Northern Technical University
الجامعة التقنية الشمالية

First Cycle – Four Levels – 240 ECTS
Bachelor's Degree (B.Sc.) – Geomatics Technics Engineering

الدورة الأولى - بكالوريوس هندسة تقنيات الجيوماتكس – أربع سنوات – ٢٤٠ وحدة اوربية



Modules Catalogue Form

University Name: Northern Technical University.....

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

Scientific Department: Geomatics Techniques Engineering

Academic or Professional Program Name: Bachelor of Geomatics Techniques Engineering

Final Certificate Name: Bachelor of Geomatics Techniques Engineering

Academic System: Bologna Process.....

Description Preparation Date: 2/9/2025

File Completion Date: 2/9/2025

Signature:

Head of Department Name:

Mohammad Yasin Hamid

Date: 2/9/2025

الكلية التقنية الهندسية / الموصل
قسم هندسة تقنيات البيئة

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:

الجامعة التقنية الشمالية
الكلية التقنية الهندسية الموصل
ضمان الجودة والأداء الجامعي

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Approval of the Dean

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1. Overview

This catalogue is about the courses (modules) given by the program of Geomatics Technology Engineering to gain the Bachelor of Science degree. The 4-year program delivers (50) Modules with (6000) total student workload hours and 240 total ECTS. The module delivery is based on the Bologna Process.

نظره عامه

يتناول هذا الدليل المواد الدراسية التي يقدمها برنامج هندسة تقنيات الجيوماتكس للحصول على درجة بكالوريوس العلوم. يقدم برنامج الأربع سنوات (50) مادة دراسية، مع (٦٠٠٠) إجمالي ساعات حمل الطالب و ٢٤٠ إجمالي وحدات أوروبية. يعتمد تقديم المواد الدراسية على عملية بولونيا.

2. Undergraduate Modules 2025-2026

Module 1

Code	Module Title	ECTS	Semester
NTU 100	DEMOCRACY AND HUMAN RIGHTS	2	1
Class (hr/w)	**OLect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	1	50	0
Description			
يُعد مقرر "الديمقراطية وحقوق الإنسان" من المتطلبات الأساسية في البرامج الأكاديمية، ويهدف إلى بناء وعي قانوني، سياسي، وأخلاقي لدى الطلبة. يركز المقرر على دراسة المفاهيم الأساسية للحريات العامة، العلاقة التبادلية بين الأنظمة الديمقراطية وصيانة حقوق الأفراد، وبيان التطور التاريخي والفلسفي لهذه المبادئ في مختلف الشرائع والقوانين المحلية والدولية.			

Module 2

Code	Module Title	ECTS	Semester
GEO 102	PLANE SURVEYING 1	8	1
Class (hr/w)	**OLect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
4	4	200	0
Description			
The Plane Surveying module covers fundamental techniques for mapping and measuring land over small areas (under 250 square kilometers). It teaches students to assume the Earth is perfectly flat, allowing them to use straightforward geometry to calculate distances, angles, elevations, and areas for civil engineering and construction projects			

Module 3

Code	Module Title	ECTS	Semester
GEO 103	COMPUTER ENGINEERING DRAWING	8	1
Class (hr/w)	**OLect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	4	150	50
Description			
The Computer Engineering Drawing module focuses on creating and interpreting technical drawings using modern Computer-Aided Design (CAD) software. It bridges the gap between engineering theory and manufacturing, teaching students how to turn a concept into an exact, standard-compliant digital model.			

Module 4

Code	Module Title	ECTS	Semester
GEO 100	MATHEMATICS	6	1
Class (hr/w)	**OLect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	4	150	0
Description			
The mathematics for engineering provides the essential numerical, analytical, and statistical tools required to solve complex physical and structural problems. It bridges abstract mathematical theories with real-world applications, teaching students how to model physical systems and analyze engineering data			

Module 5

Code	Module Title	ECTS	Semester
GEO 101	ENGINEERING GEOLOGY	4	1
Class (hr/w)	**OLect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
1	1	50	50
Description			
The Engineering Geology module bridges the gap between geological sciences and civil engineering. It focuses on applying geological principles to the planning, design, construction, and maintenance of engineering structures. Students learn to evaluate how the physical properties of earth materials (rocks, soils, and groundwater) interact with man-made structures to ensure safety, stability, and cost-effectiveness.			

Module 6

Code	Module Title	ECTS	Semester
GEO 101	ENGLISH LANGUAGE 1	2	1
Class (hr/w)	**OLect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	0	50	0
Description			
The English Language module is designed to enhance students' academic and professional communication skills. It bridges general English proficiency with technical literacy, focusing on developing the four core language skills: reading, writing, listening, and speaking within an academic context. Students learn to interpret technical data, draft professional reports, deliver academic presentations, and master essential grammatical structures required for their specific fields of study.			

Module 7

Code	Module Title	ECTS	Semester
GEO 106	PLANE SURVEYING 2	8	2
Class (hr/w)	**OLect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
4	4	200	0
Description			
The Plane Surveying module covers fundamental techniques for mapping and measuring land over small areas (under 250 square kilometers). It teaches students to assume the Earth is perfectly flat, allowing them to use straightforward geometry to calculate distances, angles, elevations, and areas for civil engineering and construction projects			

Module 8

Code	Module Title	ECTS	Semester
GEO 107	ENGINEERING MECHANICS	7	2
Class (hr/w)	**OLect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
4	3	175	0
Description			
The Engineering Mechanics module is a foundational course that introduces students to the principles of mechanics governing bodies at rest (Statics) and bodies in motion (Dynamics). It develops the analytical skills required to predict the effects of forces and motion during engineering design. Students learn to formulate and solve mathematical models of physical systems using vector algebra, free-body diagrams, and fundamental physical laws.			

Module 9

Code	Module Title	ECTS	Semester
GEO 109	ENGINEERING PHYSICS	4	2
Class (hr/w)	**OLect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
1	1	50	50
Description			
The Engineering Physics module bridges the gap between fundamental physics concepts and practical engineering applications. It provides students with a deep understanding of the physical laws governing mechanics, wave phenomena, electromagnetism, and modern physics. The course emphasizes analytical problem-solving, mathematical modeling of physical systems, and laboratory experimentation, equipping students with the scientific foundation necessary to innovate across various engineering disciplines.			

Module 10

Code	Module Title	ECTS	Semester
NTU 102	COMPUTER 1	3	2
Class (hr/w)	**OLect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
1	2	50	25
Description			
The Computer Applications module provides students with a foundational understanding of computer systems, digital literacy, and introductory programming concepts. It covers both theoretical knowledge of computer hardware and software architectures, and practical skills in operating systems, office automation tools, and algorithmic problem-solving. This course prepares students to utilize computing resources efficiently to solve technical and academic problems throughout their engineering education.			

Module 11

Code	Module Title	ECTS	Semester
NTU 103	ARABIC LANGUAGE 1	2	2
Class (hr/w)	**OLect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	0	50	0
Description			
يهدف مقرر اللغة العربية إلى تمكين الطالب من مهارات التواصل الأساسية (القراءة، الكتابة، والتحدث) وضمان سلامة التعبير اللغوي في الأوساط الأكاديمية والمهنية. يركز المقرر على صيانة اللسان والقلم من الأخطاء النحوية والإملائية الشائعة، وتطوير قدرة الطالب على صياغة التقارير الفنية، والمراسلات الرسمية، وقراءة النصوص العلمية وتحليلها بلغة عربية فصيحة وسليمة.			

Module 12

Code	Module Title	ECTS	Semester
GEO 110	DESCRIPTIVE GEOMETRY	6	2
Class (hr/w)	**OLect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
1	2	75	75
Description			
The Descriptive Geometry module provides students with the graphical and analytical techniques needed to solve three-dimensional geometric problems using two-dimensional planes. This course acts as a fundamental bridge between abstract mathematical geometry and practical engineering drawing. Students will develop spatial visualization skills, enabling them to project, analyze, and determine the true shapes, sizes, and intersections of points, lines, planes, and solids in space.			

Module 13

Code	Module Title	ECTS	Semester
GEO 201	Plain Surveying 3	8	3
Class (hr/w)	**OLect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
4	4	200	0
Description			
The Plane Surveying module covers fundamental techniques for mapping and measuring land over small areas (under 250 square kilometers). It teaches students to assume the Earth is perfectly flat, allowing them to use straightforward geometry to calculate distances, angles, elevations, and areas for civil engineering and construction projects			

Module 14

Code	Module Title	ECTS	Semester
GEO 202	Estimation & Quantity Surveying 1	4	3
Class (hr/w)	**OLect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	2	100	0
Description			
The Estimation & Quantity Surveying module provides students with the vital skills required to quantify materials, estimate costs, and manage financial contracts for construction projects. It bridges the gap between engineering designs and real-world project execution by teaching how to read technical drawings, prepare bills of quantities, and manage project budgets from inception to completion.			

Module 15

Code	Module Title	ECTS	Semester
GEO 203	Cartography	4	3
Class (hr/w)	**OLect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	2	100	0
Description			
The Cartography module introduces students to the science, art, and technology of map-making. It covers the theoretical principles of transforming the three-dimensional Earth into a two-dimensional representation and explores the design methodologies used to communicate geographic data effectively. Students learn to balance accurate spatial data with visual aesthetics to create maps that are both scientifically precise and easily understood by users.			

Module 16

Code	Module Title	ECTS	Semester
GEO 204	Engineering Surveying 1	6	3
Class (hr/w)	**OLect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	2	150	50
Description			
The Engineering Surveying 1 module introduces students to the fundamental principles, techniques, and equipment used in establishing spatial control for engineering projects. This course focuses on high-precision measurements of distances, elevations, and angles. It bridges theoretical geometric concepts with practical field applications, ensuring students can accurately collect spatial data and set out design dimensions on a construction site.			

Module 17

Code	Module Title	ECTS	Semester
GEO 205	Photogrammetry	4	3
Class (hr/w)	**OLect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	2	100	0
Description			
The Photogrammetry module introduces students to the science and technology of obtaining reliable spatial measurements, 3D models, and maps from photographs and digital imagery. The course covers the geometric principles of aerial, spaceborne, and close-range imaging systems. Students learn the mathematical models used to transform distorted two-dimensional images into precise, scaled three-dimensional geographic data.			

Module 18

Code	Module Title	ECTS	Semester
NTU 201	ENGLISH LANGUAGE 2	2	3
Class (hr/w)	**OLect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	0	50	0
Description			
The English Language module is designed to enhance students' academic and professional communication skills. It bridges general English proficiency with technical literacy, focusing on developing the four core language skills: reading, writing, listening, and speaking within an academic context. Students learn to interpret technical data, draft professional reports, deliver academic presentations, and master essential grammatical structures required for their specific fields of study.			

Module 19

Code	Module Title	ECTS	Semester
NTU 200	Al-Ba'ath Regime Crimes In Iraq	2	3
Class (hr/w)	**OLect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	0	50	0
Description			
المقرر الأكاديمي "جرائم نظام البعث في العراق" هو مقرر وطني إلزامي في الجامعات العراقية، يُدرس لتسليط الضوء على الحقبة التاريخية الممتدة من عام 1968 إلى 2003. يهدف المقرر إلى توثيق الانتهاكات والجرائم الممنهجة التي ارتكبها النظام السابق، وتعزيز قيم حقوق الإنسان والمواطنة والديمقراطية لدى الطلبة لمنع تكرار الديكتاتورية.			

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Module 20

Code	Module Title	ECTS	Semester
GEO 207	Plain Surveying 4	8	4
Class (hr/w)	**OLect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
4	4	200	0
Description			
The Plane Surveying module covers fundamental techniques for mapping and measuring land over small areas (under 250 square kilometers). It teaches students to assume the Earth is perfectly flat, allowing them to use straightforward geometry to calculate distances, angles, elevations, and areas for civil engineering and construction projects			

Module 21

Code	Module Title	ECTS	Semester
GEO 208	Fundamentals of Geographic Information System	4	4
Class (hr/w)	**OLect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	2	100	0
Description			
This course introduces the basic principles and applications of Geographic Information Systems (GIS). Students learn spatial data models, coordinate systems, map projections, data acquisition, storage, visualization, and basic spatial analysis using GIS software. The course develops essential skills for creating digital maps and supporting engineering, environmental, and planning decision-making.			

Module 22

Code	Module Title	ECTS	Semester
GEO 209	Estimation & Quantity Surveying 1	4	4
Class (hr/w)	**OLect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	2	100	0
Description			
The Estimation & Quantity Surveying module provides students with the vital skills required to quantify materials, estimate costs, and manage financial contracts for construction projects. It bridges the gap between engineering designs and real-world project execution by teaching how to read technical drawings, prepare bills of quantities, and manage project budgets from inception to completion.			

Module 23

Code	Module Title	ECTS	Semester
GEO 210	Engineering Surveying 2	4	4
Class (hr/w)	**OLect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	2	100	0
Description			
The Engineering Surveying 1 module introduces students to the fundamental principles, techniques, and equipment used in establishing spatial control for engineering projects. This course focuses on high-precision measurements of distances, elevations, and angles. It bridges theoretical geometric concepts with practical field applications, ensuring students can accurately collect spatial data and set out design dimensions on a construction site.			

Module 24

Code	Module Title	ECTS	Semester
GEO 211	Digital Photogrammetry	4	4
Class (hr/w)	**OLect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	2	100	0
Description			
The Photogrammetry module introduces students to the science and technology of obtaining reliable spatial measurements, 3D models, and maps from photographs and digital imagery. The course covers the geometric principles of aerial, spaceborne, and close-range imaging systems. Students learn the mathematical models used to transform distorted two-dimensional images into precise, scaled three-dimensional geographic data.			

Module 25

Code	Module Title	ECTS	Semester
NTU 202	Computer 2	3	4
Class (hr/w)	**OLect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
1	2	75	25
Description			
This course introduces essential computer skills with emphasis on artificial intelligence tools. Students learn to use AI applications for writing, data analysis, presentations, programming support, and problem-solving while developing digital literacy, ethical AI practices, and effective technology integration for academic and professional purposes.			

Module 26

Code	Module Title	ECTS	Semester
NTU 200	Arabic Language 2	2	4
Class (hr/w)	**OLect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	0	50	0
Description			
يهدف هذا المقرر إلى تنمية مهارات الطلبة في اللغة العربية من خلال دراسة مختارات من الأدب العربي شعرًا ونثرًا، والتعرف إلى أبرز المدارس الأدبية وأساليب التعبير البلاغي. كما يعزز مهارات القراءة والتحليل والتذوق الأدبي، وينمي القدرة على الكتابة السليمة والتواصل باللغة العربية الفصحى.			

Module 27

Code	Module Title	ECTS	Semester
GEO 301	Global Position System 1	5	5
Class (hr/w)	**OLect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	3	125	0
Description			
This course introduces the fundamentals of the Global Positioning System (GPS), including satellite navigation principles, coordinate systems, signal structure, and GPS measurements. Students learn basic positioning methods, observation planning, field procedures, and error sources affecting accuracy. The course provides practical skills in GPS data collection and preliminary processing for surveying and engineering applications.			

Module 28

Code	Module Title	ECTS	Semester
GEO 302	Remote Sensing 1	4	5
Class (hr/w)	**OLect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	2	75	25
Description			
This course introduces the fundamentals of remote sensing, including electromagnetic radiation, sensor systems, image acquisition, and satellite platforms. Students learn the principles of image interpretation, spectral characteristics of Earth features, and basic digital image processing. The course provides practical knowledge for environmental monitoring, mapping, resource management, and engineering applications.			

Module 29

Code	Module Title	ECTS	Semester
GEO 303	Python Language	7	5
Class (hr/w)	**OLect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	2	150	25
Description			
This course introduces the fundamentals of Python programming, including syntax, variables, data types, control structures, functions, and file handling. Students develop problem-solving and programming skills through practical exercises. The course also introduces basic data processing and automation techniques, preparing students for engineering, scientific, and geospatial computing applications.			

Module 30

Code	Module Title	ECTS	Semester
GEO 304	Cadastral Surveying 1	6	5
Class (hr/w)	**OLect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
3	3	150	0
Description			
This course introduces the principles and practices of cadastral surveying, focusing on land parcel identification, boundary determination, property subdivision, and cadastral mapping. Students learn legal aspects of land surveying, measurement techniques, field procedures, and documentation standards. The course develops practical skills for preparing accurate cadastral plans and supporting land administration systems.			

Module 31

Code	Module Title	ECTS	Semester
GEO 305	Numerical Analyses	4	5
Class (hr/w)	**OLect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	0	100	0
Description			
This course introduces fundamental numerical methods for solving mathematical and engineering problems. Topics include error analysis, root-finding techniques, systems of linear equations, interpolation, numerical differentiation and integration, and numerical solutions of ordinary differential equations. Students develop computational skills for implementing numerical algorithms and analyzing engineering data with accuracy and efficiency.			

Module 32

Code	Module Title	ECTS	Semester
GEO 306	Geodesy 1	4	5
Class (hr/w)	**OLect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
3	0	75	25
Description			
This course introduces the fundamentals of geodesy, including the Earth's shape, reference ellipsoids, coordinate systems, geodetic datums, gravity concepts, and geodetic measurements. Students learn basic computational methods and develop essential skills for positioning, mapping, surveying, and engineering applications using modern geodetic principles.			

Module 33

Code	Module Title	ECTS	Semester
GEO 307	Surveying Systems	7	6
Class (hr/w)	**OLect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
3	3	150	25
Description			
This course introduces the principles of modern surveying systems, including conventional and digital surveying methods, measurement techniques, coordinate systems, and surveying instruments. Students learn survey planning, data collection, error evaluation, and integration of total stations, GNSS, and GIS technologies to support engineering, mapping, and land management applications.			

Module 34

Code	Module Title	ECTS	Semester
GEO 308	Global Position System 2	5	6
Class (hr/w)	**OLect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	3	125	0
Description			
This course builds on the fundamentals of GPS by introducing advanced positioning techniques, differential and RTK methods, static and kinematic surveys, network design, data processing, and accuracy assessment. Students gain practical experience in GNSS field operations, post-processing, and the integration of GPS data with GIS and engineering surveying applications.			

Module 35

Code	Module Title	ECTS	Semester
GEO 309	Remote Sensing 2	4	6
Class (hr/w)	**OLect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	2	100	0
Description			
This course builds on the fundamentals of remote sensing by introducing advanced digital image processing, image classification, change detection, and accuracy assessment. Students learn techniques for extracting geospatial information from multispectral and satellite imagery and integrating remote sensing data with GIS for environmental monitoring, resource management, and engineering applications.			

Module 36

Code	Module Title	ECTS	Semester
GEO 310	Cadastral Surveying 2	6	6
Class (hr/w)	**OLect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
3	3	150	0
Description			
This course advances students' knowledge of cadastral surveying through boundary re-establishment, land subdivision, cadastral adjustment, and digital cadastral mapping. It covers legal and technical procedures, geospatial data management, and the application of GNSS, GIS, and total stations in cadastral surveys. Students develop practical skills for modern land administration and property registration.			

Module 37

Code	Module Title	ECTS	Semester
GEO 311	Geotechnic	4	6
Class (hr/w)	**OLect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
4	0	100	0
Description			
This course introduces the fundamental principles of geotechnics, including soil formation, classification, physical and mechanical properties, and soil behavior under loading. Students learn basic site investigation methods, soil testing techniques, and the application of geotechnical principles in foundation design, earthworks, and civil engineering projects.			

Module 38

Code	Module Title	ECTS	Semester
GEO 312	Geodesy 2	4	6
Class (hr/w)	**OLect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
3	0	75	25
Description			
This course builds on the fundamentals of geodesy by introducing advanced geodetic computations, geodetic networks, coordinate transformations, map projections, and height systems. Students learn adjustment techniques, geodetic data processing, and the application of modern geodetic methods to surveying, mapping, and engineering projects.			

Module 39

Code	Module Title	ECTS	Semester
GEO 401	Urban Planning 1	6	7
Class (hr/w)	**OLect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	2	150	0
Description			
This course introduces the fundamental concepts and principles of urban planning, including land use, urban growth, transportation systems, and sustainable development. Students learn planning methods, spatial analysis, and the preparation of basic urban plans. The course emphasizes the relationship between planning, infrastructure, environmental considerations, and community development.			

Module 40

Code	Module Title	ECTS	Semester
GEO 402	Image Processing 1	7	7
Class (hr/w)	**OLect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	4	150	25
Description			
This course introduces the fundamentals of digital image processing, including image representation, enhancement, filtering, transformation, and feature extraction. Students learn basic techniques for processing aerial and satellite images using specialized software. The course develops practical skills for improving image quality and extracting information for mapping, remote sensing, and geospatial applications.			

Module 41

Code	Module Title	ECTS	Semester
GEO 403	Radar Engineering 1	7	7
Class (hr/w)	**OLect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	4	150	25
Description			
This course introduces the fundamental principles of radar engineering, including electromagnetic wave propagation, radar systems, signal transmission and reception, target detection, and radar performance. Students learn the basics of radar measurements, system components, and radar applications in surveying, remote sensing, navigation, and environmental monitoring.			

Module 42

Code	Module Title	ECTS	Semester
GEO 404	Traffic Engineering 1	4	7
Class (hr/w)	**OLect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	2	100	0
Description			
This course introduces the fundamental principles of traffic engineering, including traffic flow characteristics, road user behavior, traffic data collection, and roadway capacity analysis. Students learn traffic control devices, intersection design, and safety considerations. The course develops practical skills for planning, analyzing, and managing efficient and safe transportation systems.			

Module 43

Code	Module Title	ECTS	Semester
GEO 405	Theory of Errors 1	4	7
Class (hr/w)	**OLect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	2	100	0
Description			
This course introduces the fundamental concepts of measurement errors and their impact on surveying and engineering observations. Students learn error classification, probability theory, statistical analysis, precision and accuracy assessment, error propagation, and the principles of least squares adjustment. The course develops essential skills for evaluating and improving the reliability of measurement results.			

Module 44

Code	Module Title	ECTS	Semester
TEMO 400	Project 1	2	7
Class (hr/w)	**OLect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	2	50	0
Description			
This course represents the first stage of the graduation project for final-year Geomatics Engineering Technology students. Under academic supervision, students identify a research or engineering problem, conduct a literature review, define project objectives and methodology, prepare the project proposal, and develop a detailed implementation plan while applying professional, technical, and research skills.			

Module 45

Code	Module Title	ECTS	Semester
GEO 407	Urban Planning 2	6	8
Class (hr/w)	**OLect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	2	150	0
Description			
This course builds on the principles of urban planning by introducing advanced planning methods, land use management, transportation planning, urban design, and sustainable development strategies. Students learn spatial planning techniques, GIS-based urban analysis, and the preparation and evaluation of comprehensive urban development plans for modern cities and communities.			

Module 46

Code	Module Title	ECTS	Semester
GEO 408	Image Processing 2	7	8
Class (hr/w)	**OLect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	4	150	25
Description			
This course builds on the fundamentals of digital image processing by introducing advanced techniques for image classification, feature extraction, segmentation, pattern recognition, and change detection. Students learn to process high-resolution aerial and satellite imagery using specialized software and apply image analysis methods to remote sensing, mapping, and geospatial engineering applications.			

Module 47

Code	Module Title	ECTS	Semester
GEO 409	Radar Engineering 2	7	8
Class (hr/w)	**OLect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	4	150	25
Description			
This course builds on the fundamentals of radar engineering by introducing advanced radar systems, synthetic aperture radar (SAR), signal processing, target classification, and radar image interpretation. Students learn the integration of radar data with remote sensing and GIS technologies for terrain mapping, environmental monitoring, disaster assessment, and engineering applications.			

Module 48

Code	Module Title	ECTS	Semester
GEO 410	Traffic Engineering 2	4	8
Class (hr/w)	**OLect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	2	100	0
Description			
This course builds on the fundamentals of traffic engineering by introducing advanced traffic operations, transportation planning, traffic simulation, intelligent transportation systems, and roadway safety analysis. Students learn methods for traffic management, capacity optimization, and network performance evaluation, applying engineering principles to improve the efficiency, safety, and sustainability of transportation systems.			

Module 49

Code	Module Title	ECTS	Semester
GEO 411	Theory of Errors 2	4	8
Class (hr/w)	**OLect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	2	100	0
Description			
This course builds on the fundamentals of error theory by introducing advanced statistical methods, least squares adjustment, network adjustment, variance–covariance analysis, and quality assessment of surveying observations. Students learn to process and evaluate geodetic and engineering measurements, ensuring the accuracy, reliability, and consistency of spatial data for professional surveying applications.			

Module 50

Code	Module Title	ECTS	Semester
TEMO 401	Project 1	2	8
Class (hr/w)	**OLect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	2	50	0
Description			
This course represents the final stage of the graduation project for Geomatics Engineering Technology students. Students implement the approved project, collect and analyze data, apply appropriate engineering methods and geospatial technologies, evaluate results, and prepare a comprehensive technical report. The course culminates in an oral presentation and project defense, demonstrating professional competence and problem-solving skills.			

3. Contact

Program Manager:

Duaa T. Hasshim | Ph.D. in Construction Engineering | Assistant Prof.

Email: douaa.talb@ntu.edu.iq

Mobile no.: 07735480808

Program Coordinator:

Mostafa R. Muzaal | Ph.D. in Geomatics Engineering | Assistant Prof.

Email: Mostafa.redha@ntu.edu.iq

Mobile no.: 07736480808

امسح الكود للوصول إلى النسخة الإلكترونية