

NORTHERN TECHNICAL UNIVERSITY

الجامعة التقنية الشمالية

Bachelor of Science (B.Sc.) – Fuel and Energy Techniques

Engineering

بكالوريوس تقني - هندسة تقنيات الوقود والطاقة

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1. Overview

This catalogue is about the courses (modules) given by the program Fuel and Energy Techniques engineering to gain the Bachelor of Science degree. The program delivers (40) Modules with (6000) total student workload hours and 240 total ECTS. The module delivery is based on the Bologna Process.

نظرة عامه

يتناول هذا الدليل المواد الدراسية التي يقدمها برنامج هندسة تقنيات الوقود والطاقة للحصول على درجة البكالوريوس التقني . يقدم البرنامج (40) مادة دراسية مع (٦٠٠٠) إجمالي ساعات حمل الطالب و ٢٤٠ إجمالي وحدات أوروبية. يعتمد تقديم المواد الدراسية على عملية بولونيا.

2. Undergraduate Courses 2023-2024

1

Code	Course/Module Title	ECTS	Semester
FEK101	Chemistry Analytical	7	1
Class (hr/w)	Sem/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
4	4	127	48
Description			
This module explores the fundamental principles and concepts of Analytical chemistry which is a specialized field within the broader discipline of chemistry that focuses on the identification, quantification, and characterization of chemical compounds and their properties. Analytical chemists employ a range of techniques and methods to analyze samples and obtain information about their composition, structure, and behavior.			

2

Code	Course/Module Title	ECTS	Semester
COGTEK 103	Engineering Drawing	7	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
1	2	81	94
Description			
This module introduces students to the basic principles of Engineering drawing, also known as technical drawing or drafting, is a visual communication tool used by engineers and designers to convey technical information about a product, system, or structure. It involves creating detailed, precise, and standardized drawings that accurately represent the dimensions, shapes, and features of the object being designed.			

3

Code	Course/Module Title	ECTS	Semester
COGTEK 100	Mathematics Principles	7	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	1	80	95
Description			
<p>This module introduces students to the basic principles of engineering mathematics, assigning students to do homework or writing research papers so that students can acquire self-learning and presentation skills, sudden exams, conducting semester and final exams at the specified dates, inform students about how grades are calculated for students during the semester, providing textbooks and help books that they need in the vocabulary of the course and demonstrations such as: the smart board.</p>			

4

Code	Course/Module Title	ECTS	Semester
FEK103	Engineering Mechanics	5	1
Class (hr/w)	Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	1	65	60
Description			
<p>A study of mechanics gives you the basic tools to understand how the world, both natural and man-made, works - if you take the time to do this carefully, you will be well prepared for more advanced studies in mechanical engineering. Knowledge of mechanics is a fundamental tool for a mechanical engineer. Our purpose is to understand what has become known as classical mechanics. The concepts of classical mechanics you will deal with include a study of forces, motion, energy, work, momentum and heat, how these are connected, and how these ideas can be applied to engineering problems. The ideas behind classical mechanics changed the human race absolutely and forever.</p>			

5

Code	Course/Module Title	ECTS	Semester
NTU101	English Language	2	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2		35	15
Description			
<p>This module Expand students' technical vocabulary and terminology specific to their field of study or profession, enabling them to accurately communicate technical concepts and ideas., improving reading and comprehension skills, enhancing writing skills, developing listening and speaking skills,</p>			

6

Code	Course/Module Title	ECTS	Semester
FEK104	Principles of Chemical Engineering	12	2
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USSWL (hr/w)
4	4	125	175
Description			
<p>Tis module aims:</p> <ol style="list-style-type: none"> 1. To introduce students to the basic principles and calculation techniques used in the chemical industries. 2. to acquaint them with the fundamentals of the material and energy balances as applied to chemical engineering processes. 3. To expose the students to solve the problems in material and energy balances that arise in relation to the problems involving different chemical process units. 4. To introduce them to numerical methods used to solve the problems. 5. The course will introduce simple language and ample examples so that it will encourage learners to get used to the course. 			

7

Code	Course/Module Title	ECTS	Semester
FEK102	Organic Chemistry	7	1
Lectures (hr/w)	Sem/Lab./Prac./Tutor.	SSWL (hr/sem)	USSWL (hr/w)
4	4	127	48
Description			
Module aims to: <ol style="list-style-type: none"> 1. Understanding what is organic chemistry 2. This course deals with the basic concept of organic chemistry. 3. This is the basic subject for all organic base compounds. 4. Understanding different type of carbon base compounds. 5. The properties and the preparation of organic copmpounds. 			

8

Code	Course/Module Title	ECTS	Semester
FEK108	Engineering Workshops	7	2
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USSWL (hr/w)
	4	66	109
Description			

This module aims to:

- 1-Study Workshop Skills by explaining principles of all workshop skills.
- 2-Explain a basic information about turning, milling, casting, welding, and other skills.
- 3-Use all available possibilities in workshop to explain skills to students.
- 4-Explain workshop skills theoretically and experimentally.
- 5- Show pupils How to manufacture all spare part experimentally.

9

Code	Course/Module Title	ECTS	Semester
NTU100	Human Rights & Democracy	2	1
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USSWL (hr/w)
2		23	15
Description			
<ol style="list-style-type: none"> 1. Increase the student's knowledge of the theoretical and historical development of human rights and democracy. 2. Develop the student's analytical and critical skills regarding the current and future aspects of human rights and democracy. 3. Train the student on the importance of active participation in public life as a means to promote respect for human rights and engage in political and cultural activities. 			

10

Code	Course/Module Title	ECTS	Semester
NTU102	Computer	2	2

Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USSWL (hr/w)
1	1	37	13
Description			
This module aims to Learn how to use the computer and develop the student's skills, understand the most important components and parts of the computer, earn the most important Microsoft Office applications.			

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Code	Course/Module Title	ECTS	Semester
FEK201	Petroleum Refining	7	3
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USSWL (hr/w)
2	1	82	93
Description			

12

Code	Course/Module Title	ECTS	Semester
FEK202	Vectors and Differential Equations	6	3
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USSWL (hr/w)

2	1	81	69
Description			

13

Code	Course/Module Title	ECTS	Semester
FEK203	Computer Programming - MATLEB	5	3
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USSWL (hr/w)
2	2	82	43
Description			

14

Code	Course/Module Title	ECTS	Semester
FEK204	Material and Energy Balances	9	3
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USSWL (hr/w)
2	1	97	128
Description			

15

Code	Course/Module Title	ECTS	Semester
NTU201	Professional Ethics	3	3
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USSWL (hr/w)
2		50	25
Description			

16

Code	Course/Module Title	ECTS	Semester
FEK206	Physical Chemistry	7	4
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USSWL (hr/w)
2	2	112	63
Description			

17

Code	Course/Module Title	ECTS	Semester
FEK207	Engineering Statistics	6	4
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USSWL (hr/w)
2	2	82	68
Description			

18

Code	Course/Module Title	ECTS	Semester
FEK208	Fluid Mechanics	8	4
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USSWL (hr/w)
2	2	112	88
Description			

19

Code	Course/Module Title	ECTS	Semester
FEK209	Electrical Technology	5	4
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USSWL (hr/w)
2	2	82	43
Description			

20

Code	Course/Module Title	ECTS	Semester
NTU200	English Language	4	4
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USSWL (hr/w)
2		50	50
Description			

21

Code	Course/Module Title	ECTS	Semester
FEK301	Mass Transfer	8	5
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USSWL (hr/w)
2	2	112	88
Description			

22

Code	Course/Module Title	ECTS	Semester
FEK302	Engineering Analysis	5	5
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USSWL (hr/w)
2		67	58
Description			

23

Code	Course/Module Title	ECTS	Semester
FEK303	Environmental Pollution and Industrial Safety	4	5
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USSWL (hr/w)
2		52	48
Description			

24

Code	Course/Module Title	ECTS	Semester
FEK304	Thermodynamics	7	5
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USSWL (hr/w)
2	2	112	63
Description			

25

Code	Course/Module Title	ECTS	Semester
FEK305	Gas Technology	6	5
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USSWL (hr/w)
2	2	82	68
Description			

26

Code	Course/Module Title	ECTS	Semester
FEK306	Heat Transfer	8	6
Lectures	Lab./Prac./Tutor.	SSWL (hr/sem)	USSWL

(hr/w)			(hr/w)
2	2	112	88
Description			

27

Code	Course/Module Title	ECTS	Semester
FEK307	Numerical Analysis	6	6
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USSWL (hr/w)
2	2	67	83
Description			

28

Code	Course/Module Title	ECTS	Semester
FEK308	Internal Combustion Engine	8	6
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USSWL (hr/w)
2	2	82	118

Description

29

Code	Course/Module Title	ECTS	Semester
FEK309	Fuel Cell Technology	8	6
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USSWL (hr/w)
2	2	82	118
Description			

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Code	Course/Module Title	ECTS	Semester
FEK310	Energy Resources	8	6
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USSWL (hr/w)
2	2	82	118
Description			

31

Code	Course/Module Title	ECTS	Semester
FEK401	Plants and Equipment Design	8	7
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USSWL (hr/w)
2	1	97	103
Description			

32

Code	Course/Module Title	ECTS	Semester
FEK402	Combustion and Explosion Technology	7	7
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USSWL (hr/w)
2	1	112	63
Description			

33

Code	Course/Module Title	ECTS	Semester
FEK403	Control and Measuring Engineering	5	7
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USSWL (hr/w)
2	1	82	43
Description			

34

Code	Course/Module Title	ECTS	Semester
FEK404	Sustainable Energy	7	7
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USSWL (hr/w)
2	1	81	94
Description			

35

Code	Course/Module Title	ECTS	Semester
FEK405	Graduation Project (Research)	3	7
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USSWL (hr/w)
1	1	45	30
Description			

36

Code	Course/Module Title	ECTS	Semester
FEK406	Process of Unit Operation	7	8
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USSWL (hr/w)
2	1	97	78
Description			

37

Code	Course/Module Title	ECTS	Semester
FEK407	Power Plants	7	8
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USSWL (hr/w)

2	1	97	78
Description			

38

Code	Course/Module Title	ECTS	Semester
FEK408	Modeling and Simulation	7	8
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USSWL (hr/w)
1	1	97	78
Description			

39

Code	Course/Module Title	ECTS	Semester
FEK409	Reactors Design	6	8
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USSWL (hr/w)
2	1	65	85
Description			

40

Code	Course/Module Title	ECTS	Semester
FEK410	Graduation Project (Practical)	3	8
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USSWL (hr/w)
		30	45
Description			

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ملاحظة: هذا النموذج تم وضعه وتقديمه من قبل مديرية ضمان الجودة في وزارة التعليم العالي والبحث العلمي