

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



# **Academic Program and Course Description Guide**

**2024**

## **Introduction About the section:**

The department was established in 1973 with the establishment of the Institute of Technology in Basra within the branches of the Department of Mechanics. The department, with its two branches (refrigeration and air conditioning and cars), separated from the Department of Mechanics in 1987 and its name was later changed to the Department of Machines and Equipment and then to Power Mechanics Technologies.

The department includes a number of scientific laboratories and workshops in the specializations of refrigeration, air conditioning, and cars, as well as computer laboratories. Over the course of many years and since the establishment of the department until now, state institutions and the private sector have been provided with a large number of graduates.

The academic program description provides a brief summary of the main features of the program and its courses, indicating the skills that students are working to acquire based on the objectives of the academic program. The importance of this description is evident because it represents the cornerstone in obtaining program accreditation, and the teaching staff participates in writing it under the supervision of the scientific committees in the scientific departments.

This guide, in its second version, includes a description of the academic program after updating the vocabulary and paragraphs of the previous guide in light of the developments and changes in the educational system in Iraq, which included a description of the academic program in its traditional form (annual, semester) in addition to adopting the description of the academic program circulated pursuant to the letter of the Department of Studies TM3/2906 dated 5/3/2023 regarding programs that adopt the Bologna process as a basis for their work.

In this regard, we cannot but emphasize the importance of writing a description of academic programs and courses to ensure the smooth running of the educational process.

## Academic Program Description Form

University name: Southern Technical University

College/Institute: Technical Institute of Technology in Basra

Scientific Department: Department Power mechanics techniques

Name of academic or professional program: Power Mechanics/ refrigeration and air conditioning Technology Department

Final Certificate Name: refrigeration and air conditioning Technical Diploma.

Academic system: Semester

Description preparation date: 5/10/2024

Date of filling the file: 17/10/2024

Signature:



Head of Department Name:

Dr. Duna Tariq Yaseen

the date: 17/10/2024

Signature



Scientific Assistant Name:

Dr. Abdel Nasser Abdel Gabbar Abbod

the date: 17/10/2024

The file is checked by

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department

**Anwar Abdul Khaliq Aboud**

the date 17-10-2024

Signature



Dean's approval

Dr. Arkan Yacoub Youssef



## .1 Program Vision

The Department of Power Mechanics Technology is one of the main technological departments at the Technical Institute in Basra. It is moving towards expanding the base of technical education and its modern applications to be a leader in providing accredited technical services and a spirit of competition and cooperation with the community.

## .2 Program Mission

The Department of Power Mechanics Technology adopts a general message based in its general form on the framework of technical education in Iraq. It is a message that it seeks to achieve every year to highlight the distinctive aspect of the department. The general objectives are centered on graduating national technical cadres at a high level of education and training, capable of absorbing technology systems and supporting the path of rapid global technical developments. The general message includes the following:

1. Use of computer and Internet technologies in education and training.
2. Activating the relationship with the private sector in training areas.
3. Follow up on the development of training plans curricula and then update laboratories and workshops.

Interacting with the labor market and community needs for rehabilitation 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 preparing and reading mechanical and electrical maps 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 maps for the initial and final engineering works of refrigeration equipment.
- ❖ Daily programmed monitoring of the performance of refrigeration and air conditioning equipment and completion of maintenance and repair operations.

The graduate is awarded a technical diploma in power mechanics/refrigeration and air conditioning techniques.

<b>.4Programmatic accreditation</b>
existing

<b>.5Other external influences</b>

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<b>.6Program Structure</b>				
<b>comment s</b>	<b>percentage</b>	<b>Study unit</b>	<b>Number of units</b>	<b>Section Structure</b>
	40%	55	First class 11	<b>Institutional Requirements</b>
	60%	62	10 second class	
				<b>College Requirements</b>
				<b>Department Requirements</b>
	<b>%0</b>			<b>Summer training</b>
				<b>Other</b>

### Refrigeration Branch/First Phase

<b>Study plan for the Department of Power Mechanics / Refrigeration and Air Conditioning Technologies for the academic year 2023/2024</b>							
<b>First year - first semester</b>							
Notes	Material type	Number of units	Number of hours			Study material	T
			the total	Practical	Theoretical		
Study in English	Specialized	4	4	2	2	Air conditioning principles Principle of Air conditioning	<b>1</b>
Study in English	Specialized	3	3	1	2	Thermodynamics / 1 Thermodynamics / 1	<b>2</b>
Study in English	help	3	3	1	2	Engineering mechanics Engineering Mechanics	<b>3</b>
	help	2	2	2	-	Computer Basics / 1 Computer Fundamentals / 1	<b>4</b>
	help	2	2	-	2	Mathematics / 1 Mathematics / 1	<b>5</b>
	General	2	2	-	2	Human rights and democracy Human Rights and Democracy	<b>6</b>
	Specialized	3	3	3	-	Engineering drawing / 1 Engineering Drawing / 1	<b>7</b>
	help	4	4	2	2	Electrical Technology Electricity technology	<b>8</b>
annual	Specialized	-	4	4	-	Laboratories Workshops	<b>9</b>
		23	27	15	11	the total	

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

**First year - Second semester**

Notes	Material type	Number of units	Number of hours			Study material	T
			the total	Practical	Theoretical		
Study in English	Specialized	4	4	2	2	Principles of cooling Principle of Refrigeration	1
Study in English	Specialized	3	3	1	2	Thermodynamics / 2 Thermodynamics / 2	2
Study in English	help	3	3	1	2	Fluid mechanics Fluid Mechanics	3
	help	2	2	-	2	Mathematics / 2 Mathematics / 2	4
	General	2	2	-	2	English language / 1 English Language / 1	5
	help	4	4	2	2	Electrical Technology Electricity technology	6
	Specialized	3	3	3	-	Engineering drawing / 2 Engineering Drawing / 2	7
annual	Specialized	8	4	4	-	Laboratories Workshops	8
	General	2	2	-	2	Crimes of the defunct Baath Party The Crimes of the defunct Baath Party	9
		32	27	13	13	the total	

## Refrigeration Branch/ semester II

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

**Second year - first semester**

Notes	Material type	Number of units	Number of hours			Study material	T
			the total	Practical	Theoretical		
Study in English	Specialized	4	4	2	2	Air conditioning / 1 / 1 Air conditioning	1
	Specialized	4	4	2	2	Cooling systems / 1 Refrigeration Systems / 1	2
Study in English	Specialized	4	4	2	2	Heat transfer / 1 Heat Transfer / 1	3
	Specialized	4	4	2	2	Control systems / 1 Control Systems / 1	4
	Specialized	6	6	4	2	Maintenance of refrigeration and air conditioning equipment / 1 Refrigeration and Air conditioning Systems Maintenance / 1	5
Study in English	Specialized	3	3	3	-	Drawing of cooling and air conditioning systems / 1 Refrigeration and Air conditioning Systems Drawing / 1	6
	help	2	2	-	2	Management and occupational safety / 1 Management and Occupational safety/1	7
	help	2	2	2	-	Computer Basics / 2 Computer Fundamentals / 2	8
annual	Specialized	-	2	2	-	Graduation project Graduation Project	9
		29	31	19	12	the total	



**Study plan for the Department of Power Mechanics / Refrigeration and Air Conditioning Technologies for the academic year 2023/2024**
**Second year - Second semester**

Notes	Material type	Number of units	Number of hours			Study material	T
			the total	Practical	Theoretical		
study in English	Specialized	4	4	2	2	Air conditioning / 2 / 2 Air conditioning	<b>1</b>
	Specialized	4	4	2	2	Cooling systems/ 2 Refrigeration Systems / 2	<b>2</b>
study in English	Specialized	4	4	2	2	Heat transfer / 2 Heat Transfer / 2	<b>3</b>
	Specialized	4	4	2	2	Control systems / 1 Control Systems / 1	<b>4</b>
	Specialized	6	6	4	2	Maintenance of refrigeration and air conditioning equipment2 Refrigeration and Air conditioning Systems Maintenance / 2	<b>5</b>
	help	2	2	-	2	Management and occupational safety / 2 Management and Occupational safety / 2	<b>6</b>
	General	2	2	-	2	English language / 2 English language / 2	<b>7</b>
study in English	Specialized	3	3	3	-	Drawing of cooling and air conditioning systems / 2 Refrigeration and Air conditioning Systems Drawing / 2	<b>8</b>
annual	Specialized	4	2	2	-	Graduation project Graduation Project	<b>9</b>
		33	31	17	14	the total	

<b>.7 Program Description</b>				
<b>Credit hours</b>		<b>Course name</b>	<b>Course code</b>	<b>Year</b>
<b>2practical</b>	<b>theoretic al2</b>	<b>cooling principles</b>		<b>The first</b>
<b>2practical</b>	<b>theore tical2</b>	<b>Cooling systems</b>		<b>Second</b>

<b>.8Expected learning outcomes of the program</b>	
<b>Knowledge</b>	
	<p>1- Study the types of refrigeration and air conditioning systems.</p> <p>2- Study the different types of tables and charts that are dealt with within the specialization.</p> <p>3- Identify the different types of coolants.</p> <p>4- Study the types of control systems used in different types of systems.</p>
<b>Skills</b>	
	<p>1- Detecting malfunctions in cooling and air conditioning devices, their causes and methods of treatment.</p> <p>2- Acquiring the skill of maintaining all types of refrigeration and air conditioning devices.</p> <p>3- Gain experience in dealing with different types of systems.</p> <p>4- Gain experience in knowing how to analyze the performance of mechanical and electrical systems.</p>
<b>Values</b>	
	<p>-procedure Experiments The process in Laboratories And the workshops And casting Lectures Theory</p> <p>-Travels Scientific And visits Field For</p>

	<p>work sites - Training Summer and practice The process on DevicesIn governmental and private institutions</p>
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### .9 Teaching and learning strategy

- Explanation and clarification through lectures.
- How to display scientific materials with different display devices
- Self-learning through homework and mini-projects
- Laboratories.
- Graduation projects.
- Scientific visits.

### .10 Evaluation methods

- Student personality test through discussion
- Interaction within the lecture
- Micro projects within the lecture
- evaluation continuous For behavior The student during Work
- Discussion Direct with Students during Lectures
- Behavior change in some students and follow-up
- Midterm and final exams
- Short daily quizzes
- Homework
- Reports
- 

### .11 Faculty

#### Members Faculty

Preparation Faculty		Requirements/Special Skills (that I found)		Specialization		Academic Rank
past	Angel			Special	Year	
	✓			Thermals	Mechanical Engin	Assistant Professor/Doctor

					earing	
	✓			Nanomaterials Engineering	Mechanical Engineering	Assistant Professor/Doctor
	✓			applied	Mechanical Engineering	Assistant Professor
	✓			Thermals	Mechanical Engineering	Assistant Professor
	✓			Mechanics	Mechanical Engineering	Assistant Professor
	✓			Software	Calculators	Assistant Professor
	✓			date	History literature	Assistant Professor

## **Professional development**

### **Orientation of new faculty members**

Periodic meetings to hone academic skills

### **Professional development for faculty members**

#### **Participation in courses and workshops**

## **.12 Acceptance Criteria**

Central acceptance for technological specialization

Choosing the scientific department according to the average, desire and experience in the field of specialization

## **.13 The most important sources of information about the**

University and Institute Website

University Guide

## **.14 Program development plan**

1-The necessity of involving students in periodic maintenance within the systematic training

2-Focus on summer training in government departments, with material and moral incentives for students and supervisors

**Skills chartFor the program**

**Required learning outcomes of the program**

General and transferable skills (or) other skills related to employability and personal development				Values				Subject-specific skills				Knowledge				essentia l Or aassista nt	Course name	Course code	Year/Le vel	
																				D4
	*	*	*	*	*	*	*	*	*				*	*	*	*	essentia l	Principles of refrigeration and air conditioning		<b>The first stage</b>
	*	*	*	*	*	*	*							*	*	essentia l	Thermodynamics			
	*	*	*	*	*	*	*									essentia l	Mechanics			
	*	*	*	*	*	*	*									essentia l	Computer Basics			
	*	*	*	*	*	*	*									essentia l	Engineering drawing			
	*	*	*	*	*	*	*									essentia l	mathematics			
	*	*	*	*	*	*	*	*		*	*	*				essentia l	Electrical Technology			
	*	*	*	*	*	*	*									essentia l	Human rights and democracy			
	*	*	*	*	*	*	*									essentia l	English language			

	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	essentia 1	Mechanical laboratories		Phase 2
*	*	*	*	*	*	*	*	*	*			*	*	*	*	essentia 1	air conditioning		
*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	essentia 1	Cooling systems		
*	*	*	*	*	*	*	*							*		essentia 1	Heat transfer		
*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	essentia 1	Control systems		
*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	essentia 1	Air conditioning and refrigeration maintenance		
*	*	*	*	*	*	*	*					*	*	*		essentia 1	Drawing of refrigeration and air conditioning systems		
*	*	*	*	*	*	*	*									essentia 1	Occupational Safety and Management		
*	*	*	*	*	*	*	*									essentia 1	Computer Basics 2		
*	*	*	*	*	*	*	*									essentia 1	English language		
*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	essentia 1	The project		

- Please tick the boxes corresponding to the individual learning outcomes of the programme that are



**subject to evaluation.**

## Course Description Form

.1 Course Name	
Principles of Air Conditioning Chapter 1 Principles of Air Cooling Chapter 2	
.2 Course Code	
.3 semester/ year	
Semester 1 / First stage Semester 2	
.4 Description Preparation Date	
2024	
.5 Available forms of attendance	
Full attendance system	
.6 Number of study hours (Total) / Number of units (Total)	
60 hours (theoretical + practical) for each semester	
7. Number of Credit Hours (Total) / Number of Units (Total)	
Name: Ayat Abdul Hussein	
.8 Course Objectives	
<ul style="list-style-type: none"> <li>- Knowledge of the principles of thermodynamics</li> <li>- Study of air properties, air properties chart and actual procedures.</li> <li>- Knowing the types of coolants and their impact on the environment.</li> <li>- Study of the steam compression system and its representation on the pressure-heat content diagram.</li> <li>- Knowing the types of compressors, condensers, expansion devices and evaporators.</li> </ul>	<p><b>Subject objectives</b></p>
.9 Teaching and learning strategies	
<ul style="list-style-type: none"> <li>- procedure Practical experiments in laboratories and workshops and giving theoretical lectures</li> <li>- Travels Scientific and field visits to work sites</li> <li>- Summer training and practical practice on devices In governmental and private institutions</li> </ul>	<p><b>Strategy</b></p>
10 Course Structure	

Evaluation method	Teaching method	Unit name/topic	Required learning outcomes	Watches	The week
<b>semester One / Principles of Air Conditioning</b>					
Theoretical and practical exams	Theoretical + Practical	Principles of Thermodynamics		8	1-2
Theoretical and practical exams	Theoretical + Practical	Air Properties / Air Properties Chart		24	3-8
Theoretical and practical exams	Theoretical + Practical	Applications on air properties chart		16	9-15
<b>semester Two / Air Cooling Principles</b>					
Theoretical and practical exams	Theoretical + Practical	Principles of refrigeration / Methods of refrigeration / Refrigerants / Pressure-enthalpy diagram		20	16-17
Theoretical and practical exams	Theoretical + Practical	Theoretical and practical steam compression system		16	18-21
Theoretical and practical exams	Theoretical + Practical	Compressors		12	22-24
Theoretical and practical exams	Theoretical + Practical	Condensers and cooling towers		8	25-26
Theoretical and practical exams	Theoretical + Practical	Stretching tools		8	27-28
Theoretical and practical exams	Theoretical + Practical	Incense burners		8	29-30
11					
ChapterFirst10) Theoretical 10 + Practical (20%, Second Semester 10) Theoretical 10 + Practical (20%), Year's Work 10% << SeekAnnual50% Final Theory 40% Final Practical 10% Total 100%					
. 12.Learning and Teaching Resources					

<p>-1 Principles of Refrigeration and Air Conditioning Book/Adnan Rikan</p> <p>-2. Principles of refrigeration and air conditioning, Dossat</p> <p>3- Applied Air-Conditioning and refrigeration, CT Gosling</p> <p>4- A course of refrigeration and air conditioning, Arora</p>	<p>Main References (Sources)</p>
<p>Virtual Library of the Ministry of Higher Education and Scientific Research</p>	<p>Recommended supporting books and references (scientific journals, reports, etc.)</p>
<p>- Virtual Library of the Ministry of Higher Education and Scientific Research</p> <p>- The Institute's electronic library</p>	<p>the reviewer Electronic, websites</p>

### Course Description Form

.13 Course Name
Thermodynamics
.14 Course Code
.15 semester/ year
Semester system/first stage
45 hours (theoretical + practical) for each semester
.16 Description Preparation
Date:
2024
17. Available Attendance Forms
Full attendance system
.18 number Study hours(Total/) Number of units (Total)
45 hours (theoretical + practical) for each semester
.19 Name of the course administrator(If more than one name is mentioned)

Name: Mohammed Jassim Mohammed

<b>Course objectives</b>	<b>.20</b>
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<ul style="list-style-type: none"> <li>- Knowledge of the principles and basics of thermodynamics</li> <li>- Knowledge of the first law of thermodynamics and its applications.</li> <li>- Knowledge of the second law of thermodynamics and its applications.</li> <li>- Knowledge of the Carnot cycle, Rankine, and steam compression.</li> <li>- Know the types of boilers / fuel</li> </ul>	<b>Subject objectives</b>
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<b>Learning strategies</b>	<b>.21</b>
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<p>Procedure Practical experiments in laboratories and workshops and giving theoretical lectures</p> <ul style="list-style-type: none"> <li>- Travels Scientific and field visits to work sites</li> <li>- Summer training and practical experience on devices in governmental and private institutions.</li> </ul>	<b>Strategy</b>
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<b>.22 Course structure</b>
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Course structure				
Chapter One				
			Watches	The week
Theoretical and practical exams	Theoretical + Practical	Thermodynamics Terms	18	1-6
Theoretical and practical exams	Theoretical + Practical	The first law of thermodynamics	6	7-8
Theoretical and practical exams	Theoretical + Practical	Applications of the first law of thermodynamics	18	9-14
Theoretical and practical exams	Theoretical + Practical	The second law of thermodynamics	3	15
Chapter Two				
Theoretical and practical exams	Theoretical + Practical	Carnot cycle	6	16-17
Theoretical and practical exams	Theoretical + Practical	Steam properties and calculations	15	18-22
Theoretical and practical exams	Theoretical + Practical	Rankine cycle	6	23-24
Theoretical and practical exams	Theoretical + Practical	Steam compression	3	25

		cycle		
<b>.23 Course Evaluation</b>				
Chapter First 10) Theoretical 10 + Practical (20%, Second Semester 10) Theoretical 10 + Practical (20%), Year's Work 10% << Seek Annual 50% Final Theory 40% Final Practical 10% Total 100%				
<b>. 24. Learning and Teaching Resources</b>				
1. Applied engineering thermodynamics, Choudhury 2- Thermodynamics, Holman 3- Introduction to Thermodynamics, Sonntag 4- Applied Thermodynamics, Eastop		2. Main references (sources)		
Virtual Library of the Ministry of Higher Education and Scientific Research		A. Books and references recommended by scientific journals, reports		
- Virtual Library of the Ministry of Higher Education and Scientific Research The Institute's electronic library		B. Electronic references, websites		

## Course Description Form

.1 Course Name	
Engineering Mechanics	
.2 Course Code	
.3 semester/ year	
Semester system/first stage	
.4 Date of preparation of this description	
2024	
.5 Available forms of attendance	
attendance	
.6 Number of study hours (Total/) Number of units (Total)	
45 hours (theoretical + practical) for each semester	
.7 Name of the course administrator (If more than one name is mentioned)	
Name: Ayat Abdul Hussein	
.8 Course objectives	
the student with the necessary skills to conduct tensile, compression k tests.	Subject objectives
the student with basic skills in calculating the mechanics of materials ed fluids.	
.9 Learning strategies	
- Conducting practical experiments in laboratories and workshops and giving theoretical lectures. - Scientific trips and field visits to work sites - Summer training and practical training on equipment in oil companies, laboratories and government departments.	Strategy
.10 Course structure	
First semester	
Name of the unit or topic	The week
Introduction to mechanics	1

<b>(Definitions, Units, Load, Applied mechanics, Stress, Strain, Safety factor, Mechanical Properties, Stress Strain diagram)</b>	
<b>Stresses due to:</b> - Normal Load (Tension & compression) - Tangential Load (Shear & Torsion) - Change in Temperature (Thermal)	2 – 8
<b>Application with uniform and non uniform material and load with variable cross section</b>	9 – 10
<b>Introduction to Fluid Mechanics (Definition, Properties of fluid, steady flow)</b>	11
<b>Fluid static, Pressure of a certain depth</b>	12
<b>Specific Gravity, Viscosity (Newton's law of Viscosity, Types of fluids), effect of temperature on viscosity, effect of pressure on viscosity</b>	13
<b>Pressure Measurement (Boardeer gage, Piezometer, Manometer, Pitot)</b>	14
<b>Floating and sub – merged calculation</b>	15

**Second semester**

<b>Subject</b>	<b>Weeks</b>
<b>Floating and sub – merged calculation</b>	1
<b>Continuity equation with application</b>	2-3
<b>Bernolli equation with application</b>	4-5
<b>Energy equation with application</b>	6-7
<b>Momentum equation with application</b>	8-9
<b>Orifice &amp; Gates</b>	10-11
<b>Flow in pipes (parallel and series losses in pipes)</b>	12-13
<b>Friction losses in pipes</b>	14
<b>Air flow in ducts</b>	15

.11Tq, the decision

ChapterFirst10) Theoretical 10 + Practical (20%, Second Semester 10) Theoretical 10 + Practical (20%), Year's Work 10% <<  
SeekAnnual50% Final Theory 40% Final Practical 10% Total 100%

.12Learning Resources

- 1- Strength of materials by Singor
- 2- Fluid Mechanic by streeter
- 3- Fluid mechanics by Donglas

2. Main references (sources)

Virtual Library of the Ministry of Higher Education and Scientific Research

A. Recommended books and references (scientific journals,



	reports, ...)
- Virtual Library of the Ministry of Higher Education and Scientific Research - The Institute's electronic library	B. Electronic references, websites

### Course Description Form

.1 Course Name	
Mathematics	
.2 Course Code	
.3 semester/ year	
Semester system/first stage	
.4 Date of preparation of this description	
2024	
.5 Available forms of attendance	
attendance	
.6 Number of study hours (Total/) Number of units (Total)	
30 hours (theoretical) per semester	
.7 Name of the course administrator (If more than one name is mentioned)	
Name: Ashwaq Talib Abdul Nabi	
8. Goals of the decision	
1- Mathematical calculations recognition.	Subject objectives
2- Identify integrals.	
. 9 Teaching and Learning Strategies	
Procedure Practical experiments in laboratories and workshops and giving theoretical lectures -Travels Scientific and field visits to work sites -Summer training and practical practice on devices In oil companies, laboratories and government departments.	Strategy
. 10 Learning and Teaching Resources	

Unit or topic name	The week
<b>Matrices, determinants, their properties</b>	1
<b>Solving Linear Equations Linear Equations, Cramer's Method, Applications, Arc Analysis, Vectors</b>	2
<b>Vectors, Limit Analysis, Types of Vectors, Quantities, Scalar Vector, Curve Algebra, Vector Arithmetic</b>	3
<b>Orthogonal vector unit, vector scale, scalar and vector product Applications of vectors Arc-moment analysis</b>	4
<b>Logarithm, definition of logarithm, laws of logarithm and how to use them, solving logarithmic equations</b>	5
<b>Trigonometric ratios and the relationship between them, some laws in trigonometric ratios, function, meaning of function, independent and dependent variable, explicit function, implicit function</b>	6
<b>Measurements, purpose of trigonometric and algebraic functions, applications of linear velocity, areas</b>	7
<b>Details, Derivative, Derivative of Algebraic Functions, Applications of the Chain Rule Implicit Function</b>	8
<b>Higher order derivative, derivative of exponential function, derivative of logarithmic function</b>	9
<b>derivative of trigonometric function, derivative of circular functions</b>	10
<b>Partial differentiation</b>	11
<b>Applications of the derivative (slope equation, column, velocity and acceleration)</b>	12
<b>Derivative applications (instantaneous change)</b>	13
<b>Increasing, decreasing, maximum and minimum, inflection points, graphing a function</b>	14
<b>Integration, Indefinite Integration, Integration of Algebraic Functions</b>	15

### .11evaluation The decision

ChapterFirst10) Theoretical 10 + Practical (20%, Second Semester 10) Theoretical 10 + Practical (20%), Year's Work 10% <<  
 SeekAnnual50% Final Theory 40% Final Practical 10% Total 100%

### .12mExported knowledge

- 1-Panal colter "Technical Mathematics" Seshom series
- 2- Murray R. "Mathematical handbook" Sesshom series
- 3- Shantinarayam "Engineering Mathematics part 1 – 1987"
- 4- Garlick B. "Technical Mathematics" 1981.

2. Main references (sources)

Virtual Library of the Ministry of Higher Education and Scientific Research

A. Recommended books and references (scientific journals,

	reports, etc.)
- Virtual Library of the Ministry of Higher Education and Scientific Research - The Institute's electronic library	B. Electronic references, websites

### Course Description Form

Course Name:	.1
human rights	
Course cod	.2
semester/ year	.3
Semester system/first stage	
Date Prepare this description	.4
2024	

.5Available forms of attendance	
attendance	
.6Number of study hours(Total/) Number of units (Total)	
30 hours (theoretical) per semester	
.7Name of the course administrator(If more than one name is mentioned)	
Name:Dr. Zainab Mahmoud	
Course objectives	
1- Recognizing human rights.	Subject objectives
2- Identifying democracy and the rights of others	
.9Science and learning strategy	
- They called Continuous educational. - Lectures Guidance and follow-up. - Online seminars and workshops	Strategy

<b>.10 structure course</b>	
<b>Vocabulary details(first semester)</b>	<b>The week</b>
<b>Human rights, definition, objectives</b>	1
<b>The Roots of Human Rights and Their Development in Human History: Human Rights in Ancient and Medieval Times</b>	2
<b>Human rights in ancient civilizations, especially the civilization of Mesopotamia</b>	3
<b>Human rights in divine laws with a focus on human rights in Islam</b>	4
<b>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)</b>	5
<b>Human Rights in Contemporary and Modern History: International Recognition of Human Rights since World War I and the League of Nations</b>	6
<b>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</b>	7
<b>NGOs and Human Rights (ICRC, Amnesty International, Human Rights Watch) National Human Rights Organizations</b>	8-9
<b>Human Rights in Iraqi Constitutions: Between Theory and Reality</b>	10
<b>The relationship between human rights and public freedoms:</b> 1- In the Universal Declaration of Human Rights 2- In regional charters and national constitutions	11-12
<b>Essential human rights and collective human rights</b>	13
<b>Economic, social and cultural human rights and civil and political human rights</b>	14
<b>Modern human rights: facts in development, the right to a clean environment, the right to solidarity, the right to religion</b>	15
<b>Vocabulary details(second semester)</b>	<b>The week</b>
<b>Guarantees of respect 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</b>	1-2
<b>Guarantees, respect and protection of human rights at the international level:</b> - The role of the United Nations and its specialized agencies in providing guarantees - The role of regional organizations (Arab League, European Union, African Union, Organization of American States, ASEAN) - The role of international non-governmental organizations and public opinion in respecting and protecting human rights	3-4
<b>General Theory of Liberties: The Origin of Rights and Liberties, the Project's Position on the Declared Rights and Liberties, the Use of the Term Public Liberties</b>	5

<b>The functional nature of the concept of public freedoms: philosophical considerations of functional right, structural considerations of positive right, economic considerations and public freedoms</b>	6
<b>The legal basis of the rule of law</b>	7-8
<b>Regulation of public freedoms by public authorities</b>	9
<b>litigation or non-judicial grievance</b>	10
<b>Judicial appeal, determining the state's responsibility for its legitimate actions</b>	11
<ul style="list-style-type: none"> <li>- <b>The impact of the duality of the judiciary on public freedoms</b></li> <li>- <b>Public freedoms under administrative jurisprudence</b></li> </ul>	12
<b>Equality: The historical development of the concept of equality</b>	13
<b>Modern development of the idea of equality</b>	14
<ul style="list-style-type: none"> <li>- <b>gender equality</b></li> <li>- <b>Equality among individuals according to their beliefs and race</b></li> </ul>	15

<b>.11 Course Evaluation</b>	
Chapter First 20%, Second Semester 20%, Year's Work 10% << Annual Endeavour 50% Final Practical 50% Total % 100	
<b>12 Learning and Teaching Resources</b>	
<b>1- The Virtual Library of the Ministry of Higher Education and Research Scientific</b>	<b>. Learning and Teaching Resources</b> <b>2. Main references (sources)</b>
Virtual Library of the Ministry of Higher Education and Scientific Research	A. Recommended books and references (scientific journals, reports, etc.)
<ul style="list-style-type: none"> <li>- Virtual Library of the Ministry of Higher Education and Scientific Research</li> <li>- The Institute's electronic library</li> </ul>	B. Electronic references, websites

### **Course Description Form**

<b>.1 Course Name</b>
Electrical Technology
<b>.2 Course Code</b>
<b>.3 Semester/ year</b>
60 hours (theoretical + practical) per semester

<b>.4 Description Preparation Date</b>	
2024	
<b>.5 Available Attendance Forms</b>	
attendance	
<b>.6 Number of study hours(Total/) Number of units (Total)</b>	
60 hours (theoretical + practical) per semester	
<b>.7 Course administrator's name (mention all, if more than one name))</b>	
Name: Furat	
<b>.8 Course Objectives</b>	
1- Identify electricity standards. 2- Conducting laboratory experiments with electrical circuits. 3- Identifying resistance and capacitance measuring devices.	<b>Subject objectives</b>
<b>.9 Science Strategies</b>	
- They called Continuous educational. - Lectures Guidance and follow-up.  Online seminars and workshops	<b>Strategy</b>

<b>.10 Course Structure</b>	
Vocabulary details(First semester)	The week
<b>Electrical transformer, methods and types of work, construction, applications, loss in transformer, transformer testing, transformer efficiency, automatic transformer.</b>	1
<b>Electronic energy distribution (voltage law).</b>	2
<b>Convert solar energy into electricity.</b>	3
<b>DC motors, their components, working principles, types of applications, types of starting, losses, power calculation.</b>	4-5-6
<b>AC motors, their components, working principles, types of applications, single phase - three phases, types of starting, speed control.</b>	7-8-9
<b>Motor protection, current protection devices, overload, temperature, surge protection.</b>	10-11-12
<b>Engine testing, engine maintenance and parts repair.</b>	13-14-15
<b>. Details of the escape At (semester Two)</b>	
<b>How to use electrical devices for current, voltage and resistance, and energy measurement.</b>	<b>The week</b> 1

Reading resistance by its colors, applying Ohm's law.	2-3
Multiple connection of resistors in series and parallel.	4-5
Reading resistance value at high temperatures..	6
Connecting electrical circuits..	7
Measuring electrical power in DC circuits.	8
Measurement of electrical power in single-phase and three-phase alternating current circuits.	9-10
Use of electric welding equipment	11
Building electrical circuits	12
Checking the motors and measuring their current and voltage.	13
Engine download, contents and structure of types of engines.	14-15

.11Tq, the decision

ChapterFirst10) Theoretical 10 + Practical (20%, Second Semester 10) Theoretical 10 + Practical (20%), Year's Work 10% <<  
 SeekAnnual50% Final Theory 40% Final Practical 10% Total 100%

.12 Learning and Teaching Resources

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

**Course Description Form**

NameThe decision	.13
Engineering drawing	
SymbolThe decision	.14
Semester/ year	.15
Semester system/first stage	
Date Prepare this description	.16
2024	

17.Shapes Available attendance	
Full attendance system	
.18 number Study hours(Total/) Number of units (Total)	
45 hours (practical) per semester	
19.Course administrator's name (mention all, if more than one name)	
.19	
Name: Dr. Duna Tariq Yaseen	
.20Course objectives	
Map recognition. Identifying isometric shapes. Conducting mechanical drawings.	Subject objectives
Science and learning strategy	
.21	
Continuing educational call. - Guidance and follow-up lectures. - - Online seminars and workshops	Strategy

.22B Intention of the rapporteur					
road Evaluation	road education	nameUnity/or topic	utputs Learning Required	hour	The week
First semester					
Practical exams	practical	BoardsThe drawing		3hours weekly	3 - 1
Practical exams	practical	Maps		3hours weekly	5 - 4
Practical exams	practical	Operations Engineering		3hours weekly	9 - 6
Practical exams	practical	fee Shapes Engineering		3hours weekly	15 - 10
Second semester					
Practical exams	practical	fee Shapes Engineering		3hours weekly	22 - 16
Practical exams	practical	The drawing Isometric		3hours weekly	27 - 23
Practical exams	practical	Shapes Isometry		3hours weekly	30 - 28



<b>23 Course Evaluation</b>	
Chapter First 20%, second semester 20%, yearly work 10% << annual effort 50% final theoretical 50% Total 100%	
<b>.24 sources</b>	
<b>1- The Virtual Library of the Ministry of Higher Education and Research Scientific</b>	<b>2. Main references (sources)</b>
<b>Virtual Library of the Ministry of Higher Education and Scientific Research</b>	<b>A. Recommended books and references (scientific journals, reports,.....)</b>
<b>- Virtual Library of the Ministry of Higher Education and Scientific Research - The Institute's electronic library</b>	<b>B. Electronic references, websites</b>

### Course Description Form

Name	The decision	.25
Computer		
Symbol	The decision	.26
semester/ year		.27
Semester system/first stage		
Date	Prepare this description	.28
2024		
.29 shapes	Available attendance	
attendance		
.30 number	Study hours(Total/) Number of units (Total)	
30 hours (practical)	per semester	
.Course administrator's name (mention all, if more than one name)		.31
Name:	Limaa Radhi Sultan	
.32	Course Objectives	

Identify operating systems.1 Getting to know the basic programs.2 3. Conducting practical applications.	GoalsStudy material
Science and learning strategy	.33
Continuing educational call. - Guidance and follow-up lectures. - - Online seminars and workshops	Strategy

.34B Intention of the rapporteur					
Evaluation method	Teaching method	Unit name/or topic	Required learning outcomes	Watches	The week
Oral and practical exams	theoretical+Practical	Operating systems		3 hours weekly	3 – 1
Oral and practical exams	theoretical+Practical	Basic programs		3 hours weekly	5 – 4
Oral and practical exams	theoretical+Practical	Auxiliary programs		3 hours weekly	9 – 0
Oral and practical exams	theoretical+Practical	Accounting programs		3 hours weekly	22 – 10
Oral and practical exams	theoretical+Practical	Practical applications		3 hours weekly	27 – 23
Oral and practical exams	theoretical+Practical	General Programs		3 hours weekly	30 – 28

. Course Evaluation	
Evaluation Continuous/ Final 50% Total 100%	
.36 Learning and Teaching Resources	
	<b>A-Required books and main references</b>
<b>-1 Library Virtual Affiliated to the Ministry of Higher Education and Research Scientific</b>	<b>for-Books and references (Magazines Scientific, Reports, )</b>

-1 Library Virtual Affiliated to the Ministry of Higher Education and Research  
 Scientific-2 What books are available in the library? Electronic To the institute

G-the reviewer Electronic, sites Internet ....

### Course Description Form

<b>.37 Course Name</b>	
Heat transfer	
<b>.38 Course Code</b>	
<b>.39 Chapter/ year</b>	
Semester system/second stage	
<b>.40 Date of preparation of this description</b>	
2024/3/26	
<b>.41 shapes Available attendance</b>	
My presence Fully	
<b>.42 number Study hours (Total/) Number of units (Total)</b>	
60 hours (theoretical + practical) for each semester	
<b>.43 Name of the course administrator (If more than one name is mentioned)</b>	
Name: Dr. Hussein Ali Atawi	
<b>.44 Course Objectives</b>	
It aims to study heat transfer to know the student the main general foundations of heat transfer and its practical applications in the field of air conditioning, such as finding the convection of a building, as well as finding thermal continuity, thickness and type of insulator used in the pipes of air conditioning systems and heat exchangers of all kinds and their uses in refrigeration	<b>Subject objectives</b>
<b>.45 Science and Education Strategy</b>	
Midterm and final exams - Short daily quizzes - Homework - Reports - - Interaction within the lecture Continuing educational call. - Guidance and follow-up lectures. - -Electronic seminars and workshops	<b>Strategy</b>

. Course Structure					
Evaluation method	Teaching method	Name of unit/course or topic	Required learning outcomes	Watches	The week
<b>First semester</b>					
N+A exam	Theoretical + Practical	WaysHeat transfer		<b>9</b>	1 - 3
N+A exam	Theoretical + Practical	Heat transfer by conduction		<b>6</b>	4 - 5
N+A exam	Theoretical + Practical	convection heat transfer		<b>12</b>	6 - 15
<b>Second semester</b>					
N+A exam	Theoretical + Practical	Heat transfer by radiation		<b>39</b>	16 - 22
N+A exam	Theoretical + Practical	Heat transfer calculations		<b>15</b>	23 - 27
N+A exam	Theoretical + Practical	Insulators		<b>9</b>	28 - 30
<b>Course Evaluation</b> .47					
ChapterFirst10) Theoretical 10 + Practical (20%, Second Semester 10) Theoretical 10 + Practical (20%), Year's Work 10% << SeekAnnual50% Final Theory 40% Final Practical 10% Total 100%					
Sources of knowledge				48	
			<b>1. Required textbooks</b>		
1. FRANK P. INCROPERA) Fundamentals of heat transfer 2. Heat Transfer 10th – Holman 3. Yunus, heat transfer			<b>2. Main references (sources)</b>		
Virtual Library of the Ministry of Higher Education and Scientific Research			<b>A. Recommended books and references (scientific journals, reports, etc.)</b>		
- Virtual Library of the Ministry of Higher Education and Scientific Research			<b>B. Electronic references, websites</b>		

- The Institute's electronic library

### Course Description Form

Name The decision	.49
Air cooling systems	
Symbol The decision	.50
semester/ year	.51
Semester system/second stage	
Date Prepare this description	.52
2024/	
.53 shapes Available attendance	
attendance	
.54 number Study hours(Total/) Number of units (Total)	
60 hours (theoretical + practical) for each semester	
Course administrator's name (mention all, if more than one name))	.55
Name Dr. Hussein Ali Atawi	
Course Objectives	.56
Ta3du - Knowing how to calculate thermal loads for 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.	
Science and learning strategies	.57
Exam Quarterly and final A Short daily quizzes -	

Homework - Reports - - Interaction within the lecture	
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Projects Students	
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<b>.58 Course structure</b>	
Vocabulary details (semester 1)	The week
<b>Compression refrigeration system (theoretical and practical) and media quality</b>	(1-2)
<b>Selection of compression system parts / evaporator - condenser - compressor - condensing unit - group balance</b>	(3-5)
<b>Compound compression system - multi-compressor {presence of an interchanger - presence of a flash tank} or multi-evaporator</b>	(6-8)
<b>General considerations for designing and laying the piping network (drain line - liquid line - suction line - water pipes)</b>	(9-10)
<b>Compression System Accessories / Target - Location</b>	(11-14)
<b>Control devices used in refrigeration systems</b>	(15-)

Vocabulary details (semester2)	The week
<b>Absorption cooling system / Working principle - Advantages - Use in the field of cooling and condensation / Comparison with the compression system - Use of solar energy for operation</b>	(1-3)
<b>Vapor jet cooling system</b>	4
<b>Air Cooling System – Features – Types</b>	(5-6)
<b>Air Cooling System.. Features - Types</b>	(7-8)
<b>Thermoelectric Cooling System – Features and Prospects</b>	9
<b>Food preservation technology - cold storage designs - warehouse load calculation - types of warehouses</b>	(10-12)
<b>Rationalization of energy consumption in cooling systems</b>	(15-13)

<b>Course Evaluation</b>	<b>.59</b>
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Chapter First 10) Theoretical 10 + Practical (20%, Second Semester 10) Theoretical 10 + Practical (20%), Year's Work 10% <<  
Seek Annual 50% Final Theory 40% Final Practical 10% Total 100%

<b>Sources of knowledge and education</b>	<b>.60</b>
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1-Air-conditioning engineering by wpJoins. 2-ASHRAE hand book 3-Air-conditioning engineering by Gopta 4- Principles of refrigeration by Dossat	A-Required books and main references
1- The Virtual Library of the Ministry of Higher Education and Research Scientific	for-Books and references (scientific fields and reports)
1- The Virtual Library of the Ministry of Higher Education and Research Scientific2- What books are available in the Institute's electronic library?	G-Electronic references, websites Internet....

### Course Description Form

<b>.1 Course Name</b>	
Refrigeration maintenance/second stage	
<b>.2 Course Code</b>	
<b>.3 Chapter/ year</b>	
Semester system	
<b>.4 Date of preparation of this description</b>	
2024	
<b>.5 Available forms of attendance</b>	
attendance	
<b>.6 Number of study hours(Total/) Number of units (Total)</b>	
6 academic days x 15 weeks = 90 annual hours (theoretical + practical)	
<b>.7 Name of the course administrator(If more than one name is mentioned)</b>	
Name: Taleb Zahir Mahdi	
<b>.8 Teaching and Learning Strategies</b>	
Identify types of maintenance.1  Learn the importance of maintenance and preservation of devices.2 3) Performing maintenance on cooling and air conditioning systems.	Subject objectives

## .9 Science and Education Strategy

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

## .10 Course structure

Vocabulary details (semester 1)	The week
Definition of maintenance, its types and purpose	1
The basic electrical parts of the air conditioning cycle and how to check them (compressor / overload / relay / thermostat) and the mechanical cycle	2
Electric refrigerator and its types (electrical circuit and its types / mechanical circuit and its types)	3
Electrical and mechanical faults / replace any part of the cycle, then check, discharge and charge	4
Freezer and its types (electrical circuit / mechanical circuit) Electrical and mechanical faults of the freezer Detecting leakage in the cycle, then checking, emptying and charging	5
Water cooler (electrical and mechanical circuit / water cycle) Electrical and mechanical faults and water cycle faults / inspection, emptying and charging	6
Oil change, types of oils, methods of adding oil, and the amount of oil according to the types of compressors	7
Wall air conditioners and their types (electrical circuits / mechanical circuits) in cooling and heating cases	8
Electrical and mechanical faults of wall air conditioners and how to replace any part then check, discharge and charge / and how to check the fan and how to know the wires and poles without the presence of signs on the fan and any diagram and types of capacitors and how to calculate them	9
Split units and their types: single-phase and three-phase (electrical circuits and their types / mechanical circuits) in the cases of cooling and heating	10
Electrical/mechanical faults of separate units and electronic brain faults and how to connect the joker brain	11
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	12
Car air conditioning (electrical circuit / mechanical circuit) Electrical and mechanical faults / How to detect leakage and then check, discharge and charge	13
A scientific visit to one of the industrial sites that has refrigeration and air conditioning equipment	14



Types of compressors, how to maintain them, electrical and mechanical parts of each type / Types of refrigerants and environmentally friendly alternatives	<b>15</b>
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<b>Vocabulary details (semester 2)</b>	<b>The week</b>
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<b>Package Units Electrical and Mechanical Circuit / Electrical and Mechanical Faults and How to Maintain and Maintain Unit Parts and How to Inspect, Unload and Charge</b>	<b>1</b>
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Boiler, its components, types and how to maintain it / maintenance before the winter season, explaining the parts in detail	<b>2</b>
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Refrigeration and freezing storage equipment, its types, parts and how to maintain it	<b>3</b>
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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 and refrigerant, how to wash condensers with chemicals, and clean each part in the cycle	<b>4</b>
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Cooling towers, their types, components, and how to maintain and sustain them before the summer season	<b>5</b>
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Types of humidifiers and types of air filters used in central cooling	<b>6</b>
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Modern cooling systems vrv / vrf and its components, how to install it and the development in this field	<b>7</b>
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A scientific visit to one of the sites that contain systemsmodern vrv and vrf	<b>8</b>
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Pumps, their types, how to maintain them and how to sustain them before the operating season	<b>9</b>
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Fans, their types, maintenance methods, and how to maintain them before the operating season	<b>10</b>
--	-----------

Control devices in small and large units, the operation of each part of the devices, and how to maintain and sustain them.	<b>11</b>
--	-----------

Testing resistors and how to know the size of resistors and electrical testing	<b>12</b>
--	-----------

Ice factories how they work and maintain	<b>13</b>
--	-----------

Control panels for small and large appliances	<b>14</b>
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Air mixing boxes, their purpose, types and how they work in each location	<b>15</b>
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ChapterFirst10) Theoretical 10 + Practical (20%, Second Semester 10) Theoretical 10 + Practical (20%), Year's Work 10% <<  
SeekAnnual50% Final Theory 40% Final Practical 10% Total 100%

## Course Description Form

.1 Course Name
Control systems/second stage
.2 Course Code
.3 semester/ year
Semester System / Second Stage
.4 Date of preparation of this description
2024
.5 Available forms of attendance
attendance
.6 Number of study hours (Total/) Number of units (Total)
4 study hours x 15 weeks = 60 hours per semester
.7 Name of the course administrator (If more than one name is mentioned)
Name: Hadeel Haitham

. 8 Course Objectives	
Identify pressure and temperature gauges. 1 2) Identify the control devices in air conditioning and refrigeration systems. 3) Electronic control circuits.	

.9 Teaching and Learning Strategies	
1) Tests Oral immanence. 2) Tests A. 3) Evaluation Daily 4) Reports Laboratory 5.) Exam Practical In-person.	

. Course Structure	
First semester	The week
Principles of control...and general definitions of the most important terms used in control	1
Principles of Control – Types of Control	2
Principles of measurement - measurement - control and measurement - the most important factors subject to control	3
Measuring and sensing devices for various factors in refrigeration and air conditioning devices {liquid level - pressure - temperature - humidity}	4

<b>Electrical Control Circuits / Electrical Control Balance - Electrical Control and Circuit Diagrams</b>	5
<b>Electrical control elements, thermostat – circuit breaker for overload protection, humidity regulators, pressure regulators, final control elements, connectors.</b>	6-7
<b>Electronic control circuits - control circuit elements, thermostat, humidistat</b>	8
<b>Pneumatic control circuits, control components, control elements, thermostat, humidity regulator, pressure regulator, control elements, gate motor, pneumatic valves, pneumatic relays, compressed air processing equipment</b>	9-10-11-12
<b>Control System Components for Refrigeration Machines – Dynamic Properties</b>	13-14-15

## Second semester

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 the thermal expansion valve, controlling capacity using the float in centrifugal devices	1-2-3-4-5
Practical applications on control devices for clean rooms - white rooms - computer rooms - hospitals	6
Control systems for home units – Control circuits for wall-mounted air conditioners, home freezers – Split devices, multi-zones (control devices for the device or multi-zones) – Central air conditioning	9-10-11--8-7
Components of the control system for the central cooling system and the most important methods used to control temperature and humidity	12
Control system for air conditioning system that operates all year round	13
Central heating control system	14
Develop a detailed control map for central air conditioning and refrigeration equipment.	15

## Course Evaluation.11

ChapterFirst10) Theoretical 10 + Practical (20%, Second Semester 10) Theoretical 10 + Practical (20%), Year's Work 10% <<  
SeekAnnual50% Final Theory 40% Final Practical 10% Total 100%

Learning and Teaching Resources .12

1) <b>Engineering Measurement &amp; Instrumentation</b> by LF Adams	Sources
2) <b>Control systems for heating &amp; ventilation and Air-condition, by Haines</b>	

### Course Description Form

.1 Course Name	
Computer Applications/Second Stage	
.2 Course Code	
.3 Semester/ year	
semester/Stage 2	
.4 Date of preparation of this description	
2024	
.5 Available forms of attendance	
attendance	
.6 Number of study hours(Total/) Number of units (Total)	
2 semesters x 15 weeks = 30 hours	
.7 Name of the course administrator(If more than one name is mentioned)	
Name:	
. Course Objectives	
1. Learn about the Internet. 2. Identify AutoCAD programs.	
.9 Science Strategies	
Midterm and final exams        - Short daily quizzes            - Homework                        - Reports                            - - Interaction within the lecture Continuing educational call.       - Guidance and follow-up lectures.   - -Electronic seminars and workshops	
.10 Course structure	
<b>Vocabulary details</b>	<b>The v</b>
<b>introduction About computer networks: An idea about the structure of the connection: the provider (server) - -( ServerAnd typesProviders (Customer)ClientAnd learn about peer-to-peer networks)-(Peer To PeerIdentifying customer networksClient / Server Network. Identify the main components of networks. General idea about basic network designs</b>	1-2-

- Linear networks Bus  
 - Ring type networks Ring  
 - Star networks Star  
 an idea General information about the types of network connection or connection:  
 - Depending on the network connection method:  
 Networks Single point connection  
 Networks multipoint connection  
 - Depending on geographical coverage:  
 Networks Local (LAN) Local Area Network, local area network devices  
 specifications Local Area Networks  
 Networks Intermediate (MAN) Metropolitan Area Network, regional area network  
 devices  
 Networks The wide (WAN) Wide Area Network Wide Area Network Devices  
 Networks Advanced and wide area: Internet Internet Intranet Intranet,

program Excel: Getting to know the concept of the program: its benefits, specifications, features, and methods of operation, and getting to know the main screen and its components and containing various effective menus and tools.  
 (File tab, Home tab, Page layout tab)  
 Cell concept, basic data types and how to enter them  
 How to save a worksheet Workbook, Worksheet Close program and close file  
 Open the saved file, enter data, perform simple calculations, and learn how to adjust or format data and structure it within a single cell or group of cells, a group of tables, a group of charts, a group of text, a group of symbols.  
 Learn about the methods of collecting data or a group of cells in its various forms, as well as how to sort data.  
 Creating mathematical formulas, which include (a set of function libraries, rules for writing mathematical formulas, a sentence). If conditional, formula check 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 the revision process Editing provided by the program, how to copy data or move data and learn about the concept of copying calculations as well as the concept of relative cells and absolute cells  
 Controlling cell display: Change its style and format by using formatting tools.  
 Dealing with charts Chart and how to convert numerical and textual data into charts of various types through the Chart Wizard command and learn 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.

5-6-7-8-9-10 -  
11-12-13-14- 5

**.11 course decision**

Chapter First 10) Theoretical 10 + Practical (20%, Second Semester 10) Theoretical 10 + Practical (20%), Year's Work 10% <<  
 Seek Annual 50% Final Theory 40% Final Practical 10% Total 100%

## Course Description Form

Name	The decision	.1
Occupational Safety and Management/Stage Two		
Symbol	The decision	.2
semester/ year		.3
semester/The second stage		
Date Prepare this description		.4
2024		

.5 Available forms of attendance		
attendance		
.6 Number of study hours (Total/ ) Number of units (Total)		
Academic 2 x 15 weeks = 30 hours per semester		
.7 Name of the course administrator (If more than one name is mentioned)		
Name: Imad Abdel Wahed		
.8 objective course		
1) Identify the management system		
2) Identify the importance of industrial management.		
.9 Science Strategies		
1) Electronic oral tests. 2) Electronic tests. 3) Electronic daily assessment. 4) Laboratory reports. 5) In-person practical exam. 6) First semester electronic exam. 7) The second semester electronic exam. 8) The final exams, in-person and electronic.		
.10 Course structure		
<b>Vocabulary details (semester One)</b>		<b>The week</b>
<b>Management</b>		<b>1</b>

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

<b>Vocabulary details(semester Two</b>	<b>The week</b>
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<b>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</b>	1
<b>Quality Elements - Design Quality</b>	2
<b>Quality of implementation - reliability - quality control costs</b>	3
<b>Standardization – Standard Specifications (Definition of Specification)</b>	4
<b>Types of Standard Specifications</b>	5
<b>Data and information collection - frequency table - frequency histogram</b>	6
<b>Quality control methods - Sample method - Types of charts</b>	7
<b>Applications in using one of the types of charts</b>	8
<b>Maintenance - Objectives - Types</b>	9
<b>Preventive Maintenance - Benefits - Unexpected Maintenance</b>	10
<b>Maintenance Department Organization</b>	11
<b>Industrial safety and security, the impact of industrial safety on production efficiency</b>	12
<b>Industrial safety quality methods, general rules and regulations for accident prevention</b>	13
<b>Industrial accident and prevention methods</b>	14
<b>Personal Protective Equipment - Fires and Fire Fighting Methods</b>	15

ChapterFirst20%, Second semester 20%, Year's work 10% << Annual effort 50% Final theoretical 50% Total % 100

### Course Description Form

NameThe decision	.1
Project / Phase II	
SymbolThe decision	.2
semester/ year	.3
Second yeare	
Date Prepare this description	.4
	2024



Shapes Available attendance		.5
Full attendance system		
.6 Number of study hours (Total/) Number of units (Total)		
2 semesters x 15 weeks = 30 hours per semester		
.7 Name of the course administrator (If more than one name is mentioned)		
Name Department lecturers		
Course Objectives		.8
Student acquisition of skill, research and learning of programs 1.		
2) Learn about the air conditioning and refrigeration procedures.		
3) Conducting laboratory experiments on air conditioning.		
.9 Science and Education Strategy		
Midterm and final exams -		<b>Strategy</b>
Short daily quizzes -		
Homework -		
Reports -		
- Interaction within the lecture		
Continuing educational call. -		
Guidance and follow-up lectures. -		
- Electronic seminars and workshops		
.10 Course structure		
Vocabulary details		<b>The week</b>
<p><b>Student projects are distributed to branch students by the branch or department and under the supervision of a professor, so that the projects include one of the following aspects..</b></p> <p><b>1- Making integrated maps for a cooling or air conditioning device, within the specialization devices, and manufacturing parts or assembling devices or accessories, with the necessary examinations and tests being carried out on it afterwards.</b></p> <p><b>2- The process of calculating the air conditioning loads for any public building and drawing the necessary plans and maps for all air ducts and water transmission pipes as well as illustrations of the required accessories, installation of pipes and devices, sequencing of control devices and testing of devices.</b></p>		

## .11 Course Evaluation

Chapter First 10) Theoretical 10 + Practical (20%, Second Semester 10) Theoretical 10 + Practical (20%), Year's Work 10% <<  
Seek Annual 50% Final Theory 40% Final Practical 10% Total 100%

## .12 Sources of knowledge

1-Air-conditioning engineering by wpJoins. 2-ASHRAE hand book 3-Air-conditioning engineering by Gupta 4-Principles of refrigeration by Dossat	A-Required books and main references
Virtual Library of the Ministry of Higher Education and Research 1 Scientific	B- Books and references (Magazines Scientific Reports, )
Virtual Library of the Ministry of Higher Education and Research 1 Scientific -2 What books are available in the institute's electronic library?	C-References Electronic, sites Internet....