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

Academic Program and Courses of Mechanical power department

2025

Introduction:

Mechanical power department was established in 1973 with the establishment of the Institute of Technology in Basra. Its one of the branches of Mechanics Department, also it consists of two branches (Refrigeration and Air Conditioning, and Automotive). In 1987, Mechanical power department separated from the Mechanics Department. Initially, its name was the Department of Machines and Equipment, then it was changed to Power Mechanics Technologies.

The Power Mechanics department includes a number of scientific laboratories and workshops related to refrigeration, air conditioning, and automobiles fields, as well as computer laboratories. Over the years, since the department's establishment, government institutions and private sector been supported by a large number of graduates.

The academic program description, provides a brief summary of the program's features and courses, indicating the skills that are being worked on to provide it to students. These skills are expected to acquire the program's objectives also the importance of this description is to add a base for obtaining program accreditation.

It was written by faculty members under the supervision of the academic committees in the academic departments.

This guide, in its second edition, includes a description of the academic program after updating the vocabularies and paragraphs of the previous guide, since the Iraqi educational system made a lot of developments. Which included a description of the academic program in its traditional form (annual and semester) in addition to, adopting the description of the academic program published by Department of Studies TM3/2906 dated 5/3/2023 which made Polonia process as the basis for their work.

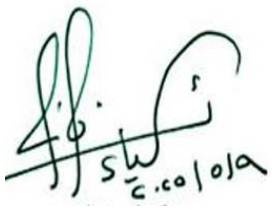
In this context, we confirm the importance of writing a descriptions of academic programs and courses to ensure the easy process of the educational.

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

Academic Program Specification Form for the Academic

***University**: Southern Technical University*
***College:** Basra Technical Institute.*
***Department:** Power Mechanics Techniques. / Refrigeration & Air Conditioning*
***Date of Form Completion:** 9 / 5 / 2025*

Dean 's Name	***Dean 's Assistant For***	***Head of Department***
Assist. prof	***Scientific Affairs***	***Assist. prof.***
Dr. Diyah Kammel Shary	*Dr. Abdel Nasser Abboud*	*Dr .Duna Tariq Yaseen*
Date: 9 / 5 /2025	***Date: 9 /5 /2025***	***Date: 9 / 5 /2025***
Signature	***Signatur***	***Signature***



Quality Assurance and University Performance Manager
Anwar Abdel Khaleq
Date: 9 / 5 /2025

Signature


1. Program Vision

The Department of Power Mechanics is one of the main technology departments at the Technical Institute in Basra. It ultimately runs the technical education base and its applications to be a leader in providing technical services based on competition and participation with the community.

2. Program Mission

The Department of Power Mechanics Technology adopts a general mission based in its general form on the framework of technical education in Iraq. This mission is sought to be achieved each year to highlight the department's distinctive features. The general objectives are focus on graduating national technical cadres with a high level of education and training, capable of absorbing technology systems and supporting the rapid global technological developments. The general mission includes the following:

1. Use computer and internet technologies in education and training.
2. Activate the relationship with the private sector in training fields.
3. Follow up on the development of training plan curricula and subsequently update laboratories and workshops.
4. Interact with the labor market and community needs for qualification and training.

3. Program Objectives

The department aims to prepare technical personnel who will be a link between the specialist and the skilled worker. The scientific branch prepares and equips the graduate and provides him with theoretical, applied and practical information to enable him to carry out the tasks assigned to him.

Refrigeration and Air Conditioning Branch:

- Contribute to the preparation and reading of mechanical and electrical drawings for installation, operation, and maintenance purposes.
- Contribute to the installation and operation of refrigeration and air conditioning systems.
- Contribute to the completion of calculations and drawing of maps for preliminary and final engineering work for refrigeration equipment.
- Daily scheduled monitoring of the performance of refrigeration and air conditioning equipment and the completion of maintenance and repair operations.
- Graduates are awarded a technical diploma in power mechanics/refrigeration and air conditioning techniques.

4. **Program Accreditation**

5. **Other external influences**

6. **Program Structure**				
Program Structure	**Number of Courses**	**Credit hours**	**Percentage**	**Reviews***
Institution Requirements	**6**	**20**	**% 16**	
College Requirements	**3**	**22**	**% 18**	
Department Requirements	**12**	**82**	**% 66**	
Summer Training	**1**	**0**	**% 0**	
Other				

Curriculum for the Department of Power Mechanics/Refrigeration and Air Conditioning Technologies for the academic year 2023/2024

First year – First course

No.	Subject	Hours			Number of units	Type of the subject	Nots
		theoretical	practical	Total			
1	Principle of Air conditioning	2	2	4	4	Specialized	Teaching in English
2	Thermodynamics / 1	2	1	3	3	Specialized	Teaching in English
3	Engineering Mechanics	2	1	3	3	Auxiliary	Teaching in English
4	Computer Fundamentals / 1	-	2	2	2	Auxiliary	
5	Mathematics / 1	2	-	2	2	Auxiliary	
6	Human Rights and Democracy	2	-	2	2	General	

7	Engineering Drawing / 1	2	3	3	3	Specialized	
8	Electricity technology	2	2	4	4	Auxiliary	
9	Workshops	-	4	4	-	Specialized	Annual
	Total	11	15	27	23		

Curriculum for the Department of Power Mechanics/Refrigeration and Air Conditioning Technologies for the academic year 2023/2024

First year – First course

No.	Subject	Hours			Number of units	Type of the subject	Nots
		theoretical	practical	Total			
1	Principle of Refrigeration	2	2	4	4	Specialized	Teaching in English
2	Thermodynamics / 2	2	1	3	3	Specialized	Teaching in English
3	Fluid Mechanics	2	1	3	3	Auxiliary	Teaching in English
4	Mathematics / 2	2	-	2	2	Auxiliary	
5	English Language / 1	2	-	2	2	General	
6	Electricity technology	2	2	4	4	Auxiliary	
7	Engineering Drawing / 2	-	3	3	3	Specialized	
8	Workshops	-	4	4	8	Specialized	Annual
9	The Crimes of the defunct Baath Party	2	-	2	2	General	
	Total	13	13	27	32		

Curriculum for the Department of Power Mechanics/Refrigeration and Air Conditioning Technologies for the academic year 2023/2024							
First year – First course							
No.	Subject	Hours			Number of units	Type of the subject	Nots
		theoretical	practical	Total			
1	Air conditioning / 1	2	2	4	4	Specialized	Teaching in English
2	Refrigeration Systems / 1	2	2	4	4	Specialized	
3	Heat Transfer / 1	2	2	4	4	Specialized	Teaching in English
4	Control Systems / 1	2	2	4	4	Specialized	
5	Refrigeration and Air conditioning Systems Maintenance / 1	2	4	6	6	Specialized	
6	Refrigeration and Air conditioning Systems Drawing / 1	-	3	3	3	Specialized	Teaching in English
7	Management and Occupational safety / 1	2	-	2	2	Auxiliary	
8	Computer Fundamentals / 2	-	2	2	2	Auxiliary	
9	Graduation Project	-	2	2	-	Specialized	Annual
	Total	12	19	31	29		

Curriculum for the Department of Power Mechanics/Refrigeration and Air Conditioning Technologies for the academic year 2023/2024							
Second year – Second course							
No.	Subject	Hours			Number of units	Type of the subject	Nots
		theoretical	practical	Total			
1	Air / 2 conditioning	2	2	4	4	Specialized	Teaching in English
2	Refrigeration Systems / 2	2	2	4	4	Specialized	
3	Heat Transfer / 2	2	2	4	4	Specialized	Teaching in English
4	Control Systems / 1	2	2	4	4	Specialized	
5	Refrigeration and Air conditioning Systems Maintenance / 2	2	4	6	6	Specialized	
6	Management and Occupational safety / 2	2	-	2	2	Auxiliary	
7	English language / 2	2	-	2	2	General	
8	Refrigeration and Air conditioning Systems Drawing / 2	-	3	3	3	Specialized	Teaching in English
9	Graduation Project	-	2	2	4	Specialized	Annual
	Total	14	17	31	33		

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
First level		Principles of air refrigeration and air-conditioning	2 theoretical	2 practical
Second level		Refrigeration system	2 theoretical	2 practical

8. Expected learning outcomes of the program

Knowledge	
1 - Study the types of refrigeration and air conditioning systems. 2- Study the different types of tables and charts used within the specialty. 3- Identify the different types of refrigerants. 4- Study the types of control systems used in different types of systems.	
Skills	
1 - Identify refrigeration and air conditioning malfunctions, their causes, and how to fix them. 2 - Gain the skill to maintain all types of refrigeration and air conditioning equipment. 3 - Gain experience in handling various types of systems. 4 - Gain experience in analyzing the performance of mechanical and electrical systems.	
Values	
- Conducting practical experiments in laboratories and workshops, along with theoretical lectures. - Scientific trips and field visits to work sites. - Summer training and practical experience	

on equipment in government and private institutions.	

9. Teaching and Learning Strategies

- Explanation and clarification through lectures.
- Methods for presenting scientific materials using various projectors.
- Self-learning through homework and mini-projects.
- Laboratories.
- Graduation projects.
- Scientific visits.

10. Evaluation methods

- Testing Student personality through discussion
- interaction In-class
- Mini-projects through the class
- Continuous assessment of student behavior during class
- Direct discussion with students during class
- Behavior changes and follow-up of some students
- Midterm and final exams
- Daily short exams
- Homework
- Reports

11.Faculty						
Faculty Members						
Academic Rank	**Specialization**		**Special Requirements/Skills (if applicable)**		**Number of the teaching staff**	
	General	**Special**			**Staff**	**Lecturer**
Ass.Proff./ Dr.	Mechanical Engineering	Heat Transfer			✓	
Ass.proff. Dr	Mechanical Engineering	Thermal engineering			✓	
Ass.proff. / master	Mechanical Engineering	Thermal engineering			✓	
Ass. Teach / Master	Mechanical Engineering	Thermal engineering			✓	
Ass. Teach / Master	Mechanical Engineering	computers			✓	
Ass. Teach / Master	Mechanical Engineering				✓	
Ass. Teach / Bach	Engineering	Refrigeration and Air Condition			✓	
Teacher / Master	IT				✓	
Teach / Dr.	History	History			✓	

Professional Development
Mentoring new faculty members
Periodic meetings to hone academic skills
Professional development of faculty members

12.**Acceptance Criterion**
Central admission for technology majors Choose a science department based on your GPA, desire, and experience in the field of specialization.

13.**The most important sources of information about the program**
University and Institute Website and University Guide

14.Program Development Plan
1- The necessity of involving students in periodic maintenance as part of systematic training. 2- Emphasis should be placed on summer training in government departments, with material and moral incentives for students and supervisors.

Program Skills Outline															
				Required program Learning outcomes											
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
First level		Principles of air refrigeration and air-conditioning	Basic	*	*	*		*	*	*	*	*	*	*	*
		Thermodynamics	Basic	*		*			*	*	*		*	*	*
		Mechanics	Basic	*		*			*	*	*		*	*	*
		Computer applications 1	Basic	*	*	*			*	*	*		*	*	*
		Engineering drawings	Basic	*		*		*		*		*	*		
		mathematics	Basic			*		*		*		*	*		
		Electrical technique	Basic			*		*	*	*	*		*	*	*
		English language skills 1	Basic			*	*	*	*	*	*		*	*	*
		Human rights and democracy	Basic	*	*	*	*	*	*	*	*	*	*	*	*
		Mechanical workshops	Basic		*	*	*					*			*
Second level		Refrigeration system	Basic		*	*	*	*	*	*		*	*	*	
		Air conditioning	Basic	*	*		*	*	*	*	*	*	*	*	*
		Heat transfer	Basic	*		*	*	*	*	*	*	*	*		*
		Control systems	Basic		*			*	*	*		*	*	*	*

		Maintenance of refrigeration and air conditioning systems	**Basic**		*			*	*	*		*	*	*	*
		Drawings of refrigeration and air conditioning systems	**Basic**	*		*		*		*		*	*		
		Management and occupational safety	**Basic**	*	*	*	*		*		*	*	*		*
		Computer applications 2	**Basic**		*		*	*	*	*		*	*	*	
		English language skills 2	**Basic**	*	*	*					*			*	
		project	**Basic**		*		*		*		*	*			

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

Course Description Form

1. Course Name:	
Principle of Air Conditioning Chapter 1 Principles of Refrigeration and Chapter 2	
2. Course Code:	
3. Semester / Year:	
Semester 1 / First Stage Semester 2	
4. Description Preparation Date:	
2025	
5. Available Attendance Forms:	
Fully present	
6. Number of Credit Hours (Total) / Number of Units (Total)	
60 hours (theoretical + practical) per semester	
7. Course administrator's name (mention all, if more than one name)	
Name: Ayat Abdel-Hussin	
8. Course Objectives	
Course Objectives	- Understanding the principles of thermodynamics Studying the properties of air, air properties diagrams, and practical procedures Understanding the types of refrigerants and their impact on the environment Studying the vapor compression system and representing it on a pressure-enthalpy diagram - Understanding the types of compressors, condensers, expansion devices, and evaporators
9. Teaching and Learning Strategies	

Strategy	- Conducting practical experiments in laboratories and workshops and delivering theoretical lectures. - Scientific trips and field visits to work sites. - Summer training and practical experience on equipment in government and private institutions.

10. Course Structure first semester

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
Chapter One / Principles of Air Conditioning					
1-2	8		Principles of thermodynamics,	Lecture+ Practical	Theoretical and practical exams
8 – 3	24		Properties of Air / Air Properties Chart	Lecture+ Practical	Theoretical and practical exams
15 - 9	16		Applications of air properties chart	Lecture+ Practical	Theoretical and practical exams
Second semester / Principles of Air Cooling					
17 – 16	20		Principles of Refrigeration / Refrigeration Methods / Refrigerants / Pressure-Endothermal Diagram	Lecture+ Practical	Theoretical and practical exams
21 – 18	16		Theoretical and practical steam compression system	Lecture+ Practical	Theoretical and practical exams
24 – 22	12		Compressors	Lecture+ Practical	Theoretical and practical exams
25 – 26	8		Condensers and cooling towers	Lecture+ Practical	Theoretical and practical exams
27 – 28	8		Stretching tools	Lecture+ Practical	Theoretical and practical exams

29 - 30	8		evaporators	Lecture+ Practical	Theoretical and practical exams

11.Course Evaluation	
the first semester (10 theoretical + 10 practical), it accounts for 20%. For the second semester (10 theoretical + 10 practical), it also accounts for 20%. Yearly assignments count for 10%. Consequently, the annual effort is 50%. The final theoretical exam is 40%, and the final practical exam is 10%. (The total is 100%).	
12.Learning and Teaching Resources	
1- Principles of Refrigeration and Air Conditioning by Adnan Rikan. 2- Principles of Refrigeration and Air Conditioning by Abdul Hadi Nama Khalifa.	
The book "Principles of Refrigeration and Air Conditioning" Khalid Al-Joudi.	

Course Description Form

13.Course Name:
Thermodynamics
14.Course Code:
15.Semester / Year:
Semester System/First Stage 45 hours (theoretical + practical) per semester
16.Description Preparation Date:
2025
17.Available Attendance Forms:
Full attendance system
18.Number of Credit Hours (Total) / Number of Units (Total)
45 hours (theoretical + practical) per semester
19.Course administrator's name (mention all, if more than one name)
Name: Mohamed Jassim Mohamed
20.Course Objectives

Course Objectives	- Knowledge of the principles and fundamentals of thermodynamics - Knowledge of the first law of thermodynamics and its applications - Knowledge of the second law of thermodynamics and its applications - Knowledge of the Carnot cycle, Rankine, and steam compression - Knowledge of boiler/fuel types

21.Teaching and Learning Strategies

Strategy	Conducting practical experiments in laboratories and workshops and giving theoretical lectures. - Scientific trips and field visits to work sites. - Summer training and practical experience on equipment in government and private institutions

22. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
First Semester					
1-6	18		Thermodynamics terms	Lecture + Practical	Theoretical and practical exams
7-8	6		The first law of thermodynamics	Lecture + Practical	Theoretical and practical exams
14 - 9	18		Applications of the first law of thermodynamics	Lecture + Practical	Theoretical and practical exams
15	3		The second law of thermodynamics	Lecture + Practical	Theoretical and practical exams
Second semester					
1-3	6		Carnot power cycle-reversed Carnot cycle (refrigeration & heat pump applications). Examples .	Lecture + Practical	Theoretical and practical exams
4-8	15		Steam process under going at constant (pressure, volume)-isentropic process, adiabatic process & applications.	Lecture + Practical	Theoretical and practical exams

9-152	6		The Rankine cycle ,processes of the cycle , examples	Lecture + Practical	Theoretical and practical exams
13-15	3		The vapour Compression cycle.	Lecture+ Practical	Theoretical and practical exams

23.Course Evaluation

For the first semester (10 theoretical + 10 practical), it accounts for 20%. For the second semester (10 theoretical + 10 practical), it also accounts for 20%. Yearly assignments count for 10%. Consequently, the annual effort is 50%. The final theoretical exam is 40%, and the final practical exam is 10%. (The total is 100%).

24.Learning and Teaching Resources

1. Applied engineering thermodynamics, Choudhury 2- Thermodynamics, Holman 3- Introduction to Thermodynamics, Sonntag 4- Applied Thermodynamics, Eastop	

Course Description Form

1. Course Name:
Mechanics
2.Course Code:
3.Semester / Year:
First year
4.Description Preparation Date:
2025
5.Available Attendance Forms:
Full attendance system
6.Number of Credit Hours (Total) / Number of Units (Total)
45 hours (theoretical + practical) per semester
7.Course administrator's name (mention all, if more than one name)
Name: Ayat Abdel-Hussin
8.Course Objectives

Course Objectives	The aim of the course is to equip students with the fundamental skills in mechanical calculations of materials and applied fluids.

9.Teaching and Learning Strategies	
Strategy	- Conducting practical experiments in laboratories and workshops and delivering theoretical lectures. - Scientific trips and field visits to work sites. - Summer training and practical experience on equipment in oil companies, laboratories, and government departments.

10. Course Structure First semester

Week	**Unit or subject name**
1	Introduction to mechanics (Definitions, Units, Load, Applied mechanics, Stress, Strain, Safety factor, Mechanical Properties, Stress Strain diagram)
2 – 8	Stresses due to : - Normal Load (Tension & compression) - Tangential Load (Shear & Torsion) - Change in Temperature (Thermal)
9 – 10	Application with uniform and non uniform material and load with variable cross section
11	Introduction to Fluid Mechanics (Definition, Properties of fluid, steady flow)

12	Fluid static , Pressure of a certain depth
13	Specific Gravity, Viscosity (Newton's law of Viscosity, Types of fluids), effect of temperature on viscosity , effect of pressure on viscosity
14	Pressure Measurement (Boardergage, Piezometer, manometer, Pitot)
15	Floating and sub – merged calculation

Second semester	
1	Floating and sub – merged calculation
2-3	Continuity equation with application
4-5	Bernolli equation with application
6-7	Energy equation with application
8-9	Momentum equation with application

10-11	Orifice & Gates
12-13	Flow in pipes (parallel and series losses in pipes)
14	Friction losses in pipes
15	Air flow in ducts

35.Course Evaluation
For the first semester (10 theoretical + 10 practical), it accounts for 20%. For the second semester (10 theoretical + 10 practical), it also accounts for 20%. Yearly assignments count for 10%. Consequently, the annual effort is 50%. The final theoretical exam is 40%, and the final practical exam is 10%. (The total is 100%).

36.Learning and Teaching Resources	
1- Strength of materials by Singor 2- Fluid Mechanic by streeter 3- Fluid mechanics by Donglas	

Course Description Form

37.Course Name:
Mathematics
38.Course Code:
39.Semester / Year:
First year
40.Description Preparation Date:
2025
41.Available Attendance Forms:
Full attendance system
42.Number of Credit Hours (Total) / Number of Units (Total)
30 hours (theoretical) per semester
43.Course administrator's name (mention all, if more than one name)
Name: Ashuaq Talib
44.Course Objectives

Course Objectives	1- Learn mathematical calculations. 2- Learn integrals.

45.Teaching and Learning Strategies

Strategy	Conducting practical experiments in laboratories and workshops and delivering theoretical lectures. - Scientific trips and field visits to work sites. - Summer training and practical experience on equipment in oil companies, laboratories, and government departments.

46. Course Structure

Week	Unit or subject name
1-2	Matrices, Determinants, and Their Properties
3-4	Solving Linear Equations: Linear Equations, Cramer's Method, Applications, Arc Factorization, Vectors
5-6	Vectors, Limit Factorization, Types of Vectors, Quantities, Scalar Vectors, Curve Algebra, Vector Arithmetic
7-9	Orthogonal Vector Unit, Vector Scale, Scalar and Cross Product, Applications of Vectors, Arc Factorization
10-12	Logarithm, Definition of Logarithm, Laws of Logarithms and How to Use Them, Solving Logarithmic Equations
13-15	Trigonometric Ratios and Their Relationship, Some Laws of Trigonometric Ratios, Function, Meaning of Function, Independent and Dependent Variables, Explicit Function, Implicit Function
Second semester	
1-3	Measurements, the purpose of trigonometric and algebraic functions, applications of linear velocity, areas
4-5	Details, derivatives, derivatives of algebraic functions, applications of the chain rule, implicit functions
6-8	Higher-order derivatives, derivatives of exponential functions, derivatives of logarithmic functions
9-10	Derivatives of trigonometric functions, derivatives of circular functions
11	Partial differentiation
12	Applications of derivatives (slope equation, normal, velocity, and acceleration)
13	Applications of derivatives (simultaneous change)
14-15	Increasing, decreasing, maximum and minimum limits, inflection points, graphing functions
15	Integration, indefinite integrals, integration of algebraic functions

47.Course Evaluation
First semester 10) Theory 10 + Practical (20%), Second semester 10) Theory 10 + Practical (20%), Yearly work 10% << Annual effort 50% Final theoretical 40% Final practical 10% Total 100%

48.Learning and Teaching Resources	
1-Panal colter “Technical Mathematics” 2- Murray R. “Mathematical handbook” 3- Shantinarayam “ Engineering Mathematics part 1 – 1987	

Course Description Form

49.Course Name:
Engineering Drawings
50.Course Code:
51.Semester / Year:
First year
52.Description Preparation Date:
2025
53.Available Attendance Forms:
Full attendance system
54.Number of Credit Hours (Total) / Number of Units (Total)
45 hours (practical) per semester
55.Course administrator's name (mention all, if more than one name)
Name: Dr. Altayyeb Abdullah
56.Course Objectives

Course Objectives	The importance of engineering drawing - The importance of using the computer for engineering drawing - Standard drawing board dimensions - Overview of AutoCAD program

57.Teaching and Learning Strategies	
Strategy	- Ongoing educational seminars. - Guidance and follow-up lectures. - Online seminars and workshops.

58. Course Structure

Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
First Semester					
3 - 1	3 hours per week		Introduction to importance of engineering drawing by computer	Practical Exams	Practical

5 - 4	3 hours per week		limits and dimension of drawing palate by AutoCAD history	Practical Exams	Practical
9 - 6	3 hours per week		Engineering operations	Practical Exams	Practical
15 - 10	3 hours per week		Interduce Basic AutoCAD Shapes by	Practical Exams	Practical
Second Semester					
22 - 16	3 hours per week		Engineering operation by AutoCAD – Dimension	Practical Exams	Practical
27 - 23	3 hours per week		Isometric drawing	Practical Exams	Practical
30 - 28	3 hours per week		Drawing perspective – drawing perspective contain circle, rectangle, Triangle , Isometric drawing	Practical Exams	Practical

59.Course Evaluation

For the first semester 20%. For the second semester 20%. Yearly assignments count for 10%. Consequently, the annual effort is 50%. The final theoretical exam is 50% (The total is 100%).

60.Learning and Teaching Resources

. The Virtual Library of the Ministry of Higher Education and Scientific Research - The Institute's Electronic Library	
The Virtual Library of the Ministry of Higher Education and Scientific Research	
- The Virtual Library of the Ministry of Higher Education and Scientific Research	

Course Description Form

61.Course Name:
Electrical techniques
62.Course Code:
63.Semester / Year:
First year
64.Description Preparation Date:
2025
65.Available Attendance Forms:
Full attendance system
66.Number of Credit Hours (Total) / Number of Units (Total)
60 hours (theoretical + practical) per semester
67.Course administrator's name (mention all, if more than one name)
Name: Furat Kareeb
68.Course Objectives

Course Objectives	1- Identify electrical meters. 2- Conduct laboratory experiments on electrical circuits. 3-Identify devices for measuring resistance and capacitance.

69.Teaching and Learning Strategies	
Strategy	Theoretical lectures Practical lectures Scientific trips Summer training Student projects

70. Course Structure

Week	Vocabulary details **First semester**
1	,Electrical transformer, methods and types of work, construction applications, losses in transformer, transformer testing, transformer efficiency, automatic transformer.
2	Electronic power distribution (voltage law).
3	Converting solar energy into electricity.
6-5-4	,DC motors, their components, working principles, types of applications types of starting, losses, power calculation.
9-8-7	,AC motors, their components, working principles, types of applications single phase - three phases, types of starting, speed control.

12-11-10	Motor protection, current protection devices, overload, temperature, surge protection.
15-14-13	Engine testing, engine maintenance and parts repair.
week	**Details of thepackages second semester**
1	,How to use electrical devices for current, voltage, and resistanceand energy measurement.
3-2	Reading resistance by its colors, applying Ohm's law.
5-4	Multiplexing of resistors in series and parallel.
6	Reading resistance value at high temperatures.
7	Connecting electrical circuits..
8	Measuring electrical power in DC circuits.
10-9	Measuring electrical power in single-phase and three-phase alternating current circuits.
11	Use of electric welding equipment
12	Building electrical circuits
13	Checking the motors and measuring their current and voltage.
15-14	Engine download, contents and structure of types of engines.

71.Course Evaluation

For the first semester (10 theoretical + 10 practical), it accounts for 20%. For the second semester (10 theoretical + 10 practical), it also accounts for 20%. Yearly assignments count for 10%. Consequently, the annual effort is 50%. The final theoretical exam is 40%, and the final practical exam is 10%. (The total is 100%).

72.Learning and Teaching Resources

Main references (sources) .2	1 Virtual Library of the Ministry of Higher Education and Research Scientific
A. Recommended books and ,references (scientific journals, reports (...	Virtual Library of the Ministry of Higher Education and Scientific Research
b. Electronic references, websites	The Virtual Library of the Ministry of Higher - Education and Scientific Research The Institute's electronic library-

Model Description The decision

1. Name The decision
human rights
2. symbol The decision
3. Chapter/The year
Semester system/first stage
4. Date Preparation This Description
2025
5. Shapes Attendance Available
My presence completely
6. Number hours Academic/ Total Number Units Total
30 hours (theoretical) per semester
7. Name Responsible The decision Acade
Name:Dr. Zainab Mahmoud
8. Course objectives

Course objectives	1. Recognizing human rights -1
	2. Recognizing democracy and the rights of others -

9. Science and Learning Strategy	
Strategy	- They called T Educational Ongoing - Lectures guidance And follow up. Online seminars and workshops

10. Course Intention

week	Vocabulary Details First semester
	Human rights, definition, objectives
	The Roots of Human Rights and Their Development in Human History: Human Rights in Ancient and Medieval Times
	Human rights in ancient civilizations, especially the civilization of Mesopotamia
	Human rights in divine laws with a focus on human rights in Islam
	Human Rights in the Middle Ages: Human Rights in Doctrines, Schools, and Political Theories, Human Rights in Corporations and Their Declarations, Revolutions, and

	Constitutions (English Documents, American Revolution, French Revolution, Russian (Revolution
	Human Rights in Contemporary and Modern History: International Recognition of Human Rights since World War I and the League of Nations
	Regional recognition of human rights: European Convention on Human Rights 1950 American Convention on Human Rights 1969 African Charter on Human Rights 1981 Arab Charter on Human Rights 1994
5	NGOs and human rights (ICRC, Amnesty International, Human Rights Watch) National human rights organizations
	Human Rights in Iraqi Constitutions: Between Theory and Reality
6	:The relationship between human rights and public freedoms 1- In the Universal Declaration of Human Rights 2- In regional charters and national constitutions
7	Essential human rights and collective human rights
	Economic, social and cultural human rights and civil and political human rights
	Modern human rights: the facts in development, the right to a clean environment, the right to solidarity, the right to religion
9-8	Guarantees of respect for and protection of human rights at the national level, guarantees in the constitution and laws, guarantees in the principle of the rule of law Guarantees in constitutional oversight, guarantees in freedom of the press and public opinion, the role of non-governmental organizations in respecting and protecting human rights
10	:Guarantees, respect and protection of human rights at the international level - The role of the United Nations and its specialized agencies in providing guarantees - The role of regional organizations (the Arab League, the European Union, the African Union, the Organization of (American States, and ASEAN - The role of international non-governmental organizations and public opinion in respecting and protecting human rights
11	The General Theory of Liberties: The origin of rights and liberties, the project's position on declared rights and liberties, the use of the term "public "liberties
12	The functional nature of the concept of public liberties: philosophical ,considerations of functional right, structural considerations of positive right economic considerations and public liberties
13	The legal basis of the rule of law

14	**Regulation of public freedoms by public authorities**
	litigation or non-judicial grievance
	Judicial appeal, determining the state's responsibility for its legitimate actions
	- **The impact of the duality of the judiciary on public freedoms** - **Public freedoms under administrative jurisprudence**
15	**Equality: The historical development of the concept of equality**
	Modern development of the idea of equality
	- **gender equality** - **Equality among individuals according to their beliefs and race**

11. Course resources

Chapter One20 % Chapter Two ,20 % Year's work 10 % << Striving Annual 50 % practical Final 50 %Tota l% 100

12. References

1 Virtual Library of the Ministry of Higher Education and Research Scientific	2. Main references (sources)
Virtual Library of the Ministry of Higher Education and Scientific Research	A. Recommended books and ,references (scientific journals (.reports, etc
The Virtual Library of the Ministry of Higher - Education and Scientific Research The Institute's electronic library -	b. Electronic references, websites

Model Description The decision

25.Name The decision
computer
26.symbol The decision
Chapter/The year .27
Semester system/first stage
28Date Preparation This Description
2025
29. shapes Attendance Available
Attendance completely
30. Number of hours AcademicTotal Number Units (Total)

hours (practical) per semester 30
31. Name Responsible The decision Academic
Name:Lumin Radhi Sultan
32 . A goal scorer the decision

Goals Study material	1. Identify operating systems 2.Get to know the basic programs 3.Conduct practical applications
.33	Science and Learning Strategy
Strategy	- Continuing educational seminars. - Guidance and follow-up lectures. - Online seminars and workshops

.34 Course Intention

	watches	Required learning outcomes	Unit name/ topic	Teaching method	**Evaluation method**
1	3 hours weekly		Operating systems	Theoretical + Practical	**Oral and practical exams**
4	3 hours weekly		Basic programs	Theoretical + Practical	**Oral and practical exams**
6	3 hours weekly		Auxiliary programs	Theoretical + Practical	**Oral and practical exams**
11	3 hours weekly		Accounting programs	Theoretical + Practical	**Oral and practical exams**
12	3 hours weekly		Practical applications	Theoretical + Practical	**Oral and practical exams**
14	3 hours weekly		Public programs	Theoretical + Practical	**Oral and practical exams**

.35Course Evaluation

Evaluation Continuous/ Final 50 % Total 100

.36 . References

A- Required books and main references	

	B- Books and references(scientific journals, Reports,)	-1 The Virtual Library of the Ministry of Higher Education and Research Scientific
	C- Electronic references, websites Internet….	-1 The Virtual Library of the Ministry of Higher Education and Research Scientific-2 What books are available in ?the institute's electronic library

Courses The stage The second

Model Description The decision

37. Name The decision	
Heat transfer	
38 . symbol The decision	
3 Chapter /The year	
Semester system/second stage	
.40 Date Preparation This Description	
2025	
.41 Shapes Attendance Available	
My presence completely	
42. Number of hours AcademicTotal Number Units (Total)	
hours (theoretical + practical) per 60 semester	
.43 Name Responsible The decision Academi	
Name Dr. Donia Tariq Yassen Dr. Hussein Ali Atawi	
.44 decision Goals The	
Course objectives	1- Providing the student with basic skills in heat transfer calculations. 2- Identify the methods of heat transfer 3.Learn how to improve heat transfer and its applications -
.45 Science and Education Strategy	
Strategy	- Midterm and final exams - Short daily exams - Homework - Reports - Interaction within the lecture - Continuing educational seminars. - Guidance and follow-up lectures. Electronic seminars and workshops-
.46Course Intention	

week	**FIRST SEMESTER** Name of unit/course or topic	Teaching method	Evaluation method
3 - 1	Basic principles and importance of heat transfer.	Theoretical Practical +	N+A exam
5 - 4	The three kinds of heat transfer , conduction heat transfer, convection heat transfer , radiation heat transfer, examples	Theoretical Practical +	N+A exam
6-7	Conduction of heat transfer in the steady state conduction through a homogeneous plans wall	Theoretical Practical +	N+A exam
8	Conduction through a composite plans wall, heat resistance . conduction through a homogeneous cylinder wall		
9	Conduction through a composite cylinder wall , influence of variable conductivity , examples		
11-10	Heat transfer by convection , Reynolds concept of similarity of the flow of fluids and the viscosity , the most important dimensionless groups, examples		
12-10	Heat transfer by free convection , heat transfer from vertical and horizontal surfaces , examples		
13-14	Heat transfer by free convection from horizontal square plates , heat transfer proportion of air at atmospheric pressure and properties of water . examples		
15	Heat transfer by forced convection , the heating of fluids in turbulent flow through pipes , examples		
Second Semester			
1-3	Heat exchanger effectiveness ratio , examples	Theoretical Practical +	N+A exam
4-5	Heat transfer through fins , condensation and boiling heat transfer		
6-8	Heat transfer by radiation , the concept of a perfect black body		
9-10	Stefan – boltzmann's law of total radiation , general equation for heat exchange by radiation between black surfaces , examples		
11-12	Heat exchange by radiation between large parallel black plane , examples		
13	Heat exchange by radiation between large parallel planes of different emissivity , examples	Theoretical Practical +	N+A exam
14	Heat conduction in series with convection and radiation, examples	Theoretical Practical +	N+A exam
15	Heat transfer through air space , examples		

.47	Course Evaluation

Chapter First10) My theory 10 + Practical (20 % Chapter 2nd , 10) My theory 10 + Practical (% 20 Works The year , 10 % << Annual quest50 Final theoretical % 40 % practical Final10 % Total 100 %

48. References

Required textbooks .1	
Main references .2 (sources)	1. FRANK P. INCROPERA) Fundamentals of heat transfer 2. Heat Transfer 10th – Holman 3. Yunus, heat transfer
A. Recommended books and references ,scientific journals) (.reports, etc	Virtual Library of the Ministry of Higher Education and Scientific Research
b. Electronic references, websites	The Virtual Library of the Ministry of Higher Education and - Scientific Research The Institute's electronic library -

Model Description The decision

49.. Name The decision
air cooling systems
50. Symbel
51. The year / Chapter
Semester system/second stage
Date Preparation This Description
2025
.53 shapes Attendance Available
My presence completely
.54 Number of hours AcademicTotal Number Units(Total)
hours (theoretical + practical) 60 per semester
Name Responsible The decision Academic) if More From Name It is mentionedthat
Name: Omar Hussein
.56 Goals The decision

	Knowing how to calculate the thermal loads of buildings cooling + heating)) **- - Study of human comfort conditions** **- Knowing the types of air conditioning systems** **- Air duct system design study** **- Knowing the types of fans and their uses** **Learn about the operating conditions of different types of .air conditioning systems**

.57	Science and learning strategies
	Midterm and final exams A - Short daily exams - Homework - Reports -- Interaction within the lecture
	Projects Students

.58 Course structure

week	) Vocabulary details **semester 1**
(2-1)	**Compression refrigeration system (theoretical and practical) and media quality**
(5-3)	**- Selection of compression system parts / evaporator - condenser compressor - condensing unit - group balance**
(8-6)	**Compound compression system - multi-compressor {presence of an interchanger - presence of a flash tank} or multi-evaporator**
(10-9)	**General considerations for designing and extending the piping network (drain line - liquid line - suction line - water pipes)**
(14-11)	**Compression System Accessories / Target - Location**
(-15)	**Control devices used in refrigeration systems**

week	Vocabulary details) (**Second semester**)
(3-1)	**bsorption cooling system / Working principle - Advantages - Use in the field of refrigeration and condensation / Comparison with the compression system - Use of solar energy for operation**
4	**vapor jet cooling system**
(6-5)	**Air Cooling System - Features – Types**
(8-7)	**Air-cooled cooling system: features and types**
9	**Thermoelectric cooling system - features and prospects**
(12-10)	**Food preservation technology - cold storage designs - warehouse load calculations - types of warehouses**
(13-15)	**Rationalizing energy consumption in cooling systems**

.59	Course Evaluation
Chapter First10) My theory 10 + Practical (20 % Chapter 2nd , 10) My theory 10 + Practical (% 20 Works The year , 10 % << Annual quest50 % Final Theory % 40 Final Practical 10 % Total100 %	
60- Sources of knowledge and education	
A- Required books and main references	1-Air-conditioning engineering by w. p.Joins . 2-ASHRAE handbook 3-Air-conditioning engineering by Gopta 4-Principles of refrigeration by Dossat
B- Books and references((and reports scientific fields	-1 The Virtual Library of the Ministry of Higher Education and Scientific Research Scientific
C- Electronic references, websites Internet....	-1 The Virtual Library of the Ministry of Higher Education and Scientific Research Scientific-2 What books are available in the ?institute's electronic library

Description form The decision

.1 . Name The decision
Refrigeration Equipment Maintenanc / Phase 2
.2 . Symbol The decision
.3. Chapte /year
Semester system
.4Date Preparation This Description
2025
.5 . Shapes Attendance Available
My presence completely
.6 Number hours Academic Total Number Units (Total)
academic 6 = hours x 15 weeks annual hours 90 + theoretical) (practical
.7 . Name Responsible The decion Academic

Name: Talib Zahir Mahdi

.8O . Course objectives

Course objectives	**1. Identify the types of maintenance** **2. Recognizing the importance of maintenance and preservatio of devices.** **3. Maintenance of cooling and air conditioning system**

.9Science and Education Strategy

- Midterm and final exams
- Short daily exams
- Homework
- Reports
- Interaction within the lecture
- Continuing educational seminar .
- Guidance and follow-up lectures.
-- Electronic seminars and workshops

10 . Course structure

week	Vocabulary details (Chapter 1)
1	Definition of maintenance, its types and purpose
2	The basic electrical parts of the air conditioning cycle and how to check them (compressor / overload / relay / thermostat) and the mechanical cycle
3	The electric refrigerator and its types (the electric circuit and its types / the (mechanical circuit and its types
4	,Electrical and mechanical faults / replacing any part of the cycle, then checking discharging and charging
5	Freezers and their types (electrical circuit / mechanical circuit) Electrical and ,mechanical faults in the freezer, detecting leakage in the cycle, then examining emptying and charging
6	,Water cooler (electrical and mechanical circuit / water cycle) Electrical mechanical and water cycle faults / inspection, emptying and charging
7	Oil change, types of oils, methods of adding oil, and the amount of oil according to the type of compressors
8	Wall-mounted air conditioners and their types (electrical circuits / mechanical circuits) in both cooling and heating cases
9	Electrical and mechanical faults of wall-mounted air conditioners and how to replace any part, then check, discharge and charge / and how to check the fan and how to identify the wires and poles without the presence of signs on the fan and any diagram and types of capacitors and how to calculate them
10	Split units and their types: single-phase and three-phase (electrical circuits and their types / mechanical circuits) in the cases of cooling and heating

11	Electrical/mechanical faults of separate units, electronic brain faults, and how to connect the Joker Brain
12	How to install separate units and choose the appropriate location and size for the device scientifically and the installation steps in detail / How to transfer a device from an installed location to a new installation location according to the steps without losses in the shipment
13	Car air conditioning (electrical circuit / mechanical circuit) electrical and mechanical faults / and how to detect leaks and then inspect, discharge and charge
14	A scientific visit to an industrial site that has refrigeration and air conditioning .equipment
15	Types of compressors, how to maintain them, and the electrical and mechanical parts of each type / types of refrigerants and environmentally friendly alternatives

week	Vocabulary details (Chapter Two)
1	Package units, electrical and mechanical circuits / electrical and mechanical faults, how to maintain and maintain parts for units, and how to inspect, unload and charge
2	Boiler, its components, types, and how to maintain it/maintain it .before the winter season. Explanation of the parts in detail
3	Refrigeration and freezing equipment, its types, parts, and how to maintain it
4	,Central cooling, its types, components, types of each part in the cycle how to maintain it, detect faults, how to charge the cycle with liquid refrigerant, how to wash condensers with chemicals, and clean each .part in the cycle
5	Cooling towers, their types, components, and how to maintain and .sustain them before the summer season
6	Types of humidifiers and air filters used in central cooling
7	Modern cooling systems vrv /vrf Its components, how to install it, and the developments in this field
8	A scientific visit to one of the sites that containVRV systems and vrf Modern
9	Pumps, their types, how to maintain them, and how to maintain them before the operating season
10	Fans, their types, maintenance methods, and how to maintain them before the operating season

11	Control devices in small and large units, the operation of each part of .the devices, and how to maintain and maintain them
12	Testing resistors, how to determine resistor size, and electrical testing
13	Ice factories: how they work and how they are maintained
14	Control panels for small and large appliances
15	Air mixing boxes, their purpose, types, and how they work in each location

Chapter First10) My theory 10 + Practical (20 % Chapter 2nd , 10) My theory 10 + Practical (% 20 Works The year , 10 % <<
Annual ques 50 % Final Theory % 40 Final Practical 10 % Total 100 %

Model Description The decision

1. Name The decision	
Control Systems/Phase Two	
.2 . symbol The decision	
.3 . Chapter/The year	
Semester system / Second stage	
.4 . Date Preparation This Description	
202 5	
.5 . Shapes Attendance Available	
My presence completely	
.6 . Number hours AcademicTotal Number Units (Total)	
study hours x 15 weeks = 60 4 hours per semester	
.7 . Name Responsible The decision Academic	
Name: Hadeel Haitham Salem	
.8 . Goals The decision	
	1. Identify pressure and temperature gauges 2. Identify the control devices in air conditioning .and refrigeration system 3. Electronic control circuit

.9Science and learning strategies	
	1) -Tests Oral In person 2).Tests A 3) Evaluation Daily 4) Reports Laboratory . 5) -Exam practical In person

.10 Course Intention

week	Vocabulary details
1	**Principles of control…and general definitions of the most important terms used in control**
2	**Principles of Control – Types of Control**
3	**Principles of measurement – measurement – control and measurement the most important factors subject to control –**
4	**Measuring and sensing devices for various factors in refrigeration and – air conditioning equipment (liquid level – pressure – temperature (humidity**
5	**Electrical Control Circuits / Electrical Control Balance – Electrical Circuit and Control Diagrams**
7–6	**Electrical control elements, thermostat – overload protection circuit breaker, humidity regulators, pressure regulators, final control .elements, contactors**
8	**,Electronic control circuits – control circuit elements, thermostat humidistat**
–11–10–9 12	**,Pneumatic control circuits, control components, control elements ,thermostat, humidity regulator, pressure regulator, control elements gate motor, pneumatic valves, pneumatic relays, compressed air processing equipment**
15–14–13	**– Components of the control system for refrigeration machines dynamic properties**

5-4-3-2-1	**Methods of controlling cooling capacity - Controlling cooling capacity through the operation of the evaporator - Controlling cooling capacity through the operation of centrifugal compressors and controlling cooling capacity using a thermal expansion valve, controlling capacity using a float in centrifugal machines**
6	**Practical applications of control devices for clean rooms, white rooms, computer .rooms, and hospitals**
7-8--11-10-9	**,Control systems for home units - control circuits for wall-mounted air conditioners home freezers - split devices, multi-zones (control devices for the device or multiple zones) - central air conditioning units**

12	**Components of the central cooling system control system and the most important methods used to control temperature and humidity**
13	**Control system for an air conditioning system that operates all year round**
14	**Central heating control system**
15	**Develop a detailed control map for central air conditioning and refrigeration .equipment**

.11

Chapter First10) My theory 10 + Practical (20 % Chapter 2nd , 10) My theory 10 + Practical (% 20 Works The year , 10 % <<
Annual ques 50 % Final Theory % 40 Final Practical 10 % Total 100 %

.12 Sources of knowledge

Sources	**1) Engineering Measurement & Instrumentation by LF Adams** **2) Control systems for heating & ventilation and air-condition, by Haines**

Description form The decision

.1. Name The decision	
Computer Applications/Second Stage	
.2 . symbol The decision	
.3 . Chapter/The year	
Phase II Loop System	
.4 . Date Preparation This Description	
202 5	
.5. Shapes Attendance Available	
My presence And the electron	
.6 . Number hours AcademicTotal Number Units(Total)	
= study hours x 15 weeks 2 30 hours	
.7 . Name Responsible The decision Academic) if More From Name It is mentionedthat	
Name:Luminousness Radhi Sultan	
.8 . Goals The decision	
	1. Learn about the Internet. 2. Identify AutoCAD programs
.9Science strategies	
	- Midterm and final exams - Short daily exams - Homework - Reports Interaction within the lecture - - Continuing educational seminars. - Guidance and follow-up lectures. Electronic seminars and workshops-
.10 . Course structure	
week	**Vocabulary details**

4-3-2-1	introduction around networks Computer: Idea around Structure Binding: Provider(Server- -) Server and types Providers Client And get to know on networks peer Topeer - (Peer To Peer) Recognition on networks Customer The provider Client / Server Network . .Learn about the main components of networks An overview of basic network designs - Networks from type sin Bus - Networks from type The ring Ring - Networks from type star Star an idea General around Types link or delivery Networks: - depending on style link Networks: networks communication Mono points networks communication Multiple points - depending on Coverage Geography: **Networks** local LAN Local Area Network Devices networks Areas Local specifications networks Areas Local **Networks** Intermediate MAN Metropolitan Area Network , Devices Area networks Regional **Networks** Thewide WAN Wide Area Network Devices networks Areas The spacious **Networks** Advanced wide Space: Internet Internet , Intranet Intranet ,
-14-13-12-11-10-9-8-7-6-5 15	**Excel program : Understanding the concept of the program: its benefits, specifications, features, and operating methods, and getting to know the main screen and its components, and the .various menus and effective tools it contains** **(File tab, Home tab, Page Layout tab)** **Cell concept, basic data types, and how to enter them** **How to save a workbook, worksheet, close the program and close the file** **Open a saved file, enter data, perform simple calculations, and learn how to adjust, format, and structure data within a single cell or group of cells, a group of tables, a group of charts, a .group of text, or a group of symbols** **Learn how to collect data or group cells in different forms, as .well as how to sort data** **Creating mathematical formulas, which include (function library group, rules for writing mathematical formulas, conditionalIf (statement, formula validation group, and calculation group** **Use some of the functions provided by the program, such as Sum, Min, Max < count, SQRT, Average, and other useful related .statistical functions** **Learn about theediting process provided by the program, how to copy or move data, and learn about the concept of copying calculations, as well as the concept ofrelative cells and absolute cells.** **Controlling cell display: Changing its style and format by using formatting tools** **Dealing with chartsand how to convert numerical and textual data into charts of various types through the ChartWizard**

	command and learning how to make the modifications and revisions provided by the program **Learn how to add or delete rows or columns on a worksheet and .how to print numeric data or charts**

.11Course Evaluation
Chapter First10) My theory 10 + Practical (20 % Chapter 2nd , 10) My theory 10 + Practical (% 20 Works The year , 10 % << Annual quest50 % Final Theory % 40 Final Practical 10 % Total 100 %

Model Description The decision

.1	Name The decision
	Occupational Management and Safety / Second Stage
.2	symbol The decision
.3	Chapter/The year
Semester system / The second stage	
.4	Date Preparation This Description
2025	
.5	Shapes Attendance Available
Attendance	
.6 Number hours Academic Total Number Units (Total)	
study hours x 15 weeks = 30 hours per semester	
.7. Name Responsible The decision Academi	
Name: H e b a A b d e l H u s s e i n	
.8Goals The decision	
	1) Identify the management system .Identify the importance of industrial management (2
.9Science strategies	
	1. Electronic oral tests. 2. Electronic tests . 3. Daily electronic assessment. 4) Laboratory reports. 5) In-person practical exam . 6) First semester exam . Electronic. The second semester electronic exam . 8) The final exams , in-. person and electronic

.10 . Course structure

week	Vocabulary details First Semester
1	**Management**
2	**Principles of Management – Levels of Management and the Factory Factory Organization –**
3	**Administrative jobs**
4	**Facility functions**
5	**Factory site selection and factors affecting it**
6	**Purchasing – The relationship of purchasing to other organization functions and purchasing steps**
7	**Warehouse – Inventory – Types of Inventory**
8	**Types of warehouses – warehouse inventory**
9	**Determine the economic order quantity**
10	**Basic Cost Concepts**
11	**Wages – Types**
12	**Methods of calculating wages**
13	**Training – The Importance of Training**
14	**Training methods**
15	**– Leadership, the competent manager, and types of managers characteristics and traits of managers and signs of good and poor management**

week	Vocabulary Details Second Semester
1	**Basic concepts in quality control (the concept of control) The concept of quality – the quality of quality control – the importance and benefits of quality control**
2	**Quality Elements – Design Quality**
3	**Implementation quality – reliability – quality control costs**

4	**Standardization – Standard Specifications (Definition of (Specification**
5	**Types of standard specifications**
6	**Data and information collection – frequency table – frequency histogram**
7	**Quality control methods – the sample method – types of charts**
8	**Applications in using one of the types of charts**
9	**Maintenance – its objectives – its types**
10	**Preventive maintenance – its benefits – sudden maintenance**
11	**Organization of the maintenance department**
12	**Industrial safety and security, the impact of industrial safety on production efficiency**
13	**Industrial safety quality methods, general rules and regulations for accident prevention**
14	**Industrial accidents and ways to prevent them**
15	**Personal Protective Equipment – Fires and Fire Fighting Methods**

Chapter First20 % Chapter The second , % 20 Works The year , 10 % << Striving Annual 50 % Theoretical Final% 50 Total% 100

Model Description The decision

.1	Name The decision
Project / Phase II	
.2	symbol The decision
.3	Chapter/The year
In-person / Second Stage	
.4	Date Preparation This Description
2025	
Shapes Attendance Available .5	
My presence completely	
.6 Number hours Academic TotalNumber Units(Total)	
study hours x 15 weeks 2 hours per semester 30 =	
.7 . Name Responsible The decision Academic	
Name:D e p a r t m e n t p r o f e s s o r s	
.8 Goals The decision	
	Student acquisition of skills, research and learning of programs 1. Identify the air conditioning and refrigeration procedures diagram .2. .Conduct laboratory experiments on air conditioning 3
.9Science and Education Strategy	
Strategy	- Midterm and final exams - Short daily exams - Homework - Reports -- Interaction within the lecture - Continuing educational seminars. - Guidance and follow-up lectures. -- Electronic seminars and workshops
.10 . Course structure	
Vocabulary details	**week**

Student projects are distributed to branch students by the branch or department and under the supervision of a professor. The projects should include one of the following aspects: **1- Preparing comprehensive maps for a refrigeration or air conditioning unit, within the scope of the specialty, and manufacturing parts or assembling the units or accessories, and then conducting the necessary examinations and tests on them.** **2- The process of calculating air conditioning loads for any public building, drawing the necessary plans and maps for all air ducts and water pipes, as well as illustrations of the required accessories, installation of pipes and devices, sequencing of control devices, and testing of devices.**	

.11Course Evaluation

Chapter First10) My theory 10 + Practical (20 % Chapter 2nd , 10) My theory 10 + Practical (% 20 Works The year , 10 % << Annual quest50 % Final Theory % 40 Final Practical 10 % Total100 %

.12 . Sources of knowledge

A-Required books and main references	1-Air-conditioning engineering by w. p.Joins . 2-ASHRAE hand book 3-Air-conditioning engineering by Gopta 4-Principles of refrigeration by Dossat
B- Books and references (scientific journals, Reports)	Virtual Library of the Ministry of Higher Education and Research1 Scientific
C- Electronic references , websites Internet....	Virtual Library of the Ministry of Higher Education and Research1 Scientific What books are available in the institute's electronic 2-library?