

Academic description form for colleges and institutes Academic year 2022/2023

**Name of University: Northern Technical University
Collage/Institute: Technical Institute of Kirkuk
Department: Chemical Industry Technologies
File Filled Date: 3/9/2023**

Scientific Assistant

Name : sawash.Sh.Ebraheem

Date: 3 /9/2023

Head Of Department:

Name:..Ali.A.Hussain

Date: 3/9/2023

**File has been checked by
Department of Quality Assurance and University Performance
Name of the Director of the Quality Assurance and University Performance
Division: Assit. Licture.Azhar.A.Abd.
Date: 6 / 9 / 2023**

Academic Program Description

This academic program description provides a brief summary of the most important program characteristics and the learning outcomes the student is expected to achieve, indicating whether he has made the most of the available opportunities. It is accompanied by a description of each course within the program

1. Educational institution	Northern Technical University
2. Scientific Department / Center	Technical Institute of Kirkuk
3. Name of academic or professional program	Chemical Industry Technologies Department
4. The name of the final certificate	Technical Diploma - for two calendar years equivalent to three years of study
5. School system: Annual/decisions/other	Annual system
6. Accredited Accreditation Program	ABET
7. Other external effects	There is a close relationship between the department's outputs and the labor market and the opinion of the labor market is taken into account in the curriculum. Depending on the graduate follow-up form.
8. Description setting date	30 / 5 / 2021
9. Objectives of the academic program	
A) Graduation of technical staff qualified to carry out the operation, maintenance and control of the operating equipment of the various chemical industrial units.	
b) Conduct chemical and laboratory physical tests of the resulting raw materials and contribute with specialized cadres in making modifications and improvements to industrial units.	
C) Knowledge of drawings, maps and industrial plans.	
D) Carrying out the work of quality control for the purpose of conforming the product to the standard specifications.	
E) Carrying out preventive and periodic maintenance of chemical industrial units.	

10. Required learning outcomes, teaching, learning and evaluation methods

Cognitive objectives

A1- Clarifying theoretical information about the operation of mechanical and thermal units and the movement of matter.

A2- Learn about oil and gas derivatives, how to obtain them, and the methods of evaluation globally and their standard specifications and chemical and physical composition.

A3- Study the physical and chemical changes of production plans that take place on a number of industries while recognizing how to conduct the physical and energy budget for various chemical industrial processes.

(a) Theoretically accurate identification of the installation and construction of devices used in chemical industries.

B- Program's skills objectives

B1- Study the devices for mechanical and thermal units and learn how to operate and maintain them.

B2- Study of the equipment for oil operations and methods of measuring the specifications of oil and its derivatives.

B3- Knowledge of drawings, maps, industrial plans and the use of Auto CAD to implement them.

4- Taking advantage of the skill of the computer and the Internet within the field of competence.

Teaching and learning methods

1) Workshops and practical experiments.

2) Laboratories and laboratory tests.

3) Summer training and practical practice on equipment in oil institutions and laboratories departments of countries.

4) Scientific travel and field visits to factories.

Evaluation methods

1) Electronic oral tests.

2) Electronic tests.

3) Daily assessment.

4) Laboratory reports.

5) Practical exam my attendance.

6) The

first quarterly exam.

7) Second quarterly exam.

8) Final exams.

C- Emotional and value objectives.

C1- Implementation of student project designs as part of graduation requirements.

C2- Maintenance of idle laboratory equipment.

Teaching and learning methods
1) Workshops and practical experiments. 2) Laboratories and laboratory tests. 3) Summer training and practical practice on equipment in oil institutions and laboratories departments of countries.
Evaluation methods
1) Electronic oral tests. 2) Electronic tests. 3) Daily assessment. 4) Laboratory reports. 5) Practical Exam my attendance. 6) The first Term Exam. 7) Second Term Exam. 8) Final Exams.
D- General skills transferred (other skills related to employability and personal development). D1- The work of the Plumbing and carpentry . D2- Welding and refrigerator work. D3- The work of turning and plumbing. D4- Computer and Internet business.
Teaching and learning methods
1) Workshops and practical experiments. 2) Manufacturing models by workshop.
Evaluation methods
1) Oral tests. 2) Electronic tests. 3) Daily evaluation of the student's performance in the workshop. 4) Practical Exam. 5) Continuous evaluation.

Study Plan 2022 -2023

First year of school

الرمز	عدد الوحدات	عدد الساعات العملية	عدد الساعات النظرية	أسم المقرر		نوع المتطلب
				باللغة الانكليزية	باللغة العربية	
NTU100	1	-	1	Human Rights and Democracy	حقوق الإنسان (إجباري)	المتطلبات الجامعية (14 وحدة) 12 وحدة إجباري + 2 وحدة اختياري
NTU106	1	-	1	Human Rights and Democracy	الديمقراطية (إجباري)	
NTU101	2	-	2	English Language 1	اللغة الانكليزية 1 (إجباري)	
NTU102	3	2	1	Computer Principles 1	مبادئ الحاسوب 1 (إجباري)	
NTU103	3	2	1	Computer Principles 2	مبادئ الحاسوب 2 (إجباري)	
NTU104	2	-	2	Arabic Language	اللغة العربية (إجباري)	
NTU105	2	1	1	Sport	الرياضة (اختياري)	
NTU107	2	-	2	French language	(اختياري) اللغة الفرنسية	
TIMO110	2	-	2	Mathematics 1	الرياضيات 1	وحدة 7 متطلبات المعهد إجبارية
TIMO111	2	-	2	Mathematics2	الرياضيات 2	
TIMO113	3	3	-	Mechanical workshop	المعامل الميكانيكية	
ICTI120	6	3	3	Fluid Flow	جريان الموائع	المتطلبات التخصصية (39 وحدة) 36 وحدة إجبارية + 3 وحدة اختياري
1CTI121	6	3	3	Operation of Industrial Units	تشغيل الوحدات الميكانيكية	
1CTI122	6	3	3	Physical Chemistry	الكيمياء الفيزيائية	
1CTI123	6	3	3	Thermodynamic	الثرموداينمك	
1CTI124	5	3	2	General Chemistry	الكيمياء العامة	
1CTI125	5	3	2	Organic chemistry	الكيمياء العضوية	
ICTI128	3	3	-	Engineering Drawing	الرسم الهندسي	
1CTI126	3	2	1	Food Chemistry	الصناعات الغذائية (اختياري)	
1CTI127	3	2	1	Pharmaceutical Chemistry	الصناعات الدوائية (اختياري)	
	61	31	30	المجموع		

Second school year

الرمز	عدد الوحدات	عدد الساعات العملية	عدد الساعات النظرية	أسم المقرر		نوع المتطلب
				باللغة الانكليزية	باللغة العربية	
NTU200	2	-	2	English Language 2	اللغة الانكليزية 2	المتطلبات الجامعية (4 وحدة) 4 وحدة إجبارية
NTU201	2	-	2	Professional Ethic	اخلاقيات المهنة	
TIMO207	2	-	2	Principles of occupational safety	مبادئ السلامة المهنية (اختياري)	متطلبات المعهد اختياري وحدة 2
TIMO208	2	-	2	-Industrial Management	الادارة الصناعية (اختياري)	
ICT210	5	3	2	Crude oil technology	تكنولوجيا النفط	المتطلبات التخصصية (53) وحدة وحدة إجبارية + 50 وحدة اختياري 3
1CT211	5	3	2	Technical & energy technology	تقنيات تحسين النفط الخام	
1CT212	5	3	2	Heat transfer	انتقال الحرارة	
1CT213	5	3	2	Mass transfer	انتقال المادة	
1CT214	4	2	2	Measurement techniques and control	تقنيات القياس والسيطرة	
1CT215	4	2	2	Principles of Electricity	مبادئ الكهرباء	
1CT216	4	2	2	Material properties	خواص المواد	
1CT217	4	2	2	construct of devices	بناء الأجهزة	
1CT218	5	3	2	Water treatment	معالجة المياه	
1CT219	5	3	2	Chemical industries	الصناعات الكيماوية	
TIMO220	4	4	-	project	(المشروع إجباري)	
1CT221	3	2	1	Environmental pollution	التلوث البيئي (اختياري)	
1CT222	3	2	1	Quality control	السيطرة النوعية (اختياري)	
ICTI223	استيفاء فقط			Summer training	التدريب الصيفي	
	61	32	27	المجموع		

Total	17	19	36	64		
-------	----	----	----	----	--	--

Total annual hours 64 x 30 weeks = 1920 hours

1. Total school hours for two years	3840	6. Percentage of assistive hours for two years	41
-------------------------------------	------	--	----

11.Planning personal development

- 1) Development courses. (Lecturer or participant)
- 2) Specialized seminars.
- 3) Regular meetings.
- 4) Cultural activities.
- 5) Sports activities.
- 6) Artistic activities.
- 7) View scientific developments.
- 8) Participation in scientific conferences.
- 9) Submit a search

12.Admission standard (regulations on college or institute admissions)

- 1) The total obtained by the student after passing the general examinations of the sixth grade of education.
- 2) To be a graduate of the scientific branch only.
- 3) The results of the medical examination that the student should be healthy and fit to study in the department.
- 4) Desire.

13.Top sources of information about the program

- 1) Principles of fluid mechanics - Part I / Beautiful Composition of Angels.
- 2) Unit Operation of chemical Eng . By maccade , Published by maccraw- hill ,3^{ed} edition 1967
- 3) Unit Operation by Brown , published by willy London 1965 .
- 4) Physical Chemistry, translated by The Writer Denial Al-Barti, Dr. Maurice Wahba, Issa Mustafa Issa.
- 5) Fuel Technology, Dr. Jaber Shansul Aesthetic, Technological University.
- 6)Ip Standard for petroleum and its products , Vol . 1& 2 . 37th ed., 1978
- 7) ASTM Standard < by American Society for testing Material, 1955
- 8) Element of heat transfer by Mjackob & A. hawk 3rd edidtion 1951 . john willy London . New York .
- 9) Unit operation of Chemical Eng . By W.L. McGrwa . Hill
- 10) Modern communication methods (Internet).
- 11) Paper sources (books and sources in the Institute's library).
- 12) Electronic sources (no books in the electronic library of the Institute)

13) Virtual Library of the Ministry of Higher Education and Scientific Research.

Curriculum Skills Chart

Department of Chemical Industry Technologies / First School Year

				Learning outputs required from the program															
Year/L evel	Deci sion code	The name of the rapporteur	Basic(a) Or not basic (g)	Cognitive goals				Skills goals Program-specific				Emotional goals And value.				Transferredgeneral andrehabilitative skills(other skills related to employability and personaldevelopment)			
				A1	A2	A3	A4	B1	in two	By 3	by 4	c1	c2	C3	C 4	D1	D2	D3	D7a nd 8
2020- 2021		Operation of mechanicalunits	fundamental	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
		Physical chemistry	Non- essential	F	F	F	F	F	F	F	F	F	F	F	F	Non	Non	Non	F
		Chemistry	Non- essential	F	F	F	F	F	F	F	F	F	F	F	F	Non	Non	Non	F
		Geometric drawing	Non- essential	Non	Non	Non	Non	F	F	F	F	F	F	F	F	F	F	F	F
		Math	Non- essential	F	F	F	F	Non	Non	Non	Non	F	F	F	F	Non	Non	Non	F
		Occupational safety	Non- essential	F	F	F	F	Non	Non	Non	Non	F	F	F	F	F	F	F	Non
		modulus	Non- essential	Non	Non	Non	Non	Non	Non	Non	Non	F	F	F	F	F	F	F	F
		Copperand B applications	Non- essential	Non	Non	Non	Non	Non	Non	Non	Non	F	F	F	F	F	F	F	F
		Human Rights and Democracy	Non- essential	Non	Non	Non	Non	Non	Non	Non	Non	Non	Non	Non	No n	Non	Non	Non	F
		English	Non- essential	Non	Non	Non	Non	Non	Non	Non	Non	Non	Non	Non	No n	Non	Non	Non	Non

Curriculum Skills Chart

Department of Chemical Industry Technologies / Second School Year

				Learning outputs required from the program															
Year/L evel	Decisio n code	The name of the rapporteur	Basic(a) Or not basic (g)	Cognitive goals				Skills goals Program-specific				Emotional goals And value.				Transferred general and rehabilitative skills (other skills related to employability and personal development)			
				A1	A2	A3	A4	B1	in two	By 3	by 4	c1	c2	C3	C 4	D1	D2	D3	D7a and 8
2020- 2021		Oil technology	fundamental	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
		Operation of thermal units	Fundamental	F	F	F	F	F	F	F	F	F	F	F	F	Non	Non	Non	F
		Chemical Industries	Fundamental	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
		Measureme nts and control	Fundamental	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
		Material properties	Fundamental	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
		Building devices	Fundamental	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
		Project	Fundamental	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
		Copperan d B applications	Non- essential	Non	Non	Non	Non	Non	Non	Non	Non	F	F	F	F	Non	Non	Non	F
		English	Non- essential	Non	Non	Non	Non	Non	Non	Non	Non	Non	Non	Non	Non	Non	Non	Non	Non

Course description form (1)

Description of the decision

This description provides a brief summary of the most important characteristics of the course and the learning outcomes that the student is expected to achieve, demonstrating whether he has made the most of the learning opportunities available.

1. Educational Institution	Northern Technical University/ Technical Institute / Kirkuk
2. Scientific Department / Center	Chemical Industry Technologies
3. Name/code decision	Operation of mechanical units/ First Stage
4. Available attendance forms	by Google meet electronically in the side theoretical and practical by attendance according to the blended learning
5. Chapter/Year	Courses system
6. Number of school hours (total)	Study $5 \times \text{week}30 = 150$ hours (annual)
7. The date of setting this description	3 /9 / 2023
8. Objective of the decision	
Studying the properties and behavior of the fluid as it flows through different pipes and devices, and introducing the student to the mechanical units, their scientific foundations, and the operations they perform (separation, mixing, miniaturization, fragmentation, and installation).	

9. Learning outcomes, teaching, learning and evaluation methods

Cognitive Objectives

Clarification of theoretical information about the operation of mechanical units by conducting various experiments and introducing the student to the laboratory units (sieves, crushers, filters, etc.).

Teaching and learning methods

Theoretical lecture (with various explanations) google class room, practical lecture (with various explanations), scientific reports. google meet.youtube section.

Workshops and practical experiments.

Evaluation methods

- | | | |
|---------------------------------|----------------------|------------------------------------|
| 1) oral tests. | 2) Electronic tests. | 3) Daily assessment. |
| 4) Laboratory reports. | 5) Practical exam. | 6) The first final quarterly exam. |
| 7) Second final quarterly exam. | | |

C- Emotional and value Objectives

C1- Implementation of student project designs as part of graduation requirements.

C2- Maintenance of idle laboratory equipment.

Teaching and learning methods

Workshops and practical experiments.

Evaluation methods

- | | | |
|---------------------------|----------------------------------|------------------------------|
| Electronic oral tests. | 2) Electronic tests. | 3) Daily assessment. |
| 4) Laboratory reports. | 5) Practical exam my attendance. | 6) The first quarterly exam. |
| 7) Second quarterly exam. | 8) Final exams. | |

General and transferred skills (other skills related to employability and personal development).

D1- Plumbing

D2- Welding

10. Decision structure					
The week	Hours	Required learning outcomes	Unit name/subject	The way you teach	Evaluation method
5 - 1	7 hours a week		Defining units and studying fluid properties Density, viscosity, pressure	Theoretical + Practical	Electronic and attendance exams
10 - 6	7 hours a week		Continuity equation, Bernoulli equation	Theoretical + Practical	Electronic and attendance exams
- 11 12	7 hours a week		Pumps, their types, how to connect them	Theoretical + Practical	Electronic and attendance exams
- 13 20	7 hours a week		Operation of mechanical units, hydration, sedimentation	Theoretical + Practical	Electronic and attendance exams
- 21 29	7 hours a week		Filtration, sieves...	Theoretical + Practical	Electronic and attendance exams
30	7 hours a week		storage	Theoretical + Practical	Electronic and attendance exams

11. Infrastructure

1- Required textbooks	2- مبادئ ميكانيكي الموائع – الجزء الاول تأليف جميل الملايكة 3- ميكانيكي الموائع الدكتور نعمة حمد عمارة – الجامعة التكنولوجية 4- ميكانيكي الموائع ترجمة نبيل زكي مرتضى والدكتور فوزي ابراهيم عبد الصادق 5- Unit. Operation of chemical Eng. By maccade, Published by maccraw-hill, 3^{ed} edition 1967 6- Unit operation by Brown, published by willy London 1965 7- Priciples of unit operation by A. S . Faust published by Toppan and Willy 2nd edition 1961 Tokyo. Japan 1960 8- Chemical Eng Vol 1 and 2nd Coulson and Richardason by preutice- Hill 1960
9- Key references (sources)	1)Element of heat transfer by Mjackob & A 2)hawk 3rd edidtion 1951 . john willy London . New York .) Unit operation of Chemical Eng . By W.L. McGrwa . Hill
أ- Electronic references, websites....	1- Virtual Library of the Ministry of Higher Education and Scientific Research 2- There are no books in the institute's electronic library.

Course description form (2)

Description of the decision

This description provides a brief summary of the most important characteristics of the course and the learning outcomes that the student is expected to achieve, demonstrating whether he has made the most of the learning opportunities available.

1. Educational Institution	Northern Technical University/ Technical Institute / Kirkuk
2. Scientific Department / Center	Chemical Industry Technologies
3. Name/code decision	occupational safety / stage one
4. Available attendance forms	blended education
5. Chapter/Year	course system
6. Number of school hours (total)	Study 2 × 15 weeks = 30 hours
7. The date of setting this description	3 /9 / 2023
8. Objective of the decision	• Electricity hazards study • Study the risks of radiation and methods of prevention • Study dealing with electricity on the job • Study of the prevention of toxic gases and methods of prevention

9. Learning outcomes, teaching, learning and evaluation methods

A- Cognitive aims

A 1- Knowing the methods of prevention

A 2- Take advantage of the types of civil defense in the event of an emergency

A3- To develop a student's ability to develop solutions when risks occur

The course's skills objectives

- Electricity hazards study
- Study the risks of radiation and methods of prevention
- Study dealing with electricity on the job
- Study of the prevention of toxic gases and methods of prevention

Teaching and learning methods

Theoretical lecture (with various explanations) google class room, practical lecture (with various explanations), scientific reports. google meet. youtube section learning methods.

Workshops and practical experiments.

Evaluation methods

- | | | |
|---------------------------|----------------------|------------------------------|
| 1) Electronic oral tests. | 2) Electronic tests. | 3) Daily assessment. |
| 4) Laboratory reports. | 5) Practical exam. | 6) The first quarterly exam. |
| 7) Second quarterly exam. | 8) Final exams. | |

C- Emotional and value goals

C1- Implementation of student project designs as part of graduation requirements.

C2- Maintenance of idle laboratory equipment.

Teaching and learning methods

Workshops and practical experiments.

Evaluation methods

Electronic oral tests. 4) Laboratory reports. 7) Second quarterly exam.	2) Electronic tests. 5) Practical exam my attendance. 8) Final exams.	3) Daily assessment. 6) The first quarterly exam.
General and transferred skills (other skills related to employability and personal development). D1- Plumbing D2- Welding		

12. Decision structure					
The week	Hours	Required learning outcomes	Unit name/subject	The way you teach	Evaluation method
1-4	2 hours a week		Meaning and objectives of occupational safety	Theoretical + Practical	Electronic and attendance exams
4-7	2 hours a week		Accidents and ways to escape from them	Theoretical + Practical	Electronic and attendance exams
7-12	2 hours a week		Hazards with chemicals and first aid when poisoning	Theoretical + Practical	Electronic and attendance exams
12-13	2 hours a week		Electrical hazards and ways to solve them	Theoretical + Practical	Electronic and attendance exams
14	2 hours a week		environmental pollution risks	Theoretical + Practical	Electronic and attendance exams
15	2 hours a week		Fire hazards and ways to escape from them	Theoretical + Practical	Electronic and attendance exams

--	--	--	--	--	--

13. Infrastructure	
10- Required textbooks	ادارة الانتاج ، كاظم جواد شبر 1973
ب- Electronic references, websites....	3- Virtual Library of the Ministry of Higher Education and Scientific Research 4- There are no books in the institute's electronic library.

Course description form (3)

Description of the decision

This description provides a brief summary of the most important characteristics of the course and the learning outcomes that the student is expected to achieve, demonstrating whether he has made the most of the learning opportunities available.

1.Educational Institution	Northern Technical University/ Technical Institute / Kirkuk
2.Scientific Department / Center	Chemical Industry Technologies
3.Name/code decision	Mathematical / stage one
4.Available attendance forms	Electronic
5.Chapter/Year	Annual system
6.Number of school hours (total)	Study 2×30 weeks = 60 hours (annual)
7.The date of setting this description	30 /5 / 2021
Objective of the decision	Strengthening students' ability to understand mathematical relationships so that the student can understand the relationships between different variables and link them to his specialization

9. Learning outcomes, teaching, learning and evaluation methods

A- Cognitive aims

A1- Learn about the different complex problems

A2- use mathematics in application.

b- Subject-specific skill objectives

B1- To develop a student's ability to find solutions to complex problems

B2- Mathematics applications in reality

A3 - Using the Mat lab program and linking them to math equations

Teaching and learning methods

Theoretical lecture (with various explanations) google class room, practical lecture

(with various explanations), scientific reports. google meet. youtube section learning methods.

Evaluation methods

- | | | |
|------------------------------|----------------------|----------------------|
| 1) Electronic oral tests. | 2) Electronic tests. | 3) Daily assessment. |
| 4) The first quarterly exam. | | |
| 5) Second quarterly exam. | 6) Final exams. | |

C- Emotional and value goals

A1- Identify student to solve complex equations

A2 - Teaching the student the basics of mathematics, how they solve

A3- Training the student on the use of Mat lab in mathematics

A4- Building practical electronic circuits

Teaching and learning methods

Theoretical lecture (with various explanations) google class room, practical lecture

(with various explanations), scientific reports. google meet. youtube section learning methods.

Evaluation methods

Electronic oral tests.	2) Electronic tests.	3) Daily assessment.
4) Laboratory reports.	5) Practical exam my attendance.	6) The first quarterly exam.
7) Second quarterly exam.	8) Final exams.	

10. Decision structure

The week	Hours	Required learning outcomes	Unit name/subject	The way you teach	Evaluation method
1 – 9	2 hours a week		Logarithms	Theoretical + Practical	Electronic and attendance exams
10 – 19	2 hours a week		Matrices	Theoretical + Practical	Electronic and attendance exams
20 – 23	2 hours a week		Vector Types	Theoretical + Practical	Electronic and attendance exams
24 – 25	2 hours a week		Differentiation	Theoretical + Practical	Electronic and attendance exams
26 – 28	2 hours a week		Integration	Theoretical + Practical	Electronic and attendance exams
29 - 30	2 hours a week		The Seven Methods Of Integration	Theoretical + Practical	Electronic and attendance exams

11. Infrastructure

Required textbooks and references	1. . 2. Applied calculus by L. J . adams New York , London 1963 3. Introductory to the college Mathematic by William E. Milne 4. اساس الاحصاء باللغة العربية ، اعداد الدكتور صبري العاني 5. Introduction to differential equation by S.L. Green 1945 6. حساب التفاضل والتكامل والهندسة التحليلية ، توماس 1968 7. Applied calculus by L. J . adams New York , London 1963 8. Introductory to the college Mathematic by William E. Milne 9. اساس الاحصاء باللغة العربية ، اعداد الدكتور صبري العاني 10. Introduction to differential equation by S.L. Green 1945
ت- Electronic references, websites....	5- Virtual Library of the Ministry of Higher Education and Scientific Research 6- There are no books in the institute's electronic library.

Course description form (4)

Description of the decision

This description provides a brief summary of the most important characteristics of the course and the learning outcomes that the student is expected to achieve, demonstrating whether he has made the most of the learning opportunities available.

1.Educational Institution	Northern Technical University/ Technical Institute / Kirkuk
2.Scientific Department / Center	Chemical Industry Technologies
3.Name/code decision	Operation of thermal units
4.Available attendance forms	blended education
5.Chapter/Year	Annual system
6.Number of school hours (total)	Study $7 \times \text{week}30 = 210$ hours (annual)
7The date of setting this description	30 /5 / 2021
8.Objective of the decision	
1) Identify devices for the topics of heat transmission and material transmission (mass).	
2) Turn on heat transmission devices and conduct practical experiments.	
3) Provide the student with theoretical information on the topics of heat transmission and material transmission (mass).	

9. Learning outcomes, teaching, learning and evaluation methods

Cognitive Objectives

A1- Providing the student with theoretical information on the topics of heat transmission and material transmission (mass).

A2- Introducing the student to laboratory scientific units.

A3- Introducing the student to the units, thermal devices and material transmission units

A4- Making calculations on the topics of heat transmission and substance transmission (distillation, fumigation, absorption..... etc.)

The course's skills objectives

Study the devices for heat transfer and make measurements of physical variables.

B2- Identify the devices for the topics of heat transmission and material transmission and operation.

3- Making calculations for industrial devices and units.

Teaching and learning methods

Workshops and practical experiments.

Evaluation methods

- | | | |
|---------------------------|----------------------|------------------------------|
| 1) Electronic oral tests. | 2) Electronic tests. | 3) Daily assessment. |
| 4) Laboratory reports. | 5) Practical exam. | 6) The first quarterly exam. |
| 7) Second quarterly exam. | 8) Final exams. | |

C- Emotional and value goals

C1- Implementation of student project designs as part of graduation requirements.

C2- Maintenance of idle laboratory equipment.

Teaching and learning methods

Workshops and practical experiments.

Evaluation methods

General and transferred skills (other skills related to employability and personal development).

D1- Turning

D2- Welding

1. Decision structure					
The week	Hours	Required learning outcomes	Unit name/subject	The way you teach	Evaluation method
1 - 9	7 hours a week		Heat transmission methods and calculations	Theoretical + Practical	Electronic and attendance exams
10 - 19	7 hours a week		Distillation	Theoretical + Practical	Electronic and attendance exams
20 - 23	7 hours a week		Reclamation	Theoretical + Practical	Electronic and attendance exams
24 - 25	7 hours a week		Cooling	Theoretical + Practical	Electronic and attendance exams
26 - 28	7 hours a week		Drying	Theoretical + Practical	Electronic and attendance exams
29 - 30	7 hours a week		Adsorption and crystallization	Theoretical + Practical	Electronic and attendance exams

2. Infrastructure	
11- Required textbooks	1- Operation of Thermal Units / Written by Azzam Abdul AziG 2- Thermal Unit Operation Laboratory / AbdulKarim Jabbar
12- Key references (sources)	1) Element of heat transfer by Mjackob & A 2) hawk 3 rd edition 1951 . john willy London . New York .) Unit operation of Chemical Eng . By W.L. McGrwa . Hill
31 Recommended books and references (scientific journals, reports,....)	1- Introduction to heat transfer. Frank p. incropera. 4 th edition. 2- Virtual Library of the Ministry of Higher Education and Scientific Research
32 Electronic references, websites....	7- Virtual Library of the Ministry of Higher Education and Scientific Research 8- There are no books in the institute's electronic library.

3. Course Development Plan
1- Take advantage of the virtual library of the Ministry of Higher Education and Scientific Research. 2- Take advantage of scientific websites in the development of the course by showing scientific films and updates in the field of the rapporteur. 3- Linking the theoretical and practical part of the course through the subject of the student project.

Course description form (5)

Description of the decision

This description provides a brief summary of the most important characteristics of the course and the learning outcomes that the student is expected to achieve, demonstrating whether he has made the most of the learning opportunities available.

1. Educational Institution	Northern Technical University/ Technical Institute / Kirkuk
2. Scientific Department / Center	Chemical Industry Technologies
3. Name/code decision	Oil technology/ second stage
4. Available attendance forms	blended education
5. Chapter/Year	Annual system
6. Number of school hours (total)	Study $5 \times \text{week}30 = 150$ hours (annual)
7. The date of setting this description	30 /5 / 2021
8. Objectives of the decision	
1) Identification of oil and petroleum industries in terms of composition, extraction and processing	
2) Learn about oil and gas derivatives and how to obtain them and on the methods of evaluation globally and their standard specifications and chemical and physical composition	
3) Conduct laboratory experiments to assess the specifications of crude oil and its derivatives.	

9. Learning outcomes, teaching, learning and evaluation methods

Cognitive objectives

A1- Providing the student with theoretical information on the subject on oil and oil industries in terms of training, extraction and treatment.

A2- On oil and gas derivatives and how to obtain them.

A3- Introducing the student to the methods of evaluation globally and its standard specifications and chemical and physical composition

A4- Introducing the student to ways to improve the specifications of crude oil and its derivatives.

The course's skills objectives

1- Study the devices on the subject of oil assessment and oil industries.

2- Identifying the devices for the topics of oil refining and liquidation.

3- Making calculations for industrial devices and units.

Teaching and learning methods

Workshops, laboratories and practical experiments.

Evaluation methods

Electronic oral tests.

2) Spontaneous electronic tests.

3) Daily

assessment.

4) Laboratory reports.

5) Practical exam.

6) The first quarterly

exam.

7) The second quarterly exam.

8) Quarterly and final exams.

C- Emotional and value goals

C1- Implementation of student project designs as part of graduation requirements.

C2- Maintenance of idle laboratory equipment.

Teaching and learning methods

Workshops, laboratories and practical experiments.

Evaluation methods

1) Electronic oral tests.

2) Spontaneous electronic tests.

3) Daily

assessment.

4) Laboratory reports.

5) Practical exam.

6) The first quarterly

exam.

7) The second quarterly exam.

8) Quarterly and final exams.

General and transferred skills (other skills related to employability and personal development).

D1- Plumbing

D2- Welding

10. Decision structure					
The week	Hours	Required learning outcomes	Unit name/subject	The way you teach	Evaluation method
1 - 3	5 hours a week		Origin of oil and chemical composition, oil classification	Theoretical + Practical	Electronic and attendance exams
4 - 5	5 hours a week		Assessment of crude oil specifications	Theoretical + Practical	Electronic and attendance exams
6 - 9	5 hours a week		Crude oil processing, distillation, furnaces	Theoretical + Practical	Electronic and attendance exams
10 - 22	5 hours a week		Refining products, derivatives processing,	Theoretical + Practical	Electronic and attendance exams
23 - 27	5 hours a week		Gas manufacturing, processing	Theoretical + Practical	Electronic and attendance exams
28 - 30	5 hours a week		Environmental pollution as a result of the oil industry	Theoretical + Practical	Electronic and attendance exams

11. Infrastructure	
13- Required textbooks	1- Fuel Technology, Dr. Jaber Shanshul Jamali, Technological University 1986
14- Key references (sources)	1-IP Standard for petroleum and its products , Vol. 1 & 2 , 37 th ed. , 1978 2-ASTM Standard < by American Society for testing Material , 1955 3-Petroleum Refinery , by W. Nelson , 4 th ed. Mc Graw Hill , 1969.
33 Recommended books and references (scientific journals, reports,...)	1-Virtual Library of the Ministry of Higher Education and Scientific Research

34 Electronic references,
websites....

**1-Virtual Library of the Ministry of Higher
Education and Scientific Research**
**2-The books in the electronic library of the
Institute**

12. Course Development Plan

- 4- Take advantage of the virtual library of the Ministry of Higher Education and Scientific Research.
- 5- Take advantage of scientific websites in the development of the course by showing scientific films and updates in the field of the rapporteur.
- 6- Linking the theoretical and practical part of the course through the subject of the student project.

Course description form (6)

Description of the decision

This description provides a brief summary of the most important characteristics of the course and the learning outcomes that the student is expected to achieve, demonstrating whether he has made the most of the learning opportunities available.

1. Educational Institution	Northern Technical University/ Technical Institute / Kirkuk
2. Scientific Department / Center	Chemical Industry Technologies
3. Name/code decision	Chemical Industries/second stage
4. Available attendance forms	blended education
5. Chapter/Year	Annual system
6. Number of school hours (total)	Study 6 × week30 = 180 hours (annual)
7. The date of setting this description	30 /5 / 2021
8. Objective of the decision	
1) This article aims to identify production processes in different stages, from raw materials to industrial output.	
2) Studying this subject the student is able to study the physical and chemical changes of the production plans that take place on a number of industries.	
3) Conducting laboratory experiments for chemical industry laboratories.	

9. Learning outcomes, teaching, learning and evaluation methods

Cognitive objectives

A1- Providing the student with theoretical information on the subject of chemical methods,

Treatment of sewage and industrial waste.

A3- Introducing the student to some chemical industries, glass, cement, soap.

A4- Introducing the student to ways to improve the specifications of crude oil and its derivatives.

The course's skills objectives

1- Study the devices on the subject of oil assessment and oil industries.

2- Identifying the devices for the topics of oil refining and liquidation.

3- Making calculations for industrial devices and units.

Teaching and learning methods

Workshops, laboratories and practical experiments.

Evaluation methods

- | | | |
|---------------------------|----------------------------------|---------------------------------|
| 1) Electronic oral tests. | 2) Electronic tests. | 3) Electronic daily assessment. |
| 4) Laboratory reports. | 5) Practical exam my attendance. | 6) |
| The first quarterly exam. | | |
| 7) Second quarterly exam. | 8) Quarterly and final exams. | |

C- Emotional and value objectives

C1- Implementation of student project designs as part of graduation requirements.

C2- Maintenance of idle laboratory devices.

Teaching and learning methods

Workshops, laboratories and practical experiments.

Evaluation methods

- | | | |
|----------------------------|----------------------------------|---------------------------------|
| 11) Electronic oral tests. | 2) Spontaneous electronic tests. | 3) Electronic daily assessment. |
| 4) Laboratory reports. | 5) Practical exam my attendance. | 6) The first quarterly exam. |
| 7) Second quarterly exam. | 8) Quarterly and final exams. | |

General and transferred skills (other skills related to employability and personal development).

D1- Turning

D2- Welding

10.Decision structure

The week	Hours	Required learning outcomes	Unit name/subject	The way you teach	Evaluation method
1 – 3	5 hours a week		Origin of oil and chemical composition, oil classification	Theoretical + Practical	Electronic and attendance exams
4 – 5	5 hours a week		Assessment of crude oil specifications	Theoretical + Practical	Electronic and attendance exams
+6 – 9	5 hours a week		Crude oil processing, distillation, furnaces	Theoretical + Practical	Electronic and attendance exams
10 - 22	5 hours a week		Refining products, derivatives processing,	Theoretical + Practical	Electronic and attendance exams
23 - 27	5 hours a week		Gas manufacturing, processing	Theoretical + Practical	Electronic and attendance exams
28 - 30	5 hours a week		Environmental pollution as a result of the oil industry	Theoretical + Practical	Electronic and attendance exams

10. Infrastructure	
15- Required textbooks	5- Fuel Technology, Dr. Jaber Shanshul Jamali, Technological University 1986
16- Key references (sources)	1-IP Standard for petroleum and its products , Vol. 1 & 2 , 37th ed. , 1978 2-ASTM Standard < by American Society for testing Material , 1955 3-Petroleum Refinery , by W. Nelson , 4th ed. Mc Graw Hill , 1969.
35 Recommended books and references (scientific journals, reports,...)	1- Virtual Library of the Ministry of Higher Education and Scientific Research
36 Electronic references, websites....	1- Virtual Library of the Ministry of Higher Education and Scientific Research 2. The books in the institute's electronic library

11. Course Development Plan

- 7- Take advantage of the virtual library of the Ministry of Higher Education and Scientific Research.
- 8- Take advantage of scientific websites in the development of the course by showing scientific films and updates in the field of the rapporteur.
- 9- Linking the theoretical and practical part of the course through the subject of the student project.

Course description form (7)

Description of the decision

This description provides a brief summary of the most important characteristics of the course and the learning outcomes that the student is expected to achieve, demonstrating whether he has made the most of the learning opportunities available.

1.Educational Institution	Northern Technical University/ Technical Institute / Kirkuk
2.Scientific Department / Center	Chemical Industry Technologies
3.Name/code decision	Measurements and control/second stage
4.Available attendance forms	blended education
5.Chapter/Year	Annual system
6.Number of school hours (total)	Study $4 \times \text{week}30 = 120$ hours (annual)
7.The date of setting this description	30 /5 / 2021
8.Objective of the decision	
1) Introduce the student to electrical devices used in technological processes and chemical industries, as well as how to measure and control variables, and give a practical idea about electrical and measuring devices.	
2) Expand the student's awareness of the use of devices and how to deal with them and to control chemical variables. and expand their theoretical knowledge.	

9.Learning outcomes, teaching, learning and evaluation methods

Cognitive objectives

Providing the student with theoretical information on the subject of connecting electrical devices used in technological processes.

A2 How to deal with the devices used in the chemical industries and how to control them.

.

B - Skills objectives of the course

B1 - Studying the devices related to the subject of measurements and control evaluation on industrial devices.

B 2 - Familiarization with the devices related to the two topics of oil refining and liquidation.

B 3- Carrying out calculations for industrial equipment and units.

Teaching and learning methods

Workshops, laboratories and practical experiments.

Evaluation methods

- | | | |
|--|----------------------------------|---------------------|
| 1) Electronic oral tests.
assessment. | 2) Electronic tests. | 3) Electronic daily |
| 4) Laboratory reports. | 5) Practical exam my attendance. | 6) The first |
| 7) Second quarterly exam. | 8) Quarterly and final exams. | |

C- Emotional and value objectives

C1- Implementation of student project designs as part of graduation requirements.

C2- Maintenance of idle laboratory devices.

Teaching and learning methods

Workshops, laboratories and practical experiments.

Evaluation methods

- 11) Electronic oral tests. 2) Spontaneous electronic tests. 3) Electronic daily assessment.
 4) Laboratory reports. 5) Practical exam my attendance. 6) The first quarterly exam.
 7) Second quarterly exam. 8) Quarterly and final exams.

General and transferred skills (other skills related to employability and personal development).
 D1- Turning
 D2- Welding

Decision structure

The week	Hours	Required learning outcomes	Unit name/subject	The way you teach	Evaluation method
1 – 3	4 hours a week		Purposes of Measurements and Control technology, Used terms	Theoretical + Practical	Electronic and attendance exams
4 – 5	4 hours a week		Principals of Electricity, Electrical energy and Electrical power, Ohm s Law, Resistors, Capacitors	Theoretical + Practical	Electronic and attendance exams
+6 – 9	4 hours a week		Signal transmitting, Pointing and Recording instruments, the Units	Theoretical + Practical	Electronic and attendance exams
10 - 22	4 hours a week		Electrical Machines, Generators, Motors	Theoretical + Practical	Electronic and attendance exams
23 – 27	4 hours a week		Pressure measurement, Electrical methods	Theoretical + Practical	Electronic and attendance exams
28 – 30	4 hours a week		Environmental pollution as a result	Theoretical + Practical	Electronic and

		of the oil industry		attendance
--	--	---------------------	--	------------

12. Infrastructure	
1.Required textbooks	القياسات التكنولوجية واجهزة القياس المستعملة في الصناعات الكيماوية ، تأليف م . كولاكوف. دار مير للطباعة والنشر ، الاتحاد السوفياتي / موسكو
2.Key references (sources)	1.Industrial Instrumentation by E.Eck man New York, John wiley and sons .Inc London Cham an and Hall Limited 5 th printing . July 1975. 2.Process Instrumentation and controls Hand Book by Considine Douglas M. McGraw. Hill Book company copyright first edition 1957. 3.Chemical Engineering hand book by Perry fifth edition McGraw. Hill 1957.
3.Recommended books and references (scientific journals, reports,....)	1- Virtual Library of the Ministry of Higher Education and Scientific Research
4.Electronic references, websites....	1- Virtual Library of the Ministry of Higher Education and Scientific Research 2. The books in the institute's electronic library

Course description form (8)

Description of the decision

This description provides a brief summary of the most important characteristics of the course and the learning outcomes that the student is expected to achieve, demonstrating whether he has made the most of the learning opportunities available.

1.Educational Institution	Northern Technical University/ Technical Institute / Kirkuk
2.Scientific Department / Center	Chemical Industry Technologies
3.Name/code decision	properties of materiel/second stage
4.Available attendance forms	blended education
5.Chapter/Year	course system
6.Number of school hours (total)	Study 2 × week15 = 30 hours (annual)
7.The date of setting this description	30 /5 / 2021

8.Objective of the decision

1) Introducing the student about the effects of external forces on the parts of the machines and the consequent stresses and deformations because of them and how to treat these cases depending on the mathematical relations to determine the permissible forces, as well as introducing the student to the types of minerals that are used in the construction of devices and machines used in the chemical industries and the types of these minerals, their properties Its specifications, uses, how to extract it and how to protect it when exposed to corrosion

2) Teaching the student how to test metals to know their mechanical properties (hardness, shocks, toughness, tensile and compressive resistance) according to industrial requirements and providing the student with information about the properties and specifications of metals and how to preserve them from corrosion

9.Learning outcomes, teaching, learning and evaluation methods

Cognitive objectives

Teaching the student how to test metals to know their mechanical properties (hardness, shocks, toughness, tensile and compressive resistance) according to industrial requirements and providing the student with information about the properties and specifications of metals and how to preserve them from corrosion .

B - Skills objectives of the course

B1 - Studying the devices related to the subject of measurements and control evaluation on industrial devices.

B 2 - Familiarization with the devices related to the two topics of oil refining and liquidation.

B 3- Carrying out calculations for industrial equipment and units.

Teaching and learning methods

Workshops, laboratories and practical experiments.

Evaluation methods

1) Electronic oral tests. assessment.

2) Electronic tests.

3) Electronic daily

4) Laboratory reports. quarterly exam.

5) Practical exam my attendance. 6) The first

7) Second quarterly exam. 8) Quarterly and final exams.
C- Emotional and value objectives C1- Implementation of student project designs as part of graduation requirements. C2- Maintenance of idle laboratory devices.
Teaching and learning methods
Workshops, laboratories and practical experiments.
Evaluation methods
11) Electronic oral tests. 2) Spontaneous electronic tests. 3) Electronic daily assessment. 4) Laboratory reports. 5) Practical exam my attendance. 6) The first quarterly exam. 7) Second quarterly exam. 8) Quarterly and final exams.
General and transferred skills (other skills related to employability and personal development). D1- Turning D2- Welding

10.Decision structure					
The week	Hours	Required learning outcomes	Unit name/subject	The way you teach	Evaluation method
1 – 3	4 hours a week		Introduction, objective and definitions of forces, stresses, deformations, mechanical properties and mathematical problems about	Theoretical + Practical	Electronic and attendance exams

			forces		
4 – 5	4 hours a week		Stresses and Compressions (Hooke's Law, Stress-Strain Diagram)	Theoretical + Practical	Electronic and attendance exams
+6 – 9	4 hours a week		Shear stresses	Theoretical + Practical	Electronic and attendance exams
10 - 22	4 hours a week		Metallurgy	Theoretical + Practical	Electronic and attendance exams
23 – 27	4 hours a week		non-ferrous metals	Theoretical + Practical	Electronic and attendance exams
28 – 30	4 hours a week		corrosion	Theoretical + Practical	Electronic and attendance exams

13. Infrastructure

1.Required textbooks 2.Key references (sources)	-Strenth of Material, R.C. Stephens , 1974 -Engineering Mechanics, by Singer , 3 rd ed. , 1972
3.Recommended books and references (scientific journals, reports,...)	1- Virtual Library of the Ministry of Higher Education and Scientific Research
4.Electronic references, websites....	1- Virtual Library of the Ministry of Higher Education and Scientific Research 2. The books in the institute's electronic library

Course description form (9)

Description of the decision

This description provides a brief summary of the most important characteristics of the course and the learning outcomes that the student is expected to achieve, demonstrating whether he has made the most of the learning opportunities available.

1.Educational Institution	Northern Technical University/ Technical Institute / Kirkuk
2.Scientific Department / Center	Chemical Industry Technologies
3.Name/code decision	Construction of Equipment/ second stage
4.Available attendance forms	blended education
5.Chapter/Year	course system
6.Number of school hours (total)	Study $2 \times \text{week}15 = 30$ hours (annual)
7.The date of setting this description	31 /5 / 2021

8.Objective of the decision

1) Introducing the student about the effects of external forces on the parts of the machines and the consequent stresses and deformations because of them and how to treat these cases depending on the mathematical relations to determine the permissible forces, as well as introducing the student to the types of minerals that are used in the construction of devices and machines used in the chemical industries and the types of these minerals, their properties Its specifications, uses, how to extract it and how to protect it when exposed to corrosion

2) Teaching the student how to test metals to know their mechanical properties (hardness, shocks, toughness, tensile and compressive resistance) according to industrial requirements and providing the student with information about the properties and specifications of metals and how to preserve them from corrosion

9. Learning outcomes, teaching, learning and evaluation methods

Cognitive objectives

Teaching the student how to test metals to know their mechanical properties (hardness, shocks, toughness, tensile and compressive resistance) according to industrial requirements and providing the student with information about the properties and specifications of metals and how to preserve them from corrosion .

B - Skills objectives of the course

B1 - Studying the devices related to the subject of measurements and control evaluation on industrial devices.

B 2 - Familiarization with the devices related to the two topics of oil refining and liquidation.

B 3- Carrying out calculations for industrial equipment and units.

Teaching and learning methods

Workshops, laboratories and practical experiments.

Evaluation methods

- | | | |
|---------------------------------------|----------------------------------|---------------------|
| 1) Electronic oral tests. assessment. | 2) Electronic tests. | 3) Electronic daily |
| 4) Laboratory reports. | 5) Practical exam my attendance. | 6) The first |
| 7) Second quarterly exam. | 8) Quarterly and final exams. | |

C- Emotional and value objectives C1- Implementation of student project designs as part of graduation requirements. C2- Maintenance of idle laboratory devices.
Teaching and learning methods
Workshops, laboratories and practical experiments.
Evaluation methods
11) Electronic oral tests. 2) Spontaneous electronic tests. 3) Electronic daily assessment. 4) Laboratory reports. 5) Practical exam my attendance. 6) The first quarterly exam. 7) Second quarterly exam. 8) Quarterly and final exams.
General and transferred skills (other skills related to employability and personal development). D1- Turning D2- Welding

10.Decision structure					
The week	Hours	Required learning outcomes	Unit name/subject	The way you teach	Evaluation method
1 – 3	4 hours a week		Purposes of Measurements and Control technology, Used terms	Theoretical + Practical	Electronic and attendance exams
4 – 5	4 hours a week		Principals of Electricity, Electrical energy and Electrical power, Ohm s Law, Resistors, Capacitors	Theoretical + Practical	Electronic and attendance exams
+6 – 9	4 hours a week		Signal transmitting, Pointing and Recording instruments, the Units	Theoretical + Practical	Electronic and attendance exams

10 - 12	4 hours a week		Electrical Machines, Generators, Motors	Theoretical + Practical	Electronic and attendance exams
12-14	4 hours a week		Pressure measurement, Electrical methods	Theoretical + Practical	Electronic and attendance exams
14-15	4 hours a week		Environmental pollution as a result of the oil industry	Theoretical + Practical	Electronic and attendance exams

14. Infrastructure

1.Required textbooks	القياسات التكنولوجية واجهزة القياس المستعملة في الصناعات الكيماوية ، تأليف م . كولاكوف. دار مير للطباعة والنشر ، الاتحاد السوفياتي / موسكو
2.Key references (sources)	1.Industrial Instrumentation by E.Eck man New York, John wiley and sons .Inc London Cham an and Hall Limited 5th printing . July 1975. 2.Process Instrumentation and controls Hand Book by Considine Douglas M. McGraw. Hill Book company copyright first edition 1957. 3.Chemical Engineering hand book by Perry fifth edition McGraw. Hill 1957.
3.Recommended books and references (scientific journals, reports,...)	1- Virtual Library of the Ministry of Higher Education and Scientific Research
4.Electronic references, websites....	1- Virtual Library of the Ministry of Higher Education and Scientific Research 2. The books in the institute's electronic library

Course description form (10)

Description of the decision

This description provides a brief summary of the most important characteristics of the course and the learning outcomes that the student is expected to achieve, demonstrating whether he has made the most of the learning opportunities available.

1.Educational Institution	Northern Technical University/ Technical Institute / Kirkuk
2.Scientific Department / Center	Chemical Industry Technologies
3.Name/code decision	Computer applications / second stage
4.Available attendance forms	blended education
5.Chapter/Year	course system
6.Number of school hours (total)	Study 2 × week30 = 60 hours (annual)
7.The date of setting this description	30 /5 / 2021
8.Objective of the decision	
1) Providing the student with theoretical information related to a topic about applied programs (internet, Excel, AutoCAD) and their windows and methods of operation.	

9.Learning outcomes, teaching, learning and evaluation methods

Cognitive objectives

B1 - Study AutoCAD

Get to know the different program work environment for the screen

Menus , Screen , Scroll Bars , Tool Bars , Properties Bar

Teaching and learning methods

Theoretical lecture (with various explanations) google class room, practical lecture (with various explanations), scientific reports. google meet.youtube

Evaluation methods

- | | | |
|---------------------------|----------------------------------|---------------------------------|
| 1) Electronic oral tests. | 2) Electronic tests. | 3) Electronic daily assessment. |
| 4) Laboratory reports. | 5) Practical exam my attendance. | 6) The first quarterly exam. |
| 7) Second quarterly exam. | 8) Quarterly and final exams. | |

C- Emotional and value objectives

C1- Implementation of student project designs as part of graduation requirements.

C2- Maintenance of idle laboratory devices.

Teaching and learning methods

Workshops, laboratories and practical experiments.

10.Decision structure

The week	Hours	Required learning outcomes	Unit name/subject	The way you teach	Evaluation method
1 – 3	4 hours a week		Purposes of Measurements and Control technology, Used terms	Theoretical + Practical	Electronic and attendance exams
4 – 5	4 hours a week		Principals of Electricity,	Theoretical + Practical	Electronic and

			Electrical energy and Electrical power, Ohm s Law, Resistors, Capacitors		attendance exams
+6 – 9	4 hours a week		Signal transmitting, Pointing and Recording instruments, the Units	Theoretical + Practical	Electronic and attendance exams
10 - 22	4 hours a week		Electrical Machines, Generators, Motors	Theoretical + Practical	Electronic and attendance exams
23 – 27	4 hours a week		Pressure measurement, Electrical methods	Theoretical + Practical	Electronic and attendance exams
28 – 30	4 hours a week		Environmental pollution as a result of the oil industry	Theoretical + Practical	Electronic and attendance exams

15. Infrastructure

1.Required textbooks	القياسات التكنولوجية واجهزة القياس المستعملة في الصناعات الكيماوية ، تأليف م . كولاكوف. دار مير للطباعة والنشر ، الاتحاد السوفياتي / موسكو
2.Key references (sources)	1.Industrial Instrumentation by E.Eck man New York, John wiley and sons .Inc London Cham an and Hall Limited 5th printing . July 1975. 2.Process Instrumentation and controls Hand Book by Considine Douglas M. McGraw. Hill Book company copyright first edition 1957. 3.Chemical Engineering hand book by Perry fifth edition McGraw. Hill 1957.
3.Recommended books and references (scientific journals, reports,....)	1- Virtual Library of the Ministry of Higher Education and Scientific Research
4.Electronic references, websites....	1- Virtual Library of the Ministry of Higher Education and Scientific Research 2. The books in the institute's electronic library