Republic of Iraq
Ministry of Higher Education & Scientific Research
Supervision and Scientific Evaluation Directorate
Quality Assurance and Academic Accreditation
Fuel & Energy Techniques Engineering Department

Academic Program Specification Form For The Academic Year 2024-2025

University: Northern Technical University
College/Institute: College of Oil and Gas Techniques Engineering\Kirkuk
Scientific Department: Department of Fuel and Energy Techniques Engineering

Dean's Name :	Deans Assistant For Scientific Affairs	Head of Department
Assist.Prof. Dr.Obid Majed Ali	Assist.Prof. Dr.Galawish Nouri Taher	Dr. Mohammed Qader Abdulrahman
Date : 10/10/2024	Date : 10/10/2024	Date : 08/10/2024
Signature:	Signature:	Signature:

The College Quality Assurance
And University Performance
Manager
Maha Adnan Dawood
Date : 10/10/2024
Signature:

PROGRAMME SPECIFICATION

The Bachelor's degree program in Fuel and Energy Technology Engineering extends for four academic years. The academic year consists of two semesters: the first semester (fall) and the fall semester. Second (spring) semester = 14 academic weeks + one week allocated for rest before the exam + one week allocated for the exam.

Teaching is carried out according to the application of the Bologna educational path that can be developed and updated according to the requirements of the labor market in the governmental and private oil sectors that are related to the specialization of the scientific department. For each subject there is a formative assessment and a summative assessment. Formative assessment includes tasks and duties assigned by the subject professor to the student during one semester (daily exams, homework, reports, work projects, field visits, and discussions) and others according to the nature of the academic subject. As for the summative assessment, it consists of two parts: the mid-term exam and the final exam, and it may include a general exam. Leah.

Number of academic subjects during four years = 43 academic subjects. The total number of credits for academic subjects during four years required to complete graduation requirements = 240 European credits distributed approximately equally for each semester or year of study.

Educational Institution	Northern Technical University/ College of Oil and Gas Techniques Engineering /Kirkuk
Scientific Department	Department of Fuel and Energy Technology Engineering
Name of the academic or professional program	Bachelor Degree in Fuel and Energy Techniques Engineering
Name of the final certificate	Bachelor Fuel and Energy Techniques engineering
Academic system:	Bologna Process
Accredited accreditation program	Program of the Ministry of Higher Education and Scientific Research
Other external influences	Scientific, field visits and summer training in oil and gas companies
Date the description was prepared	08/10/2024

- ✓ **Objectives:** The study of Fuel and energy engineering technologies aims to the following:

1- Preparing specialized engineers in the field of fuel production and finding new sources of energy.

2- Finding new ways to produce fuel and energy that are environmentally friendly and efficient in terms of mass.

3- Designing fuel and energy production equipment and units.

4- Conducting research and applied studies related to energy production.

5- Operating oil units and monitoring production lines and control.

6-Applying occupational safety procedures and procedures to reduce environmental pollution.

7-Familiarity with the procedures for maintaining and repairing production.

8- Promote research in the field of fuel and energy with research centers of oil companies and corresponding scientific departments

- ✓ **Required Program Outcomes, Teaching, Learning and Assessment Methods:**

A- Cognitive objectives of Program:

A1- It aims to know the analysis of chemical elements and calculations of material and energy balances.

A2- It aims to know the operation of laboratory equipment and work with it.

A3- It aims to know the science of organic chemicals.

A4- It aims to know the science of internal combustion engines, mass and heat transfers.

A5- It aims to learn mathematics and engineering analyses.

A6- It aims to know how to follow industrial safety procedures and protect the environment from pollution.

A7. Understanding of the importance of manufacturing process to the economy and design.

B: Skills objectives of the program:

B 1- It aims to learn the skill of computer operation and organization work.

B2- It aims to learn the skill of operating oil and gas refining units

B3- It aims to learn the skill of designing and establishing laboratories.

B4- It aims to learn the skill of monitoring production lines.

B5- It aims to learn the skill of scientific research through the implementation of the engineering project.

B6- It aims to learn the skill of leadership and working within a team.

B7- Ability to fit an experimental data.

C. Emotional and Value Objectives:

C1- Reading, Writing, Speaking and Listening for English language.

C2- Apply mathematics to everyday life problems.

C3- Recognize the uses of commands in programs.

C4- Distinguishes between designs – code – run parts and use different objects in creating the programs, language abilities and reasons to use.

C5- Creating educational cadres that can be relied upon in state institutions within the specialization.

C6- Develop solutions to problems that occur in institutions and systems specialized in the field of fuel.

C7- Work to create the requirements of the labor market and raise the economic capacity.

C8- Preparing engineering cadres who can assume responsibility for leadership and teamwork.

C9-Respect the time, laws and instructions, and follow the instructions and directives issued by the Supreme Council.

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

D1 - Communication and conversation skills such as English language and presentation skill.

D 2 - Teamwork skills.

D 3- Leadership skills and responsibility.

D 4 - Skills of self-education and self-reliance in following up on scientific developments.

- ✓ **Teaching and Learning Methods**:

1-Method of delivery (lecture).

2- Method of cooperative learning between students.

3-Method of teaching in teams.

4-Method of exploration.

5-Method of solving problems (Troubleshooting).

6-Method of training style.

- ✓ **Assessment methods**

1-Written examination: To assess knowledge, understanding and skills (Formative assessment + Mid-year exam and final exam of each semester in the academic year).

2- Oral examination: To assess knowledge, skills and intellectual functions, and attitude.

3-Assignments & other activities like seminars between students groups and scientific debates.

4-Quizzes (Shock exams).

5-Homworks.

6- Laboratory Experiments Reports.

✓ General Courses and Curriculum Structure

Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
							CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)							
First	One	1	FEK 101	Analytical Chemistry	الكيمياء التحليلية	English	4		2		1	1	7	127	48	175	7.00	C	
		2	FEK 102	Organic Chemistry	الكيمياء العضوية	English	4		2		1	1	7	127	48	175	7.00	C	
		3	FEK 103	Engineering Mechanics	الميكانيك الهندسي	English	3				1		5	65	60	125	5.00	C	
		4	COGTEK 100	Mathematics Principles	مبادئ الرياضيات	English	4				1		5	80	95	175	7.00	C	
		5	NTU 100	Human Rights & Democracy	الديمقراطية و حقوق الانسان	Arabic	2						5	35	15	50	2.00	B	
		6	NTU 101	English Language	اللغة الانكليزية	English	2						5	35	15	50	2.00	B	
						Total	19	0	4	0	4	2	34	469	281	750	30.00		

Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
							CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)							
First	Two	1	FEK104	Principles of Chemical Engineering	مبادئ الهندسة الكيميائية	English	4	1			1		5	95	180	275	11.00	C	
		2	COGTEK 101	Engineering Drawing	الرسم الهندسي	English	1		2	2			5	80	120	200	8.00	C	
		3	FEK 105	Engineering Workshops	الورش الهندسية	English			3	1			5	65	85	150	6.00	C	
		4	NTU 102	Computer	الحاسوب	English	1		1				7	37	38	75	3.00	B	
		5	NTU 103	Arabic Language	اللغة العربية	Arabic	1					1	5	35	15	50	2.00	S	
						Total	7	1	6	3	1	1	27	312	438	750	30.00		

Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
							CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)							
Second	Three	1	FEK 200	Petroleum Refining	تكرير البترول	English	4		2			1	3	108	92	200	8.00	C	
		2	COGTEK 201	Mathematics	رياضيات	English	3				2		3	78	97	175	7.00	C	
		3	FEK 201	Material and Energy Balances	موازنات المادة والطاقة	English	4	1			2	1	3	123	102	225	9.00	C	
		4	FEK 202	Computer Programming-MATLAB	برمجة الحاسوب.الماتلاب	English	2		2				3	63	37	100	4.00	C	
		6	NTU 201	Baath Party crimes in Iraq	جرائم حزب البعث في العراق	Arabic	2						3	33	17	50	2.00	B	
						Total	15	1	2	0	4	2	15	405	345	750	30.00		

Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
							CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)							
Second	Four	1	FEK 203	Physical Chemistry	الكيمياء الفيزيائية	English	4		2				3	93	107	200	8.00	C	
		2	FEK 204	Engineering Statistics	الأحصاء الهندسي	English	2		2				3	63	87	150	6.00	C	
		3	COGTEK 200	Fluid Mechanics	ميكانيك الموائع	English	4		2		1		3	108	92	200	8.00	C	
		4	FEK 205	Electrical Technology	تكنلوجيا الكهرباء	English	2		2				3	63	87	150	6.00	B	
		6	NTU 204	Professional Ethics	اخلاقيات المهنة	Arabic	2						3	33	17	50	2.00	B	
						Total	14	0	8	0	1	0	15	360	390	750	30.00		

Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam hr/sem	SSWL	USSWL	SWL	ECTS	Module Type	Prerequisite Module(s) Code
							CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)		hr/sem	hr/sem	hr/sem			
Third	Five	1	FEK301	Mass Transfer	أنتقال المادة	English	4		2		1	1	3	123	52	175	7.00	C	
		2	FEK302	Engineering Analysis	التحليلات الهندسية	English	4				1	1	3	93	57	150	6.00	C	
		3	FEK303	Environmental Pollution and Industrial Safety	التلوث البيئي و السلامة الصناعية	English	2					1	3	48	52	100	4.00	S	
		4	FEK304	Termodynamics	الديناميك الحراري	English	4		2		1		3	108	67	175	7.00	C	
		5	FEK305	Gas Technology	تكنلوجيا الغاز	English	2		2			1	3	78	72	150	6.00	C	
														0		0	0.00		
						Total	16	0	6	0	3	4	15	450	300	750	30.00		

Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam hr/sem	SSWL	USSWL	SWL	ECTS	Module Type	Prerequisite Module(s) Code
							CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)		hr/sem	hr/sem	hr/sem			
Third	Six	1	FEK306	Heat Transfer	أنتقال الحرارة	English	4		2		1		3	108	67	175	7.00	C	
		2	FEK307	Numerical Analysis	التحليلات العددية	English	2		2		1	1	3	93	32	125	5.00	C	
		3	FEK308	Internal Combustion Engine	محركات الأحتراق الداخلي	English	2		2			1	3	78	72	150	6.00	E	
		4	FEK309	Fuel Cell Technology	تكنلوجيا خلايا الوقود	English	2		2			1	3	78	72	150	6.00	E	
		5	FEK310	Energy Resources	مصادر الطاقة	English	2		2			1	3	78	72	150	6.00	C	
						Total	12	0	10	0	2	4	15	435	315	750	30.00		

Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam hr/sem	SSWL	USSWL	SWL	ECTS	Module Type	Prerequisite Module(s) Code
							CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)		hr/sem	hr/sem	hr/sem			
Fourth	Seven	1	FEK401	Plants and Equipment Design	تصميم المعامل والمعدات	English	2				2	1	3	78	122	200	8.00	C	
		2	FEK 402	Combustion and Explosion Technology	تكنلوجيا الاحتراق والانفجار	English	2		2		1	1	3	93	57	150	6.00	C	
		3	FEK 403	Control and Measuring Engineering	هندسة القياس والسيطرة	English	2		2			1	3	78	43	125	5.00	B	
		4	FEK 404	Sustainable Energy	الطاقة المستدامة	English	2				1	1	3	63	87	150	6.00	C	
		5	NTU 400	Methodology of Scientific Research	منهجية البحث العلمي	English	1			2		1	3	63	62	125	5.00	C	
						Total	9	0	4	2	4	5	15	375	371	750	30.0		

Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam hr/sem	SSWL	USSWL	SWL	ECTS	Module Type	Prerequisite Module(s) Code
							CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)		hr/sem	hr/sem	hr/sem			
Fourth	Eight	1	FEK406	Process of Unit Operation	عمليات الوحدات الصناعية	English	2		2		1	1	3	93	82	175	7.00	C	
		2	FEK407	Power Plants	محطات القدرة	English	2		2		1	1	3	93	57	150	6.00	C	
		3	FEK408	Modeling and Simulation	النمذجة والمحاكاة	English	1		2	1	1	1	3	93	57	150	6.00	C	
		4	FEK409	Reactors Design	تصميم المفاعلات	English	2				1	1	3	63	87	150	6.00	C	
		5	COGTEK 401	Graduation Project	مشروع التخرج	English	1			2		1		60	65	125	5.00	C	
						Total	8	0	6	3	4	5	12	402	348	750	30.0		

						Total	100	2	46	8	23	23	148	3208	2788	6000	240.0		Must be 240 ECTS

Note: The student should complete 4 weeks of Summer Internships to fullfil the requirements of the Bachelor's degree

Structured SWL (hr/w) type			Module type			SWL:	Student Workload
	CL	Class Lecture		B	Basic learning activities	SSWL:	Structured SWL
	Lab	Laboratory		C	Core learning activity	USSWL:	Unstructured SWL
	Pr	Practical Training		S	Suport or related learning activity		
	Tut	Tutorial		E	Elective learning activity		
	Lect	Online lecture					
	Semn	Seminar					

Note: Columns O, Q and R are progrmaed, protected and should not be edited