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

2025

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 extracurricular activities to achieve the learning outcomes of the program.

Academic Program Description Form

University Name: Basrah university

Faculty/Institute: Engineering college

Scientific Department: Mechanical engineering

Academic or Professional Program Name: The curricula of the Mechanical Engineering Department

Final Certificate Name: Bchelor of Mechanical Engineering

Academic System: Daily Attendance & Bologna system

Description Preparation Date: 2025

File Completion Date:2025

Signature:

Head of Department Name:

Assist. Prof. Dr. Raad Jamal Jassim

Date:

Signature: M.A. Ism

Scientific Associate Name:

Prof. Dr. Muneer A. Ismael

Date:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Assist. Prof. Dr Ali K. Marzook

Date:

Signature:

Approval of the Dean

Prof. Dr. Mofeed Turky Rashid

1. Program Vision

The vision of the Mechanical Engineering Department is to graduate engineers specialized in mechanical engineering in accordance with the latest internationally accredited curricula, with the aim of implementing various engineering projects currently required by the country. The department seeks to provide a high-quality engineering, educational, and research environment in the field of mechanical engineering to serve and build the nation, while highlighting the vital role of mechanical engineers in cultural development and scientific advancement.

2. Program Mission

The Department of Mechanical Engineering has adopted a rigorous academic program that combines theoretical lectures with a wide range of practical applications. Through continuous development of its laboratories, the department has ensured that the practical component complements the theoretical courses, enabling students to thoroughly understand and enhance their knowledge of engineering materials. The department is committed to a clear path in scientific research, focusing primarily on applied aspects aimed at serving development in Iraq.

3. Program Objectives

1. Preparing and qualifying specialized engineers to meet the requirements of the labor market in the private and public sectors in mechanical engineering through diversity in teaching and learning methods and training students to apply the acquired knowledge and skills to solve real problems.

2. Providing distinguished academic programs in the field of mechanical engineering, both theoretical and practical, to comply with international standards of academic quality and meet the needs of the labor market.

3. Encouraging and developing scientific research in the fields of mechanical engineering in general and in the fields of thermal mechanics, heat transfer and all areas of applied mechanics and control in particular on mechanical and hydraulic systems and robots in addition to the fields of manufacturing and metalworking.

4. Preparing a stimulating environment for faculty members to develop their knowledge and educational and research skills, such as courses, seminars, and workshops to prepare researchers with high scientific skills.

5. Building and developing partnerships with the governmental and private sectors and the community in all its various institutions and exchanging experiences.

4. Accreditation

ABET

5. Other external influences
Field and scientific visits

7. Program Description				
Level/Year	**Course or module code**	**Course or module title**	**Credit hours**	
			Theore.	**Prac.**
First year first semester	BEM111	Mathematics I	5	
	BEM112	Engineering Mechanics-Static	6	
	BEM113	Engineering Drawing I	5	
	BEM114	Applied Science	4	
	UOB103	Computer I	2	2
	UOB102	Human Rights and Democracy	2	
	UOB104	Arabic Language I	2	
First year second semester	BEM121	Mathematics II	5	
	BEM122	Engineering Mechanics-Dynamic	5	
	BEM123	Engineering Drawing II	4	
	BEM124	Electrical Engineering	3	3
	BEM125	Production Engineering	5	3
	UOB101	English Language	2	
Second year first semester	BEM211	Engineering Mathematics I	4	
	BEM212	Fluid Mechanics	6	3
	BEM213	Strength of Materials	6	3
	UOB203	Computer II	2	2
	UOB205	Crimes of Uprooted Baath Party	2	
	UOB204	Arabic Language II	2	
Second year second semester	BEM221	Engineering Mathematics II	4	
	BEM222	Thermodynamics	5	3
	BEM223	Engineering Metallurgy	4	3
	BEM224	Mechanical Drawing	4	

	BEM225	Electrical Machines	2	
	UOB201	English Language II	2	
Third year First Semester	E311	Engineering Analysis	4	-
	ME312	Heat Transfer I	3	-
	ME313	Theory of Mechanisms	3	3
	ME314	Internal Combustion Engines I	3	3
	ME315	Gas Dynamics	3	-
	ME316	Electrical Machines I	3	-
	ME317	Manufacturing Processes I	2	3
Third year Second Semester	E321	Numerical Analysis	3	2
	ME322	Heat Transfer II	3	3
	ME323	Theory of Machines	3	-
	ME324	Internal Combustion Engines II	3	-
	ME325	Turbo Machinery	3	3
	ME326	Electrical Machines II	3	2
	ME327	Manufacturing Processes II	2	-
Fourth year First Semester	ME411	Design of Machine Elements I	4	3
	ME412	Control	3	-
	ME413	Air Conditioning and Refrigeration I	3	3
	ME414	Engineering Materials	2	-
	ME415	Theory of Vibrations	3	-
	ME416	Power Plants I	3	-
	ME417	Industrial Engineering	2	-
	E418	Engineering Project	2	3
Fourth year Second Semester	ME421	Design of Machine Elements II	3	-
	ME422	Measurements	3	3
	ME423	Air Conditioning and Refrigeration II	3	-
	ME424	Failure of Engineering Materials	2	-
	ME425	Vibrations Applications	3	3

	ME426	Power Plants II	3	3
	ME427	Project Management	2	-
	E418	Engineering Project (continued)	-	3

8. Expected learning outcomes of the program

A. Knowledge and Understanding

A1. Clarify the basic concepts of mechanical systems and their applications in engineering and industrial fields.
A2. Acquiring knowledge in designing mechanical parts and trying to apply them in practice and solving industrial problems.
A3. Identifying mechanical parts and metal testing methods and their suitability for engineering uses.
A4. Studying mechanical systems and identifying how to conduct designs calculations according to standard specifications.

B. Subject-specific skills

B1. Designing simple and complex mechanical systems through the computer and performing design calculations.
B2. Gaining experience in manufacturing mechanical parts and testing their suitability for engineering uses.
B3. Gaining experience in writing scientific and engineering reports and how to read designs and engineering drawings.
B4. Keeping abreast of development and modernity in metal manufacturing processes and using modern mechanical designs.

C. Thinking Skills

C1. Interest: Arousing students' attention through questions during the lecture.
C2. Response: Follow up on the student's interaction with the material displayed on the screen.
C3. Attention: Follow up on the interest of the student who interacted the most with the presented material.
C4. Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.

C5. Formation of value behavior: meaning that the student reaches the top of the emotional ladder so that he has a stable level in the lesson and does not become lazy or fidgety.

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1. Develop the student's ability to deal with technical means.
D2. Develop the student's ability to deal with the Internet.
D3. Develop the student's ability to deal with multiple media.

D4. Develop the student's ability to dialogue and discussion.

9. Teaching and Learning Strategies

1. Explanation and clarification through lectures and increasing understanding through laboratories.
2. The method of displaying scientific materials on display devices, data shows, smart boards, plasma screens for tablets.
3. Self-learning by homework.
4. The weekly discussion of the subject and the solution of some additional questions for the subject.

10. Evaluation methods

1. Short exams (Quiz).
2. Homework.
3. Semester and final exams for theoretical subjects.
4. Interaction within the lecture and student attendance.

Assessment methods

1. Effective participation in the classroom is evidence of the student's commitment and responsibility.
2. Commitment to the deadline specified in submitting the duties and research required of the student to submit them.
3. The quarterly and final exams express commitment and cognitive and skill achievement.

11. Faculty										
	Faculty Member	Highest Degree Earned, Field and Year.	Scientific Rank	Type of Academic Appointment [2] PS or TS[2]	Experience			Level of activity H ,M ,L		
					Total Faculty	This Institution	Work & Other	Professional organization	Professional Development	Consulting work in industry
1	Ameen Ahmed Nassar	Ph.D., Cranfield University, UK, Applied, Mechanics 1999.	P	PS	32	32	2	H	H	H
2	Abdul Kareem Flaih Hassan	Ph.D., University of Basrah, Applied Mechanics,	P	PS	42	42	5	H	H	H
3	Salman Hasham Hamady	Ph.D., University of Basrah, Heat Transfer, 2007.	P	PS	30	30	2	H	H	H
4	Muneer Abdul Jaleel Ismael	Ph.D., University of Basrah, Heat Transfer, 2007.	P	PS	22	22	2	H	H	H
5	Falah Ahsy Abood	Ph.D., University of Basrah, Heat Transfer, 2007.	ASP	PS	30	30	2	H	H	H
6	Nathera Abdelhassan Salah	Ph.D., University of Basrah, Applied Mechanics, 2007.	ASP	PS	31	31	1	H	H	H
7	Hussein Sadeq Sultan	Ph.D., University of Basrah, Heat Transfer, 2011.	ASP	PS	22	22	3	H	H	H
8	Rafil Mahmood Laftah	Ph.D., University of Basrah, Applied Mechanics, 2007.	ASP	PS	22	22	2	H	H	H
9	Qusai Talib Abdel Wahab	Ph.D., University of Basrah, Applied Mechanics, 2004.	ASP	PS	22	22	1	H	H	H

10	Jafer Kalef Ali	Ph.D., University of Basrah, Applied Mechanics, 2012.	P	PS	21	21	1	H	H	H
11	Khaled Baker Saleem	Ph.D., University of Basrah, Heat Transfer, 2009.	ASP	PS	22	22	2	H	H	H
12	Haider Khazal Mihbas	Ph.D., University of Basrah, Applied Mechanics, 2013.	ASP	PS	18	18	1	H	H	H
13	Hassanein Ibraheem Khalaf	Ph.D., University of Basrah, Applied Mechanics, 2015.	ASP	PS	21	19	2	H	H	H
14	Murtadha Abbas Jabber	Ph.D., University of Basrah, metallurgical engineering, 2010.	ASP	PS	22	22	3	H	H	H
15	Raheem Khazal Musawel	Ph.D., University of Basrah, Applied Mechanics, 2014.	ASP	PS	22	22	2	H	H	H
16	Abdulbaseer Shari Bahedh	Ph.D., University of Basrah, Applied Mechanics, 2016.	ASP	PS	17	17	3	H	H	H
17	Mohammed Khairullah Kadhim	Ph.D.,Cardiff University, UK, Heat Transfer, 2017.	ASP	PS	18	18	3	H	H	H
18	Haider Mahdy Laeth	Ph.D., University of Basrah, Applied Mechanics, 2013.	ASP	PS	18	18	3	H	H	H
19	Imad Abdul-Kadhem Kheioon	Ph.D., University of Basrah, Applied Mechanics, 2013.	ASP	PS	24	24	3	H	H	H
20	Ali Habel Zaibel	Ph.D., University of Basrah, Applied Mechanics, 2000.	L	PS	21	21	1	H	H	H
21	Emad Abdullah Khazal	Ph.D., University of Basrah, Fluid Mechanics, 2011.	L	PS	22	22	2	H	H	H
22	Raad Jamal Jassim	Ph.D., University of Basrah, Applied Mechanics, 2013.	ASP	PS	21	21	3	H	H	H
23	Ali Hasan Abedaali	Ph.D., University of Basrah, Applied Mechanics, 2013.	L	PS	22	22	1	H	H	H
24	Basil Shenain Munahi	Ph.D., University of Basrah, Applied	L	PS	21	21	1	H	H	H

		Mechanics, 2014.								
25	Mahmood Shaker Jamel	Ph.D., University Tenaga Nasional, Malaysia, Heat Transfer, 2014.	L	PS	22	22	3	H	H	H
26	Usama Jasim Naeem	Ph.D., Huazhong University, China, Applied Mechanics, 2013.	L	PS	19	19	2	H	H	H
27	Alaa Hlejy Mohammed	Ph.D., University of Basrah, Heat Transfer, 2016.	L	PS	16	16	5	H	H	H
28	Asma Aassy Kawy	Ph.D., University of Basrah, Applied Mechanics, 2016.	L	PS	22	22	1	H	H	H
29	Sana Mahdy Shrama	Ph.D., University of Basrah, Heat Transfer, 2016.	L	PS	22	22	1	H	H	H
30	Ali Kadem Hady	Ph.D., Lund University, Sweden, Heat Transfer, 2016.	L	PS	21	21	2	H	H	H
31	Ahmad Abdulkareem Mahdi	Ph.D., Salford University, UK, Heat Transfer, 2017.	L	PS	16	16	2	H	H	H
32	Sana Jaafar Yaseen	Ph.D., University of Basrah, Heat Transfer, 2018.	L	PS	20	20	2	H	H	H
33	Rafed Jabbar Mohammed	Ph.D., University of Basrah, Applied Mechanics, 2020.	L	PS	21	21	2	H	H	H
34	Qahtan Adnan Jawad	Ph.D., University of Basrah, Applied Mechanics, 2020.	L	PS	12	12	2	H	H	H
35	Mohammed Baker Mehsen	Ph.D., Cardiff University, UK, Heat Transfer, 2017.	L	PS	18	18	2	H	H	H
36	Yahya Mohammed Ameen	Ph.D., University of Basrah, Applied Mechanics, 2021.	L	PS	25	12	4	H	H	H
37	Ehsan Nadehm Jawad	Ph.D., University of Basrah, Heat Transfer, 2022.	L	PS	14	14	1	H	H	H

38	Hasanain Sami Abdulhadi	Ph.D., Wright State University, USA, Applied Mechanics, 2020.	L	PS	16	16	2	H	H	H
39	Rana Lateef Netoosh Dawood	MSc, University of Basrah, Heat Transfer, 2002.	L	PS	22	22	1	H	H	H
40	Zainab Kareem Rady	MSc, University of Basrah, Heat Transfer, 2002.	L	PS	22	22	2	H	H	H
41	Huda Abedallha Abedalkreem	MSc, University of Basrah, Heat Transfer, 2010.	L	PS	14	14	1	H	H	H
42	Feras Moter Khlaf	MSc, University of Basrah, Heat Transfer, 2010.	ASL	PS	14	14	2	H	H	H
43	Safaa Hafedh Hayder,	MSc, 2020. Southern Technical University, Fuel and Energy.	ASL	PS	7	7	1	H	H	H
44	Nagham Muhammed Abdul-Kareem	MSc, University of Basrah, 2018.	ASL	TS	4	4	1	H	H	H

(1) **Code: P = Professor, ASP = Assistant Professor, L = Lecturer, ASL = Assistant Lecturer and O = Other.**
(2) **Code: PS = Permanent Staff, TS = Temporary Staff.**

Professional Development

Mentoring new faculty members

The department places great emphasis on guiding new faculty members by familiarizing them with its mission and educational objectives, and by providing them with the necessary orientation on effective teaching strategies, modern assessment methods, and the integration of technology into the teaching and learning process.

In addition, orientation sessions and training workshops are organized to support new faculty members in adapting to the academic environment and to clarify their teaching, research, and administrative responsibilities. These initiatives also strengthen communication between new faculty members and their more experienced colleagues through mentoring and professional guidance programs.

Thus, the department's efforts go beyond merely supporting new faculty at the beginning of their academic careers. They aim to build a strong base of qualified teaching staff capable of developing curricula, improving teaching methodologies, and making effective contributions to both research and community service.

Professional development of faculty members

Professional development for faculty members is considered one of the fundamental pillars upon which the department relies to achieve its academic and research objectives. This is accomplished through a variety of activities and programs, such as:

1. Training workshops on modern teaching methods and active learning techniques.
2. Developmental courses in the use of e-learning tools and digital technologies to support the educational process.
3. Mentoring and academic supervision programs to exchange experiences between new faculty members and senior academic staff.
4. Encouraging scientific research and publication in reputable journals through supporting both individual and collaborative research projects.
5. Participation in conferences and scientific seminars at the local and international levels to promote knowledge exchange and professional networking.

12. Acceptance Criterion

1. Rate: greater than 90 %.

2. Age: less than 25 years old.

3. Number: about 70 students annually.

13. The most important sources of information about the program

1. The websites of Iraqi and foreign universities.

2. The workshops are held by the Ministry of Higher Education in addition to the Ministry's standards.

3. The Accreditation Board for Engineering and Technology program (ABET).

14. Program Development Plan

The Department of Mechanical Engineering seeks to continuously improve its academic program through:

- Updating the curriculum to include emerging topics such as renewable energy and artificial intelligence.
- Enhancing teaching and assessment methods by integrating e-learning and providing continuous training for faculty members.
- Supporting scientific research and strengthening collaboration with industry.
- Upgrading infrastructure and laboratory facilities.
- Expanding student and community services through surveys, training workshops, and partnerships with institutions

Curriculum Skills Map																		
please tick in the relevant boxes where individual Programme Learning Outcomes are being assessed																		
Programme Learning Outcomes																		
Year / Level	Course Code	Course Title	Core Title or Option	Knowledge and understanding				Subject-specific skills				Thinking Skills				General and Transferable Skills (or) Other skills relevant to employability and personal development			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4	D1	D2	D3	D4
First year first semester	BEM111	Mathematics I	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	BEM112	Engineering Mechanics-Static	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	BEM113	Engineering Drawing I	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	BEM114	Applied Science	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	UOB103	Computer I	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	UOB102	Human Rights and Democracy	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	UOB104	Arabic Language I	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
First year second semester	BEM121	Mathematics II	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	BEM122	Engineering Mechanics-Dynamic	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	BEM123	Engineering Drawing II	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	BEM124	Electrical Engineering	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	BEM125	Production Engineering	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	UOB101	English Language	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Second year first semester	BEM211	Engineering Mathematics I	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	BEM212	Fluid Mechanics	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	BEM213	Strength of Materials	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

	UOB203	Computer II	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	UOB205	Crimes of Uprooted Baath Party	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	UOB204	Arabic Language II	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Second year second semester	BEM221	Engineering Mathematics II	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	BEM222	Thermodynamics	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	BEM223	Engineering Metallurgy	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	BEM224	Mechanical Drawing	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	BEM225	Electrical Machines	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	UOB201	English Language II	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Third year First Semester	E311	Engineering Analysis	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	ME312	Heat Transfer I	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	ME313	Theory of Mechanisms	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	ME314	Internal Combustion Engines I	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	ME315	Gas Dynamics	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	ME316	Electrical Machines I	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	ME317	Manufacturing Processes I	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Third year Second Semester	E321	Numerical Analysis	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	ME322	Heat Transfer II	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	ME323	Theory of Machines	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	ME324	Internal Combustion Engines II	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	ME325	Turbo Machinery	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	ME326	Electrical Machines II	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

	ME327	Manufacturing Processes II	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Fourth year First Semester	ME411	Design of Machine Elements I	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	ME412	Control	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	ME413	Air Conditioning and Refrigeration I	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	ME414	Engineering Materials	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	ME415	Theory of Vibrations	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	ME416	Power Plants I	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	ME417	Industrial Engineering	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	E418	Engineering Project	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Fourth year Second Semester	ME421	Design of Machine Elements II	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	ME422	Measurements	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	ME423	Air Conditioning and Refrigeration II	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	ME424	Failure of Engineering Materials	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	ME425	Vibrations Applications	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	ME426	Power Plants II	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	ME427	Project Management	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	E418	Engineering Project (continued)	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Daily Attendance

TEMPLATE

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

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 programme specification.

1. Teaching Institution	University of Basrah
2. University Department/Centre	Mechanical Engineering Department
3. Course title/code	Engineering Analysis / E311
5. Modes of Attendance offered	Daily attendance
6. Semester/Year	First Semester / Third Year
7. Number of hours tuition (total)	60 hours
8. Date of production/revision of this specification	2025
9. Aims of the Course	
1. Preparing and qualifying engineers to meet the requirements of the labor market in the private and public sectors in mechanical engineering.	
2. Providing distinguished academic programs in the field of mechanical engineering, both theoretical and practical, that comply with international standards of academic quality and meet the needs of the labor market.	
3. Building and developing partnerships with the governmental and private sectors and the community with all its various institutions.	
4. Developing and improving scientific research in the fields of mechanical engineering, writing programs for solving differential equations and complex functions, data processing, digital signal analysis and control.	

5. Preparing a stimulating environment for faculty members to develop their knowledge and educational and research skills.

10· Learning Outcomes, Teaching, Learning and Assessment Method

A- Knowledge and Understanding

A1- Clarify the basic concepts of Engineering Analysis and their applications in social and industrial fields.

A2- Acquiring the skill in dealing with and addressing problems through the acquired sciences in this field.

A3- Acquisition of basic skills to solve engineering problems.

A4- Gaining experience in describing engineering problems mathematically and finding related equations to solve them.

B. Subject-specific skills

B1 - The ability to solve mathematical equations.

B 2 - The ability to think about addressing problems according to the algorithms and methods of their work.

B 3 - Writing scientific reports, reading charts, and analyzing digital data.

Teaching and Learning Methods

1. Explanation and clarification through lectures.
2. Using data show, smart boards, and plasma screens.
3. Self-learning through homework and mini-projects within the lectures.
4. Laboratories.
5. Mid-term and summer training.

Assessment methods

• Active participation in the classroom is evidence of the student's commitment and responsibility.
• Commitment to the deadline in submitting the duties and research required of the student to submit them.
• The quarterly and final exams express commitment and cognitive and skill achievement.

C. Thinking Skills

C1- Attention: Arousing the students’ attention by showing an applied mathematical problem on the display screen.

C2- Response: Follow up the student's interaction with the material displayed on the screen.

C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to display

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1 - Develop the student's ability to deal with technical means.

D2 - Develop the student's ability to deal with complex functions and solve equations.

D3 - Develop the student's ability to deal with multiple media.

D4 - Develop the student's ability to dialogue and discussion.

11. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	4	Complex Functions	Complex variables and functions	Theoretical	Questions and discussion
2	4	Special Complex Functions	Complex variables and functions	Theoretical	Questions and discussion
3	4	Continuity and Differentiation	Complex variables and functions	Theoretical	Questions and discussion
4	4	Cauchy-Riemann Equations	Complex variables and functions	Theoretical and tutorial	Questions and discussion
5	4	Complex Integration	Complex variables and functions	Theoretical and tutorial	Questions and discussion
6	4	Fourier Series	Fourier Series	Theoretical	Questions and discussion
7	4	Complex Fourier Series	Fourier Series	Theoretical and tutorial	Questions and discussion
8	4	Laplace Transform of Special Functions and Cases	Laplace Transform	Theoretical	Questions and discussion
9	4	Inverse Laplace Transform	Laplace Transform	Theoretical and tutorial	Questions and discussion
10	4	Ordinary Differential Equations	Ordinary Differential Equations	Theoretical	Questions and discussion
11	4	Solution of ODE	Ordinary Differential Equations	Theoretical and tutorial	Questions and discussion
12	4	Partial Differential Equation	Partial Differential Equation	Theoretical	Questions and discussion
13	4	D-Alembert Solution of the 1-Dim Wave Equation	Partial Differential Equation	Theoretical	Questions and discussion
14	4	Using Separation of Variables to Solve PDE	Partial Differential Equation	Theoretical and tutorial	Questions and discussion
15	4	Solution of 1-Dim Diffuse Equation	Partial Differential Equation	Theoretical and tutorial	Questions and discussion

12. Infrastructure

Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	1. Advanced Engineering Mathematics, Wylie, McGraw Hill Books Company. 2. Advanced Engineering Mathematics, Kreyszig, Jon Wylie and Sons. 3. Mathematical Methods for Engineers and Scientists, K. T. Tang 4. Numerical Methods, Robert W. Hornbeck, Quantum Publishers Inc.

	Finite Elements Methods, A. Alzafrani, Cranfield University.
Special requirements (include for example workshops, periodicals, IT software, websites)	
Community-based facilities (include for example, guest Lectures, internship, field studies)	

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

This course gives students a comprehensive experience in the topics and applications related to the subject of heat transfer. It is also a development of theoretical capabilities and ways to implement them in practice in this field. This course opens high horizons for the development of self-capacity in building more modern thermal systems and addressing all industrial problems in the field of heat transfer. Heat and scientifically successful methods.

1. Teaching Institution	University of Basrah
2. University Department/Centre	Mechanical Engineering Department
3. Course title/code	Heat Transfer I / ME312
5. Modes of Attendance offered	Daily Attendance
6. Semester/Year	First Semester/ Third year
7. Number of hours tuition (total)	45 hours
8. Date of production/revision of this specification	2025
9. Aims of the Course	
The course aims to graduate students capable of entering the field of industry with sufficient theoretical and practical experience.	

10. Learning Outcomes, Teaching, Learning and Assessment Methods

A. Knowledge and Understanding

- Consolidating the basic principles of heat transfer.
- Introducing the most important practical applications in different industries.
- Calculation of the most important variables to be taken into consideration in the design of systems related to heat transfer.
- Explanation and clarification of modern methods of dealing with issues related

to heat transfer and practical applications.

- The use of modern technologies and concepts in understanding the principles of heat energy.

B. Subject-specific skills

- The possibility of studying the principles of heat transfer in modern systems.
- Gaining high confidence in the ability to design modern systems.
- Publishing research articles in the field of heat transfer.

Teaching and Learning Methods

1. Use of recorded video clips.
2. Direct attendance lectures.
3. Laboratories and practical experiments.
4. Practical projects.
5. Using modern display methods such as smart screens.
6. Scientific visits.
7. Seminars held in the department.
8. Preparing lectures using modern programs.

Assessment methods

1. Daily exams.
2. Duties.
3. Semester and final exams for theoretical and practical subjects.
4. Design of practical systems.
5. Classroom participation.
6. Laboratories and evaluation of experiments.

C. Thinking Skills

C1- The lecture should be a source of focus for the students

C2- Communication should be continuous during the lesson

C3 - Asking some surprising questions to draw the students' attention and evaluate the interacting students

C4 - Discussing the students in their opinion in the presentation method.

C5 - The lecture should not be boring and bored.

Week	Hours	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	3	Introduction to Heat Transfer / Basics of Heat Transfer	theoretical	Questions and discussion
2	3	Methods of Heat Transfer / Conduction, Convection and Radiation	theoretical	Questions and discussion
3	3	One Dimensional Steady State Heat Conduction/ plane wall	theory + solution examples	Questions and discussion and quiz
4	3	One Dimensional Steady State Heat Conduction / Cylindrical and Spherical Coordinates	theory + solution examples	Questions and discussion
5	3	Thermal Resistance Concept	theoretical	Questions and discussion
6	3	Multilayer Plane Walls	theory + solution of examples	Questions and discussion
7	3	Multilayered/ Cylinder Sphere	theoretical	Questions and discussion and quiz
8	3	Critical Radius of Insulation	theoretical	Questions and discussion
9	3	Extended Surface Heat Transfer	Theoretical + solution of examples	Questions and discussion
10	3	Extended Surface Heat Transfer	theoretical	Questions and discussion +quiz
11	3	Two-Dimensional, Steady-State Conduction	theoretical	Questions and discussion
12	3	Transient Conduction	Theoretical +solution of examples	Questions and discussion
13	3	Lumped Capacity Method	Theoretical +solution of examples	Questions and discussion +quiz
14	3	The semi-infinite solid	theoretical	Questions and discussion
15	3	Heisler Charts	Theoretical +solution of examples	Questions and discussion +quiz

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	Fundamentals of Heat and Mass Transfer By FRANK P. INCROPERA
Special requirements (include for example workshops, periodicals, IT software, websites)	HEAT TRANSFER / A Practical Approach by YUNUS A. CENGEL
Community-based facilities (include for example, guest Lectures, internship, field studies)	HEAT TRANSFER by J.P. Holman

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAM REVIEW

COURSE SPECIFICATION

The theory of mechanism generates in the student an impression and an understanding about the mechanism of movement of all kinds as a result of the force applied to the mechanical parts.

1. Teaching Institution	University of Basrah
2. University Department/Centre	Mechanical Engineering Department
3. Course title/code	Theory of Mechanisms / ME313
5. Modes of Attendance offered	Daily Attendance
6. Semester/Year	First Semester / Third year
7. Number of hours tuition (total)	90
8. Date of production/revision of this specification	2025
9. Aims of the Course	
The course aims to graduate cadres capable of entering the field of machinery manufacturing and design.	

10· Learning Outcomes, Teaching, Learning and Assessment Method
A1- The basic principles of the theory of machines and machines. A2- Design of movement systems. A3- Maintenance and operation of modern machine systems. A4 - Incorporating programming into the design of movement and power systems.
B. Subject-specific skills Confidence in the possibility of designing different movement systems. B2 - Raising the level of ability to introduce advanced means in the theories

and methods of movement and force.
B3 - The work of large and small projects.
B4 - The ability to operate and rehabilitate machines and equipment.

Teaching and Learning Methods

• Reading the relevant books in the field of the course.
• Discussion within the lesson.
• Solve some advanced issues.
• Searching websites.
• Attending scientific conferences.

Assessment methods

• Discussion within the lesson.
• Homework and reports.
• Daily tests.
• Semester and final exams.

C. Thinking Skills
C1 - Activating the participation of students.
C2- Paying attention to the student's desire to accept the lesson material.
C3 - Evaluation of the students interacting in the lesson.
C4 - Presenting practical examples that interest the students for the lesson.
C 5 - Presenting various topics to keep the recipient away from boredom and boredom.

D. General and Transferable Skills (other skills relevant to employability and personal development)
D1- Paying attention to and evaluating duties.
D 2 - Access to a systematic and scientific method in raising topics.
D3 - Clarify the importance of benefiting from technological and informational progress.
D 4- Allocate time for discussion.

11. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	6	Motions and forces terms	introduction	Theoretical/practical	Questions and discussion
2	6	Velocity vectors	Velocity diagram	Theoretical/practical	Questions and discussion
3	6	Acceleration vectors	Acceleration diagram	Theoretical/practical	Questions and discussion and quiz
4	6	Simple crank mech.	Simple crank mech.	Theoretical/practical	Questions and discussion
5	6	Velocity and acceleration of mech.	Velocity and acceleration of mech.	Theoretical/practical	Questions and discussion
6	6	Uniform velocity and SHM	cams and followers displacements	Theoretical/practical	Questions and discussion
7	6	Cam and follower strokes	Cam motions and types	Theoretical/practical	Questions and discussion and quiz
8	6	Cam and follower diagrams two scale	Cam and follower diagrams	Theoretical/practical	Questions and discussion
9	6	Gyroscopic couples	Gyroscopic	Theoretical/practical	Questions and discussion
10	6	Gyroscopic motions	Gyroscopic applications	Theoretical/practical	Questions and discussion +quiz
11	6	Examples of Gyro for certain applications	Aircraft and ship Gyro equation	Theoretical/practical	Questions and discussion
12	6	Benefits and details	Flywheels	Theoretical/practical	Questions and discussion
13	6	Equations and applications	Turning moment diagrams	Theoretical/practical	Questions and discussion +quiz
14	6	Types and equations	Clutches	Theoretical/practical	Questions and discussion
15	6	Examples on clutches	Clutches applications	Theoretical/practical	Questions and discussion +quiz

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	Theory of Machines by RS Khurmi and JK Gupt
Special requirements (include for example workshops, periodicals, IT software, websites)	Theory of machines. London, E. Arnold,
Community-based facilities (include for example, guest Lectures, internship, field studies)	

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAM REVIEW

COURSE SPECIFICATION

This course gives students a comprehensive experience in preparing modern models and designing or developing Internal Combustion Engines. It is also a development of theoretical capabilities in building models for Internal Combustion Engines in theory and ways to implement them in practice.

1. Teaching Institution	University of Basrah
2. University Department/Centre	Mechanical Engineering Department
3. Course title/code	Internal Combustion Engines / ME314
5. Modes of Attendance offered	Daily Attendance
6. Semester/Year	First Semester/ Third year
7. Number of hours tuition (total)	48 hours
8. Date of production/revision of this specification	2025
9. Aims of the Course	
The course aims to graduate cadres capable of entering the field of manufacturing, designing and maintaining measurement regulators for all mechanical equipment.	

10· Learning Outcomes, Teaching, Learning and Assessment Method
A- Knowledge and Understanding A1- Basic principles for the work of Internal Combustion Engines. A2- Design of Internal Combustion Engines. A3 - Maintenance and operation of modern Internal Combustion Engines. A4- Incorporating artificial intelligence into the design of Internal Combustion Engines
B. Subject-specific skills B1 - Confidence in the ability to design Internal Combustion Engines. B2 - Raising the level of ability to introduce advanced methods in Internal Combustion Engines B3 - The work of large and small projects. B4 - The ability to operate and rehabilitate Internal Combustion Engines.
Teaching and Learning Methods
• Reading the relevant books in the field of the course. • Discussion within the lesson. • Solve some advanced issues. • Searching websites. • Attending scientific conferences.
Assessment methods
• Discussion within the lesson. • Homework and reports. • Daily tests. • Semester and final exams.
C. Thinking Skills C1 - Activating the participation of students. C2- Paying attention to the student's desire to accept the lesson material. C3 - Evaluation of the students interacting in the lesson. C4 - Presenting practical examples that interest the students for the lesson. C 5 - Presenting various topics to keep the recipient away from boredom and boredom.
D. General and Transferable Skills (other skills relevant to employability and personal development) D1- Paying attention to and evaluating duties. D 2 - Access to a systematic and scientific method in raising topics. D3 - Clarify the importance of benefiting from technological and informational progress. D 4- Allocate time for discussion.

11. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	3	Introduction to reciprocating engine	Basic Engine types and Their Operation	theoretical	Questions and discussion
2	3	Engine classification by cylinder arrangement.	Familiarization basic engine nomenclature.	theoretical	Questions and discussion
3	3	Spark ignition engine (4 – stroke and 2 – stroke cycle).	Spark ignition engine (4 – stroke and 2 – stroke cycle).	theory + solution examples	Questions and discussion and quiz
4	3	Compression ignition engine (4 – stroke and 2 – stroke cycle).	Compression ignition engine (4 – stroke and 2 – stroke cycle).	theory + solution examples	Questions and discussion
5	3	SI and CI Engines.	Fundamental differences between SI and CI Engines.	theoretical	Questions and discussion
6	3	reciprocating engine.	Energy flow through a reciprocating engine.	theory + solution of examples	Questions and discussion
7	3	Rotary engines.	Rotary engines.	theoretical	Questions and discussion and quiz
8	3	The Wankel engine.	The continuous – combustion gas turbine	theoretical	Questions and discussion
9	3	Basic power measurements.	Engine Power and Performance	Theoretical + solution of examples	Questions and discussion
10	3	Indicated Mean effective pressure, Indicated power.	Engine Power and Performance	theoretical	Questions and discussion +quiz
11	3	Friction power. Mean effective power.	Engine Power and Performance	theoretical	Questions and discussion
12	3	The Air – Cycle approximation:	Thermodynamics of I.C. Engine	Theoretical +solution of examples	Questions and discussion
13	3	Air – cycle calculations.	Thermodynamics of I.C. Engine	Theoretical +solution of examples	Questions and discussion +quiz
14	3	The Actual Engine Cycle	Thermodynamics of I.C. Engine	theoretical	Questions and discussion
15	3	Effect of engine variable on flame speed	Thermodynamics of I.C. Engine	Theoretical +solution of examples	Questions and discussion +quiz

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	1. The Internal – Combustion Engines, C.F. Taylor, E.S. Taylor International Text Book Company, 2 nd Edition, Pennsylvania, 1966. 2. The Internal – Combustion Engine in Theory and Practice C.F.Taylor, The M.I.T. Press, Mass, 1968. 3. Internal Combustion Engines and Air Pollutions, In text Educational Publishers, New York, 1970
Special requirements (include for example workshops, periodicals, IT software, websites)	Engineering Fundamentals of the Internal Combustion Engine by Willard W. Pulkrabek

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

The course is a description of the theories that control the compressible flow of gases and their applications in rocket and jet engines.

1. Teaching Institution	University of Basrah
2. University Department/Centre	Mechanical Engineering Department
3. Course title/code	Gas Dynamic / ME315
5. Modes of Attendance offered	Daily Attendance
6. Semester/Year	First Semester / Third year
7. Number of hours tuition (total)	45 hours
8. Date of production/revision of this specification	2025
9. Aims of the Course	
The course aims to introduce students to the basics of compressive flow and its application to gas and compressed air transmission systems, as well as to introduce students to the basics of the work of rocket and jet engines.	

10· Learning Outcomes, Teaching, Learning and Assessment Method
A- Knowledge and Understanding A1- Clarify the basic concepts of compressible flow. A2- Acquisition of skills in dealing with problems and issues related to compression flow. A3- Acquisition of basic skills as an introduction to the study of flow around aircraft. A4- Gain a basic understanding of how jet propulsion engines work.
B. Subject-specific skills B1 - The ability to know the types of compressive flow. B2 - The ability to think about addressing a particular problem or issue. B3 - Writing scientific reports. B4 - The ability to gain experience in dealing with jet engines.

Teaching and Learning Methods
● Readings, self-learning, panel discussions. ● Exercises and activities in the lecture. ● Homework. ● Directing students to some websites to benefit and develop capabilities. ● Conducting seminars to explain and analyze a specific issue and find solutions to it.
Assessment methods
● Interaction within the lecture. ● Homework and reports. ● Short Quizzes. ● Semester and final exams.
C. Thinking Skills C1- Attention: Arousing the students' attention by running simulation devices and scientific videos. C2 - Response: Follow up the student's interaction with the material displayed on the screen. C3- Attention: Follow up on the interest of the student who interacted the most with the presented material. C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.
D. General and Transferable Skills (other skills relevant to employability and personal development) D1- Develop the student’s ability to perform the duties and deliver them on time D 2- Engineering thinking to find scientific solutions to various problems D3 - Developing the student's ability to dialogue and debate D4 - Develop the student's ability to deal with modern technology, especially the Internet

11. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	3	Review of Gas Dynamic	Introduction on Gas Dynamic	Theory	Question and Discussion
2	3	Boosting the knowledge in Isentropic flow	Isentropic Flow	Theory + Tutorial	Question and Discussion + Quiz
3	3	Stating the physics of Mach cone	Mach number and Mach cone	Theory	Question and Discussion
4	3	Importance of Gas Dynamic	Flow through variable area duct	Theory + Tutorial	Question and Discussion + Quiz
5	3	Application of Gas Dynamic	Flow cases in C-D nozzle	Theory	Question and Discussion
6	3	Application of Gas Dynamic	Flow cases in a converging Nozzle	Theory + Tutorial	Question and Discussion + Quiz
7	3	Application of Gas Dynamic	Normal Shock wave	Theory	Question and Discussion
8	3	Application of Gas Dynamic	Oblique Shock wave	Theory + Tutorial	Question and Discussion
9	3	Application of Gas Dynamic	Expansion wave	Theory	Question and Discussion + Quiz
10	3	Application of Gas Dynamic	Prandtl Mayer function	Theory + Tutorial	Question and Discussion
11	3	Application of Gas Dynamic	Rocket Engine	Theory	Question and Discussion
12	3	Application of Gas Dynamic	Turbojet Engine	Theory + Tutorial	Question and Discussion + Quiz
13	3	Application of Gas Dynamic	Fuel Consumption in Turbojet Engine	Theory	Question and Discussion
14	3	Application of Gas Dynamic	Twin-Spool turbojet engine	Theory + Tutorial	Question and Discussion
15	3	Application of Gas Dynamic	Twin-Spool turbojet engine	Theory + Tutorial	Question and Discussion + Quiz

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS	Fluid Mechanics Gas Turbine Theory
Special requirements (include for example workshops, periodicals, IT software, websites)	Introduction to Compressible flow
Community-based facilities (include for example, guest Lectures, internship, field studies)	

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

In this course, the basic principles that the student studied in the first stage in the basics of electrical engineering are relied on to enable the student to understand the work of DC and AC induction machines (generators and motors), as well as electrical transformers. Where the basic principles of the electrical machine are studied and the types of electrical machines and the basic components of the electrical machine, which are essential for all kinds of machines, are studied. Then, identifying the method of generating an induced electromotive force, electrical switching, the reaction of the production member, studying the internal and external features, and how to draw these features, and extracting the special mathematical relationships that link these features. Then study the types of generators for DC and AC inductive current and their characteristics, as well as the characteristics and types of DC and AC motors, and what distinguishes each type of features suitable for different mechanical loads.
As well as the study of electrical transformers and the principles of their work and the mathematical relationships governing these transformers, and the study of the types of step up or step down transformers (for voltage or current), as well as knowledge of the internal installation and tests to which the transformers are subjected, which we benefit from in determining the efficiency of the transformer and the extent of its regulation of electrical voltage, as well as knowledge of measurement transformers (transformers).

1. Teaching Institution	University of Basrah
2. University Department/Centre	Mechanical Engineering Department
3. Course title/code	Electrical Machines / ME316
5. Modes of Attendance offered	Daily Attendance
6. Semester/Year	First Semester / Third Year
7. Number of hours tuition (total)	45 hours
8. Date of production/revision of this specification	2025
9. Aims of the Course	
The course aims to provide the student with basic skills in the subject of studying and understanding the characteristics of types of DC and AC (inductive) machines, as well as electrical transformers.	

10. Course outcomes and methods of teaching, learning and assessment
A- Cognitive goals A1- Identifying the machine’s (continuous and alternating) installation and derivation of the E.M.F equation and the equivalent circuit of the motors A2- Identify the types of generators and their features. A3- Identify the types of motors and their features. A4- Learn about the applications of generators and motors.
B - Skills objectives of the course. B1 - Learn how DC and AC generators work and features B2 - Learn how DC and AC motors work and features
• Explain the basic principles of the work of generators and engines and link them to practical applications. • Allocating lectures to solve theoretical issues and discuss basic concepts. • Directing students to each other to benefit from the systematic training for the third stage.
Evaluation methods
• Interaction within the lecture. • Homework and reports. • Short exams. • Semester and final exams.
C- Emotional and value goals C1- Helping the student on how to lay the scientific foundations for solving various problems. C2-Help the student to understand the theoretical basis for the work of the machine and the transformer
D - Transferred general and qualifying skills (other skills related to employability and personal development). D1 - Qualifying the student to deal with practical problems and how to solve them. D2 - Teaching the student to write scientific reports describing the various problems and the mechanism for solving them. D3 - Enabling the student to pass the exams held by companies and government and private institutions. D4 - Increasing the student's self-confidence and creating a leadership spirit for him to manage practical problems.

11. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	3	DC machine construction	DC machine construction	Theoretical and tutorial	Questions and discussion
2	3	E.M.F. Equation and output equation and commutation	E.M.F. Equation and output equation and commutation	Theoretical	Questions, discussion and Quiz
3	3	Types of dc generators DC Motor types	Types of dc generators DC Motor types	Theoretical	Questions and discussion
4	3	Test of dc generators	Test of dc generators	Theoretical and tutorial	Questions, discussion and Quiz
5	3	Starting of dc motors	Starting of dc motors	Theoretical and tutorial	Questions and discussion
6	3	Principle of action	Principle of action	Theoretical	Questions and discussion
7	3	leakage reactions	leakage reactions	Theoretical and tutorial	Questions and discussion
8	3	equivalent circuit	equivalent circuit	Theoretical	Questions, discussion and Quiz
9	3	voltage regulation and efficiency	voltage regulation and efficiency	Theoretical and tutorial	Questions and discussion
10	3	open circuit and short circuit tests.	open circuit and short circuit tests.	Theoretical	Questions and discussion
11	3	Production of rotating magnetic field	Production of rotating magnetic field	Theoretical and tutorial	Questions and discussion
12	3	synchronous speed and slip	synchronous speed and slip	Theoretical	Questions and discussion
13	3	equivalent circuit – torque / speed curve	equivalent circuit – torque / speed curve	Theoretical	Questions, discussion and Quiz
14	3	– starting of cage and slip – ring induction motors	– starting of cage and slip – ring induction motors	Theoretical and tutorial	Questions and discussion
15	3	– speed control and reversal of direction.	– speed control and reversal of direction.	Theoretical and tutorial	Questions and discussion

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS	Edward Hughes - Hughes electrical and electronic technology [electronic resource]-Pearson Education (2012).pdf Electrical technology by Hindmarch
Special requirements (include for example workshops, periodicals, IT software, websites)	1. Electrical Technology by Theraja 2. المكائن الكهربائية وتطبيقاتها للدكتور محمد زكي
Community-based facilities (include for example, guest Lectures, internship, field studies)	

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

The course provides the possibility of identifying mechanical manufacturing processes, for example, casting processes, forming processes such as (rolling, extrusion, forging and conventional and nonconventional drawing processes, material removal processes, joining processes, powder metallurgy .....etc. As well as calculating and estimating the mechanical loads required for each process and selecting the appropriate manufacturing process for each product according to the required specifications and conditions of work environment. Diagnose the defects associated during the manufacturing process and after manufacturing appear on the final product. Study manufacturing defects from a technical and engineering point of view and trying to avoid them.

1. Teaching Institution	University of Basrah
2. University Department/Centre	Mechanical Engineering Department
3. Course title/code	Manufacturing Processes I / ME317
5. Modes of Attendance offered	Daily Attendance
6. Semester/Year	First Semester / Third Year
7. Number of hours tuition (total)	60 hours
8. Date of production/revision of this specification	2025
9. Aims of the Course	
The course provides the possibility of identifying mechanical manufacturing processes, for example, casting processes, forming processes such as (rolling, extrusion, forging and conventional and nonconventional drawing processes, material removal processes, joining processes, powder metallurgy ..... etc. As well as calculating and estimating the mechanical loads required for each process and selecting the appropriate manufacturing process for each product according to the required specifications and conditions of work environment. Diagnose the defects associated during the manufacturing process and after manufacturing appear on the final product. Study manufacturing defects from a technical and engineering point of view and trying to avoid them.	

11. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1st	2	Types of manufacturing processes, materials in manufacturing	Introduction to manufacturing processes	Theoretical	Questions + discussion
2nd	2	Classification of manufacturing processes	Introduction to manufacturing processes	Theoretical + Tutorial	Questions + discussion + quiz
3rd	2	Characteristics of casting processes, calculations of casting	Casting processes	Theoretical	Questions + discussion
4th	2	Types of special casting processes,	Casting processes	Theoretical + Tutorial	Questions + discussion + quiz
5th	2	Defects in castings	Casting processes	Theoretical	Questions + discussion
6th	2	Introduction, types of metal deformation	Metal Forming Processes	Theoretical + Tutorial	Questions + discussion
7th	2	Rolling processes engineering analysis	Metal Forming Processes	Theoretical	Questions + discussion
8th	2	Special rolling processes	Metal Forming Processes	Theoretical	Questions + discussion + quiz
9th	2	Extrusion processes engineering analysis	Metal Forming Processes	Theoretical + Tutorial	Questions + discussion
10th	2	Special extrusion processes	Metal Forming Processes	Theoretical	Questions + discussion
11th	2	Conventional drawing processes engineering analysis	Metal Forming Processes	Theoretical	Questions + discussion
12th	2	Special conventional drawing processes	Metal Forming Processes	Theoretical + Tutorial	Questions + discussion
13th	2	Non-conventional drawing processes engineering analysis	Metal Forming Processes	Theoretical	Questions + discussion + quiz
14th	2	Dieless drawing processes	Metal Forming Processes	Theoretical	Questions + discussion
15th	2	Forging processes engineering analysis	Metal Forming Processes	Theoretical + Tutorial	Questions + discussion

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS	Mikell P. Groover, “Fundamentals of Modern Manufacturing: materials, processes and systems”, 5th edition, John Wiley & Sons, Inc., 2013.
Special requirements (include for example workshops, periodicals, IT software, websites)	Reputable websites. Libraries sites in international universities.
Community-based facilities (include for example, guest Lectures, internship, field studies)	

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

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 programme specification.

1. Teaching Institution	University of Basrah
2. University Department/Centre	Mechanical Engineering Department
3. Course title/code	Numerical Analysis / E312
5. Modes of Attendance offered	Daily attendance
6. Semester/Year	Second Semester / Third Year
7. Number of hours tuition (total)	45 hours
8. Date of production/revision of this specification	2025
9. Aims of the Course	
1. Preparing and qualifying engineers to meet the requirements of the labor market in the private and public sectors in mechanical engineering.	
2. Providing distinguished academic programs in the field of mechanical engineering, both theoretical and practical, that comply with international standards of academic quality and meet the needs of the labor market.	
3. Building and developing partnerships with the governmental and private sectors and the community with all its various institutions.	
4. Developing and improving scientific research in the fields of mechanical engineering, writing programs for solving differential equations and complex functions, data processing, digital signal analysis and control.	
5. Preparing a stimulating environment for faculty members to develop their knowledge and educational and research skills.	

10· Learning Outcomes, Teaching, Learning and Assessment Method

A- Knowledge and Understanding

A1- Clarify the basic concepts of Numerical Analysis and their applications in social and industrial fields.

A2- Acquiring the skill in dealing with and addressing problems through the acquired sciences in this field.

A3- Acquisition of basic skills to solve engineering problems.

A4- Gaining experience in describing engineering problems mathematically and finding related equations to solve them.

B. Subject-specific skills

B1 - The ability to solve mathematical equations numerically.

B 2 - The ability to think about addressing problems according to the algorithms and methods of their work.

B 3 - Writing scientific reports, reading charts, and analyzing digital data.

Teaching and Learning Methods

1. Explanation and clarification through lectures.
2. Using data show, smart boards, and plasma screens.
3. Self-learning through homework and mini-projects within the lectures.
4. Laboratories.
5. Graduation projects.
6. Mid-term and summer training.

Assessment methods

• Active participation in the classroom is evidence of the student's commitment and responsibility.
• Commitment to the deadline in submitting the duties and research required of the student to submit them.
• The quarterly and final exams express commitment and cognitive and skill achievement.

C. Thinking Skills

C1- Attention: Arousing the students’ attention by showing an applied mathematical problem on the display screen.

C2- Response: Follow up the student's interaction with the material displayed on the screen.

C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to display

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1 - Develop the student's ability to deal with technical means.

D2 - Develop the student's ability to deal with complex functions and solve equations.

D3 - Develop the student's ability to deal with multiple media.

D4 - Develop the student's ability to dialogue and discussion.

11. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	3	Fixed-point, Newton-Raphson	Finding Roots	Theoretical and tutorial	Questions and discussion
2	3	Iteration method Gauss Elimination method	Solution of Simultaneous Equations	Theoretical	Questions and discussion
3	3	Gauss-Jordan method	Solution of Simultaneous Equations	Theoretical	Questions and discussion
4	3	Forward, Backward and Central differences	Finite differences	Theoretical and tutorial	Questions and discussion
5	3	Newton Interpolation Lagrange Interpolation	Interpolation and Extrapolation	Theoretical and tutorial	Questions and discussion
6	3	Polynomial fitting	Curve fitting	Theoretical	Questions and discussion
7	3	Exponential and Power Fitting	Curve Fitting	Theoretical and tutorial	Questions and discussion
8	3	Trapezoidal and Simpson methods	Numerical Integration and Differentiation	Theoretical	Questions and discussion
9	3	Euler method	Solution of Ordinary Differential Equations	Theoretical and tutorial	Questions and discussion
10	3	Runge Kutta method	Solution of Ordinary Differential Equations	Theoretical	Questions and discussion
11	3	Runge Kutta Second Order method	Solution of Second Order Ordinary Differential Equations	Theoretical and tutorial	Questions and discussion
12	3	Solution of Laplace Equation	Solution of Partial Differential Equation	Theoretical	Questions and discussion
13	3	Solution of the Wave Equation	Solution of Partial Differential Equation	Theoretical	Questions and discussion
14	3	Solution of Diffuse Equation	Solution of Partial Differential Equation	Theoretical and tutorial	Questions and discussion
15	3	Crank-Nicolson method	Solution of Partial Differential Equation	Theoretical and tutorial	Questions and discussion

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	1. An Introduction to Numerical Analysis. Endre Suli. 2. Advanced Engineering Mathematics, Kreyszig, Jon Wylie and Sons. 3. Mathematical Methods for Engineers and Scientists, K. T. Tang 4. Numerical Methods, Robert W. Hornbeck, Quantum Publishers Inc.
Special requirements (include for example workshops, periodicals, IT software, websites)	
Community-based facilities (include for example, guest Lectures, internship, field studies)	

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

This course gives students a comprehensive experience in the topics and applications related to the subject of heat transfer. It is also a development of theoretical capabilities and ways to implement them in practice in this field. This course opens high horizons for the development of self-capacity in building more modern thermal systems and addressing all industrial problems in the field of heat transfer. Heat and scientifically successful methods.

1. Teaching Institution	University of Basrah
2. University Department/Centre	Mechanical Engineering Department
3. Course title/code	Heat Transfer / ME322
5. Modes of Attendance offered	Daily Attendance
6. Semester/Year	Second Semester/ Third year
7. Number of hours tuition (total)	45 hours
8. Date of production/revision of this specification	2025
9. Aims of the Course	
The course aims to graduate cadres capable of entering the field of industry with sufficient theoretical and practical experience.	

10. Learning Outcomes, Teaching, Learning and Assessment Methods

A. Knowledge and Understanding

A1. Consolidating the basic principles of heat transfer.
A2. Introducing the most important practical applications in different industries.
A3. Calculation of the most important variables to be taken into consideration in the design of systems related to heat transfer.
A4. Explanation and clarification of modern methods of dealing with issues related to heat transfer and practical applications.

B. Subject-specific skills

B1. The possibility of studying the principles of heat transfer in modern systems.
B2. Gaining high confidence in the ability to design modern systems.
B3. Publishing research articles in the field of heat transfer.

Teaching and Learning Methods

1. Use of recorded video clips.
2. Direct attendance lectures.
3. Laboratories and practical experiments.
4. Practical projects.
5. Using modern display methods such as smart screens.
6. Scientific visits.
7. Seminars held in the department.
8. Preparing lectures using modern programs.

Assessment methods

1. Daily exams.
2. Duties.
3. Semester and final exams for theoretical and practical subjects.
4. Design of practical systems.
5. Classroom participation.
6. Laboratories and evaluation of experiments.

C. Thinking Skills

C1- The lecture should be a source of focus for the students
C2- Communication should be continuous during the lesson
C3 - Asking some surprising questions to draw the students' attention and evaluate the interacting students
C4 - Discussing the students in their opinion in the presentation method.

Week	Hours	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	3	Introduction to Convection Heat Transfer	theoretical	Questions and discussion
2	3	The Convection Boundary Layers	theoretical	Questions and discussion
3	3	Local and Average Convection Coefficients	theory + solution examples	Questions and discussion and quiz
4	3	Laminar and Turbulent Flow	theory + solution examples	Questions and discussion
5	3	The Boundary Layer Equations	theoretical	Questions and discussion
6	3	Physical Interpretation of the Dimensionless Parameters	theory + solution of examples	Questions and discussion
7	3	External Flow	theoretical	Questions and discussion and quiz
8	3	External Flow	theoretical	Questions and discussion
9	3	Internal Flow	Theoretical + solution of examples	Questions and discussion
10	3	Internal Flow	theoretical	Questions and discussion +quiz
11	3	Free Convection	theoretical	Questions and discussion
12	3	Boiling and Condensation	Theoretical +solution of examples	Questions and discussion
13	3	Heat Exchangers	Theoretical +solution of examples	Questions and discussion +quiz
14	3	Heat Exchangers	theoretical	Questions and discussion
15	3	Radiation: Processes and Properties	Theoretical +solution of examples	Questions and discussion +quiz

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	Fundamentals of Heat and Mass Transfer By FRANK P. INCROPERA
Special requirements (include for example workshops, periodicals, IT software, websites)	HEAT TRANSFER / A Practical Approach By YUNUS A. CENGEL
Community-based facilities (include for example, guest Lectures, internship, field studies)	HEAT TRANSFER By J.P. Holman

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAM REVIEW

COURSE SPECIFICATION

The theory of machines generates in the student an impression and an understanding about the mechanism of movement of all kinds as a result of the force applied to the mechanical parts.

1. Teaching Institution	University of Basrah
2. University Department/Centre	Mechanical Engineering Department
3. Course title/code	Theory of Machines / ME323
5. Modes of Attendance offered	Daily Attendance
6. Semester/Year	Second Semester / Third year
7. Number of hours tuition (total)	30 hours
8. Date of production/revision of this specification	2025
9. Aims of the Course	
The course aims to graduate cadres capable of entering the field of machinery manufacturing and design.	

10· Learning Outcomes, Teaching, Learning and Assessment Method
A1- The basic principles of the theory of machines and machines. A2- Design of movement systems. A3- Maintenance and operation of modern machine systems. A4 - Incorporating programming into the design of movement and power systems.
B. Subject-specific skills Confidence in the possibility of designing different movement systems. B2 - Raising the level of ability to introduce advanced means in the theories and methods of movement and force. B3 - The work of large and small projects. B4 - The ability to operate and rehabilitate machines and equipment.
Teaching and Learning Methods
• Reading the relevant books in the field of the course. • Discussion within the lesson. • Solve some advanced issues. • Searching websites. • Attending scientific conferences.
Assessment methods
• Discussion within the lesson. • Homework and reports. • Daily tests. • Semester and final exams.
C. Thinking Skills C1 - Activating the participation of students. C2- Paying attention to the student's desire to accept the lesson material. C3 - Evaluation of the students interacting in the lesson. C4 - Presenting practical examples that interest the students for the lesson. C 5 - Presenting various topics to keep the recipient away from boredom and boredom.
D. General and Transferable Skills (other skills relevant to employability and personal development) D1- Paying attention to and evaluating duties. D 2 - Access to a systematic and scientific method in raising topics. D3 - Clarify the importance of benefiting from technological and informational progress. D 4- Allocate time for discussion.

11. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	2/0	Introductions for types and applications	Belt drive	Theoretical/practical	Questions and discussion
2	2/0	Belts equations	Types of belt	Theoretical/practical	Questions and discussion
3	2/0	Introductions for types and applications	Governors	Theoretical/practical	Questions and discussion and quiz
4	2/0	Equations & details	Watt and porters gov.	Theoretical/practical	Questions and discussion
5	2/0	Equations & details	Proell gov.	Theoretical/practical	Questions and discussion
6	2/0	Equations & details	Hartenall gov.	Theoretical/practical	Questions and discussion
7	2/0	Introductions for types and applications	Balance of retaining masses	Theoretical/practical	Questions and discussion and quiz
8	2/0	Equations & details	Static and dynamic Balance of retaining masses	Theoretical/practical	Questions and discussion
9	2/0	Equations & details	Same plane in Balance of retaining masses	Theoretical/practical	Questions and discussion
10	2/0	Equations & details	different planes in Balance of retaining masses	Theoretical/practical	Questions and discussion +quiz
11	2/0	Introductions for types and applications	Gears	Theoretical/practical	Questions and discussion
12	2/0	Define and drive	Gears equations	Theoretical/practical	Questions and discussion
13	2/0	Introductions for types and applications	Automatic control of machines	Theoretical/practical	Questions and discussion +quiz
14	2/0	Define and drive	Equations of control systems for machines	Theoretical/practical	Questions and discussion
15	2/0	TOM general	Tutorial	Theoretical/practical	Questions and discussion +quiz

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	Theory of Machines by RS Khurmi and JK Gupt
Special requirements (include for example workshops, periodicals, IT software, websites)	Theory of machines. London, E. Arnold,
Community-based facilities (include for example, guest Lectures, internship, field studies)	

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

The course is a study of applying momentum preservation equations to fluid machines such as water turbines, pumps, and axial flow gas compressors.

1. Teaching Institution	University of Basrah
2. University Department/Centre	Mechanical Engineering Department
3. Course title/code	Turbomachinery
5. Modes of Attendance offered	Daily Attendance
6. Semester/Year	First Semester / Third year
7. Number of hours tuition (total)	60 hours
8. Date of production/revision of this specification	2025
9. Aims of the Course	
The course aims to introduce students to the basics of compressive flow and its application to gas and compressed air transmission systems, as well as to introduce students to the basics of the work of rocket and jet engines.	

10· Learning Outcomes, Teaching, Learning and Assessment Method
A1- Clarify the basic concepts of fluid machinery. A2- Acquisition of skills in dealing with problems and issues with fluid machines. A3- Acquisition of basic skills in studying pump problems. A4- Gain a basic understanding of how axial gas compressors work.
B. Subject-specific skills B1 - The ability to know the types of water turbines and choose the most appropriate type according to the available water column. B2 - The ability to think about addressing a specific problem or issue. B 3 - Writing scientific reports. B4 - The ability to gain experience in dealing with pumps and their problems.
Teaching and Learning Methods
● Readings, self-learning, panel discussions. ● Exercises and activities in the lecture. ● Homework. ● Directing students to some websites to benefit and develop capabilities. ● Conducting seminars to explain and analyze a specific issue and find solutions to it.
Assessment methods
● Interaction within the lecture. ● Homework and reports. ● Short Quizzes. ● Semester and final exams.
C. Thinking Skills C1- Attention: Arousing the students' attention by running simulation devices and scientific videos. C2 - Response: Follow up the student's interaction with the material displayed on the screen. C3- Attention: Follow up on the interest of the student who interacted the most with the presented material. C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.
D. General and Transferable Skills (other skills relevant to employability and personal development) D1- Develop the student’s ability to perform the duties and deliver them on time D 2- Engineering thinking to find scientific solutions to various problems D3 - Developing the student's ability to dialogue and debate D4 - Develop the student's ability to deal with modern technology, especially the Internet

11. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	3	Review of the principals of fluid flow	Introduction on fluid power	Theory	Question and Discussion
2	3	Principles and components of Pelton wheel flow	Impulse Turbine-Pelton Wheel	Theory + Tutorial	Question and Discussion + Quiz
3	3	Principles of reaction Turbines	Reaction Turbine	Theory	Question and Discussion
4	3	Importance of Gas Dynamic	Reaction turbine-Francis turbine	Theory + Tutorial	Question and Discussion + Quiz
5	3	Understanding the components of velocity triangles at inlet and outlet	Velocity diagrams of Francis Turbines	Theory	Question and Discussion
6	3	Kaplan Turbine	Principles and components of axial turbines	Theory + Tutorial	Question and Discussion + Quiz
7	3	Understanding the components of velocity triangles at inlet and outlet	Velocity diagrams in Kaplan turbine	Theory	Question and Discussion
8	3	Using the similarity rules in studying the performance of similar machines	Similarity rules	Theory + Tutorial	Question and Discussion
9	3	Principles of centrifugal pump and building the velocity diagrams	Centrifugal pumps	Theory	Question and Discussion + Quiz
10	3	The importance of parallel and series connections	Pumps connection	Theory + Tutorial	Question and Discussion
11	3	Understanding the types of impeller of centrifugal pumps	Types of centrifugal pumps	Theory	Question and Discussion
12	3	How to avoid the cavitation in centrifugal pumps	Cavitation in pumps	Theory + Tutorial	Question and Discussion + Quiz
13	3	Understanding the principles of axial flow gas compressor	Axial flow compressor	Theory	Question and Discussion
14	3	Establishing the velocity triangles at any radius of rotor	Velocity diagrams in axial flow compressor	Theory + Tutorial	Question and Discussion
15	3	Calculating the stage and overall pressure ratios	Pressure ratio in axial flow compressor	Theory + Tutorial	Question and Discussion + Quiz

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS	Fluid Mechanics (by Streeter)
Special requirements (include for example workshops, periodicals, IT software, websites)	Fundamentals of Fluid Mechanics (by Munson)
Community-based facilities (include for example, guest Lectures, internship, field studies)	

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

In this course, it is based on the basic principles that the student studied in the third stage, the first course in electrical machines, to enable the student to understand the principle of the work of synchronous machines (generators and motors). The different composition of this material to the formation of the diode, transistor, thyristor and the nature of the work of each of these elements. The third chapter deals with electrical stations and methods of protection using circuit breakers and relays, as well as how to correct the power factor. As for the fourth chapter, it is concerned with studying the methods of measuring electrical quantities such as voltage and current, as well as non-electrical quantities such as pressure, temperature and flow, using sensors and converting these quantities into electrical signals in order to facilitate the process of reading or measuring them.

1. Teaching Institution	University of Basrah
2. University Department/Centre	Mechanical Engineering Department
3. Course title/code	Electrical Machines / ME326
5. Modes of Attendance offered	Daily Attendance
6. Semester/Year	Second Semester / Third Year
7. Number of hours tuition (total)	45 hours
8. Date of production/revision of this specification	2025
9. Aims of the Course	
The course aims to provide the student with basic skills in the subject of studying and understanding the characteristics of synchronous machines of both types (motors and generators), as well as studying semiconductors, electrical stations, methods of protection, and how to measure electrical and non-electrical quantities.	
10. Course outcomes and methods of teaching, learning and assessment	
A- Cognitive goals A1- Learn about synchronous machines and their features. A2- Identify the types of semiconductors and their characteristics. A3- Identify electrical stations, erase methods, and the power correction factor. A5 - Identify the methods of measurement for electrical and non-electrical quantities.	

B - Skills objectives of the course.

B1 - Learn how synchronous machines work and features

B2 - Learn how semiconductors work

B 3- Learn how relays and circuit breakers work in stations.

B4- Learn how to measure electrical and non-electrical quantities.

Teaching and learning methods

- Explain the basic principles of the work of generators and synchronous motors and link them to practical applications.
- Explain the basic principles of semiconductor work
- Explanation of the basic principles of the work of relays and circuit breakers
- Explanation of the basic principles of the mechanism of measuring electrical and non-electrical quantities
- Allocating lectures to solve theoretical issues and discuss basic concepts.
- Directing students to each other to benefit from the systematic training for the third stage.

Evaluation methods

- Interaction within the lecture.
- Homework and reports.
- Short exams.
- Semester and final exams.

C- Emotional and value goals

C1- Helping the student on how to lay the scientific foundations for solving various problems.

C2-Help the student to understand the theoretical basis for the work of the machine and the transformer

D - Transferred general and qualifying skills (other skills related to employability and personal development).

D1 - Qualifying the student to deal with practical problems and how to solve them.

D2 - Teaching the student to write scientific reports describing the various problems and the mechanism for solving them.

D3 - Enabling the student to pass the exams held by companies and government and private institutions.

D4 - Increasing the student's self-confidence and creating a leadership spirit for him to manage practical problems.

11. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	3	E.M.F. equation – armature reaction	E.M.F. equation – armature reaction	Theoretical and tutorial	Questions and discussion
2	3	synchronous impedance voltage regulation – synchronization.	synchronous impedance voltage regulation – synchronization.	Theoretical	Questions, discussion and Quiz
3	3	Synchronous motor– principle of operation	Synchronous motor– principle of operation	Theoretical	Questions and discussion
4	3	starting methods V. curves application of synchronous motors.	starting methods V. curves application of synchronous motors.	Theoretical and tutorial	Questions, discussion and Quiz
5	3	Semiconductor diodes – Rectifiers	Semiconductor diodes – Rectifiers	Theoretical and tutorial	Questions and discussion
6	3	Different types of Bridge circuits	Different types of Bridge circuits	Theoretical	Questions and discussion
7	3	Transistors – Power Amplifiers	Transistors – Power Amplifiers	Theoretical and tutorial	Questions and discussion
8	3	SCRs and their applications.	SCRs and their applications.	Theoretical	Questions, discussion and Quiz
9	3	Means of industrial power supply – Factory layouts for distribution and sub	Means of industrial power supply – Factory layouts for distribution and sub	Theoretical and tutorial	Questions and discussion
10	3	– stations – protection schemes – relays and circuit breakers	– stations – protection schemes – relays and circuit breakers	Theoretical	Questions and discussion
11	3	Illumination and heating designs	Illumination and heating designs	Theoretical and tutorial	Questions and discussion
12	3	power factor corrections.	power factor corrections.	Theoretical	Questions and discussion
13	3	Measurement of current, voltage and power – recording of energy consumption	Measurement of current, voltage and power – recording of energy consumption	Theoretical	Questions, discussion and Quiz
14	3	measurement of non – electrical parameters pressure, velocity , flow, temperature etc	measurement of non – electrical parameters pressure, velocity , flow, temperature etc	Theoretical and tutorial	Questions and discussion
15	3	voltage divider extension of instrument range.	voltage divider extension of instrument range.	Theoretical and tutorial	Questions and discussion

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	Edward Hughes - Hughes electrical and electronic technology [electronic resource]-Pearson Education (2012).pdf Electrical technology by Hindmarch
Special requirements (include for example workshops, periodicals, IT software, websites)	1. Electrical Technology by Theraja 2. المكائن الكهربائية وتطبيقاتها للدكتور محمد زكي
Community-based facilities (include for example, guest Lectures, internship, field studies)	College library to obtain additional resources for the curriculum. Peruse the scientific websites for recent developments in the subject.

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

The course provides the possibility of identifying mechanical manufacturing processes, for example, casting processes, forming processes such as (rolling, extrusion, forging and conventional and nonconventional drawing processes, material removal processes, joining processes, powder metallurgy .....etc. As well as calculating and estimating the mechanical loads required for each process and selecting the appropriate manufacturing process for each product according to the required specifications and conditions of work environment. Diagnose the defects associated during the manufacturing process and after manufacturing appear on the final product. Study manufacturing defects from a technical and engineering point of view and trying to avoid them.

1. Teaching Institution	University of Basrah
2. University Department/Centre	Mechanical Engineering Department
3. Course title/code	Manufacturing Processes II / ME317
5. Modes of Attendance offered	Daily Attendance
6. Semester/Year	Second Semester / Third Year
7. Number of hours tuition (total)	60 hours
8. Date of production/revision of this specification	2025
9. Aims of the Course	
The course provides the possibility of identifying mechanical manufacturing processes, for example, casting processes, forming processes such as (rolling, extrusion, forging and conventional and nonconventional drawing processes, material removal processes, joining processes, powder metallurgy ..... etc. As well as calculating and estimating the mechanical loads required for each process and selecting the appropriate manufacturing process for each product according to the required specifications and conditions of work environment. Diagnose the defects associated during the manufacturing process and after manufacturing appear on the final product. Study manufacturing defects from a technical and engineering point of view and trying to avoid them.	

11. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1st	2	Special Forging processes	Metal Forming Processes	Theoretical	Questions discussion
2nd	2	Introduction to sheet metalworking processes	Metal Forming Processes	Theoretical Tutorial	Questions discussion Quiz
3rd	2	Cutting operations in sheet metalworking processes	Metal Forming Processes	Theoretical	Questions discussion
4th	2	Bending operations in sheet metalworking processes	Metal Forming Processes	Theoretical Tutorial	Questions discussion Quiz
5th	2	Deep drawing operations in sheet metalworking processes	Metal Forming Processes	Theoretical	Questions discussion
6th	2	Introduction, conventional material removal processes	Material Removal Processes	Theoretical Tutorial	Questions discussion
7th	2	Nonconventional material removal processes	Material Removal Processes	Theoretical	Questions discussion
8th	2	Engineering analysis of machining processes	Material Removal Processes	Theoretical	Questions discussion Quiz
9th	2	Characteristics, materials and products	Powder metallurgy processes	Theoretical Tutorial	Questions discussion
10th	2	Introduction to Welding processes	Joining processes	Theoretical	Questions discussion
11th	2	Types of welding processes	Joining processes	Theoretical	Questions discussion
12th	2	Defect in welding processes	Joining processes	Theoretical Tutorial	Questions discussion
13th	2	Introduction to mechanical assembly processes	Joining processes	Theoretical	Questions discussion Quiz
14th	2	Specific methods in mechanical assembly processes	Joining processes	Theoretical	Questions discussion
15th	2	Design for mechanical assembly	Joining processes	Theoretical Tutorial	Questions discussion

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	Mikell P. Groover, “Fundamentals of Modern Manufacturing: materials, processes and systems”, 5th edition, John Wiley & Sons, Inc., 2013.
Special requirements (include for example workshops, periodicals, IT software, websites)	Reputable websites. Libraries sites in international universities.
Community-based facilities (include for example, guest Lectures, internship, field studies)	

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

The course provides the possibility of solving problems and issues related to mechanical design in a scientific manner, depending on the tools and elements that represent an important part of engineering analysis.

1. Teaching Institution	University of Basrah
2. University Department/Centre	Mechanical Engineering Department
3. Course title/code	Mechanical Design I / ME411
5. Modes of Attendance offered	Daily attendance
6. Semester/Year	First Semester / Fourth year
7. Number of hours tuition (total)	60 hours
8. Date of production/revision of this specification	2025
9. Aims of the Course	
1. Be able to use technology tools (World Wide Web, PowerPoint, Excel, analysis software) to analyze, solve, and present solutions to mechanical engineering design problems	
2. Develop skills necessary to package acquired technical and professional abilities that are required to succeed in engineering design practice.	
3. Understand the mechanical engineering design elements enough to commit to a major design and create a career plan.	
4. To teach students how to apply mechanical engineering design theory to identify and quantify machine elements in the design of commonly used mechanical systems	

10· Learning Outcomes, Teaching, Learning and Assessment Method

A- Knowledge and Understanding

A1- Clarify the basic concepts in the design of machines through the design of mechanical elements and components.

A2- Acquisition of skills in dealing with engineering problems and issues.

A3 - Acquisition of basic skills as introductions to building mechanical designs.

A4- Gain a basic understanding of how mechanical systems work in various industrial applications.

B. Subject-specific skills

B1 - The ability to design applied mechanical problems.

B2 - The ability to think about solving a specific engineering problem or problem.

B3 - Writing scientific reports.

B4 - The ability to gain experience in dealing with mechanical systems.

Teaching and Learning Methods

• Readings, self-learning, panel discussions.
• Exercises and activities in the lecture.
• Homework.
• Directing students to some websites to benefit and develop capabilities.
• Conducting seminars to explain and analyze a specific issue and find solutions to it.

Assessment methods

• Interaction within the lecture.
• Homework and reports.
• Short exams (quizzes).
• Semester and final exams.

C. Thinking Skills

C1- Attention: Arousing the students' attention by implementing one of the applied programs on the display screen in the hall.

C2 - Response: Follow up the student's interaction with the material displayed on the screen.

C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to be presented.

C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1- Develop the student's ability to perform the duties and deliver them on time

D 2- Logical and sequential thinking to find engineering solutions to various problems

D3- Develop the student's ability to dialogue and discussion

D4- Develop the student's ability to deal with modern technology, especially the Internet

11. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	4	Stress types, Mohr circle	Stress analysis	Theoretical	Questions and Assignments
2	4	Principal stresses	Stress analysis	Theoretical + tutorial	Questions and Assignments
3	4	Neutral axis calculation	Curved beams	Theoretical	Questions and Assignments
4	4	Calculation of maximum stresses	Curved beams	Theoretical + tutorial	Questions and Assignments
5	4	Basic definitions	Static loading	Theoretical	Questions and Assignments
6	4	Rankine, Tresca and Von-Mises theories	Failure theories, ductile materials	Theoretical + tutorial	Questions and Assignments
7	4	Rankine, Moher and modified Mohr theories	Failure theories, brittle materials	Theoretical + tutorial	Questions and Assignments
8	4	Basic definitions	Fatigue loading	Theoretical	Questions and Assignments
9	4	Endurance limit	Fatigue test, S-N curve	Theoretical + tutorial	Questions and Assignments
10	4	Correction of endurance limit for real environmental conditions	Modification factors	Theoretical	Questions and Assignments
11	4	Calculation of safety factors	Failure theories: Goodman diagram	Theoretical + tutorial	Questions and Assignments
12	4	Basic spring types and terminology	Spring types, Basic definitions	Theoretical	Questions and Assignments
13	4	Calculation of max, shear stress	Stress analysis: max. Shear stress, spring stiffness	Theoretical + tutorial	Questions and Assignments
14	4	Use of strength properties' tables	Spring materials and strengths	Theoretical	Questions and Assignments
15	4	Estimate spring life / safety factor	Springs: dynamic loading	Theoretical + tutorial	Questions and Assignments

2. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	Shigley's mechanical engineering design
Special requirements (include for example workshops, periodicals, IT software, websites)	https://nptel.ac.in/courses/112/105/112105124/
Community-based facilities (include for example, guest Lectures, internship, field studies)	

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

This course gives students a comprehensive experience in preparing modern models and designing or developing control systems. It is also a development of theoretical capabilities in building models of control systems in theory and ways to implement them in practice. This course opens high horizons for the development of self-abilities in the introduction of artificial intelligence in the production and manufacture of systems the control.

1. Teaching Institution	University of Basrah
2. University Department/Centre	Mechanical Engineering Department
3. Course title/code	Control
5. Modes of Attendance offered	Daily Attendance
6. Semester/Year	First Semester / Fourth year
7. Number of hours tuition (total)	32 hours
8. Date of production/revision of this specification	2025
9. Aims of the Course	
The course aims to graduate cadres capable of entering the field of manufacturing, designing and maintaining control regulators for all mechanical equipment.	

10· Learning Outcomes, Teaching, Learning and Assessment Method

A- Knowledge and Understanding

A1- Basic principles for the operation of control systems.
A2- Design of control systems.
A3 - Maintenance and operation of modern biography systems.
A4- Incorporating artificial intelligence into the design of control systems.

B. Subject-specific skills

B1 - Confidence in the ability to design control systems.
B2 - Raising the level of ability to introduce advanced methods to control variables.
B3 - The work of large and small projects.
B4 - The ability to operate and rehabilitate control systems.

Teaching and Learning Methods

- Reading the relevant books in the field of the course.
- Discussion within the lesson.
- Solve some advanced issues.
- Searching websites.
- Attending scientific conferences.

Assessment methods

- Discussion within the lesson.
- Homework and reports.
- Daily tests.
- Semester and final exams.

C. Thinking Skills

C1 - Activating the participation of students.
C2- Paying attention to the student's desire to accept the lesson material.
C3 - Evaluation of the students interacting in the lesson.
C4 - Presenting practical examples that interest the students for the lesson.
C 5 - Presenting various topics to keep the recipient away from boredom and boredom.

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1- Paying attention to and evaluating duties.
D 2 - Access to a systematic and scientific method in raising topics.
D3 - Clarify the importance of benefiting from technological and informational progress.
D 4- Allocate time for discussion.

11. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	2	Introduction to control system	Examples of control systems	theoretical	Questions and discussion
2	2	Laplace transform	Using of Laplace transform in control systems	theoretical	Questions and discussion
3	2	Modeling of dynamic systems	Obtained of transfer functions	theory + solution examples	Questions and discussion and quiz
4	2	Modeling of liquid level control systems	Draw the block diagram of such systems, obtained transfer function, applications	theory + solution examples	Questions and discussion
5	2	Modeling of pneumatic control systems	Draw the block diagram of such systems, obtained transfer function, applications, PID control.	theoretical	Questions and discussion
6	2	Modeling of hydraulic control systems	Draw the block diagram of such systems, obtained transfer function, applications, PID control.	theory + solution of examples	Questions and discussion
7	2	Modeling of heat control systems	Draw the block diagram of such systems, obtained transfer function, applications	theoretical	Questions and discussion and quiz
8	2	Second order system	Determine their rise time, settling time, maximum overshoot, and peak time.	theoretical	Questions and discussion
9	2	stability	Apply Routh’s criterion	Theoretical + solution of examples	Questions and discussion
10	2	Steady state errors	Static, velocity and acceleration steady state errors	theoretical	Questions and discussion +quiz
11	2	Root locus	Conception of root locus analyses	theoretical	Questions and discussion
12	2	Root locus	Plot root locus diagram	Theoretical +solution of examples	Questions and discussion
13	2	Root locus	Application of root locus	Theoretical +solution of examples	Questions and discussion +quiz
14	2	Frequency response analyses	Advantages of using frequency response	theoretical	Questions and discussion
15	2	Bode diagram	Plotting of bode diagram	Theoretical +solution of examples	Questions and discussion +quiz

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	(Modern control engineering) By Katsuhiko Ogata+ (Principles of control systems) by S.P.Eugene Control systems engineering by Norman S. Nise Automatic control engineering by Francis H. Raven Automatic control systems by Benjamin C. Kuo Advanced control engineering by Roland S. Burns Linear control systems with MATLAB applications by B.S. Manke
Special requirements (include for example workshops, periodicals, IT software, websites)	
Community-based facilities (include for example, guest Lectures, internship, field studies)	

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

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 programme specification.

1. Teaching Institution	University of Basrah
2. University Department/Centre	Mechanical Engineering Department
3. Course title/code	Air conditioning and refrigeration-I/ME413
5. Modes of Attendance offered	Daily Attendance
6. Semester/Year	First Semester / Fourth year
7. Number of hours tuition (total)	45 hours
8. Date of production/revision of this specification	2025
9. Aims of the Course	
1. Students will learn the basic concepts and principles of air conditioning and refrigeration. 2. Students will learn the fundamental analysis methodology of air conditioning and refrigeration. 3. Students will learn the basic process and systems of air conditioning and refrigeration. 4. Students will apply the course knowledge to do a design project of HVAC system.	

11. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	3	Thermodynamics	Introduction of moist air properties	Theory and tutorial	Quiz, homework
2	3	Thermodynamics	Relative humidity, moisture content	Theory and tutorial	Quiz, homework
3	3	Thermodynamics	Air conditioning processes and psychrometric chart	Theory and tutorial	Quiz, homework
4	3	Thermodynamics, Heat transfer	Sensible and latent heat	Theory and tutorial	Quiz, homework
5	3	Thermodynamics,	Humidification and dehumidification of air	Theory and tutorial	Quiz, homework
6	3	Thermodynamics	Adiabatic mixing and adiabatic saturation	Theory and tutorial	Quiz, homework
7	3	Thermodynamics, Heat transfer	Summer air conditioning systems	Theory and tutorial	Quiz, homework
8	3	Thermodynamics, Heat transfer	Cooling load estimation	Theory and tutorial	Quiz, homework
9	3	Heat transfer	Steady state heat conduction in buildings	Theory and tutorial	Quiz, homework
10	3	Heat transfer	Unsteady state heat conduction in buildings	Theory and tutorial	Quiz, homework
11	3	Thermodynamics, Heat transfer	Cooling load items, examples and applications	Theory and tutorial	Quiz, homework
12	3	Thermodynamics, Heat transfer	Heating load estimation	Theory and tutorial	Quiz, homework
13	3	Fluid mechanics	Duct design	Theory and tutorial	Quiz, homework
14	3	Fluid mechanics	Duct Design(continue)	Theory and tutorial	Quiz, homework
15	3	Fluid mechanics	Fans selection	Theory and tutorial	Quiz, homework

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	
Special requirements (include for example workshops, periodicals, IT software, websites)	
Community-based facilities (include for example, guest Lectures, internship, field studies)	

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

The course provides the possibility of identifying the mechanical properties of engineering materials and methods of their measurement, and then identifying the types of possible failures: refraction, fatigue, and creep. Transition to know the differe The course provides the possibility of identifying engineering materials, their classifications, characteristics of each type and their advantages, in addition to the applications, and then identifying ferrous materials, non-ferrous materials, ceramic materials, polymers, and finally composite materials.

1. Teaching Institution	University of Basrah
2. University Department/Centre	Mechanical engineering department
3. Course title/code	Engineering Materials / ME414
5. Modes of Attendance offered	Daily Attendance
6. Semester/Year	First semester / Fourth stage
7. Number of hours tuition (total)	60 hours
8. Date of production/revision of this specification	2025
9. Aims of the Course	
This course is designed for students interested in building technical knowledge and expertise in the principles that govern: 1. Classifications of engineering materials 2. Iron materials, specifications and characteristics 3- Non-ferrous materials, properties and applications 4. Ceramic materials, classification, specifications and applications 5. Polymers 6. Composite materials, their manufacture methods and applications	

10· Learning Outcomes, Teaching, Learning and Assessment Method
A1- Clarify the basic concepts of engineering materials and their classifications A2- Acquisition of skills in knowledge of different engineering subjects. A3- Acquisition of basic skills as an introduction to the selection of materials for various engineering applications A4- Gaining a basic understanding of the importance of engineering materials in the field of applications and taking into account specifications and costs.
B. Subject-specific skills B1 - The ability to know the classifications of engineering materials. B 2 - the ability to think about choosing the appropriate materials for engineering applications. B3 - Writing scientific reports. B4 - The ability to gain experience in dealing with changes that occur to engineering materials as a result of different operating conditions.
Teaching and Learning Methods
• Readings, self-learning, panel discussions. • Exercises and activities in the lecture. • Homework. • Directing students to some websites to benefit and develop capabilities. • Conducting seminars to explain and analyze a specific issue and find solutions to it.
Assessment methods
• Interaction within the lecture. • Homework and reports. • Short exams. • Semester and final exams.
C. Thinking Skills C1. Attention: Arousing the students' attention by implementing one of the applied programs on the display screen in the hall. C2 - Response: Follow up the student's interaction with the material displayed on the screen. C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to be presented. C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.
D. General and Transferable Skills (other skills relevant to employability and personal development) D1. Develop the student’s ability to perform the duties and deliver them on time D 2- Logical and programmatic thinking to find software solutions to various problems D 3- Develop the student's ability to dialogue and discussion D4 - Develop the student's ability to deal with modern technology, especially the Internet

11. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
First	2	•Nomenclature of Ferrous Alloys •Low Carbon steel •Medium Carbon Steel	ferrous materials	theoretical	Questions and discussion
Second	2	•High Carbon Steel •Stainless—Steels •Effects of Alloying Elements on Steel	ferrous materials	theoretical	Questions and discussion
Third	2	•Cast Irons •SIMPLE HEAT TREATMENTS •Heat Treatment of Steels for Strength	ferrous materials	theoretical	Questions and discussion
Fourth	2	•Light Metals •Heavy Metals	non-ferrous materials	theoretical	Questions and discussion
Fifth	2	•Refractory Metal	non-ferrous materials	theoretical	Questions and discussion
Sixth	2	•Precious Metals •Precipitation Hardening	non-ferrous materials	theoretical	Questions and discussion
Seventh	2	•SPECTRUM OF CERAMICS USES •CERAMIC CRYSTAL STRUCTURES	ceramics	theoretical	Questions and discussion
Eighth	2	•PROPERTIES OF CERAMICS •Traditional Ceramics	ceramics	theoretical	Questions and discussion
Ninth	2	•Advanced Ceramics •Mechanical Properties •STRESS–STRAIN BEHAVIOR (Flexural Strength)	ceramics	theoretical	Questions and discussion
Tenth	2	•Classification of polymers •Synthetic Polymers •Polyimides	Polymers	theoretical	Questions and discussion
Eleventh	2	•Polyvinyl Chloride (PVC) •Epoxies •Polyethylene •Acetals	Polymers	theoretical	Questions and discussion
Twelfth	2	•Mechanical Properties •Viscoelasticity •Viscoelastic Creep	Polymers	theoretical	Questions and discussion
Thirteenth	2	•Classification according to type of reinforcement and matrix •Type of constituents	composite materials	theoretical	Questions and discussion
Fourteenth	2	•Particle reinforced composite materials •Rule of mixtures •Fiber reinforced composite materials	composite materials	theoretical	Questions and discussion
Fifteenth	2	•Types of fibers •Structural composite materials	composite materials	theoretical	Questions and discussion

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	
Special requirements (include for example workshops, periodicals, IT software, websites)	1- Materials Science and Engineering: An Introduction, 10th Edition, William D. Callister Jr., January 2018. 2- Selection and Use of Engineering Materials by J. A. Charles, F. A. A. Crane, and J. A. G. Furness, Third Edition 2001. 3- The Science and Engineering of Materials by D. R. Askeland, and P. Phule Fourth Edition 2003.
Community-based facilities (include for example, guest Lectures, internship, field studies)	Reputable websites. Libraries sites in some international universities.

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

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 programme specification.

1. Teaching Institution	University of Basrah
2. University Department/Centre	Mechanical Engineering Department
3. Course title/code	Theory of Vibration / ME415
5. Modes of Attendance offered	Daily Attendance
6. Semester/Year	First Semester / Fourth year
7. Number of hours tuition (total)	45 hours
8. Date of production/revision of this specification	2025
9. Aims of the Course	
Clarify the basic concepts. Acquisition of skills in dealing with engineering problems and issues related to vibrations. Acquiring basic skills as an introduction to understanding the principles of vibration. Gain a basic understanding of how vibrations occur in various industrial applications.	

10· Learning Outcomes, Teaching, Learning and Assessment Method

A- Knowledge and Understanding

A1. Clarify the basic concepts.

A2. Acquisition of skills in dealing with engineering problems and issues related to vibrations.

A3. Acquiring basic skills as an introduction to understanding the principles of vibration.

A4. Gain a basic understanding of how vibrations occur in various industrial applications.

B. Subject-specific skills

B1. The ability to solve various engineering problems.

B2. The ability to think about a specific problem or issue.

B3. Writing scientific reports.

B4. The ability to gain experience in dealing with vibration issues.

Teaching and Learning Methods

• Readings, self-learning, panel discussions.
• Exercises and activities in the lecture.
• Homework.
• Directing students to some websites to benefit and develop capabilities.
• Conducting seminars to explain and analyze a specific issue and find solutions to it.

Assessment methods

• Interaction within the lecture.
• Homework and reports.
•Short exams (Quiz).
•Semester and final exams.

C. Thinking Skills

C1 - Activating the participation of students.

C2- Paying attention to the student's desire to accept the lesson material.

C3 - Evaluation of the students interacting in the lesson.

C4 - Presenting practical examples that interest the students for the lesson.

C 5 - Presenting various topics to keep the recipient away from boredom and boredom.

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1- Paying attention to and evaluating duties.

D 2 - Access to a systematic and scientific method in raising topics.

D3 - Clarify the importance of benefiting from technological and informational progress.

D 4- Allocate time for discussion.

11. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
first	3	Introduction, why study vibration, course strategy	introduction	Theoretical	Questions and discussion
second	3	Degree of freedom	Vibration classification	Theoretical & tutorial	Questions and discussion
Third	3	Simple harmonic motion	Vibration classification	Theoretical	Questions and discussion
Forth	3	Free vibration forced, damped, undamped ,… etc	Vibration classification	Theoretical & tutorial	Questions and discussion
Fifth	3	Introduction, newton method, motion equation frequency	Free vibration	Theoretical	Questions and discussion
Six	3	Energy method	Free vibration	Theoretical & tutorial	Questions and discussion
Seven	3	Virtual work	Free vibration	Theoretical	Questions and discussion
Eight	3	Damped vibration, logarithmic	Free vibration	Theoretical & tutorial	Questions and discussion
Nine	3	Harmonically excited vibration	Forced vibration	Theoretical	Questions and discussion
Ten	3	Response under irregular periodic force	Forced vibration	Theoretical & tutorial	Questions and discussion
Eleven	3	Response under non-periodic force	Forced vibration	Theoretical	Questions and discussion
Twelve	3	Derivation of Equation of Motion.	Multi Degrees of Freedom	Theoretical	Questions and discussion
Thirteen	3	Influence coefficients	Multi Degrees of Freedom	Theoretical & tutorial	Questions and discussion
Fourteen	3	Lagrange's Equation	Multi Degrees of Freedom	Theoretical	Questions and discussion
Fifteen	3	Eigen Value Problem	Multi Degrees of Freedom	Theoretical & tutorial	Questions and discussion

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	1. Theory of Vibration with Application, William T. Thomson. 2. Mechanics of Machines Elementary Theory and Examples, J. H. Hannah and R. C. Stephens.
Special requirements (include for example workshops, periodicals, IT software, websites)	
Community-based facilities (include for example, guest Lectures, internship, field studies)	

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

This course gives students a comprehensive experience about power plants of their traditional and non-traditional types, by identifying their method of operation, design, types of components, and the philosophy of their use, based on the scientific background gained largely from the subject of thermodynamics and heat transfer.

1. Teaching Institution	University of Basrah
2. University Department/Centre	Mechanical Engineering Department
3. Course title/code	Power Plant I / ME416
5. Modes of Attendance offered	Daily Attendance
6. Semester/Year	First Semester / Fourth year
7. Number of hours tuition (total)	45 hours
8. Date of production/revision of this specification	2025
9. Aims of the Course	
The course aims to graduate cadres capable of entering the field of electric power stations, whether design or operation.	

10· Learning Outcomes, Teaching, Learning and Assessment Method

A- Knowledge and Understanding

A1- Basic principles for the operation of power plant.
A2- Design of power plant.
A3- Identify the types of power stations.
A4- Identifying the modern types of power stations and ways to develop them.

B. Subject-specific skills

B1 - Confidence in the ability to design power plant.
B2 - Raising the level of ability to introduce advanced methods to power plant.
B3 - The work of large and small projects.
B4 - The ability to operate and rehabilitate power plant.

Teaching and Learning Methods

- Reading the relevant books in the field of the course.
- Discussion within the lesson.
- Solve some advanced issues.
- Searching websites.
- Attending scientific conferences.

Assessment methods

- Discussion within the lesson.
- Homework and reports.
- Daily tests.
- Semester and final exams.

C. Thinking Skills

C1 - Activating the participation of students.
C2- Paying attention to the student's desire to accept the lesson material.
C3 - Evaluation of the students interacting in the lesson.
C4 - Presenting practical examples that interest the students for the lesson.
C 5 - Presenting various topics to keep the recipient away from boredom and boredom.

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1- Paying attention to and evaluating duties.
D 2 - Access to a systematic and scientific method in raising topics.
D3 - Clarify the importance of benefiting from technological and informational progress.
D 4- Allocate time for discussion.

11. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	3	Introduction	Introduce the power plant	theoretical	Questions and discussion
2	3	Types of power plant.	Explain the types of power plant.	theoretical	Questions and discussion
3	3	Classification of Power Plants	Classification of Power Plants	theory + solution examples	Questions and discussion and quiz
4	3	Fuel Cell Basics	Fuel Cell Basics	theory + solution examples	Questions and discussion
5	3	Photovoltaic Cells	Photovoltaic Cells	theoretical	Questions and discussion
6	3	Other types for Power plants	Other types for Power plants.	theory + solution of examples	Questions and discussion
7	3	History of power plant in Iraq	History of power plant in Iraq	theoretical	Questions and discussion and quiz
8	3	Gas Turbine	Introduce the components of gas stations, their applications, classifications, and advantages	theoretical	Questions and discussion
9	3	Analysis of Gas Turbine	Analysis of Gas Turbine	Theoretical + solution of examples	Questions and discussion
10	3	Actual calculation in Gas Turbine	Actual calculation in Gas Turbine	theoretical	Questions and discussion +quiz
11	3	Enhance the Gas Turbine efficiency	Methods to Enhance the Gas Turbine efficiency	theoretical	Questions and discussion
12	3	Steam Turbine	Introduce the components of steam stations, their applications, classifications, and advantages	Theoretical +solution of examples	Questions and discussion
13	3	Steam Turbine cycles	Introduce the Steam Turbine cycles	Theoretical +solution of examples	Questions and discussion +quiz
14	3	Enhance the steam Turbine efficiency	Enhance the steam Turbine efficiency	theoretical	Questions and discussion
15	3	Solve some examples	Solve some examples	Theoretical +solution of examples	Questions and discussion +quiz

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS	Applied Thermodynamics by Onkar Singh Applied-thermodynamics-and-engineering-fifth-edition-by-Eastop-and-A-Mcconkey
Special requirements (include for example workshops, periodicals, IT software, websites)	Power Plant by Raja A text book of Power Plant Engineering By Raja
Community-based facilities (include for example, guest Lectures, internship, field studies)	

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

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 programme specification.

1. Teaching Institution	University of Basrah
2. University Department/Centre	Mechanical Engineering Department
3. Course title/code	Industrial Engineering / ME 417
4. Modes of Attendance offered	Daily Attendance
5. Semester/Year	First Semester / Fourth Year
6. Number of hours tuition (total)	30 hours
7. Date of production/revision of this specification	2025
8. Aims of the Course	
The course aims to learn the basics of industrial engineering and its role in managing factories, laboratories and projects, while developing students' abilities to rely on international standards to achieve the best performance.	

9· Learning Outcomes, Teaching, Learning and Assessment Method

A- Knowledge and Understanding

A1- Clarify the basic concepts in industrial engineering.
A2- Acquisition of skills in dealing with industrial problems.
A3- Acquisition of basic skills in relying on international standards.
A4- Gain a basic understanding of how programmed systems work in various industrial applications.

B. Subject-specific skills

B1 - The ability to solve industrial problems.
B2 - The ability to think about addressing a particular problem or issue.
B3 - Writing scientific reports.
B4 - The ability to gain experience in dealing with priority methods.

Teaching and Learning Methods

- Readings, self-learning, panel discussions.
- Exercises and activities in the lecture.
- Homework.
- Directing students to some websites to benefit and develop capabilities.
- Conducting seminars to explain and analyze a specific issue and find solutions to it.

Assessment methods

- Interaction within the lecture.
- Homework and reports.
- Short exams (Quiz).
- Semester and final exams.

C. Thinking Skills

C1- Attention: Arousing the students' attention by implementing one of the applied programs on the display screen in the hall.
C2 - Response: Follow up the student's interaction with the material displayed on the screen.
C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to be presented.
C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1- Develop the student’s ability to perform the duties and deliver them on time
D 2- Logical and programmatic thinking to find industrial solutions to various problems
D 3- Develop the student's ability to dialogue and discussion
D4 - Develop the student's ability to deal with modern technology, especially the Internet

10. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	2		Introduction	Define Industrial engineering and its fields of application	Questions and Assignments
2	2		Operation research	2.1 Introduction to Game Theory	Questions and Assignments
3	2		Maintenance Engineering	2.2 Properties of a Game	Questions, Assignments and Quiz
4	2		Fundamentals of Control: INVENTORY MANAGEMENT AND CONTROL	2.3 Characteristics of Game Theory	Questions and Assignments
5	2		Fundamentals of Control: INVENTORY MANAGEMENT AND CONTROL	2.4 Classification of Games	Questions, Assignments and Quiz
6	2		Break Even Analysis	2.5 Limitations of Game Theory	Questions and Assignments
7	2		Sequencing	2.5 Solving Two-Person and Zero-Sum Game	Questions, Assignments and Quiz
8	2		Introduction to Transportation Problem	Replacement	Questions and Assignments
9	2		Introduction to Transportation Problem	Replacement of items that Deteriorates with time	Questions, Assignments and Quiz
10	2		Assignment Problem	Present with factor	Questions and Assignments
11	2		Assignment Problem	Replacement of items that fail completely	Questions, Assignments and Quiz
12	2		Games with Mixed Strategies	Objectives of Inventory Management	Questions and Assignments
14	2		Introduction to Linear Programming	Requirements for Effective Inventory Management	Questions, Assignments and Quiz
15	2		Introduction to Linear Programming	Inventory Counting Systems	Questions and Assignments

11. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	
Special requirements (include for example workshops, periodicals, IT software, websites)	
Community-based facilities (include for example, guest Lectures, internship, field studies)	

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

The course provides the possibility of solving problems and issues related to mechanical design in a scientific manner, depending on the tools and elements that represent an important part of engineering analysis.

1. Teaching Institution	Basrah University
2. University Department/Centre	Mechanical Engineering Department
3. Course title/code	MeE432 Mechanical Design II
5. Modes of Attendance offered	Daily attendance
6. Semester/Year	First course/ fourth year
7. Number of hours tuition (total)	60 hours
8. Date of production/revision of this specification	2025
9. Aims of the Course	
1. Be able to use technology tools (World Wide Web, PowerPoint, Excel, analysis software) to analyze, solve, and present solutions to mechanical engineering design problems	
2. Develop skills necessary to package acquired technical and professional abilities that are required to succeed in engineering design practice.	
3. Understand the mechanical engineering design elements enough to commit to a major designs and create an career plan.	
4. To teach students how to apply mechanical engineering design theory to identify and quantify machine elements in the design of commonly used mechanical systems	

10· Learning Outcomes, Teaching, Learning and Assessment Method
A- Knowledge and Understanding A1- Clarify the basic concepts in the design of machines through the design of mechanical elements and components. A2- Acquisition of skills in dealing with engineering problems and issues.

A3 - Acquisition of basic skills as introductions to building mechanical designs.

A4- Gain a basic understanding of how mechanical systems work in various industrial applications.

B. Subject-specific skills

B1 - The ability to design applied mechanical problems.

B2 - The ability to think about solving a specific engineering problem or problem.

B3 - Writing scientific reports.

B4 - The ability to gain experience in dealing with mechanical systems.

Teaching and Learning Methods

- Readings, self-learning, panel discussions.
- Exercises and activities in the lecture.
- Homework.
- Directing students to some websites to benefit and develop capabilities.
- Conducting seminars to explain and analyze a specific issue and find solutions to it.

Assessment methods

- Interaction within the lecture.
- Homework and reports.
- Short exams (quizes).
- Semester and final exams.

C. Thinking Skills

C1- Attention: Arousing the students' attention by implementing one of the applied programs on the display screen in the hall.

C2 - Response: Follow up the student's interaction with the material displayed on the screen.

C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to be presented.

C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1- Develop the student's ability to perform the duties and deliver them on time

D 2- Logical and sequential thinking to find engineering solutions to various problems

D 3- Develop the student's ability to dialogue and discussion

D4 - Develop the student's ability to deal with modern technology, especially the Internet

11. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	4	screw types, fasteners types	Introduction to screws and fasteners	Theoretical	Questions and Assignments
2	4	Efficiency of power screws	Power screws	Theoretical + tutorial	Questions and Assignments
3	4	Load ratio between bolt and members	Bolted joints in tension	Theoretical + tutorial	Questions and Assignments
4	4	Calculation of load carried by each bolt	Bolted joints in shear eccentric	Theoretical + tutorial	Questions and Assignments
5	4	Load safety factor and separation safety factor	Dynamic loading in tensile joints	Theoretical + tutorial	Questions and Assignments
6	4	Welding codes and types	Introduction to welding	Theoretical	Questions and Assignments
7	4	Stress analysis: calculation of max. shear stress	Welding, joint analysis in shear stress	Theoretical	Questions and Assignments
8	4	Stress analysis: calculation of bending stress	Welding, joint analysis in bending stress	Theoretical	Questions and Assignments
9	4	Gear types, definitions	Introduction to gears	Theoretical + tutorial	Questions and Assignments
10	4	Involute drawing, properties	Conjugate action, involute properties	Theoretical	Questions and Assignments
11	4	Gears interaction, definition of gear train	Contact ratios, gear teeth forming, gear trains	Theoretical	Questions and Assignments
12	4	Calculation of tangential force component	Force analysis, spur gear/helical gear	Theoretical	Questions and Assignments
13	4	Calculation of stress using AGMA equation	Stress analysis, spur/helical gears	Theoretical + tutorial	Questions and Assignments
14	4	Rolling bearing types	Types of rolling contact bearing, bearing life	Theoretical	Questions and Assignments
15	4	Estimate equation for No. Of cycles (life), usage of selection tables	Rating life, selection of bearing	Theoretical + tutorial	Questions and Assignments

2. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	Shigley's mechanical engineering design
Special requirements (include for example workshops, periodicals, IT software, websites)	https://nptel.ac.in/courses/112/105/112105124/
Community-based facilities (include for example, guest Lectures, internship, field studies)	

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

This course gives students a comprehensive experience in preparing modern models and designing or developing control systems. It is also a development of theoretical capabilities in building models of control systems in theory and ways to implement them in practice. This course opens high horizons for the development of self-abilities in the introduction of artificial intelligence in the production and manufacture of systems the control.

1. Teaching Institution	University of Basrah
2. University Department/Centre	Dept. of Mechanical Engineering
3. Course title/code	control
4. Program to which it contributes	
5. Modes of Attendance offered	daily
6. Semester/Year	1st Semester/fourth year
7. Number of hours tuition (total)	32
8. Date of production/revision of this specification	2025
9. Aims of the Course	
The course aims to graduate cadres capable of entering the field of manufacturing, designing and maintaining control regulators for all mechanical equipment.	

10· Learning Outcomes, Teaching, Learning and Assessment Method
A- Knowledge and Understanding A1- Basic principles for the operation of control systems. A2- Design of control systems. A3 - Maintenance and operation of modern biography systems. A4- Incorporating artificial intelligence into the design of control systems.
B. Subject-specific skills B1 - Confidence in the ability to design control systems. B2 - Raising the level of ability to introduce advanced methods to control variables. B3 - The work of large and small projects.

B4 - The ability to operate and rehabilitate control systems.

Teaching and Learning Methods

• Reading the relevant books in the field of the course.
• Discussion within the lesson.
• Solve some advanced issues.
• Searching websites.
• Attending scientific conferences.

Assessment methods

• Discussion within the lesson.
• Homework and reports.
• Daily tests.
• Semester and final exams.

C. Thinking Skills

C1 - Activating the participation of students.
C2- Paying attention to the student's desire to accept the lesson material.
C3 - Evaluation of the students interacting in the lesson.
C4 - Presenting practical examples that interest the students for the lesson.
C 5 - Presenting various topics to keep the recipient away from boredom and boredom.

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1- Paying attention to and evaluating duties.
D 2 - Access to a systematic and scientific method in raising topics.
D3 - Clarify the importance of benefiting from technological and informational progress.
D 4- Allocate time for discussion.

11. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	2	Introduction to control system	Examples of control systems	theoretical	Questions and discussion
2	2	Laplace transform	Using of Laplace transform in control systems	theoretical	Questions and discussion
3	2	Modeling of dynamic systems	Obtained of transfer functions	theory + solution examples	Questions and discussion and quiz
4	2	Modeling of liquid level control systems	Draw the block diagram of such systems, obtained transfer function, applications	theory + solution examples	Questions and discussion
5	2	Modeling of pneumatic control systems	Draw the block diagram of such systems, obtained transfer function, applications, PID control.	theoretical	Questions and discussion

6	2	Modeling of hydraulic control systems	Draw the block diagram of such systems, obtained transfer function, applications, PID control.	theory + solution of examples	Questions and discussion
7	2	Modeling of heat control systems	Draw the block diagram of such systems, obtained transfer function, applications	theoretical	Questions and discussion and quiz
8	2	Second order system	Determine their rise time, settling time, maximum overshoot, and peak time.	theoretical	Questions and discussion
9	2	stability	Apply Routh's criterion	Theoretical + solution of examples	Questions and discussion
10	2	Steady state errors	Static, velocity and acceleration steady state errors	theoretical	Questions and discussion +quiz
11	2	Root locus	Conception of root locus analyses	theoretical	Questions and discussion
12	2	Root locus	Plot root locus diagram	Theoretical +solution of examples	Questions and discussion
13	2	Root locus	Application of root locus	Theoretical +solution of examples	Questions and discussion +quiz
14	2	Frequency response analyses	Advantages of using frequency response	theoretical	Questions and discussion
15	2	Bode diagram	Plotting of bode diagram	Theoretical +solution of examples	Questions and discussion +quiz

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	(Modern control engineering) By Katsuhiko Ogata+ (Principles of control systems) by S.P.Eugene + Control systems engineering by Norman S. Nise +Automatic control engineering by Francis H. Raven +Automatic control systems by Benjamin C. Kuo Advanced control engineering by Roland S. Burns + Linear control systems with MATLAB applications by B.S. Manke
Special requirements (include for example workshops, periodicals, IT software, websites)	
Community-based facilities (include for example, guest Lectures, internship, field studies)	

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

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 programme specification.

1. Teaching Institution	University of Basrah
2. University Department/Centre	Engineering college -mechanical engineering department
3. Course title/code	Air conditioning and refrigeration-II
4. Modes of Attendance offered	Daily Attendance
5. Semester/Year	second Semester /4th year
6. Number of hours tuition (total)	45 hours
7. Date of production/revision of this specification	2025
8. Aims of the Course	
1. Students will learn the basic concepts and principles of air conditioning and refrigeration. 2. Students will learn the fundamental analysis methodology of air conditioning and refrigeration. 3. Students will learn the basic process and systems of air conditioning and refrigeration. 4. Students will apply the course knowledge to do a design project of HVAC system.	
10· Learning Outcomes, Teaching, Learning and Assessment Method	
A- Cognitive goals A1- Clarify the basic concepts of the air conditioning process. A2- Acquiring skills in dealing with problems and issues specific to the design of air conditioning systems. A3- Acquire basic skills in cooling and checking load calculations. A4- Gain a basic understanding of how to design an integrated project for air conditioning works.	

B - Skills objectives of the course.

B1 - The ability to study the thermal performance of buildings of all kinds.
B2 - The ability to think about addressing a specific problem or issue related to the design of air conditioning systems.
B3 - Writing scientific reports on air conditioning devices and their technical performance.
B4 - The ability to gain experience in dealing with various air conditioning systems.

Teaching and Learning Methods

- Readings, self-learning, panel discussions.
- Exercises and activities in the lecture.
- Homework.
- Directing students to some websites to benefit and develop capabilities.
- Conducting seminars to explain and analyze a specific issue and find solutions to it.

Assessment methods

- Interaction within the lecture.
- Homework and reports.
- Short exams (Quiz).
- Semester and final exams.

C- Emotional and value goals.

C1- Attention: Arousing the students' attention by implementing one of the applied programs on the display screen in the hall.
C2 - Response: Follow up the student's interaction with the material displayed on the screen.
C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to be presented.
C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.

D - Transferred general and qualifying skills (other skills related to employability and personal development).

D1- Develop the student’s ability to perform the duties and deliver them on time
D 2- Logical thinking to find solutions to various problems
D 3- Develop the student's ability to dialogue and discussion
D4 - Develop the student's ability to deal with modern technology, especially the Internet

9. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	3	Fluid mechanics	System of air conditioning	Theory and tutorial	Quiz, homework
2	3	Fluid mechanics	Pipe system design	Theory and tutorial	Quiz, homework
3	3	Fluid mechanics	Piping Network	Theory and tutorial	Quiz, homework
4	3	Thermodynamics, Heat transfer	Chillers	Theory and tutorial	Quiz, homework
5	3	Fluid mechanics	Pumps	Theory and tutorial	Quiz, homework
6	3	Thermodynamics	Refrigeration	Theory and tutorial	Quiz, homework
7	3	Thermodynamics	Vapor compression refrigeration system	Theory and tutorial	Quiz, homework
8	3	Thermodynamics	Carnot refrigeration cycle	Theory and tutorial	Quiz, homework
9	3	Thermodynamics	Ideal refrigeration cycle	Theory and tutorial	Quiz, homework
10	3	Thermodynamics	Real vapor compression refrigeration cycle	Theory and tutorial	Quiz, homework
11	3	Thermodynamics, Heat transfer	Absorption refrigeration system	Theory and tutorial	Quiz, homework
12	3	Thermodynamics, Heat transfer	Steam jet refrigeration	Theory and tutorial	Quiz, homework
13	3	Thermodynamics, Heat transfer	Air cycle refrigeration	Theory and tutorial	Quiz, homework
14	3	Thermodynamics, Heat transfer	Cold storages	Theory and tutorial	Quiz, homework
15	3	Fluid mechanics, Heat transfer	Automatic control	Theory and tutorial	Quiz, homework

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	
Special requirements (include for example workshops, periodicals, IT software, websites)	
Community-based facilities (include for example, guest Lectures, internship, field studies)	

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

The course provides the possibility of identifying the mechanical properties of engineering materials and methods of their measurement, and then identifying the types of possible failures: refraction, fatigue, and creep. Transition to know the different types of corrosion and mechanical wear and know their types and ways to prevent them.

1. Teaching Institution	University of Basrah
2. University Department/Centre	Mechanical engineering department
3. Course title/code	Failure of Engineering Materials Code: ME424
5. Modes of Attendance offered	daily work
6. Semester/Year	The second semester / fourth stage
7. Number of hours tuition (total)	60 hours
8. Date of production/revision of this specification	2025
9. Aims of the Course	
This course is designed for students interested in building knowledge and technical expertise in the principles governing: 1. Mechanical Properties of materials 2. diagnosis of cause(s) and mechanisms of failure. 3.experimental techniques for characterizing fractures. 4. The course covers the fundamental types of fracture and their characteristic features, fracture modes. 5. Understanding of the mechanisms of fracture such as fatigue, corrosion fatigue, thermal fatigue, creep, Wear and corrosion will also be covered. 6. The philosophy of performing failure analysis and steps involved in failure analysis investigations will be covered. 7. Case studies on documented engineering failures and failure analysis reports will be discussed.	

10· Learning Outcomes, Teaching, Learning and Assessment Method

A- Knowledge and Understanding

A1. Clarify the basic concepts of mechanical properties and methods of measuring these properties.

A 2- Acquisition of skills in dealing with various failures.

A3- Acquisition of basic skills as an introduction to preparing designs and selecting appropriate materials for different uses.

A4- Gain a basic understanding of how the various corrosion mechanisms work and ways to prevent them.

B. Subject-specific skills

B1. the ability to calculate the mechanical properties of engineering materials.

B 2 - the ability to think about the treatment of various failure problems.

B3 - Writing scientific reports.

B4 - The ability to gain experience in dealing with corrosion protection systems.

Teaching and Learning Methods

• Readings, self-learning, panel discussions.
• Exercises and activities in the lecture.
• Homework.
• Directing students to some websites to benefit and develop capabilities.
• Conducting seminars to explain and analyze a specific issue and find solutions to it.

Assessment methods

• Interaction within the lecture.
• Homework and reports.
• Short exams.
• Semester and final exams.

C. Thinking Skills

C1. Attention: Arousing the students' attention by implementing one of the applied programs on the display screen in the hall.

C2 - Response: Follow up the student's interaction with the material displayed on the screen.

C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to be presented.

C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1. Develop the student’s ability to perform the duties and deliver them on time

D 2- Logical and programmatic thinking to find software solutions to various problems

D 3- Develop the student's ability to dialogue and discussion

D4 - Develop the student's ability to deal with modern technology, especially the Internet

11. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	2	Elastic Deformation, Stress-Strain Behavior,	Mechanical Properties	theoretical	Questions and discussion
2	2	Elastic Properties of Materials, Plastic Deformation,	Mechanical Properties	theoretical	Questions and discussion
3	2	Tensile Properties, True Stress and Strain, Hardness.	Mechanical Properties	theoretical	Questions and discussion
4	2	Fundamentals of Fracture, Ductile Fracture	Fracture	theoretical	Questions and discussion
5	2	Brittle Fracture, Principles of Fracture Mechanics	Fracture	theoretical	Questions and discussion
6	2	Impact Fracture Testing	Fracture	theoretical	Questions and discussion
7	2	Cyclic Stresses, the S–N Curve	Fatigue	theoretical	Questions and discussion
8	2	Crack Initiation and Propagation, Factors That Affect Fatigue Life	Fatigue	theoretical	Questions and discussion
9	2	Environmental Effects	Fatigue	theoretical	Questions and discussion
10	2	Generalized Creep Behavior, Stress and Temperature Effects	Creep	theoretical	Questions and discussion
11	2	Data Extrapolation Methods (Larson- Miller Methods)	Creep	theoretical	Questions and discussion
12	2	Alloys for High-Temperature Use	Creep	theoretical	Questions and discussion
13	2	Electrochemical Considerations, Forms of Corrosion	Corrosion and Wear	theoretical	Questions and discussion
14	2	Corrosion Prevention	Corrosion and Wear	theoretical	Questions and discussion
15	2	Wear and Erosion	Corrosion and Wear	theoretical	Questions and discussion

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	
Special requirements (include for example workshops, periodicals, IT software, websites)	1- Materials Science and Engineering, William D. Callister, Ninth Edition, 2018. The Science and Engineering of Materials by D. R. Askeland, and P. Phule Fifth Edition 2017.
Community-based facilities (include for example, guest Lectures, internship, field studies)	Reputable websites. Libraries sites in some international universities.

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

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 programme specification.

1. Teaching Institution	University of Basrah
2. University Department/Centre	Dept. of Mechanical Engineering
3. Course title/code	Application of Vibration
5. Modes of Attendance offered	daily
6. Semester/Year	2nd Semester/fourth year
7. Number of hours tuition (total)	90
8. Date of production/revision of this specification	2025
9. Aims of the Course	
Clarify the basic concepts. 1. Preparing and qualifying specialized specialists for the requirements of the labor market in the private and public sectors in mechanical engineering through diversification in the methods of learning and teaching and training students to apply the acquired knowledge and skills in mathematics. 2. Providing distinguished academic programs in the theoretical and practical fields of mechanical engineering and international quality rules that meet the needs of the labor market. 3. The emergence of scientific research in the field of mechanical engineering, vibrations in general, the principles of vibration theory, and how vibrations are generated in parts in particular. 4. Preparing a stimulating environment for faculty members to develop their knowledge and educational skills. 5. Building development and government social affairs, and, and, and society in all different institutions.	

10· Learning Outcomes, Teaching, Learning and Assessment Method
A- Knowledge and Understanding A1. Clarify the basic concepts. A2. Acquisition of skills in dealing with engineering problems and issues related to vibrations. A3. Acquiring basic skills as an introduction to understanding the application of vibration. A4. Gain a basic understanding of how vibrations occur in various industrial applications.
B. Subject-specific skills B1. The ability to solve various engineering problems. B2. The ability to think about a specific problem or issue. B3. Writing scientific reports. B4. The ability to gain experience in dealing with vibration issues.
Teaching and Learning Methods
• Readings, self-learning, panel discussions. • Exercises and activities in the lecture. • Homework. • Directing students to some websites to benefit and develop capabilities. • Conducting seminars to explain and analyze a specific issue and find solutions to it.
Assessment methods
• Interaction within the lecture. • Homework and reports. •Short exams (Quiz). •Semester and final exams.
C. Thinking Skills C1 - Activating the participation of students. C2- Paying attention to the student's desire to accept the lesson material. C3 - Evaluation of the students interacting in the lesson. C4 - Presenting practical examples that interest the students for the lesson. C 5 - Presenting various topics to keep the recipient away from boredom and boredom.
D. General and Transferable Skills (other skills relevant to employability and personal development) D1- Paying attention to and evaluating duties. D 2 - Access to a systematic and scientific method in raising topics. D3 - Clarify the importance of benefiting from technological and informational progress. D 4- Allocate time for discussion.

11. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
first	3	Conservative Lagrange Equation	Advanced in Vibration Analysis	Theoretical	Questions and discussion
second	3	Non- Conservative Lagrange Equation	Advanced in Vibration Analysis	Theoretical & tutorial	Questions and discussion
Third	3	Elasticity Matrix	Properties of Vibration Systems	Theoretical	Questions and discussion
Forth	3	Stiffness Matrix and mass matrix	Properties of Vibration Systems	Theoretical & tutorial	Questions and discussion
Fifth	3	Rayleigh Method	Approximate Numerical Methods	Theoretical	Questions and discussion
Six	3	Dunkerley's Formula	Approximate Numerical Methods	Theoretical & tutorial	Questions and discussion
Seven	3	Holzer method	Approximate Numerical Methods	Theoretical	Questions and discussion
Eight	3	Transverse Vibration of String. logarithmic	Continuous Systems	Theoretical & tutorial	Questions and discussion
Nine	3	Longitudinal Vibrations of rod	Continuous Systems	Theoretical	Questions and discussion
Ten	3	Torsional Vibrations of Shafts and Rods	Continuous Systems	Theoretical & tutorial	Questions and discussion
Eleven	3	Vibration Pickups	Vibration Measurements	Theoretical	Questions and discussion
Twelve	3	Vibration Exciters	Multi Degrees of Freedom	Theoretical	Questions and discussion
Thirteen	3	Signal Analysis	Multi Degrees of Freedom	Theoretical & tutorial	Questions and discussion
Fourteen	3	Faults Identified by Vibration	Machines, Maintenance and Monitoring	Theoretical	Questions and discussion
Fifteen	3	Faults Identified by Vibration	Machines, Maintenance and Monitoring	Theoretical & tutorial	Questions and discussion

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	1. Theory of Vibration with Application, William T. Thomson. 2. Mechanics of Machines Elementary Theory and Examples, J. H. Hannah and R. C. Stephens.
Special requirements (include for example workshops, periodicals, IT software, websites)	
Community-based facilities (include for example, guest Lectures, internship, field studies)	

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

This course gives students a comprehensive experience about power stations, in particular steam stations, their components, and ways to increase their efficiency. It also introduce hydroelectric stations by identifying their method of operation, design, types of components and the philosophy of their use. This course opens high horizons for the development of self-capacity in the use of alternative and environmentally friendly energies. On the lab, the student will learn about the components of a steam station operating by oil, and the student will do some experiments to calculate the efficiency of the station.

1. Teaching Institution	University of Basrah
2. University Department/Centre	Dept. of Mechanical Engineering
3. Course title/code	Power Plant II (ME426)
4. Program to which it contributes	
5. Modes of Attendance offered	daily
6. Semester/Year	2nd Semester/fourth year
7. Number of hours tuition (total)	45
8. Date of production/revision of this specification	2025
9. Aims of the Course	
The course aims to graduate cadres capable of entering the field of electric power stations, whether design or operation.	

10· Learning Outcomes, Teaching, Learning and Assessment Method
A- Knowledge and Understanding A1- Basic principles for the operation of power plant. A2- Design of power plant. A3- Identify the types of power stations. A4- Identifying the modern types of power stations and ways to develop them.
B. Subject-specific skills B1 - Confidence in the ability to design power plant. B2 - Raising the level of ability to introduce advanced methods to power plant. B3 - The work of large and small projects. B4 - The ability to operate and rehabilitate power plant.
Teaching and Learning Methods
• Reading the relevant books in the field of the course. • Discussion within the lesson. • Solve some advanced issues. • Searching websites. • Attending scientific conferences.
Assessment methods
• Discussion within the lesson. • Homework and reports. • Daily tests. • Semester and final exams.
C. Thinking Skills C1 - Activating the participation of students. C2- Paying attention to the student's desire to accept the lesson material. C3 - Evaluation of the students interacting in the lesson. C4 - Presenting practical examples that interest the students for the lesson. C 5 - Presenting various topics to keep the recipient away from boredom and boredom.
D. General and Transferable Skills (other skills relevant to employability and personal development) D1- Paying attention to and evaluating duties. D 2 - Access to a systematic and scientific method in raising topics. D3 - Clarify the importance of benefiting from technological and informational progress. D 4- Allocate time for discussion.

11. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	3	Boilers	Introduce the boilers	theoretical	Questions and discussion
2	3	Types of boilers.	Explain the types of boilers	theoretical	Questions and discussion
3	3	Mathematical analysis of boilers	Mathematical analysis of boilers	theory + solution examples	Questions and discussion and quiz
4	3	Mathematical analysis of boilers	Complete mathematical analysis of boilers	theory + solution examples	Questions and discussion
5	3	Solve some examples	Solve some examples	theoretical	Questions and discussion
6	3	Condensers	Introduce Condensers	theory + solution of examples	Questions and discussion
7	3	Types of Condensers	Types of Condensers	theoretical	Questions and discussion and quiz
8	3	Analytical of Condensers	Introduce the analysis of Condensers	theoretical	Questions and discussion
9	3	Analysis of Gas Turbine	Analysis of Gas Turbine	Theoretical + solution of examples	Questions and discussion
10	3	Solve some examples	Solve some examples	theoretical	Questions and discussion +quiz
11	3	Turbine	Introduce the turbines and their types	theoretical	Questions and discussion
12	3	Components of Turbines	Introduce the turbines and their components	Theoretical +solution of examples	Questions and discussion
13	3	Hydroelectric power plant	Introduce the Hydroelectric power plant	Theoretical +solution of examples	Questions and discussion +quiz
14	3	The types of Hydroelectric power plant	The types of Hydroelectric power plant	theoretical	Questions and discussion
15	3	Solve some examples	Solve some examples	Theoretical +solution of examples	Questions and discussion +quiz

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	Applied Thermodynamics by Onkar Singh Applied-thermodynamics-and-engineering-fifth-edition-by-Eastop-and-A-Mcconkey
Special requirements (include for example workshops, periodicals, IT software, websites)	Power Plant by Raja A text book of Power Plant Engineering By Raja
Community-based facilities (include for example, guest Lectures, internship, field studies)	

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

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 programme specification.

1. Teaching Institution	University of Basrah
2. University Department/Centre	Mechanical Engineering department
3. Course title/code	Project Management / ME 427
5. Modes of Attendance offered	daily attendance
6. Semester/Year	Second semester / second year
7. Number of hours tuition (total)	30 hours
8. Date of production/revision of this specification	2025
9. Aims of the Course	
The course aims to learn the basics of project management and its role in managing factories, laboratories and projects, while developing the students' abilities to rely on international standards to achieve the best performance.	

10· Learning Outcomes, Teaching, Learning and Assessment Method

A- Knowledge and Understanding

A1- Clarify the basic concepts of project management.

A2- Acquisition of skills in addressing project problems

A3- Acquisition of basic skills in relying on international standards.

A4- Gain a basic understanding of how programmed systems work in various industrial applications.

B. Subject-specific skills

B1 - The ability to solve industrial problems.

B2 - The ability to think about addressing a particular problem or issue.

B3 - Writing scientific reports.

B4 - The ability to gain experience in dealing with priority methods.

Teaching and Learning Methods

• Readings, self-learning, panel discussions.
• Exercises and activities in the lecture.
• Homework.
• Directing students to some websites to benefit and develop capabilities.
• Conducting seminars to explain and analyze a specific issue and find solutions to it.

Assessment methods

• Interaction within the lecture.
• Homework and reports.
• Short exams (Quiz).
• Semester and final exams.

C. Thinking Skills

C1- Attention: Arousing the students' attention by implementing one of the applied programs on the display screen in the hall.

C2 - Response: Follow up the student's interaction with the material displayed on the screen.

C3- Attention: Follow up on the interest of the student who interacted more with the presented material, by increasing this interaction by requesting other programs and applications to be presented.

C4 - Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1- Develop the student’s ability to perform the duties and deliver them on time

D 2- Logical and programmatic thinking to find industrial solutions to various problems

D 3- Develop the student's ability to dialogue and discussion

D4 - Develop the student's ability to deal with modern technology, especially the Internet

11. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	2		Introduction	Define project management	Questions, discussion and
2	2		Project Initiations	Principle and practice	Questions, discussion and Quiz
3	2		Planning	Principle and practice	Questions, discussion and
4	2		Activity Networks	Principle and practice	Questions, discussion and Quiz
5	2		Activity Networks- - examples	Principle and practice	Questions, discussion and
6	2		Project Resource Analysis	Principle and practice	Questions, discussion and Quiz
7	2		Project Resource Analysis examples	Principle and practice	Questions, discussion and
8	2		SOLVED PROBLEMS	Principle and practice	Questions, discussion and Quiz
9	2		Risk Management	Principle and practice	Questions, discussion and
10	2		Risk Management examples	Principle and practice	Questions, discussion and Quiz
11	2		NPV	Principle and practice	Questions, discussion and
12	2		NPV EXAMPLES	Principle and practice	Questions, discussion and Quiz
14	2		COST MANAGMNET	Principle and practice	Questions, discussion and
15	2		Cost management examples	Principle and practice	Questions, discussion and

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	
Special requirements (include for example workshops, periodicals, IT software, websites)	
Community-based facilities (include for example, guest Lectures, internship, field studies)	