name:

Date:

Signature:

Scientific Associate Name:

Date:

The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date:

Signature:

Approval of the Dean

1. Program Vision

This text is intended for students beginning the study of mechanical engineering design. The focus is on blending fundamental development of concepts with practical specification of components. Students of this text should find that it inherently directs them into familiarity with both the basis for decisions and the standards of industrial components. For this reason, as students transition to practicing engineers, they will find that this text is indispensable as a reference text.

2. Program Mission

Program mission is written here as stated in the university's catalogue and website.

3. Program Objectives

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 readers to link design and analysis.
4. Encourage readers to link fundamental concepts with practical component specification.
5.knowing to the ways of choose engineering material and the dimension of the machine.
6. Calculate the stresses in each part of the machine.
7. Suggest the correct solutions for machine design.
8.Knowing on the engineering applications for each part of machine.
9.Give the student many examples and case studies to design it.

4. Program Accreditation

Does the program have program accreditation? And from which agency?

5. Other external influences

Is there a sponsor for the program?

~~**Institution**~~

Requirements

6. Program Structure

~~**Requirements**~~

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*

Department Requirements				
Summer Training				
Other				

* This can include notes whether the course is basic or optional.

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
			theoretical	practical

8. Expected learning outcomes of the program

Knowledge	
Learning Outcomes 1	Learning Outcomes Statement 1
Skills	
Learning Outcomes 2	Learning Outcomes Statement 2
Learning Outcomes 3	Learning Outcomes Statement 3
Ethics	
Learning Outcomes 4	Learning Outcomes Statement 4
Learning Outcomes 5	Learning Outcomes Statement 5

9. Teaching and Learning Strategies

Teaching and learning strategies and methods adopted in the implementation of the program in general.

10. Evaluation methods

Implemented at all stages of the program in general.

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer

Professional Development

Mentoring new faculty members

Briefly describes the process used to mentor new, visiting, full-time, and part-time faculty at the institution and department level.

Professional development of faculty members

Briefly describe the academic and professional development plan and arrangements for faculty such as teaching and learning strategies, assessment of learning outcomes, professional development, etc.

12. Acceptance Criterion

(Setting regulations related to enrollment in the college or institute, whether central admission or others)

13. The most important sources of information about the program

State briefly the sources of information about the program.

14. Program Development Plan

Program Skills Outline															
				Required program Learning outcomes											
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4

- **Please tick the boxes corresponding to the individual program learning outcomes under evaluation.**

Course Description Form

1. Course Name:
Machine Design I
2. Course Code:
214
3. Semester / Year:
Sixth/ Third
4. Description Preparation Date:
2024
5. Available Attendance Forms:
In person
6. Number of Credit Hours (Total) / Number of Units (Total)
ECTS credit = 5
7. Course administrator's name (mention all, if more than one name)
Name: Essam Zuhier Fadhel Email: eng.osam.zuhair@uobabylon.edu.iq
8. Course Objectives
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 readers to link design and analysis. 4. Encourage readers to link fundamental concepts with practical component specification. 5.knowing to the ways of choose engineering material and the dimension of the machine. 6. Calculate the stresses in each part of the machine. 7. Suggest the correct solutions for machine design. 8.Knowing on the engineering applications for each part of machine.
9. Teaching and Learning Strategies

Strategy	1.Students will have the ability to determine the loads and calculate the dimensions of the machine parts. 2. Students will be able to determine the loads and calculate the dimensions of mechanical parts that contain holes. 3. Students will have the ability to determine the type of applied loads, whether they are static or dynamic loads. 4. The students intend to have the ability to predict the failure of the structure according to the type of load, static or dynamic load. 5. Understanding how to design the shafts and the keys relative to the static load or the dynamic load.

	6. Learn to design the welding joint, rivets and screws according to the applied loads (static or dynamic). 7. The student shall be able to design the spring according to the different applied loads.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	6			Introduction to machine design element: Define the machine design element and explain what is the main goal of this subject in a current stage.	The evaluation is done through class activities to solve a set of examples.
2	6			Characteristics of static and dynamics loading: Explain the differences between static loading and dynamic loading.	The evaluation is done through class activities to solve a set of examples.
3	6			Safety factor and design cods: Define the safety factor and how can it calculate in static and dynamic loads and explain the journal of the design codes.	The evaluation is done through class activities to solve a set of examples.
4	6			Stress concentration: Define the stress concentration and explain the foundation of the stress concentration factor in brittle and dynamic materials	The evaluation is done through class activities to solve a set of examples.

5	6			Failures theories for ductile and brittle materials at static load.	The evaluation is done through class activities to solve a set of examples.
6	6			Define the cyclic failure and design the members for finite life: Define the fatigue failure and explain the type of dynamic loads also, explain the calculation of life machine member which subjected to cyclic loads.	The evaluation is done through class activities to solve a set of examples.
7	6			Combined mean and alternating two or more type of stresses and theories of failure in dynamic loads.	The evaluation is done through class activities to solve a set of examples.
8	6			Shaft design for dynamic and static load: Explain and give many examples to design the shaft which key a gear or pulley on it for static and dynamic load.	The evaluation is done through class activities to solve a set of examples.
9	6			Design of key and the splines: View the types of keys and explain how the stresses for more type of the key can be found. Also calculate the stresses on the splines.	The evaluation is done through class activities to solve a set of examples.

10	6			Flange coupling: Design each part of the coupling.	The evaluation is done through class activities to solve a set of examples.
11	6			Design of welded joints: Explain the welded joints which subjected to static and dynamic loads and find the weld size using the theories of failures.	The evaluation is done through class activities to solve a set of examples.
12	6			Design of mechanical springs: Explain the stresses in springs which subjected to the different loads	The evaluation is done through class activities to solve a set of examples.
13	6			Design the screws and fasteners: Introduction to the fasteners and the explain the design of screw threads.	The evaluation is done through class activities to solve a set of examples.
14	6			Stresses in bolts due external load: Explain the stresses in the bolts and nut which subjected (for many type) for static and dynamic loads.	The evaluation is done through class activities to solve a set of examples.

11. Course Evaluation

Quizzes 10%, Assignments 10%, Midterm Exam 20%, and Final Exam 60% , then the total is 100%

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Required Textbooks	**L. Norton " An Integrated Approach of Machine Design ", Prentice – Hall Inc. 1998.**
Recommended Texts	**E. Joseph Shigley "Mechanical Engineering Design ", 8th Edition, McGraw – Hill Book Company, 2008.**

Ministry of Higher Education and Scientific Research
Scientific Supervision and Scientific Evaluation Apparatus
Directorate of Quality Assurance and Academic Accreditation
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Academic Program and Course Description Guide

2024

Introduction:

The educational program is a well-planned set of courses that include procedures and experiences arranged in the form of an academic syllabus. Its main goal is to improve and build graduates' skills so they are ready for the job market. The program is reviewed and evaluated every year through internal or external audit procedures and programs like the External Examiner Program.

The academic program description is a short summary of the main features of the program and its courses. It shows what skills students are working to develop based on the program's goals. This description is very important because it is the main part of getting the program accredited, and it is written by the teaching staff together under the supervision of scientific committees in the scientific departments.

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

In this regard, we can only emphasize the importance of writing an academic programs and course description to ensure the proper functioning of the educational process.

Concepts and terminology:

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Course Description: Provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the students to achieve, proving whether they have made the most of the available learning opportunities. It is derived from the program description.

Program Vision: An ambitious picture for the future of the academic program to be sophisticated, inspiring, stimulating, realistic and applicable.

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Curriculum Structure: All courses / subjects included in the academic program according to the approved learning system (quarterly, annual, Bologna Process) whether it is a requirement (ministry, university, college and scientific department) with the number of credit hours.

Learning Outcomes: A compatible set of knowledge, skills and values acquired by students after the successful completion of the academic program and must determine the learning outcomes of each course in a way that achieves the objectives of the program.

Teaching and learning strategies: They are the strategies used by the faculty members to develop students' teaching and learning, and they are plans that are followed to reach the learning goals. They describe all classroom and extra-curricular activities to achieve the learning outcomes of the program.

Academic Program Description Form

University Name: Babylon
Faculty/Institute: Engineering
Scientific Department: Mechanical
Academic or Professional Program Name: Vibration 1
Final Certificate Name: .....
Academic System: .....
Description Preparation Date:
File Completion Date:

Signature:
Head of Department Name:

Date:

Signature:
Scientific Associate Name:

Date:

The file is checked by:
Department of Quality Assurance and University Performance
Director of the Quality Assurance and University Performance Department:
Date:
Signature:

Approval of the Dean

1. **Program Vision**
Program vision is written here as stated in the university's catalogue and website.

2. **Program Mission**
Program mission is written here as stated in the university's catalogue and website.

3. **Program Objectives**
General statements describing what the program or institution intends to achieve.

4. **Program Accreditation**
NO

5. **Other external influences**
NO

6. **Program Structure**				
Program Structure	**Number of Courses**	**Credit hours**	**Percentage**	**Reviews***
Institution Requirements				
College Requirements				

Department Requirements				
Summer Training				
Other				

* This can include notes whether the course is basic or optional.

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
			theoretical	practical

8. Expected learning outcomes of the program

Knowledge	
Learning Outcomes 1	Learning Outcomes Statement 1
Skills	
Learning Outcomes 2	Learning Outcomes Statement 2
Learning Outcomes 3	Learning Outcomes Statement 3
Ethics	
Learning Outcomes 4	Learning Outcomes Statement 4
Learning Outcomes 5	Learning Outcomes Statement 5

9. Teaching and Learning Strategies

Teaching and learning strategies and methods adopted in the implementation of the program in general.

10. Evaluation methods

Implemented at all stages of the program in general.

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Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
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Mentoring new faculty members

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Briefly describe the academic and professional development plan and arrangements for faculty such as teaching and learning strategies, assessment of learning outcomes, professional development, etc.

12. Acceptance Criterion

(**Setting regulations related to enrollment in the college or institute, whether central admission or others**)

13. The most important sources of information about the program

State briefly the sources of information about the program.

14. Program Development Plan

Program Skills Outline															
				Required program Learning outcomes											
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
2	Mechanics II	MEC201	BASIC	\	\	\		\	\	\		\	\	\	

- **Please tick the boxes corresponding to the individual program learning outcomes under evaluation.**

Course Description Form

1. Course Name: Mechanics II
2. Course Code: MEC201
3. Semester / Year: Semester
4. Description Preparation Date: 2023-2024
5. Available Attendance Forms:
6. Number of Credit Hours (45) / Number of Units (2)
7. Course administrator's name (mention all, if more than one name)
Name:Qasim Hassan Bader Email:
8. Course Objectives

	Engineering design in the field of mechanical engineering needs a deep knowledge of the nature of the behavior of structures, machines and other mechanical parts under the influence of the loads that they are exposed to during use, hence the importance of studying movement. The topic is divided into two parts, where displacements, speed, acceleration are mainly calculated, in addition to calculating dynamic forces.

9. Teaching and Learning Strategies	
Strategy	B1 – Ability to visualize movement B2 – The ability to transform the constructor into a mathematical model that expresses the problem B3 – The ability to use numerical methods in the solution

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Lectures and exercises	Included an introduction to the basic definitions in the Dynamics material.	. Kinematics of particle	activity

2,3	3	Lectures and exercises	It aims to study the degrees of freedom of linear motion	. Kinematics of particle	Self-Learning Assignments, project
4	3	Lectures and exercises	Aim to study different types of planar motion	. Kinematics of particle	Self-Learning Assignments
5,6	3	Lectures and exercises	Studied Species Relative Motion	. Kinematics of particle	Self-Learning Assignments
7	3	Lectures and exercises	Study of mass, force and acceleration and their applications	. Kinematics of particle	Self-Learning Assignments
8,9	3	Lectures and exercises	Workpiece and power applications	. Kinematics of particle	Self-Learning Assignments
10,11	3	Lectures and exercises	Momentum and Payment Applications	. Kinematics of particle	Seminars, Tutorials
12,13	3	Lectures and exercises	Special applications such as collision study	. Kinematics of particle	Seminars, Tutorials
14		Lectures and exercises	Study the motion of a particle group or an entire system	. Kinematics of particle	Self-Learning Assignments
15		Lectures and exercises	Study of applications of Newton's second law	. Kinematics of particle	Writtien Exam, Computer Laboratory

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports.....etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

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Academic Program Description Form

University Name: Babylon
Faculty/Institute: Engineering
Scientific Department: Mechanical
Academic or Professional Program Name: Vibration 1
Final Certificate Name: .....
Academic System: .....
Description Preparation Date:
File Completion Date:

Signature:
Head of Department Name:

Date:

Signature:
Scientific Associate Name:

Date:

The file is checked by:
Department of Quality Assurance and University Performance
Director of the Quality Assurance and University Performance Department:
Date:
Signature:

Approval of the Dean

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3. **Program Objectives**
General statements describing what the program or institution intends to achieve.

4. **Program Accreditation**
NO

5. **Other external influences**
NO

6. **Program Structure**				
Program Structure	**Number of Courses**	**Credit hours**	**Percentage**	**Reviews***
Institution Requirements				
College Requirements				

Department Requirements				
Summer Training				
Other				

* This can include notes whether the course is basic or optional.

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
			theoretical	practical

8. Expected learning outcomes of the program

Knowledge	
Learning Outcomes 1	Learning Outcomes Statement 1
Skills	
Learning Outcomes 2	Learning Outcomes Statement 2
Learning Outcomes 3	Learning Outcomes Statement 3
Ethics	
Learning Outcomes 4	Learning Outcomes Statement 4
Learning Outcomes 5	Learning Outcomes Statement 5

9. Teaching and Learning Strategies

Teaching and learning strategies and methods adopted in the implementation of the program in general.

10. Evaluation methods

Implemented at all stages of the program in general.

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
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State briefly the sources of information about the program.

14. Program Development Plan

Program Skills Outline															
				Required program Learning outcomes											
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
4		Engineering materials	BASIC	\	\	\		\	\	\		\	\	\	

- **Please tick the boxes corresponding to the individual program learning outcomes under evaluation.**

Course Description Form

1. Course Name:
Engineering materials
2. Course Code:
3. Semester / Year:
Semester
4. Description Preparation Date:
2023-2024
5. Available Attendance Forms:
6. Number of Credit Hours (60) / Number of Units (3)
7. Course administrator's name (mention all, if more than one name)
Name: Aenas Laith Ali Email:: mat.aenas.laith@uobabylon.edu.iq
8. Course Objectives

This course is designed for students interested in building knowledge and technical expertise in the principles that govern 1Classifications of engineering materials 2Iron materials, specifications and properties 3Non-ferrous materials, properties and applications 4Ceramic materials, classification, specifications and applications 5Polymers 6. Composite materials, manufacturing methods and applications	....

9. Teaching and Learning Strategies	
Strategy	• Lectures, • Tutorials, • Self-Learning Assignments • Seminars • Computer Laboratory, and • Project class room activity

10. Course Structure					
road Evaluation	road education	name Unit / or the topic	Outputs Learning required	hours	week

Questions And discuss	theoretical	ferrous materials	•Nomenclature of Ferrous Alloys •Low Carbon steel •Medium Carbon Steel	2	1
Questions And discuss And cuz	theoretical + totrial	ferrous materials	•High Carbon Steel •Stainless—Steel • Effects of Alloying elements on steel	2	2
Questions And discuss	theoretical	ferrous materials	•Cast Irons •SIMPLE HEAT TREATMENTS •Heat Treatment of Steels for Strength	2	3
Questions And discuss And cuz	theoretical + totrial	Non-ferrous materials	•Light Metals •Heavy Metals	2	4
Questions And discuss	theoretical	Non-ferrous materials	•Refractory Metal	2	5
Questions And discuss	theoretical + totrial	Non-ferrous materials	•Precious Metals •Precipitation Hardening	2	6
Questions And discuss	theoretical	ceramics	•SPECTRUM OF CERAMICS USES •CERAMIC CRYSTAL STRUCTURES	2	7
Questions And discuss And cuz	theoretical	ceramics	•PROPERTIES OF CERAMICS •Traditional Ceramics	2	8
Questions And discuss	theoretical + totrial	ceramics	•Advanced Ceramics •Mechanical Properties •STRESS–STRAIN BEHAVIOR (Flexural Strength)	2	9
Questions And discuss	theoretical	Polymers	•Classification of polymers •Synthetic Polymers •Polyimides	2	10
Questions And discuss	theoretical	Polymers	•Polyvinyl Chloride (PVC) •Epoxies •Polyethylene •Acetals	2	11
Questions And discuss	theoretical + totrial	Polymers	•Mechanical Properties •Viscoelasticity •Viscoelastic Creep	2	12
Questions And discuss And cuz	theoretical	composite materials	•Classification according to type of reinforcement and matrix •Type of components	2	13
Questions And discuss	theoretical	composite materials	•Particle reinforced composite materials •Rule of mixtures	2	14
			•Fiber reinforced composite materials		

Questions And discuss	theoretical + totrial	composite materials	•Types of fibres •Structural composite materials	2	15
. 12Structure Infrastructure					

	- 1 Books decided required
7- Materials Science and Engineering: An Introduction, 10th Edition, William D. Callister Jr. , January 2018. 8- Selection and Use of Engineering Materials by J. A. Charles, F. A. A. Crane, and J. A. G. Furness, Third Edition 2001. 9- The Science and Engineering of Materials by D. R. Askeland , and P. Phule Fourth Edition 2003.	2 -the reviewer Main (Sources)
Locations Electronic Sober . Sites Libraries in some Universities Globalism .	A Books And references that recommend With it (Magazines Scientific , Reports ,)

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Signature:
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Signature:
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Professional development of faculty members

Briefly describe the academic and professional development plan and arrangements for faculty such as teaching and learning strategies, assessment of learning outcomes, professional development, etc.

12. Acceptance Criterion

(**Setting regulations related to enrollment in the college or institute, whether central admission or others**)

13. The most important sources of information about the program

State briefly the sources of information about the program.

14. Program Development Plan

Program Skills Outline															
				Required program Learning outcomes											
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
1 2+		Engineering Metallurgy 2	BASIC	*	*	*	*	*	*	*	*	*	*	*	*

- **Please tick the boxes corresponding to the individual program learning outcomes under evaluation.**

Course Description Form

1. Course Name:
Engineering Metallurgy
2. Course Code:
3. Semester / Year:
Semester
4. Description Preparation Date:
2023-2024
5. Available Attendance Forms:
6. Number of Credit Hours (60) / Number of Units (3)
7. Course administrator's name (mention all, if more than one name)
Name: **Aenas Laith Ali** Email: mat.aenas.laith@uobabylon.edu.iq
8. Course Objectives

1. Teaching students the basic principles of metallurgical engineering (its atomic structures/properties, metallurgy, temperaments, and phase transitions) 2. Teaching students the scientific foundations and knowledge of the phases found in minerals 3. Teaching students the correct foundations in choosing the appropriate metals suitable for the exact designs 4. Working on students to acquire the skills required in choosing the metal and the type of heat treatments to which it must be exposed 5. Urging students to work together in solving problems and exchanging opinions about the failure of mechanical devices available in homes, even if they appear simple, and poor products due to poor selection of the metals they are made of.	....

9. Teaching and Learning Strategies	
Strategy	• Lectures, • Tutorials, • Self-Learning Assignments • Seminars • Computer Laboratory, and • Project class room activity

10. Course Structure

Week	Hours	Required Learning	Unit or subject	Learning	Evaluation

		Outcomes			**method**

Course structure .1					
Evaluation method	Teaching method	Name of the unit/course or subject	Required learning outcomes	hours	the week
Chapter one					
Daily exam Descriptive homework assignments, a semester exam, and a practical report	**Theoretical ,lectures ,two hours laboratory two hours**	**Terminology and basics of minerals**	**Introduction to the opacity of minerals/classificat materials, ion of atoms/crystalline structures**	4	1
			The grid system and its types	4	2
		Representation of crystal structures	**Miller established the two systems four- (three- and .(axial**	4	3
		Density calculations	**Calculate the atomic crowding factor with densities different**	4	4
			Various analyzes of crystal structures	4	5
			Defects of atoms and their types	4	6
			Diffusion processes and their types	4	7
		Calculations of the number of gaps	**Calculating the gaps and the factors affecting them**	4	8
			First rate law of diffusion	4	9
			Dislocations and And their types surface defects	4	10
			Heat equilibrium diagrams and	4	11

			alloys and their properties/pure metals and their properties and application of the to the arm rule iron- carbide diagram/ iron		
			Types of equilibrium diagrams and thermal coefficients for iron	4	12
			The different phases present in an iron/ iron diagram carbide	4	13
			Constant temperature cooling and fermentation/pellet izing	4	14
			of Hardening/types and hardening baths normalizing austinber / martinber	4	15

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports.....etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Ministry of Higher Education and Scientific ResearchScientific Supervision and Scientific Evaluation ApparatusDirectorate of Quality Assurance and Academic AccreditationAccreditationDepartment

Academic Programand CourseDescription Guide

2024

Introduction:

The educational program is a well-planned set of courses that include procedures and experiences arranged in the form of an academic syllabus. Its main goal is to improve and build graduates' skills so they are ready for the job market. The program is reviewed and evaluated every year through internal or external audit procedures and programs like the External Examiner Program.

The academic program description is a short summary of the main features of the program and its courses. It shows what skills students are working to develop based on the program's goals. This description is very important because it is the main part of getting the program accredited, and it is written by the teaching staff together under the supervision of scientific committees in the scientific departments.

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

In this regard, we can only emphasize the importance of writing an academic programs and course description to ensure the proper functioning of the educational process.

Conceptsandterminology:

Academic Program Description: The academic program description provides a brief summary of its vision, mission and objectives, including an accurate description of the targeted learning outcomes according to specific learning strategies.

Course Description: Provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the students to achieve, proving whether they have made the most of the available learning opportunities. It is derived from the program description.

Program Vision: An ambitious picture for the future of the academic program to be sophisticated, inspiring, stimulating, realistic and applicable.

Program Mission: Briefly outlines the objectives and activities necessary to achieve them and defines the program's development paths and directions.

Program Objectives: They are statements that describe what the academic program intends to achieve within a specific period of time and are measurable and observable.

Curriculum Structure: All courses / subjects included in the academic program according to the approved learning system (quarterly, annual, Bologna Process) whether it is a requirement (ministry, university, college and scientific department) with the number of credit hours.

Learning Outcomes: A compatible set of knowledge, skills and values acquired by students after the successful completion of the academic program and must determine the learning outcomes of each course in a way that achieves the objectives of the program.

Teaching and learning strategies: They are the strategies used by the faculty members to develop students' teaching and learning, and they are plans that are followed to reach the learning goals. They describe all classroom and extra-curricular activities to achieve the learning outcomes of the program.

Academic Program Description Form

UniversityName:Babylon
Faculty/Institute:Engineering
ScientificDepartment:Mechanical
AcademicorProfessionalProgramName:Vibration 1
FinalCertificateName:.....
AcademicSystem:.....
DescriptionPreparationDate:File
CompletionDate:

Signature:
HeadofDepartmentName:Da

te:

Signature:
ScientificAssociateName:Date:

Thefileischeckedby:
DepartmentofQualityAssuranceandUniversityPerformance
DirectoroftheQualityAssuranceandUniversityPerformanceDepartment:Date:
Signature:

ApprovaloftheDean

1. **Program Vision**
Program vision is written here as stated in the university's catalogue and website.

2. **Program Mission**
Program mission is written here as stated in the university's catalogue and website.

3. **Program Objectives**
General statements describing what the program or institution intends to achieve.

4. **Program Accreditation**
NO

5. **Other external influences**
NO

6. **Program Structure**				
Program Structure	**Number of Courses**	**Credit hours**	**Percentage**	**Reviews***
Institution Requirements				
College Requirements				

Department Requirements				
Summer Training				
Other				

* This can include notes whether the course is basic or optional.

7. Program Description				
Year/Level	**Course Code**	**Course Name**	**Credit Hours**	
			theoretical	**practical**

8. Expected learning outcomes of the program	
Knowledge	
Learning Outcomes 1	Learning Outcomes Statement 1
Skills	
Learning Outcomes 2	Learning Outcomes Statement 2
Learning Outcomes 3	Learning Outcomes Statement 3
Ethics	
Learning Outcomes 4	Learning Outcomes Statement 4
Learning Outcomes 5	Learning Outcomes Statement 5

9. Teaching and Learning Strategies
Teaching and learning strategies and methods adopted in the implementation of the program in general.

10. Evaluation methods
Implemented at all stages of the program in general.

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer

Professional Development

Mentoring new faculty members

Briefly describes the process used to mentor new, visiting, full-time, and part-time faculty at the institution and department level.

Professional development of faculty members

Briefly describe the academic and professional development plan and arrangements for faculty such as teaching and learning strategies, assessment of learning outcomes, professional development, etc.

12. Acceptance Criterion

(Setting regulations related to enrollment in the college or institute, whether central admission or others)

13. The most important sources of information about the program

State briefly the sources of information about the program.

14. Program Development Plan

Program Skills Outline															
				RequiredprogramLearningoutcomes											
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
Second	Math4	Mathematics 4	BASIC	\	\	\		\	\	\		\	\	\	

- **Pleasetickthebo xescorrespondingtotheindividual programlearningoutcomesunderevaluation.**

CourseDescriptionForm

1. CourseName: Mathematics 4

2. CourseCode: **Math4**

3. Semester/Year:Semester

4. DescriptionPreparationDate: 2023-2024

5.AvailableAttendanceForms:

6.NumberofCreditHours(4)/NumberofUnits(60)

7.Courseadministrator's name (mentionall,if morethanone name)

Name: Ahmed kadhim
Email: ahmedkadhim7474@gmail.com

8. Course Objectives

Study and analysis of the mathematical subjects such as matrix Differential equations and complex numbers.	The aims of this course are to provide students with the basic knowledge and skills of analysis of the mathematics especially in engineering mathematics . This course will also provide students with the ability to solve problems in the selected topics

9. Teaching and Learning Strategies

Strategy	• Lectures, • Tutorials, • Self-Learning Assignments • class room activity homework

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	a2, b1	Introduction	Lecture	activity
2,3	3	a1, a2,b1,b2	matrix	Lecture , Tutorials	Self-Learning Assignments,
4	3	a1, a2,b1,b2	Determinant	Lecture , Tutorials	Self-Learning Assignments

5,6	3	a1, a2,b1,b2	Cramer rule	Lecture , Tutorials	Self-Learning Assignments
7	3	a1, a2,b1,b2	Differential equations	Lecture , Tutorials	Self-Learning Assignments
8,9	3	a1, a2,b1,b2	Euler method	Lecture , Tutorials	Self-Learning Assignments
10,11	3	a1, a2,b1,b2, c1	homogeneous eq	Lecture , Tutorials	Seminars, Tutorials
12,13	3	a1, a2,b1,b2, c1	Complex numbers	Lecture , Tutorials	Seminars, Tutorials
14		a1, a2,b1,b2	Complex root	Lecture , Tutorials	Self-Learning Assignments
15		a1, a2,b1,b2,c1, d1,d2.	Final Examination	Lecture , Tutorials	Writtien Exam,

11. Course Evaluation
Distributingthescoreoutof100accordingtothetasksassignedtothestudentsuchasdailypreparation,dailyoral,monthly,orwrittenexams,reports.....etc

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	