Northern Technical University

الجامعة التقنية الشمالية

First Cycle – Bachelor's degree (B.Sc.) –AI Engineering Technology -Kirkuk

الدورة الاولى – بكالوريوس هندسة تقني – هندسة تقنيات الذكاء الاصطناعي – كركوك



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1. Overview

This catalogue describes the courses (modules) offered by the Bachelor of Artificial Intelligence Engineering Technology programme. The programme includes (49) modules with over (6,000) total student workload hours and a total of 240 European Credit Transfer and Accumulation System (ECTS). The delivery of modules based on the Bologna Process.

١. نظره عامه

هذا الدليل يصف المواد الدراسية التي يقدمها برنامج هندسة تقنيات الذكاء الاصطناعي للحصول على درجة بكالوريوس التقني في هندسة تقنيات الذكاء الاصطناعي. يتضمن البرنامج ٤٩ مادة دراسية والتي تتمثل باكثر من ٦,٠٠٠ ساعة حمل على الطالب و إجمالي ٢٤٠ وحدات أوروبية. يعتمد البرنامج و المواد الدراسية على مسار بولونيا.

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2. Undergraduate Courses/ Modules 2025-2026

Module 1

Module Code	Course/Module Title	ECTS	Semester
AIK111	Digital Logic	5	1
Class (hr/week)	**Lect. /Lab. /Prac. /Tutor**	**SSWL (hr/w)**	**USWL (hr/w)**
2	2	78	47
Description			
Introduces the fundamental principles of digital systems, including number systems, Boolean algebra, logic gates, logic simplification, and combinational circuit design. Students develop the skills to analyze, design, and implement digital circuits using standard design techniques.			

Module 2

Module Code	Course/Module Title	ECTS	Semester
AIK112	DC Circuit Analysis	5	1
Class (hr/week)	**Lect. /Lab. /Prac. /Tutor**	**SSWL (hr/w)**	**USWL (hr/w)**
2	2	63	62
Description			
Covers the fundamentals of direct current (DC) electrical circuits, including circuit elements, Ohm's law, Kirchhoff's laws, network theorems, and circuit analysis techniques. Practical laboratory exercises reinforce theoretical concepts through hardware implementation and simulation.			

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Module 3

Module Code	Course/Module Title	ECTS	Semester
AIK113	Introduction to Artificial Intelligence	5	1
Class (hr/week)	**Lect. /Lab. /Prac. /Tutor**	**SSWL (hr/w)**	**USWL (hr/w)**
2	2	78	47
Description			
Provides an introduction to the concepts and applications of artificial intelligence, including machine learning, neural networks, fuzzy logic, optimization, AI ethics, and future developments. The course equips students with a foundational understanding of modern AI technologies and their real-world applications.			

Module 4

Module Code	Course/Module Title	ECTS	Semester
AIK114	Fundamentals of Programming	6	1
Class (hr/week)	**Lect. /Lab. /Prac. /Tutor**	**SSWL (hr/w)**	**USWL (hr/w)**
2	2	78	72
Description			
Introduces programming concepts using the C++ language. Topics include variables, data types, control structures, arrays, pointers, functions, and problem-solving techniques, enabling students to develop, debug, and optimize programs for engineering applications.			



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Module 5

Module Code	Course/Module Title	ECTS	Semester
TECCAI100	Mathematics	5	1
Class (hr/week)	**Lect. /Lab. /Prac. /Tutor**	**SSWL (hr/w)**	**USWL (hr/w)**
3		63	62
Description			
Develops the mathematical foundations required for engineering studies, covering matrices, determinants, functions, differential calculus, integral calculus, and their applications. The course strengthens analytical reasoning and problem-solving skills for technical disciplines.			

Module 6

Module Code	Course/Module Title	ECTS	Semester
NTU100	Democracy and Human Rights	2	1
Class (hr/week)	**Lect. /Lab. /Prac. /Tutor**	**SSWL (hr/w)**	**USWL (hr/w)**
2		33	17
Description			
Introduces the principles of democracy, citizenship, constitutional rights, human rights, equality, and the rule of law. The course promotes ethical awareness, civic responsibility, and respect for human rights within society.			



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Module 7

Module Code	Course/Module Title	ECTS	Semester
NTU101	English Language	2	1
Class (hr/week)	**Lect. /Lab. /Prac. /Tutor**	**SSWL (hr/w)**	**USWL (hr/w)**
2		33	17
Description			
Develops students' English language proficiency with emphasis on reading, writing, listening, speaking, and technical communication. The course supports effective academic and professional communication in engineering and technology contexts.			

Module 8

Module Code	Course/Module Title	ECTS	Semester
AIK121	Digital Circuits Design	5	2
Class (hr/week)	**Lect. /Lab. /Prac. /Tutor**	**SSWL (hr/w)**	**USWL (hr/w)**
2	2	78	47
Description			
Covers the analysis and design of combinational and sequential digital circuits using Boolean algebra, logic gates, flip-flops, counters, registers, and programmable logic devices. Students develop practical skills in designing and implementing digital systems.			



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Module 9

Module Code	Course/Module Title	ECTS	Semester
AIK122	Object Oriented Programming	5	2
Class (hr/week)	**Lect. /Lab. /Prac. /Tutor**	**SSWL (hr/w)**	**USWL (hr/w)**
2	2	63	62
Description			
Introduces object-oriented programming concepts using C++, including classes, objects, inheritance, polymorphism, encapsulation, exception handling, and file processing. The course emphasizes software design and modular programming practices.			

Module 10

Module Code	Course/Module Title	ECTS	Semester
AIK123	Engineering Mathematics	5	2
Class (hr/week)	**Lect. /Lab. /Prac. /Tutor**	**SSWL (hr/w)**	**USWL (hr/w)**
3		63	62
Description			
Provides mathematical methods essential for engineering applications, including differential equations, Laplace transforms, Fourier series, vector calculus, and complex numbers. Students develop analytical skills for solving engineering problems.			



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Module 11

Module Code	Course/Module Title	ECTS	Semester
AIK124	AC Circuit Analysis	5	**2**
Class (hr/week)	**Lect. /Lab. /Prac. /Tutor**	**SSWL (hr/w)**	**USWL (hr/w)**
2	2	63	62
Description			
Introduces the analysis of alternating current (AC) circuits, covering sinusoidal waveforms, phasors, impedance, power analysis, resonance, and single- and three-phase circuits. Laboratory work reinforces theoretical concepts through practical measurements and simulations.			

Module 12

Module Code	Course/Module Title	ECTS	Semester
AIK125	Engineering Drawing	3	**2**
Class (hr/week)	**Lect. /Lab. /Prac. /Tutor**	**SSWL (hr/w)**	**USWL (hr/w)**
	3	48	27
Description			
Develops the ability to create and interpret engineering drawings using standard drafting conventions. Topics include orthographic projection, sectional views, dimensioning, and computer-aided drafting techniques for engineering design.			



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Module 13

Module Code	Course/Module Title	ECTS	Semester
CAIK100	Physics	2	**2**
Class (hr/week)	**Lect. /Lab. /Prac. /Tutor**	**SSWL (hr/w)**	**USWL (hr/w)**
2		33	17
Description			
Introduces fundamental principles of physics relevant to engineering, including mechanics, electricity, magnetism, waves, and modern physics. The course combines theoretical concepts with laboratory experiments to strengthen scientific understanding.			

Module 14

Module Code	Course/Module Title	ECTS	Semester
NTU102	Computer	3	**2**
Class (hr/week)	**Lect. /Lab. /Prac. /Tutor**	**SSWL (hr/w)**	**USWL (hr/w)**
2	1	48	27
Description			
Provides essential computer skills, including computer hardware and software fundamentals, operating systems, office applications, internet technologies, and introductory programming concepts to support engineering studies.			

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Module 15

Module Code	Course/Module Title	ECTS	Semester
NTU103	Arabic Language	2	2
Class (hr/week)	**Lect. /Lab. /Prac. /Tutor**	**SSWL (hr/w)**	**USWL (hr/w)**
2		33	17
Description			
Develops students' proficiency in Arabic through grammar, writing, reading comprehension, and effective communication, with emphasis on academic and professional language skills.			

3. Contact Information

Program Manager:

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