

**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

2023-2024

Introduction:

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

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

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

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

Concepts and terminology:

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

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

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

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

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

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

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

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

Academic Program Description Form

University Name: Al-Furat Al- Awsat Technical University

Faculty/Institute: Engineering Technical College-Najaf

Scientific Department: Aeronautical Engineering Technical

Academic or Professional Program Name: Bachelor of Aeronautical Technical Engineering

Final Certificate Name: Bachelor of Aeronautical Engineering Technical

Academic System: Annual - for the academic year 2022/2023

Description Preparation Date : 4 /9 /2023

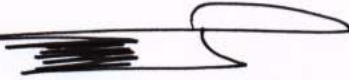
File Completion Date: 5 /6 /2024

Signature: 

Head of Department Name:

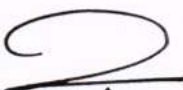
Prof. Dr. Ali Sh. Baqir

Date: 09 - 06 - 2024

Signature: 

Scientific Associate Name:

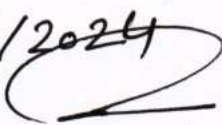
Date: 9/6/2024

The file is checked by: 

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date: 9/6/2024

Signature: 



Approval of the Dean

1. Program Vision

- Pioneer in technical engineering education in the field of specialization
- Internationally recognized
- An educational entity with strong research

2. Program Mission

- Serve our students by teaching them problem solving, leadership and teamwork skills, the value of quality commitment, ethical behavior, and respect for others.
- Providing high-quality technical engineer graduates in the field of aerospace engineering.
- Innovative technology for the benefit of society locally and globally.
- Providing modern research in the field of aviation technology.
- Cooperating with civil and military bodies to market the skills of the field of specialization.
- Providing advice on obtaining a civil aviation license and an air service training license from
- European Aviation Safety Agency (EASA) and licenses for ground support...etc

3. Program Objectives

Due to the rapid scientific and technological progress in the field of aircraft technology, the Aeronautical Engineering Technology Department is working to achieve clear strategic goals that will help it achieve a prominent position within the academic communities, which are becoming clear

In the following:

1. Maintaining and improving the quality of the curriculum through:
 - Introducing scientifically and internationally updated study materials in the study of aircraft technology and keeping pace with rapid scientific development through direct contact with decision-makers for aircraft

engineering in all parts of the world and direct contact with colleges and institutes specialized in aircraft technology.

- Continuous evaluation and development of curricula.
 - Linking student projects and research to community needs.
 - Expanding students' concepts through field visits to domestic airports, seminars, and training on airport runways and maintenance workshops.
2. Modernizing and opening laboratories by providing them with the latest technical equipment and equipment in the field of specialization and managing them with skilled technicians.
 3. Providing the best university environment for the teaching staff.
 4. Maintaining the technical development of faculty members through:
 - Encouraging active participation in conferences and technical meetings, especially with Iraqi and international airport administrations and international training companies.
 - Continuous review and evaluation of their activities.
 - Encouraging faculty initiatives and achievements.
 5. Knowledge production through:
 - Conducting distinguished theoretical and applied research.
 - Encouraging scientific publishing and stimulating the collective work of research groups from different specializations.
 - Striving to increase sources of research funding through publishing in international engineering journals.
 6. Initiatives to reduce administrative routine and facilitate work procedures through educational guidance and developing the relationship between students and teachers.
 7. Activating and strengthening ties with public government agencies and the private sector through:
 - Organizing conferences, seminars and educational courses.
 - Encouraging consulting work and providing services at the professional level in all engineering specialties

4. Program Accreditation

A request for programmatic accreditation for the self-evaluation report of the Aeronautical Engineering Technology Department for the academic year 2021/2022 has been submitted to the presidency of Al-Furat Al-Awsat Technical University.

5. Other external influences

- Iraqi Airways
- The Iraqi Ministry of Defense
- The Iraqi Civil Aviation Authority
- Iraqi and international aircraft maintenance companies
- Local and international airports

6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	5	12	6.2%	
College Requirements	11	48	25.2 %	
Department Requirements	24	130	%68.4	
Summer Training				
Other				

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

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
			theoretical	practical
1 st level	CREQ 141	Electrical Engineering	2	1
	CREQ 142	Eng. Drawing & Descriptive	1	3
	UREQ 161	Human Right & Democracy	2	
	MATH 151	Mathematics I	3	
	ARE112	Mechanics I	3	
	ARE111	Properties of Materials	2	
	ARE121	Thermodynamic I	2	2
	CREQ 143	Programming I	1	2
	CREQ 144	Work shop		6
	UREQ 162	English language I	1	
Year/Level	Course Code	Course Name	Credit Hours	
			theoretical	practical
2 nd level	ARE 223	Fluid Mechanics	2	2
	ARE 215	Manufacturing Processes	2	1
	MATH 252	Mathematics II	3	
	CREQ 246	Mechanical Drawing	1	3
	ARE 213	Mechanics II	3	
	ARE 214	Strength of Material	2	2
	ARE 231	Theory of flight	2	
	ARE 222	Thermodynamic II	2	2
	CREQ 245	Programming II	1	2
	UREQ 262	English language II	1	
Year/Level	Course Code	Course Name	Credit Hours	
			theoretical	practical
3 rd level	ARE 324	Aerodynamics	2	2
	ARE 332	Aircraft Elec. and instrument	2	2
	ARE 316	Mech. Eng. Design I	2	3
	CREQ 347	Eng. & Num. Analysis	2	
	ARE 325	Heat Transfer	2	2
	CREQ 348	Industrial Engineering	2	
	ARE 317	Theory of Machines	2	2
	ARE 333	Aircraft Engines	2	2
	ARE 326	Gas dynamic	2	1
	UREQ 362	English language III	1	
Year/Level	Course Code	Course Name	Credit Hours	
			theoretical	practical
4 th level	ARE 436	Aircraft Design	3	1
	ARE 435	Aircraft Engines & Jet Propulsion	2	1
	ARE 438	Aircraft Stability & Control	2	1
	ARE 434	Aircraft Structures	2	1
	ARE 439	Aircraft Sys. & Maintenance	2	2

	ARE 449	Computer Aided Engineering		3
	ARE 418	Automatic Control	2	1
	ARE 437	Aircraft Vibration	2	2
	CREQ 4410	Final project		4
	UREQ 462	English language IV	1	

8. Expected learning outcomes of the program

Knowledge and understanding

A1	Ability to apply knowledge in mathematics, science, and engineering.
A2	Understand the professional and ethical responsibilities of the field of specialization.
A3	Ability to evaluate course outcomes with faculty, industry and professional practitioners, as well as employers and graduate students to improve them
A4	Teaching leadership skills and the value of quality commitment, ethical behavior and respect for others

Subject-specific skills

B1	Ability to work and integrate into multidisciplinary teams
B2	Ability to design and conduct experiments as well as analyze and interpret data.
B3	The ability to use modern techniques, engineering skills and tools to practice engineering.
B4	Ability to identify and formulate engineering problems in the field of specialization

thinking skills

C1	The ability to communicate effectively with those concerned with the field of specialization on both the civil and military sides
C2	Recognizing the need and ability to engage in lifelong learning.
C3	Knowledge of contemporary issues in the field of specialization
C4	The broad learning necessary to understand the impact of engineering solutions on global economic, environmental and social problems

Generic and transferable skills (other skills related to employability and personal development)

D1	Ability to manage and work on ground and air support equipment for aircraft
D2	The ability to design mechanically using the latest 3D design and simulation programs, which is a process to meet the required needs within the field of specialization in a realistic framework that imposes environmental, economic, social, political and health restrictions.....
D3	The ability to work with the latest devices for diagnosing mechanical, electrical and electronic faults in aircraft systems.
D4	The ability to adapt to similar specializations (communications engineering, refrigeration and air conditioning engineering, mechanical engineering, renewable energies,)

9. Teaching and Learning Strategies

In-person and electronic lecture, workshop, laboratory, methodological teaching, summer training

10. Evaluation methods

Oral exams, written exams, semester exams, final exams, daily assessment, homework, reports, seminars, simulation programs

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
Prof. Dr.	Nuclear Eng.	Thermal			1	
Assistant. Prog Dr.	Mechanical	Applied			1	
Assistant. Prog Dr.	Mechanical	aerodynamic			1	
Assistant. Prog Dr.	Mechanical	combustion			1	
lecturer	Mechanical	Applied			3	
lecturer	Mechanical	Thermal			2	
lecturer	Materials	Materials			2	
lecturer	Manufacturing	Manufacturing			1	
lecturer	Mathematics	Mathematics			1	
lecturer	English/Arabic language	English/Arabic language			2	

Professional Development

Mentoring new faculty members

One of the tasks of the Aeronautical Engineering Technology Department is to hold training programs for new recruits on a regular basis and for appropriate periods that are compatible with the teaching strategies in the Aeronautical Technology Engineering Department with different types of learning outcomes that aim to develop the educational program. The teaching staff in the department is bound by the teaching and evaluation strategies explicitly stipulated in the course descriptions. Programs with sufficient flexibility to meet the needs of different groups and according to their individual differences.

Professional development of faculty members

One of the things that is taken into consideration when classifying an effective education system is placing the quality of teaching in an important position while providing learners with the knowledge in addition to the values and skills that they need during the various stages of their learning throughout their lives. Establishing a map of teaching and learning objectives in a clear strategy is considered one of the axioms in classifying an effective education system. These objectives may relate to improving the quality of teaching, developing mechanisms to manage teaching affairs, fully supporting it, developing its performance, and maintaining this level throughout one's professional life. Most education plans include strategies that actually encourage both quality and teaching, for example, developing educational curricula, developing teacher education, increasing the proportion of teachers to match the increase in the number of students, improving classroom conditions, and increasing the financial allocations allocated for this.

12. Acceptance Criterion

Graduates of the scientific branch of preparatory studies only, as there is no corresponding branch in vocational preparatory schools corresponding to the aviation major

13. The most important sources of information about the program

- University of Technology in Baghdad
- The Iraqi Ministry of Transport
- The American Academic Accreditation Board (ABET).

- European Transport Safety Agency EASA
- American Society of Mechanical Engineers (ASME).
- International Civil Aviation Organization ICAO
- Iraqi Civil Aviation Authority ICAA

14. Program Development Plan

1– Institutional commitment to continuous improvement of the quality of outputs:
The Aeronautical Engineering Technology Department is committed to the educational organization's continuous commitment to the strong participation of the educational organization's employees in quality assurance processes. It provides the Quality Assurance Division in the educational organization with the necessary resources and provides assistance to it wherever needed. All faculty and staff also participate in continuous improvement processes and prepare reports about them – each in their field of work – to reach the goal of continuous improvement of outcomes.

2– Use indicators and benchmarks

The Aeronautical Engineering Technology Department always compares its achievements with the previous year of plans that were developed during the academic year, as it works to add courses, workshops, seminars, research, and student projects to its scientific plan so that it keeps pace with the labor market and technical development.

3– Independent verification of standards

The Aeronautical Engineering Technology Department works to verify the results of the self-evaluation processes of performance quality, by examining their evidence and evidence, including feedback through questionnaires and the opinions of stakeholders and beneficiaries such as students, teachers, graduates, and employers (labor market) within the improvement processes. Continuous.

Program Skills Outline

Required program Learning outcomes

Year Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics													
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4					D1	D2	D3	D4		
1 st level	CREQ 141	Electrical Engineering	Basic	0				0	0																
	CREQ 142	Eng. Draw. & Descrip.	Basic	0							0													0	
	UREQ 161	Human Right & Dem.	Basic		0				0																
	MATH 151	Mathematics I	Basic	0					0						0										
	ARE112	Mechanics I	Basic	0					0						0										
	ARE111	Properties of Materials	Basic	0					0						0										
	ARE121	Thermodynamic I	Basic	0					0						0										0
	CREQ 143	Programming I	Basic	0					0						0										
	CREQ 144	Work shop	Basic		0				0																
	UREQ 162	English language I	Basic	0					0																
2 nd level	ARE 223	Fluid Mechanics	Basic	0						0															
	ARE 215	Manufac. Processes	Basic	0					0						0										
	MATH 252	Mathematics II	Basic	0						0														0	
	CREQ 246	Mechanical Drawing	Basic	0							0				0									0	
	ARE 213	Mechanics II	Basic	0					0						0										
	ARE 214	Strength of Material	Basic	0					0						0										
	ARE 231	Theory of flight	Basic			0			0					0											
	ARE 222	Thermodynamic II	Basic	0					0					0											0
	CREQ 245	Programming II	Basic	0								0												0	
	UREQ 262	English language II	Basic	0					0						0									0	

Program Skills Outline

Required program Learning outcomes

Year Level	Course Code	Course Name	Basic or optional	Required program Learning outcomes											
				Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
3 rd level	ARE 324	Aerodynamics	Basic	0				0				0			
	ARE 332	Airc. Elec. and instr.	Basic	0				0				0			0
	ARE 316	Mech. Eng. Design I	Basic	0					0			0		0	
	CREQ 347	Eng. & Num. Analysis	Basic	0					0				0		
	ARE 325	Heat Transfer	Basic	0	0			0					0		0
	CREQ 348	Industrial Engineering	Basic			0					0				
	ARE 317	Theory of Machines	Basic	0				0				0			
	ARE 333	Aircraft Engines	Basic	0				0				0			
	ARE 326	Gas dynamic	Basic	0					0			0			0
	UREQ 362	English language III	Basic	0					0			0			0
4 th level	ARE 436	Aircraft Design	Basic			0			0				0		
	ARE 435	Airc. Eng. & Jet Prop.	Basic	0				0				0			
	ARE 438	Airc. Stability & Cont.	Basic	0				0				0		0	
	ARE 434	Aircraft Structures	Basic	0				0				0			
	ARE 439	Airc. Sys. & Maint.	Basic		0			0				0			
	ARE 449	CAE	Basic	0		0		0	0	0	0			0	0
	ARE 418	Automatic Control	Basic	0				0				0			
	ARE 437	Aircraft Vibration	Basic	0				0				0		0	
	CREQ 410	Final project	Basic	0	0	0	0	0	0	0	0	0	0	0	0
	UREQ 462	English language IV	Basic	0				0				0			0



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



University: Al-Furat Al-Awsat Technical University
College: Engineering Technical College/ NAJAF
Department: Aeronautical technology engineering
Scientific title: Assistance lecturer
Academic qualification: Master
Work location: Aeronautical technology engineering

Course Description Form 2023/2024

1- Course Name	Engineering Mechanics-Static
2- Course Code	ATU13024
3- Semester / Year	2024/2023
4- Description Preparation Date:	2024/4/3
5- Available Attendance Forms:	Lectures in the presence of students (Online if necessary)
6- Number of study hours (total)/number of units (total)	78 hours-15 week / 6 unit
7- Name of the course administrator (if there is more than one teaching staff, all of their names will be mentioned)	Ass.lect. Rand Kareem

8. Expected learning outcomes of the program

Knowledge and understanding

A1	Ability to apply knowledge in mathematics, science, and engineering.	√
A2	Understand the professional and ethical responsibilities of the field of specialization.	√
A3	Ability to evaluate course outcomes with faculty, industry and professional practitioners, as well as employers and graduate students to improve them	√
A4	Teaching leadership skills and the value of quality commitment, ethical behavior and respect for others	√

Subject-specific skills

B1	Ability to work and integrate into multidisciplinary teams	√
B2	Ability to design and conduct experiments as well as analyze and interpret data.	√
B3	The ability to use modern techniques, engineering skills and tools to practice engineering.	√
B4	Ability to identify and formulate engineering problems in the field of specialization	√

thinking skills

C1	The ability to communicate effectively with those concerned with the field of specialization on both the civil and military sides	√
C2	Recognizing the need and ability to engage in lifelong learning.	√
C3	Knowledge of contemporary issues in the field of specialization	√
C4	The broad learning necessary to understand the impact of engineering solutions on global economic, environmental and social problems	√

Generic and transferable skills (other skills related to employability and personal development)

D1	Ability to manage and work on ground and air support equipment for aircraft	√
D2	The ability to design mechanically using the latest 3D design and simulation programs, which is a process to meet the required needs within the field of specialization in a realistic framework that imposes environmental, economic, social, political and health restrictions.....	√
D3	The ability to work with the latest devices for diagnosing mechanical, electrical and electronic faults in aircraft systems.	√
D4	The ability to adapt to similar specializations (communications engineering, refrigeration and air conditioning engineering, mechanical engineering, renewable energies,)	√



9. Teaching and Learning Strategies

Strategies	Encourage students' participation in solving exercises, while improving and expanding their critical thinking skills. This will be accomplished through interactive classroom and tutorial programs and by looking at types of simple experiments that include some sampling activities of interest to students.
-------------------	--

10- Outcomes of the bachelor's program in technical engineering according to the guidelines of the National Council for Programmatic Accreditation for Technical Engineering Education, the Academic Accreditation for Engineering and Technology (ABET), and the International Engineering Alliance (IEA).	
a - Selects and applies modern knowledge, techniques, skills and devices in large-scale engineering activities.	√
b - Selects and applies knowledge of mathematics, engineering, technology, and other sciences to solve engineering problems that require the application of applied principles, procedures, or methodologies.	√
c- Conducts the required tests, experiments, and measurements, analyzes and interprets their results, and applies experimental results to improve engineering processes.	
d- Designs systems, components, or processes for large-scale engineering problems that fit the objectives of the educational program.	
e- Works effectively as a member or leader in a specialized engineering team.	√
f- Identifies, analyzes and solves large-scale engineering problems.	√
g - Identify and utilize appropriate technical literature as well as apply written documents, oral communications, and graphics in both technical and non-technical environments.	√
h- Participates in self-directed continuing professional development.	√
i - Selects and applies modern knowledge, techniques, skills and devices in large-scale engineering activities.	√
j - Selects and applies knowledge of mathematics, engineering, technology, and other sciences to solve engineering problems that require the application of applied principles, procedures, or methodologies.	√
k- Conducts the required tests, experiments, and measurements, analyzes and interprets their results, and applies experimental results to improve engineering processes.	

11. Objectives of the educational program: Given the rapid scientific and technological progress in the field of aircraft technology, the Department of Aviation Technology Engineering is working to achieve clear strategic objectives that will help it achieve a prominent position within the academic communities, which are becoming clear.

A- Maintaining and improving the quality of the curriculum	A1	Introducing scientifically and internationally updated study materials in the study of aircraft technology and keeping pace with rapid scientific development through direct contact with aircraft engineering decision-makers all over the world and direct contact with colleges and institutes specialized in aircraft technology.	√
	A2	Continuous evaluation and development of curricula.	√
	A3	Linking student projects and research to community needs.	√
	A4	Expanding students' concepts through field visits to domestic airports, seminars, and training on airport runways and maintenance workshops.	√
B - Modernizing and opening laboratories by providing them with the latest technical equipment and equipment in the field of specialization and managing them with skilled technicians.	B1	Students use the latest modern laboratory and programming technologies	√
C- Providing the best university environment for faculty and students	C1	Providing air-conditioned classrooms equipped with the latest display devices, providing offices for teachers, green spaces, a club, and a library.	√
D- Maintaining the technical development of faculty members	D1	Encouraging participation and effective scientific visits in conferences and technical meetings, especially with Iraqi and international airport administrations and international training companies.	√
	D2	Continuous review and evaluation of student and faculty activities	√
	D3	Continuous review and evaluation of student and faculty activities Encouraging students' initiatives and achievements in various academic, artistic and religious fields with the teaching staff	√
E- Knowledge production	E1	Conducting distinguished theoretical and applied research for students with the faculty	√
	E2	Encouraging scientific publishing and stimulating the collective work of research groups from different disciplines	√
	E3	Striving to increase sources of funding for practical and theoretical research for students and faculty through publishing in local and international engineering journals	√
F- Initiatives	F1	Initiatives to reduce administrative routine and facilitate work procedures through educational guidance and developing the relationship between students and teachers.	√
G- Activating and strengthening ties with public government agencies and the private sector	G1	Organizing conferences, seminars and educational courses	√
	G2	Encouraging consulting work and providing services at the professional level in all engineering specializations (technology incubator)	√

12. Course structure

Week	Hours	Required learning outcomes		Name of the unit or topic	Learning method		Direct assessment method		Indirect assessment method	
1	5	Knowledge and understanding	√	Engineering Mechanics-Static Introduction to static , vectors	The direct method is .through lectures	√	Written tests		Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant		Interviews or questionnaires to survey student .opinions	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
2	5	Knowledge and understanding	√	Forces	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	

		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
3	5	Knowledge and understanding	√	3D Forces	The direct method is through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
4	5	Knowledge and understanding	√	Moments	The direct method is through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	

		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
5	5	Knowledge and understanding	√	couples	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
6	5	Knowledge and understanding	√	Resultant	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	

		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
7	5	Knowledge and understanding	√	Resultant	The direct method is through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
8	5	Knowledge and understanding	√	Equilibrium	The direct method is through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	

		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
9	5	Knowledge and understanding	√	Trusses, planes, joint method	The direct method is through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
10	5	Knowledge and understanding	√	Frame and Machines	The direct method is through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	

		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
11	5	Knowledge and understanding	√	Friction	The direct method is through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
12	5	Knowledge and understanding	√	Application of friction on bearings	The direct method is through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	

		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
13	5	Knowledge and understanding	√	Centered of line, area and volume	The direct method is through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
14	5	Knowledge and understanding	√	Moment of inertia	The direct method is through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	

		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
15	5	Knowledge and understanding	√	Theory of parallel axes	The direct method is through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	√
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	√
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	√
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	√
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	

13. Course evaluation: Distributing the grade out of 100 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, and written exams, reports, etc.

Quizzes	Assignments	Activities and absences	Report	Midterm Exam	Final/practical exam	Final/theoretical exam
10	10	10	10	10	/	50

14. Learning and teaching resources

ENGINEERING MECHANICS, statics by R. C. HIBBELER	Required textbooks (methodology, if any)
ENGINEERING MECHANICS, statics by R. C. HIBBELER	Main references (sources)
ENGINEERING MECHANICS, statics by J. L. MERIAM	Recommended supporting books and references (scientific journals, reports....)
You Tube, Electronic websites	Electronic references, Internet sites



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



University: Al-Furat Al-Awsat Technical University
College: Engineering Technical College/ NAJAF
Department: Aeronautical technology engineering
Scientific title: Assist.lecturer
Academic qualification: master
Work location: Aeronautical technology engineering

Course Description Form 2023/2024

1- Course Name	Mariam ameen aliwi
2- Course Code	Math252
3- Semester / Year	٢٠٢٤/٢٠٢٣
4- Description Preparation Date:	٢٠٢٤/٤/١
5- Available Attendance Forms:	Lectures in the presence of students (Online if necessary)
6- Number of study hours (total)/number of units (total)	90 hours-30 week / 6 unit
7- Name of the course administrator (if there is more than one teaching staff, all of their names will be mentioned)	Mariam ameen aliwi

8. Expected learning outcomes of the program

Knowledge and understanding

A1	Ability to apply knowledge in mathematics, science, and engineering.	√
A2	Understand the professional and ethical responsibilities of the field of specialization.	√
A3	Ability to evaluate course outcomes with faculty, industry and professional practitioners, as well as employers and graduate students to improve them	√
A4	Teaching leadership skills and the value of quality commitment, ethical behavior and respect for others	√

Subject-specific skills

B1	Ability to work and integrate into multidisciplinary teams	√
B2	Ability to design and conduct experiments as well as analyze and interpret data.	√
B3	The ability to use modern techniques, engineering skills and tools to practice engineering.	√
B4	Ability to identify and formulate engineering problems in the field of specialization	√

thinking skills

C1	The ability to communicate effectively with those concerned with the field of specialization on both the civil and military sides	√
C2	Recognizing the need and ability to engage in lifelong learning.	√
C3	Knowledge of contemporary issues in the field of specialization	√
C4	The broad learning necessary to understand the impact of engineering solutions on global economic, environmental and social problems	√

Generic and transferable skills (other skills related to employability and personal development)

D1	Ability to manage and work on ground and air support equipment for aircraft	√
D2	The ability to design mechanically using the latest 3D design and simulation programs, which is a process to meet the required needs within the field of specialization in a realistic framework that imposes environmental, economic, social, political and health restrictions.....	√
D3	The ability to work with the latest devices for diagnosing mechanical, electrical and electronic faults in aircraft systems.	√
D4	The ability to adapt to similar specializations (communications engineering, refrigeration and air conditioning engineering, mechanical engineering, renewable energies,)	√

9. Teaching and Learning Strategies

Strategies	Encourage students' participation in solving exercises, while improving and expanding their critical thinking skills. This will be accomplished through interactive classroom and tutorial programs and by looking at types of simple experiments that include some sampling activities of interest to students.
-------------------	--

10- Outcomes of the bachelor's program in technical engineering according to the guidelines of the National Council for Programmatic Accreditation for Technical Engineering Education, the Academic Accreditation for Engineering and Technology (ABET), and the International Engineering Alliance (IEA).	
a - Selects and applies modern knowledge, techniques, skills and devices in large-scale engineering activities.	√
b - Selects and applies knowledge of mathematics, engineering, technology, and other sciences to solve engineering problems that require the application of applied principles, procedures, or methodologies.	√
c- Conducts the required tests, experiments, and measurements, analyzes and interprets their results, and applies experimental results to improve engineering processes.	
d- Designs systems, components, or processes for large-scale engineering problems that fit the objectives of the educational program.	
e- Works effectively as a member or leader in a specialized engineering team.	√
f- Identifies, analyzes and solves large-scale engineering problems.	√
g - Identify and utilize appropriate technical literature as well as apply written documents, oral communications, and graphics in both technical and non-technical environments.	√
h- Participates in self-directed continuing professional development.	√
i - Selects and applies modern knowledge, techniques, skills and devices in large-scale engineering activities.	√
j - Selects and applies knowledge of mathematics, engineering, technology, and other sciences to solve engineering problems that require the application of applied principles, procedures, or methodologies.	√
k- Conducts the required tests, experiments, and measurements, analyzes and interprets their results, and applies experimental results to improve engineering processes.	

11. Objectives of the educational program: Given the rapid scientific and technological progress in the field of aircraft technology, the Department of Aviation Technology Engineering is working to achieve clear strategic objectives that will help it achieve a prominent position within the academic communities, which are becoming clear.

A- Maintaining and improving the quality of the curriculum	A1	Introducing scientifically and internationally updated study materials in the study of aircraft technology and keeping pace with rapid scientific development through direct contact with aircraft engineering decision-makers all over the world and direct contact with colleges and institutes specialized in aircraft technology.	√
	A2	Continuous evaluation and development of curricula.	√
	A3	Linking student projects and research to community needs.	√
	A4	Expanding students' concepts through field visits to domestic airports, seminars, and training on airport runways and maintenance workshops.	√
B - Modernizing and opening laboratories by providing them with the latest technical equipment and equipment in the field of specialization and managing them with skilled technicians.	B1	Students use the latest modern laboratory and programming technologies	√
C- Providing the best university environment for faculty and students	C1	Providing air-conditioned classrooms equipped with the latest display devices, providing offices for teachers, green spaces, a club, and a library.	√
D- Maintaining the technical development of faculty members	D1	Encouraging participation and effective scientific visits in conferences and technical meetings, especially with Iraqi and international airport administrations and international training companies.	√
	D2	Continuous review and evaluation of student and faculty activities	√
	D3	Continuous review and evaluation of student and faculty activities Encouraging students' initiatives and achievements in various academic, artistic and religious fields with the teaching staff	√
E- Knowledge production	E1	Conducting distinguished theoretical and applied research for students with the faculty	√
	E2	Encouraging scientific publishing and stimulating the collective work of research groups from different disciplines	√
	E3	Striving to increase sources of funding for practical and theoretical research for students and faculty through publishing in local and international engineering journals	√
F- Initiatives	F1	Initiatives to reduce administrative routine and facilitate work procedures through educational guidance and developing the relationship between students and teachers.	√
G- Activating and strengthening ties with public government agencies and the private sector	G1	Organizing conferences, seminars and educational courses	√
	G2	Encouraging consulting work and providing services at the professional level in all engineering specializations (technology incubator)	√

12. Course structure

Week	Hours	Required learning outcomes		Name of the unit or topic	Learning method		Direct assessment method		Indirect assessment method	
1	3	Knowledge and understanding	√	Ordinary Linear Differential Equations - 1 st order differential equations - Separable - Homogeneous	The direct method is through lectures	√	Written tests		Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization	√	Completion files and performance assistant		Interviews or questionnaires to survey student opinions	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
2	3	Knowledge and understanding	√	- Exact - Linear - Bernoulli	The direct method is through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable	√		An interactive method by	√	Projects and		external assessmeters	

		skills (other skills related to employability and personal development)			dividing students into small groups		observation			
۳	۳	Knowledge and understanding	√	- 2 nd Order Differential Equations - Reducible to 1 st order - Homogeneous	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
۴	۳	Knowledge and understanding	√	- Non Homogeneous	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related	√		An interactive method by dividing students into	√	Projects and observation		external assessmeters	

		to employability and personal development)			small groups					
o	r	Knowledge and understanding	√	- Higher Order Differential Equations - Homogeneous - Non Homogeneous - Applications	The direct method is through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
1	r	Knowledge and understanding	√	- Sequences and Series - Sequence - Series - Geometric Series - Tests of Convergence	The direct method is through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	

		personal development)							
V	۳	Knowledge and understanding	√	- Definition - The General Term Test - The Integral Test - The Comparison Test - The Limit Comparison Test - The Ratio Test - The Root Test	The direct method is through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
A	۳	Knowledge and understanding	√	- Alternating Series - Power Series - Interval of Convergence - Taylor Series	The direct method is through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters

9	3	Knowledge and understanding	√	- Maclaurin Series - Applications	The direct method is through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
10	3	Knowledge and understanding	√	Fourier Series - Periodic Function - Even and Odd Functions - Half Range Expansion Function	The direct method is through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
11	3	Knowledge and	√	Partial Differentiation	The direct method is	√	Written tests	√	Interviews or	

		understanding		- Definition - Mechanism of Differentiation - Functions of Two Variables - Functions of Higher Variables	.through lectures			questionnaires to survey graduates' opinions		
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
۱۲	۳	Knowledge and understanding	√	- Functions of Higher Variables – Transformation - Chain Rule - Total Differential	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
۱۳	۳	Knowledge and understanding	√	-Gradient, Divergence, and Curl of Vector	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to	

				- Equation of Normal Line and Tangent Plane				survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√ Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√ Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation	external assessmeters	
١٤	٣	Knowledge and understanding	√	- Directional Derivative - Maxima, Minima and Saddle Points - Lagrange Theorem	The direct method is .through lectures	√	Written tests	√ Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√ Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√ Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation	external assessmeters	
١٥	٣	Knowledge and understanding	√	General Applications	The direct method is .through lectures	√	Written tests	√ Interviews or questionnaires to survey graduates'	√

								opinions		
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	√
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	√
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	√
۱۶	۳	Knowledge and understanding	√	Vector - Vector in Space - Parallel Vectors - Triple Product	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
۱۷	۳	Knowledge and understanding	√	- Volume of Box - Projection of Two Vectors - Applications	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	

		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
۱۸	۳	Knowledge and understanding	√	- Equation of Line in Space - Equation of Plane in space - Applications	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
۱۹	۳	Knowledge and understanding	√	- Vector Valued Functions - Curvature - Motion of Particle	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is	√	Oral exams	√	Interviews or	

					through preparing research papers and discussing them collectively			questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
۲۰	۳	Knowledge and understanding	√	Applications of Double and Triple Integrals - Sketching of Geometric Shapes - Double Integrals	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
۲۱	۳	Knowledge and understanding	√	- Triple Integrals - Applications	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing	√	Oral exams	√	Interviews or questionnaires to

					research papers and discussing them collectively			survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
۲۲	۳	Knowledge and understanding	√	- Jacobian Transformation - Area in Polar Curve - Surface Area	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
۲۳	۳	Knowledge and understanding	√	Special Functions - Gama Function - Beta Function	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and	√	Oral exams	√	Interviews or questionnaires to survey employers'

					discussing them collectively				opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
٢٤	٣	Knowledge and understanding	√	Polar Coordinates - Polar Curve Representation	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
٢٥	٣	Knowledge and understanding	√	- Sketching of Polar Curve - General Curve	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	

					collectively				
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
۲۶	۳	Knowledge and understanding	√	- Special Curve (Line, Circle, Conic Section)	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
۲۷	۳	Knowledge and understanding	√	- Rotation of Axis	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions

		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
۲۸	۳	Knowledge and understanding	√	- The Arc Length of Polar Curve - Surface Area of Rotation - The Angle Between The Tangent Line and Radius Vector For a Polar Curve	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
۲۹	۳	Knowledge and understanding	√	- Slope of Tangent - Asymptotes - Plane Area	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the	√	Completion files	√	Interviews or	

[illegible]

13. Course evaluation: Distributing the grade out of 100 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, and written exams, reports, etc.

First semester/theoretical	First semester/practical	Second/theoretical semester	Second/practical semester	Work of the year/activities and absences	Final/practical exam	Final/theoretical exam
20	\	20	\	10	\	50

14. Learning and teaching resources

	Required textbooks (methodology, if any)
Calculus,by Thomas	Main references (sources)
Calculus, Frank Iris	Recommended supporting books and references (scientific journals, reports....)
	Electronic references, Internet sites



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



University: Al-Furat Al-Awsat Technical University
College: Engineering Technical College/ NAJAF
Department: Aeronautical technology engineering
Scientific title: Ass.Lecturer
Academic qualification: Master
Work location: Aeronautical technology engineering

Course Description Form 2023/2024

1- Course Name	Industrial engineering
2- Course Code	CREQ 348
3- Semester / Year	2024/2023
4- Description Preparation Date:	2024/4/7
5- Available Attendance Forms:	Lectures in the presence of students (Online if necessary)
6- Number of study hours (total)/number of units (total)	90 hours-30 week / 6 unit
7- Name of the course administrator (if there is more than one teaching staff, all of their names will be mentioned)	Zahraa hamzah Hasan

8. Expected learning outcomes of the program

Knowledge and understanding

A1	Ability to apply knowledge in mathematics, science, and engineering.	√
A2	Understand the professional and ethical responsibilities of the field of specialization.	√
A3	Ability to evaluate course outcomes with faculty, industry and professional practitioners, as well as employers and graduate students to improve them	√
A4	Teaching leadership skills and the value of quality commitment, ethical behavior and respect for others	√

Subject-specific skills

B1	Ability to work and integrate into multidisciplinary teams	√
B2	Ability to design and conduct experiments as well as analyze and interpret data.	√
B3	The ability to use modern techniques, engineering skills and tools to practice engineering.	√
B4	Ability to identify and formulate engineering problems in the field of specialization	√

thinking skills

C1	The ability to communicate effectively with those concerned with the field of specialization on both the civil and military sides	√
C2	Recognizing the need and ability to engage in lifelong learning.	√
C3	Knowledge of contemporary issues in the field of specialization	√
C4	The broad learning necessary to understand the impact of engineering solutions on global economic, environmental and social problems	√

Generic and transferable skills (other skills related to employability and personal development)

D1	Ability to manage and work on ground and air support equipment for aircraft	√
D2	The ability to design mechanically using the latest 3D design and simulation programs, which is a process to meet the required needs within the field of specialization in a realistic framework that imposes environmental, economic, social, political and health restrictions.....	√
D3	The ability to work with the latest devices for diagnosing mechanical, electrical and electronic faults in aircraft systems.	√
D4	The ability to adapt to similar specializations (communications engineering, refrigeration and air conditioning engineering, mechanical engineering, renewable energies,)	√

9. Teaching and Learning Strategies

Strategies	Encourage students' participation in solving exercises, while improving and expanding their critical thinking skills. This will be accomplished through interactive classroom and tutorial programs and by looking at types of simple experiments that include some sampling activities of interest to students.
-------------------	--

10- Outcomes of the bachelor's program in technical engineering according to the guidelines of the National Council for Programmatic Accreditation for Technical Engineering Education, the Academic Accreditation for Engineering and Technology (ABET), and the International Engineering Alliance (IEA).	
a - Selects and applies modern knowledge, techniques, skills and devices in large-scale engineering activities.	√
b - Selects and applies knowledge of mathematics, engineering, technology, and other sciences to solve engineering problems that require the application of applied principles, procedures, or methodologies.	√
c- Conducts the required tests, experiments, and measurements, analyzes and interprets their results, and applies experimental results to improve engineering processes.	
d- Designs systems, components, or processes for large-scale engineering problems that fit the objectives of the educational program.	
e- Works effectively as a member or leader in a specialized engineering team.	√
f- Identifies, analyzes and solves large-scale engineering problems.	√
g - Identify and utilize appropriate technical literature as well as apply written documents, oral communications, and graphics in both technical and non-technical environments.	√
h- Participates in self-directed continuing professional development.	√
i - Selects and applies modern knowledge, techniques, skills and devices in large-scale engineering activities.	√
j - Selects and applies knowledge of mathematics, engineering, technology, and other sciences to solve engineering problems that require the application of applied principles, procedures, or methodologies.	√
k- Conducts the required tests, experiments, and measurements, analyzes and interprets their results, and applies experimental results to improve engineering processes.	

11. Objectives of the educational program: Given the rapid scientific and technological progress in the field of aircraft technology, the Department of Aviation Technology Engineering is working to achieve clear strategic objectives that will help it achieve a prominent position within the academic communities, which are becoming clear.			
A- Maintaining and improving the quality of the curriculum	A1	Introducing scientifically and internationally updated study materials in the study of aircraft technology and keeping pace with rapid scientific development through direct contact with aircraft engineering decision-makers all over the world and direct contact with colleges and institutes specialized in aircraft technology.	√
	A2	Continuous evaluation and development of curricula.	√
	A3	Linking student projects and research to community needs.	√
	A4	Expanding students' concepts through field visits to domestic airports, seminars, and training on airport runways and maintenance workshops.	√
B - Modernizing and opening laboratories by providing them with the latest technical equipment and equipment in the field of specialization and managing them with skilled technicians.	B1	Students use the latest modern laboratory and programming technologies	√
C- Providing the best university environment for faculty and students	C1	Providing air-conditioned classrooms equipped with the latest display devices, providing offices for teachers, green spaces, a club, and a library.	√
D- Maintaining the technical development of faculty members	D1	Encouraging participation and effective scientific visits in conferences and technical meetings, especially with Iraqi and international airport administrations and international training companies.	√
	D2	Continuous review and evaluation of student and faculty activities	√
	D3	Continuous review and evaluation of student and faculty activities Encouraging students' initiatives and achievements in various academic, artistic and religious fields with the teaching staff	√
E- Knowledge production	E1	Conducting distinguished theoretical and applied research for students with the faculty	√
	E2	Encouraging scientific publishing and stimulating the collective work of research groups from different disciplines	√
	E3	Striving to increase sources of funding for practical and theoretical research for students and faculty through publishing in local and international engineering journals	√
F- Initiatives	F1	Initiatives to reduce administrative routine and facilitate work procedures through educational guidance and developing the relationship between students and teachers.	√
G- Activating and strengthening ties with public government agencies and the private sector	G1	Organizing conferences, seminars and educational courses	√
	G2	Encouraging consulting work and providing services at the professional level in all engineering specializations (technology incubator)	√

12. Course structure

Week	Hours	Required learning outcomes		Name of the unit or topic	Learning method		Direct assessment method		Indirect assessment method	
1	3	Knowledge and understanding	√	Preview - Construction the frequency distribution - Representation the data in Histogram , Frequency polygon and ogive - Measures of location and measures of variation	The direct method is through lectures	√	Written tests		Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant		Interviews or questionnaires to survey student .opinions	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
2	3	Knowledge and understanding	√	Probability density function - Probabilities of simple or two events - Probabilities for combinations of three or more events - Permutations and combinations - The probability density function(p.d.f.)	The direct method is through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	

		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
3	3	Knowledge and understanding	√	The distribution functions - The binomial and poisson distributions	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
4	3	Knowledge and understanding	√	The gamma , chi-square and normal distributions	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	

		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
5	3	Knowledge and understanding	√	The distribution functions - The binomial and poisson distributions - The gamma , chi-square and normal distributions	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
6	3	Knowledge and understanding	√	The distribution functions - The binomial and poisson distributions - The gamma , chi-square and normal distributions	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	

		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
7	3	Knowledge and understanding	√	Correlation and regression - The sample correlation coefficients ; computation of simple correlation - Testing hypotheses about the population correlation coefficient	The direct method is through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
8	3	Knowledge and understanding	√	Linear regression and testing hypotheses about the parameters in a simple linear regression	The direct method is through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	

		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
9	3	Knowledge and understanding	√	Multiple linear regression	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
10	3	Knowledge and understanding	√	Analysis of variance (ANOVA) - One- way analysis of variance with different sample sizes	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	

		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
11	3	Knowledge and understanding	√	Two- way analysis of variance	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
12	3	Knowledge and understanding	√	Linear programming (L.P.) - Definition of the L.P.	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	

		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation	√	external assessmeters	
13	3	Knowledge and understanding	√	Transportation and Assignment models - Finding the starting solution using northwest corner method, Least cost method , Vogell's approximation method (VAM) and Russel's approximation	The direct method is through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
14	3	Knowledge and understanding	√	Network planning - Graph the network and find the critical path (CP)	The direct method is through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	

		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation	√	external assessmeters	
15	3	Knowledge and understanding	√	the program evaluation and review technique (PERT)	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	√
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	√
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	√
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation	√	external assessmeters	√
16	3	Knowledge and understanding	√	Sequencing models - Processing n jobs through one machine (shortest and largest processing time Spt and Lpt)	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	

		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
17	3	Knowledge and understanding	√	processing n jobs through two machines	The direct method is through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
18	3	Knowledge and understanding	√	Quality control Replacement and maintenance models - Using the average total cost as a criterion to determine the period of replacement the machines	The direct method is through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	

		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
19	3	Knowledge and understanding	√	Inventory models - General inventory model	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
20	3	Knowledge and understanding	√	Static economic order quality (EOQ) models ; EOQ with price break ; and multi - item	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	

		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
21	3	Knowledge and understanding	√	Quality control - Acceptance sampling	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
22	3	Knowledge and understanding	√	Calculation the OC-curve for single sampling schemes ; rectifying schemes; double sampling schemes ;	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	

		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
23	3	Knowledge and understanding	√	Reliability - Reliability	The direct method is through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
24	3	Knowledge and understanding	√	Reliability - Reliability	The direct method is through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	

		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
25	3	Knowledge and understanding	√	Mean time to failure MTF	The direct method is through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
26	3	Knowledge and understanding	√	Variance	The direct method is through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	

		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
27	3	Knowledge and understanding	√	Hazard rate function	The direct method is through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
28	3	Knowledge and understanding	√	Conditional reliability	The direct method is through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	

		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
29	3	Knowledge and understanding	√	Exponential and Weibull reliability functions	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
30	3	Knowledge and understanding	√	Reliability of system with serial and parallel configuration - Combined series – parallel system and high –level and low – level redundancy	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	√
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	√
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	√

[illegible]

13. Course evaluation: Distributing the grade out of 100 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, and written exams, reports, etc.

First semester/theoretical	First semester/practical	Second/theoretical semester	Second/practical semester	Work of the year/activities and absences	Final/practical exam	Final/theoretical exam
20	-	20	-	10	-	50

14. Learning and teaching resources

Aircraft Systems and maintenance, lists of Airbus company	Required textbooks (methodology, if any)
Aircraft Systems and maintenance, lists of Airbus company	Main references (sources)
Aircraft Systems and maintenance, lists of Airbus company	Recommended supporting books and references (scientific journals, reports....)
You Tube, Electronic websites	Electronic references, Internet sites



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



University: Al-Furat Al-Awsat Technical University
College: Engineering Technical College/ NAJAF
Department: Aeronautical technology engineering
Scientific title: lecturer
Academic qualification: master degree
Work location: Aeronautical technology engineering

Course Description Form 2023/2024

1- Course Name	Computer Added Engineering
2- Course Code	CREQ 449
3- Semester / Year	2024/2023
4- Description Preparation Date:	2024/4/7
5- Available Attendance Forms:	Lectures in the presence of students (Online if necessary)
6- Number of study hours (total)/number of units (total)	hours-30 week / 2 unit
7- Name of the course administrator (if there is more than one teaching staff, all of their names will be mentioned)	Bahaa Abdulhur Hatem

8. Expected learning outcomes of the program

Knowledge and understanding

A1	Ability to apply knowledge in mathematics, science, and engineering.	√
A2	Understand the professional and ethical responsibilities of the field of specialization.	√
A3	Ability to evaluate course outcomes with faculty, industry and professional practitioners, as well as employers and graduate students to improve them	√
A4	Teaching leadership skills and the value of quality commitment, ethical behavior and respect for others	√

Subject-specific skills

B1	Ability to work and integrate into multidisciplinary teams	√
B2	Ability to design and conduct experiments as well as analyze and interpret data.	√
B3	The ability to use modern techniques, engineering skills and tools to practice engineering.	√
B4	Ability to identify and formulate engineering problems in the field of specialization	√

thinking skills

C1	The ability to communicate effectively with those concerned with the field of specialization on both the civil and military sides	√
C2	Recognizing the need and ability to engage in lifelong learning.	√
C3	Knowledge of contemporary issues in the field of specialization	√
C4	The broad learning necessary to understand the impact of engineering solutions on global economic, environmental and social problems	√

Generic and transferable skills (other skills related to employability and personal development)

D1	Ability to manage and work on ground and air support equipment for aircraft	√
D2	The ability to design mechanically using the latest 3D design and simulation programs, which is a process to meet the required needs within the field of specialization in a realistic framework that imposes environmental, economic, social, political and health restrictions.....	√
D3	The ability to work with the latest devices for diagnosing mechanical, electrical and electronic faults in aircraft systems.	√
D4	The ability to adapt to similar specializations (communications engineering, refrigeration and air conditioning engineering, mechanical engineering, renewable energies,)	√

9. Teaching and Learning Strategies

Strategies	Encourage students' participation in solving exercises, while improving and expanding their critical thinking skills. This will be accomplished through interactive classroom and tutorial programs and by looking at types of simple experiments that include some sampling activities of interest to students.
-------------------	--

10- Outcomes of the bachelor's program in technical engineering according to the guidelines of the National Council for Programmatic Accreditation for Technical Engineering Education, the Academic Accreditation for Engineering and Technology (ABET), and the International Engineering Alliance (IEA).		
a - Selects and applies modern knowledge, techniques, skills and devices in large-scale engineering activities.		√
b - Selects and applies knowledge of mathematics, engineering, technology, and other sciences to solve engineering problems that require the application of applied principles, procedures, or methodologies.		√
c- Conducts the required tests, experiments, and measurements, analyzes and interprets their results, and applies experimental results to improve engineering processes.		
d- Designs systems, components, or processes for large-scale engineering problems that fit the objectives of the educational program.		
e- Works effectively as a member or leader in a specialized engineering team.		√
f- Identifies, analyzes and solves large-scale engineering problems.		√
g - Identify and utilize appropriate technical literature as well as apply written documents, oral communications, and graphics in both technical and non-technical environments.		√
h- Participates in self-directed continuing professional development.		√
i - Selects and applies modern knowledge, techniques, skills and devices in large-scale engineering activities.		√
j - Selects and applies knowledge of mathematics, engineering, technology, and other sciences to solve engineering problems that require the application of applied principles, procedures, or methodologies.		√
k- Conducts the required tests, experiments, and measurements, analyzes and interprets their results, and applies experimental results to improve engineering processes.		

11. Objectives of the educational program: Given the rapid scientific and technological progress in the field of aircraft technology, the Department of Aviation Technology Engineering is working to achieve clear strategic objectives that will help it achieve a prominent position within the academic communities, which are becoming clear.			
A- Maintaining and improving the quality of the curriculum	A1	Introducing scientifically and internationally updated study materials in the study of aircraft technology and keeping pace with rapid scientific development through direct contact with aircraft engineering decision-makers all over the world and direct contact with colleges and institutes specialized in aircraft technology.	√
	A2	Continuous evaluation and development of curricula.	√
	A3	Linking student projects and research to community needs.	√
	A4	Expanding students' concepts through field visits to domestic airports, seminars, and training on airport runways and maintenance workshops.	√
B - Modernizing and opening laboratories by providing them with the latest technical equipment and equipment in the field of specialization and managing them with skilled technicians.	B1	Students use the latest modern laboratory and programming technologies	√
C- Providing the best university environment for faculty and students	C1	Providing air-conditioned classrooms equipped with the latest display devices, providing offices for teachers, green spaces, a club, and a library.	√
D- Maintaining the technical development of faculty members	D1	Encouraging participation and effective scientific visits in conferences and technical meetings, especially with Iraqi and international airport administrations and international training companies.	√
	D2	Continuous review and evaluation of student and faculty activities	√
	D3	Continuous review and evaluation of student and faculty activities Encouraging students' initiatives and achievements in various academic, artistic and religious fields with the teaching staff	√
E- Knowledge production	E1	Conducting distinguished theoretical and applied research for students with the faculty	√
	E2	Encouraging scientific publishing and stimulating the collective work of research groups from different disciplines	√
	E3	Striving to increase sources of funding for practical and theoretical research for students and faculty through publishing in local and international engineering journals	√
F- Initiatives	F1	Initiatives to reduce administrative routine and facilitate work procedures through educational guidance and developing the relationship between students and teachers.	√
G- Activating and strengthening ties with public government agencies and the private sector	G1	Organizing conferences, seminars and educational courses	√
	G2	Encouraging consulting work and providing services at the professional level in all engineering specializations (technology incubator)	√

12. Course structure									
Week	Hours	Required learning outcomes		Name of the unit or topic	Learning method		Direct assessment method		Indirect assessment method
1	3	Knowledge and understanding	√	Introduction to CAE - Characteristics of CAE and its importance	The direct method is through lectures	√	Written tests		Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization	√	Completion files and performance assistant		Interviews or questionnaires to survey student opinions
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters
2	3	Knowledge and understanding	√	Introduction to Modeling - Dealing with real physical objects - Treating them as CAE models	The direct method is through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.

		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
3	3	Knowledge and understanding	√	Modeling of 3-Dimensional Problems - Some examples of solid objects of real problems - Loads & boundary conditions - Utilization of symmetry to simplify problems modeling	The direct method is through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
4	3	Knowledge and understanding	√	Modeling of 3-Dimensional Problems - Some examples of solid objects of real problems - Loads & boundary conditions - Utilization of symmetry to simplify problems modeling	The direct method is through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	

		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
5	3	Knowledge and understanding	√	Reduction to Plane Problems - Importance & conditions of reduction to plane problems - Reduction to axis-symmetrical models Modeling 2-D plane - stress, plane strain, and fluid flow	The direct method is through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
6	3	Knowledge and understanding	√	Reduction to Plane Problems - Importance & conditions of reduction to plane problems - Reduction to axis-symmetrical models Modeling 2-D plane - stress, plane strain, and fluid flow	The direct method is through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	

		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
7	3	Knowledge and understanding	√	Reduction to Plane Problems - Importance & conditions of reduction to plane problems - Reduction to axis-symmetrical models Modeling 2-D plane - stress, plane strain, and fluid flow	The direct method is through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
8	3	Knowledge and understanding	√	Bar, Beam, Problems Analysis of bar, beam - problems	The direct method is through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	

		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
9	3	Knowledge and understanding	√	Plate Problems - Condition of reduction to plate model Load, Symmetry -	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
10	3	Knowledge and understanding	√	Meshing; 2-D - Types of mesh Methods of meshing -	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	

		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
11	3	Knowledge and understanding	√	Meshing 3-D - Types of mesh Methods of meshing -	The direct method is through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
12	3	Knowledge and understanding	√	Meshing Bar, Beam, and Plate - Types of mesh Methods of meshing -	The direct method is through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	

		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
13	3	Knowledge and understanding	√	Load – Structural - Types & implementation of structural loads	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
14	3	Knowledge and understanding	√	Load – Thermal Types & - implementation of thermal loads	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	

		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
15	3	Knowledge and understanding	√	Load – Fluid - Types & implementation of fluid- flow loads	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	√
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	√
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	√
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	√
16	3	Knowledge and understanding	√	Solution- Structural Static structural - problems	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	

		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
17	3	Knowledge and understanding	√	Solution – Dynamic Dynamic structural - problems	The direct method is through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
18	3	Knowledge and understanding	√	Solution – Thermal Heat transfer - problems	The direct method is through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	

		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
19	3	Knowledge and understanding	√	Solution- Fluid Fluid flow problems -	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
20	3	Knowledge and understanding	√	Results - Types of results - Visual contours & data results - Results at internal sections Animation -	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	

		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
21	3	Knowledge and understanding	√	Results - Types of results - Visual contours & data results - Results at internal sections Animation -	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
22	3	Knowledge and understanding	√	Report Generation - Software- dependent generation of eng. Reports of analyzed problems	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	

		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
23	3	Knowledge and understanding	√	Applications - Static 3D stress analysis problem - Steady- state heat transfer problem - Laminar flow problem Modal analysis - problem	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
24	3	Knowledge and understanding	√	Applications - Static 3D stress analysis problem - Steady- state heat transfer problem - Laminar flow problem Modal analysis - problem	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	

		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
25	3	Knowledge and understanding	√	Applications - Static 3D stress analysis problem - Steady- state heat transfer problem - Laminar flow problem Modal analysis - problem	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
26	3	Knowledge and understanding	√	Applications - Static 3D stress analysis problem -	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	

		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
27	3	Knowledge and understanding	√	Importing Geometry - Types & standards of solid geometry Importing from CAD - systems	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
28	3	Knowledge and understanding	√	Contact Problems - Introduction to contact problems Software- specific - implementation	The direct method is .through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of .specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	

		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
29	3	Knowledge and understanding	√	Plastic Deformation - Non-linear material behavior and solution	The direct method is through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	
		Generic and transferable skills (other skills related to employability and personal development)	√		An interactive method by dividing students into small groups	√	Projects and observation		external assessmeters	
30	3	Knowledge and understanding	√	Phase- change problems - Analysis & implementation of phase- change problems	The direct method is through lectures	√	Written tests	√	Interviews or questionnaires to survey graduates' opinions	√
		Subject-specific skills	√		The subjective method is through preparing research papers and discussing them collectively	√	Oral exams	√	Interviews or questionnaires to survey employers' opinions	√
		thinking skills	√		Scientific seminars on the most important research carried out in the field of specialization	√	Completion files and performance assistant	√	Interviews or questionnaires to survey student opinions.	√

[illegible]

13. Course evaluation: Distributing the grade out of 100 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, and written exams, reports, etc.						
First semester/theoretical	First semester/practical	Second/theoretical semester	Second/practical semester	Work of the year/activities and absences	Final/practical exam	Final/theoretical exam
0	20	0	20	10	50	0

14. Learning and teaching resources	
Structural & Thermal Analysis Using the ANSYS Workbench Release 14	Required textbooks (methodology, if any)
Structural & Thermal Analysis Using the ANSYS Workbench Release 14	Main references (sources)
Structural & Thermal Analysis Using the ANSYS Workbench Release 14	Recommended supporting books and references (scientific journals, reports....)
You Tube, Ansys websites	Electronic references, Internet sites