Program Catalogue | 2025-2026 |

Northern Technical University

Bachelor's degree (B.Sc.) – Bachelor's degree in Engineering Technological for Chemical and Petroleum

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Program Catalogue Form

University Name: .Northern Technical University.....

Faculty/Institute: .Technical Engineering College Mosul.....

Scientific Department: Chemical and Petroleum Industries Technologies Engineering

Academic or Professional Program Name: Bachelor of Chemical and Petroleum Industries Technologies Engineering

Final Certificate Name: Bachelor of Chemical and Petroleum Industries Technologies Engineering

Academic System: Bologna Process.....

Description Preparation Date: 2/9/2025

File Completion Date: 2/9/2025

Signature:

Head of Department Name:

Harder Ismael Ibrahim

Date: 2/9/2025

Signature:

Scientific Associate Name:

Prof. Dr. Mohammed Sabah Jarjees

Date: 25/9/2025

The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance

Department: Assist. Lect. Warqaa Hashim Mahmood

Date:

Signature:

Approval of the Dean

1. Mission & Vision Statement

Vision Statement

Our vision is to be a globally recognized leader in chemical and petroleum engineering, known for excellence in education, cutting-edge research, and industry partnerships. We envision a future where our graduates are at the forefront of technological innovation, driving advancements inchemical and petroleum processes that enhance efficiency, safety, and environmental sustainability. Through interdisciplinary collaboration and a commitment to lifelong learning, we aim to shape the next generation of engineers who will transform the chemical and petroleum industries, shaping a brighter and more sustainable future for all.

Mission Statement

1: Conduct innovative research: We strive to push the boundaries of knowledge in chemical and petroleum engineering through rigorous and forward-thinking research initiatives.

2: Foster education and skill development: We are committed to providing high-quality education that equips students with the necessary technical expertise, critical thinking abilities, and ethical values required for success in the chemical and petroleum industries.

3: Promote industry collaboration: We actively engage with industry partners to foster collaborative relationships, exchange knowledge, and address real-world challenges in the chemical and petroleum sectors.

4: Drive sustainable development: We are dedicated to advancing sustainable practices in the chemical and petroleum industries, seeking innovative solutions that minimize environmental impact and contribute to a greener and more sustainable future.

5: Optimize processes and technologies: We strive to optimize chemical and petroleum processes by leveraging cutting-edge technologies, automation, and data-driven approaches, enhancing efficiency, safety, and productivity.

6: Make a positive societal impact: We aim to make significant contributions to society by developing engineers who are capable of addressing societal needs, promoting social responsibility, and utilizing chemical and petroleum engineering to improve the well-being of individuals and communities.

2. Program Specification

Program code:	**BSc-Technological Engineering for Chemical and Oil Industries**	**ECTS**	**240**
Duration:	**4 levels, 8 Semesters**	**Method of Attendance:**	**Full Time**

Level 1: Program Overview

Introduction to the program and its purpose in the Department of Chemical and Petroleum Industries Technologies Engineering.

High-level objectives of the program, including project management, resource allocation, data analysis, collaboration, and documentation.

Level 2: Functional Requirements

Detailed functional requirements for each key aspect of the program:

Project management: Project creation, task management, Gantt charts, resource allocation, and budget management.

Data analysis: Data collection and storage, data visualization, statistical analysis, and reporting.

Collaboration and communication: Document sharing, communication tools, and calendar integration.

Documentation and reporting: Document management, report generation, and version control.

Level 3: Non-functional Requirements

Non-functional requirements that govern the design and implementation of the program:

Security: Measures to protect data and ensure access control.

Scalability: Ability to handle a growing number of projects, users, and data.

Usability: User-friendly interface and efficient navigation.

Integration: Compatibility and integration with existing systems and tools.

Performance: Efficient performance, response times, and handling of concurrent users and data.

Compatibility: Support for common operating systems, web browsers, and devices.

Level 4: Implementation Considerations

Detailed considerations for implementing the program:

Technology Stack: Programming languages, frameworks, and databases to be used.

Development Methodology: Approach to development, such as Agile.

Testing and Quality Assurance: Procedures for testing and ensuring program reliability.

Deployment and Maintenance: Plan for deployment, hosting, updates, and ongoing maintenance

3. Program Objectives

Objective 1: Project Management Efficiency

Streamline project planning, execution, and monitoring.

Facilitate task management, progress tracking, and timeline adherence.

Improve resource allocation and utilization for projects.

Objective 2: Resource Optimization

Optimize allocation of personnel, equipment, and materials for projects.

Consider availability, expertise, and project requirements when assigning resources.

Enhance visibility into resource utilization and availability.

Objective 3: Data Analysis and Insights

Enable efficient data collection, storage, and organization.

Provide tools for data visualization and analysis.

Incorporate statistical functions to identify patterns, trends, and anomalies.

Generate comprehensive reports summarizing data analysis results.

Objective 4: Collaboration and Communication

Foster effective communication and collaboration among team members and stakeholders.

Facilitate document sharing, version control, and collaborative editing.

Offer messaging, notifications, and discussion forums for real-time communication.

Integrate with calendars to schedule meetings and synchronize project events.

Objective 5: Documentation Management

Simplify the creation, management, and organization of project documentation.

Provide templates and tools for generating professional reports.

Ensure version control for documents to track changes and revisions.

Objective 6: Quality and Compliance

Support adherence to quality standards and compliance requirements.

Implement checks and workflows to ensure regulatory compliance.

Facilitate documentation of procedures, specifications, and guidelines.

Objective 7: Continuous Improvement and Knowledge Management

Promote a culture of continuous improvement and knowledge sharing.

Capture lessons learned and best practices for future reference.

Provide mechanisms for sharing expertise and fostering innovation.

Objective 8: Security and Data Protection

Implement robust security measures to protect sensitive data.

Enforce access controls and user authentication.

Comply with data privacy regulations and industry standards.

These objectives aim to enhance the efficiency, effectiveness, collaboration, documentation, quality, knowledge management, and security within the Department of Chemical and Petroleum Industries Technologies Engineering. The program will enable better project management, resource allocation, data analysis, collaboration, documentation, compliance, and knowledge sharing to support the department's activities

4. Student Learning Outcomes

Learning Outcomes from the Department of Chemical and Petroleum Industries Technologies Engineering

Learning Outcome 1: Fundamental Knowledge

Acquire a strong foundation in the principles and theories of chemical and petroleum industries technologies engineering.

Demonstrate understanding of key concepts related to chemical processes, petroleum refining, and industrial applications.

Learning Outcome 2: Technical Skills

Develop proficiency in using industry-standard software and tools for process simulation, data analysis, and project management.

Gain hands-on experience in operating and maintaining equipment used in chemical and petroleum industries.

Learning Outcome 3: Problem Solving

Apply critical thinking and problem-solving skills to analyze and solve complex engineering problems in the chemical and petroleum industries.

Utilize mathematical and scientific principles to develop innovative solutions.

Learning Outcome 4: Laboratory Techniques

Demonstrate proficiency in conducting experiments, collecting data, and analyzing results in a laboratory setting.

Apply safety protocols and quality assurance measures during laboratory work.

Learning Outcome 5: Design and Optimization

Apply engineering principles to design and optimize chemical processes and petroleum refining operations.

Consider factors such as efficiency, sustainability, and cost-effectiveness in the design process.

Learning Outcome 6: Communication Skills

Communicate effectively, both orally and in writing, to convey technical information to diverse audiences.

Prepare technical reports, project proposals, and presentations.

Learning Outcome 7: Teamwork and Collaboration

Work effectively in multidisciplinary teams to solve complex engineering problems.

Collaborate with colleagues from different backgrounds and contribute to team projects.

Learning Outcome 8: Ethical and Professional Conduct

Demonstrate ethical behavior and professional responsibility in all aspects of chemical and petroleum engineering practice.

Understand and adhere to professional codes of conduct and industry standards.

Learning Outcome 9: Lifelong Learning

Recognize the importance of continuous learning and professional development in the rapidly evolving field of chemical and petroleum industries technologies engineering.

Seek opportunities for further education, skill enhancement, and staying updated with industry trends.

Learning Outcome 10: Societal and Environmental Impact

Understand the societal and environmental implications of chemical and petroleum industries technologies and engineering. Consider sustainability, environmental regulations, and social responsibility in engineering decisions and practices. These learning outcomes aim to equip students with the necessary knowledge, skills, and attributes to succeed in the field of Chemical and Petroleum Industries Technologies Engineering. The program focuses on developing a strong technical foundation, problem-solving abilities, laboratory proficiency, effective communication and teamwork skills, ethical conduct, and a broader understanding of societal and environmental impact

1. Academic Staff

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2. Credits, Grading and GPA

Credits

(Northern Technical University) University is following the Bologna Process with the European Credit Transfer System (ECTS) credit system. The total degree program number of ECTS is 240, 30 ECTS per semester. 1 ECTS is equivalent to 25 hrs student workload, including structured and unstructured workload.

Grading

Before the evaluation, the results divided into two subgroups: pass and fail. Therefore, the results are independent of the students who failed a course. The grading system defined as follows:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب – قيد المعالجة	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				
Number Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

Calculation of the Cumulative Grade Point Average (CGPA)

1. The CGPA is calculated by the summation of each module score multiplied by its ECTS, all are divided by the program total ECTS.

   CGPA of a 4-year B.Sc. degree:

   CGPA = [(1st ^{m}odule score x ECTS) + (2nd ^{m}odule score x ECTS) + ……] / 240

3. Curriculum/Module

Semester 1 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
NTU100	Human Rights and Democracy	33	17	2	B	
NTU101	English Language	33	17	2	B	
ETCP106	Mathematics	63	137	8	S	
ETCP105	Engineering Drawing	63	137	8	S	
ETCP100	Principles of Chemical Engineering	93	157	10	C	
		285	465	30		

Semester 2 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
NTU103	Arabic Language	33	17	2	B	
NTU102	Computer	63	12	3	B	
ETCP107	Electrical Principles	78	72	6	S	
ETCP103	Workshop	63	62	5	S	
ETCP102	General Chemistry	78	122	8	C	
ETCP104	neering Mechanics &Strength of Materials	63	87	6	S	
		345	355	30		

Semester 3 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
NTU200	Crimes of the Ba'ath Regime in Iraq	33	17	2.00	S	
ETCP200	Petroleum Chemistry	78	122	8.00	C	
ETCP201	Engineering Mathematics	63	87	6.00	C	
ETCP202	Physical Chemistry	78	122	8.00	C	
ETCP203	Engineering Materials	78	87	6.60	C	
		330	435	330		

Semester 4 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
NTU201	English language	33	17	2.00	B	
NTU203	Arabic language	33	17	2.00	B	
NTU202	computer	63	12	3.00	B	
ETCP204	Fluid Flow	78	122	8.00	C	
ETCP206	Kinetics	93	32	5.00	C	
ETCP207	Energy balance	48	102	6.00	C	
ETCP208	Fluid Petroleum Properties	78	22	4.00	C	
		426	324	30		

Semester 5 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
ETCP300	Mass Transfer 1	78	47	5	C	
ETCP301	Heat Transfer 1	63	62	5	C	
ETCP302	Chemical Engineering Thermodynamics 1	63	62	5	C	
ETCP303	Reactor Design I	63	62	5	C	
ETCP304	Instrumental of Chemical Analysis	63	37	4	C	
ETCP305	Automation in Chemical Industries	63	37	4	C	
ETCP306	Engineering Analysis	48	2	2	C	
		441	309	30		

Semester 6 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
ETCP307	Industrial Safety	33	42	3	C	
ETCP308	Mass Transfer 2	78	47	5	C	
ETCP309	Heat Transfer 2	63	62	5	C	
ETCP310	Chemical Engineering Thermodynamics 2	63	62	5	C	
ETCP311	Reactor Design 2	63	62	5	C	
ETCP312	Chemical Process Simulation	63	37	4	C	
ETCP313	Renewable energies	63	12	3	C	
		426	324	30		

Semester 7 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
TEMO400	Project 1	63	37	4.00	C	
ETCP400	Petroleum Refinery	63	87	6.00	C	
ETCP401	Equipment Design 1	63	87	6.00	C	
ETCP402	Chemical Industries	93	7	4.00	C	
ETCP403	Unit Operation 1	63	87	6.00	C	
ETCP404	Environmental Pollution in Chmeical Industries	63	37	4.00	C	
		345	342	30		

Semester 8 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
TEMO401	Project 2	63	37	4.00	C	
ETCP405	Petrochemical Industries	78	22	4.00	C	
ETCP406	Equipment Design 2	63	87	6.00	C	
ETCP407	Gas Technology	48	52	4.00	C	
ETCP408	Unit Operation 2	63	87	6.00	C	
ETCP409	Process Control	63	37	4.00	C	
ETCP410	Numerical Analysis	48	2	2.00	C	
		426	324	30		

Contact

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