Ministry of Higher Education and Scientific Research
Scientific Supervision and Scientific Evaluation Apparatus
Directorate of Quality Assurance and Academic Accreditation
Accreditation Department

Academic Program and Course Description Guide

2025

Introduction:

The educational program is a well-planned set of courses that include procedures and experiences arranged in the form of an academic syllabus. Its main goal is to improve and build graduates' skills so they are ready for the job market. The program is reviewed and evaluated every year through internal or external audit procedures and programs like the External Examiner Program.

The academic program description is a short summary of the main features of the program and its courses. It shows what skills students are working to develop based on the program's goals. This description is very important because it is the main part of getting the program accredited, and it is written by the teaching staff together under the supervision of scientific committees in the scientific departments.

This guide, in its second version, includes a description of the academic program after updating the subjects and paragraphs of the previous guide in light of the updates and developments of the educational system in Iraq, which included the description of the academic program in its traditional form (annual, quarterly), as well as the adoption of the academic program description circulated according to the letter of the Department of Studies T 3/2906 on 3/5/2023 regarding the programs that adopt the Bologna Process as the basis for their work.

In this regard, we can only emphasize the importance of writing an academic programs and course description to ensure the proper functioning of the educational process.

Concepts and terminology:

Academic Program Description: The academic program description provides a brief summary of its vision, mission and objectives, including an accurate description of the targeted learning outcomes according to specific learning strategies.

Course Description: Provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the students to achieve, proving whether they have made the most of the available learning opportunities. It is derived from the program description.

Program Vision: An ambitious picture for the future of the academic program to be sophisticated, inspiring, stimulating, realistic and applicable.

Program Mission: Briefly outlines the objectives and activities necessary to achieve them and defines the program's development paths and directions.

Program Objectives: They are statements that describe what the academic program intends to achieve within a specific period of time and are measurable and observable.

Curriculum Structure: All courses / subjects included in the academic program according to the approved learning system (quarterly, annual, Bologna Process) whether it is a requirement (ministry, university, college and scientific department) with the number of credit hours.

Learning Outcomes: A compatible set of knowledge, skills and values acquired by students after the successful completion of the academic program and must determine the learning outcomes of each course in a way that achieves the objectives of the program.

Teaching and learning strategies: They are the strategies used by the faculty members to develop students' teaching and learning, and they are plans that are followed to reach the learning goals. They describe all classroom and extra-curricular activities to achieve the learning outcomes of the program.

Academic Program Description Form

University Name: Northern Technical University

Faculty/Institute: Technical Institute / Mosul

Scientific Department: Surveying Techniques Department

Academic or Professional Program Name: Technical diploma

Final Certificate Name: Diploma in Surveying Techniques

Academic System: Courses

Description Preparation Date: 15/ 7/2025

File Completion Date: 22/ 7/2025

Signature:

Head of Department Name:

Dr. Mohammed Tareq Khaleel

Date: 22/7/2025

Signature:

Scientific Associate Name:

Dr. Hassan Messar Qassim

Date: 22/7/2025

The file is checked by: Mohammed Khalid Yousif

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date: 22/7/2025

Signature:

A.N

Approval of the Dean

Academic Program Description Form

University Name: **Northern Technical University**

Faculty/Institute: **Technical Institute / Mosul**

Scientific Department: **Surveying Techniques Department**

Academic or Professional Program Name: **Technical diploma**

Final Certificate Name: **Diploma in Surveying Techniques**

Academic System: **Course**s

Description Preparation Date: / /2025

File Completion Date: / /2025

Signature:	**Signature**:
Head of Department Name:	**Scientific Associate Name**:
Dr. Mohammed Tareq Khaleel	
Date:	**Date**:

The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date:

Signature:

Approval of the Dean

1. Program Vision

The Department of Surveying Techniques aspires to establish a distinguished educational system that meets future labor market demands and fulfills societal needs, while adhering to local and international standards of quality and academic accreditation. We aim to be the primary source of qualified technical personnel who contribute to sustainable development projects and serve the community.

2. Program Mission

To create an advanced technical environment and equip graduates with the latest skills and knowledge in the field of surveying technologies, enabling them to compete effectively in the labor market. We strive to prepare technical professionals capable of actively participating in community development through the application of cutting-edge surveying technologies and contributing to sustainable development initiatives.

3. Program Objectives

The Department of Surveying Techniques seeks to achieve its objectives through the following strategic goals:

- Prepare specialized technical personnel in the field of surveying engineering, qualified to enter the labor market and meet technical needs in both public and private sectors.
- Lead in the use of modern educational technologies and keep pace with global advancements in surveying and geomatics.
- Continuously develop curricula to align with technological and scientific changes and meet local and international labor market requirements.
- Establish ongoing communication channels between academia and the labor market to ensure learning outcomes match market needs.
- Provide added value to society through consulting services and specialized technical studies in the field of surveying.
- Enable outstanding graduates to pursue further studies at specialized technical colleges to enhance their academic qualifications.
- Fully align with the goals and strategies of higher education and technical training in Iraq.
- Contribute to national and developmental projects by supplying specialized technical expertise.
- Promote a culture of quality and innovation in the technical field among students and graduates.
- Build strategic partnerships with industrial and engineering institutions to enhance training and employment opportunities.

4. Program Accreditation

Not Applicable
(Program accreditation application submitted)

5. Other external influences

- Linking the program with the labor market or community
- Providing financial, logistical, or training support
- Facilitating employment and practical training opportunities
- Offering ongoing guidance for program development

6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	10	20	26%	
College Requirements	2	5	5%	
Department Requirements	26	95	69%	
Summer Training				
Other				

* This can include notes whether the course is basic or optional.

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
			theoretical	practical
2025-2026 / Level One / Sem. One	NTU 100	Democracy and human rights	2	0
	NTU 101	English language	2	0
	NTU 102	Computer	1	1
	NTU 103	Arabic	2	0
	TIMO 110	Mathematics 1	2	0
	TIMO 111	Mechanics lab	0	3
	SUT 120	Surveying 1	2	4
	SUT 122	Aerial Survey 1	2	2
	SUT 128	Computer engineering drawing 1	0	2
	SUT 124	Remote Sensing 1	1	0
2025-2026 / Level One / Sem. Two	NTU 104	Sports(Optional)	1	1
	SUT 130	spherical triangles	2	0
	SUT 121	Surveying using theodolite	2	4
	SUT 129	Drawing using AutoCAD	0	2
	SUT 123	Photogrammetry	2	2
	SUT 125	Image processing	1	0
	SUT 126	Earth surface science	1	0
	SUT 127	Civil coefficient	0	2
2025-2026 / Level Two / Sem. Three	NTU 200	English language	2	0
	NTU 204	Professional ethics	2	0
	NTU 203	Crimes of the Baath regime in Iraq	2	0
	SUT 206	Photogrammetry2	2	2

	SUT 202	Plane Surveying	2	6
	SUT 203	Engineering survey	2	3
	SUT 204	Mapping principles	2	3
	SUT 208	Specifications and Estimates	2	0
	SUT 205	Global Positioning System	1	3
	SUT 207	computer mapping	0	3
2025-2026 / Level Two / Sem. Four	NTU 202	Arabic	2	0
	NTU 201	Computer	1	1
	SUT 213	Digital Scan	2	2
	SUT 209	Surveying using the total station device	2	6
	SUT 210	cadastral survey	2	3
	SUT 211	Map design and preparation	2	3
	SUT 215	Quantity survey	2	0
	SUT 212	Geographic Information Systems GIS	1	3
	SUT 214	Computer aided road design	0	3
	SUT 216	The project	0	3

8. Expected learning outcomes of the program

Knowledge

1. **Remembering:**
   - Identify types of surveying instruments (theodolite, level, total station, GNSS devices).
   - Recall major geodetic coordinate systems (e.g., WGS84, UTM).
2. **Understanding:**
   - Explain operating principles of electronic surveying instruments.
   - Differentiate between plane and geodetic surveying.
3. **Applying:**
   - Use various surveying instruments for precise field measurements.
   - Apply error correction equations to surveying measurements.
4. **Analyzing:**
   - Analyze measurement error sources and correction methods.
   - Interpret discrepancies between different measurements.
5. **Evaluating:**
   - Assess map accuracy against surveying standards.
   - Evaluate suitability of surveying methods for specific projects.
6. **Creating:** Design control point networks for engineering projects.
7. **Produce** accurate survey maps using specialized software (AutoCAD, ArcGIS).

Cognitive Learning Outcomes for Surveying Technology

Aims to develop students' ability to:

1. **Knowledge Acquisition:**
   - Understand fundamental surveying concepts (plane, geodetic, photogrammetric).
   - Comprehend coordinate systems and geodetic datums.
   - Know characteristics of surveying instruments.
   - Understand measurement principles and quality control.
2. **Critical Thinking:**

- Analyze measurement accuracy and error sources.
- Evaluate appropriate surveying methodologies.
- Interpret geospatial data patterns.
- Critically assess surveying results.

3. **Knowledge Application**:

- Operate surveying instruments for data collection.
- Implement error correction calculations.
- Utilize GIS software for spatial analysis.
- Solve practical surveying problems.

4. **Knowledge Creation**:

- Design control networks for major projects.
- Develop innovative surveying approaches.
- Produce technical maps and reports.
- Propose solutions for geomatics challenges.
- Prepares graduates to apply surveying knowledge with precision and creativity while maintaining quality standards.

Skills

1. Practical Skills:
• Ability to operate and use surveying instruments such as: Theodolite, Total Station, and GPS/GNSS devices.
• Ability to perform precise surveying measurements (dimensions, angles, elevations).
• Ability to use surveying drawing and analysis software such as: AutoCAD Civil 3D and GIS programs (e.g., ArcGIS).

2. Intellectual Skills:
• Ability to calculate and convert coordinates between different systems (e.g., UTM to Geographic Coordinates).
• Ability to analyze surveying errors and correct data (e.g., handling measurement errors).
• Ability to plan surveying projects (e.g., land division or road planning).
• Ability to solve mathematical problems related to surveying (e.g., calculating areas, volumes, slopes).
• Ability to interpret topographic maps and aerial images.

3. Communication Skills:
• Ability to write technical surveying reports (e.g., boundary determination reports or surveying reports).
• Ability to communicate with engineering teams (engineers, workers, clients).
• Ability to explain surveying concepts to non-specialists.
• Ability to work within a team in field and office projects.

Importance of Skills-Based Learning Outcomes:

1. **Enhancing Learning:**

- Setting clear objectives (e.g., mastering Total Station or GIS software).
- Focusing on practical application rather than theory alone.

2. **Improving Performance:**

- Completing tasks accurately (e.g., surveying measurements and coordinate calculations).
- Reducing errors in engineering projects.

3. **Increasing Job Opportunities:**

- Skills are in demand in contracting, municipalities, and engineering consulting.
- Graduates become more competitive in the job market.

4. **Personal Development:**

- Boosting self-confidence through technical skills (e.g., surveying and aerial photography).
- Improving teamwork and problem-solving abilities.

How to Achieve Skills-Based Learning Outcomes?

1. **Practical Training (Field and Office Application):**

- Providing labs equipped with surveying instruments (Total Station, GPS, Level).
- Executing real-world projects such as land surveying or creating topographic maps.
- Collaborating with surveying companies for field training.

2. **Repeated Practice (Mastery Through Repetition):**

- Training students to take measurements and calculate coordinates repeatedly to ensure accuracy.
- Using software like AutoCAD and GIS in multiple projects to enhance experience.

3. **Feedback (Evaluation and Development):**

- Assessing student performance in field projects and providing immediate feedback.
- Discussing common measurement errors and how to correct them.

4. **Challenge (Solving Complex Problems):**

- Assigning students non-routine tasks such as surveying rugged terrain or processing LiDAR scanner data.
- Encouraging them to innovate solutions for accuracy issues or data errors.

5. **Self-Learning (Continuous Development):**

- Encouraging students to pursue courses in new surveying software (e.g., Revit or 3D Mapping).
- Guiding them to use online educational resources (e.g., videos or courses).

Ethics

Expected Learning Outcomes:

1. Knowledge:

- Master fundamental surveying principles and theories
- Understand surveying equipment (e.g., Total Station, GNSS) and software (e.g., GIS)

2. Skills:

- Collect and analyze surveying data
- Operate specialized equipment and software
- Solve field problems effectively

3. Values:

- Commitment to accuracy and integrity
- Adherence to safety standards
- Effective teamwork

Importance of Expected Learning Outcomes:

1. **Graduate Quality Assurance:**
   Prepares technically competent graduates meeting labor market demands in surveying
2. **Academic Program Evaluation:**
   Provides objective standards to assess curriculum and teaching effectiveness
3. **Educational Process Development:**
   Forms basis for curriculum planning and updating educational tools
4. **Professional Standards Alignment:**
   Ensures outcomes match surveying and geomatics industry requirements

Examples of Expected Learning Outcomes:

1. Knowledge Outcomes:

- Understand surveying fundamentals

- Know measurement equipment (GNSS, Total Station)
- Master GIS and scanning software

2. Skill Outcomes:

- Execute precise field measurements
- Process surveying data
- Prepare maps and designs

3. Value Outcomes:

- Maintain accuracy and integrity
- Observe safety protocols
- Collaborate effectively in teams

8. Teaching and Learning Strategies

The department relies on a combination of interactive lectures using 3D models and simulation programs, field applications with the latest surveying equipment such as total stations and GNSS devices, in addition to project-based learning through implementing real surveying work and data analysis using GIS and AutoCAD programs, with a focus on the practical aspect through field visits to project sites and summer training in specialized companies to ensure students acquire the applied skills required in the labor market.

9. Evaluation methods

Oral tests, written tests, semester exams, final exams, daily assessment, practical tests, reports, daily assignments

10. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
Assistant Professor	Civil Eng.	Road and Bridge Engineering			1	
Lecturer	Water Resources Eng.	Irrigation Eng.			1	
Lecturer	Civil Eng.	Irrigation Eng.			1	
Assistant Lecturer	Construction Material Eng.	Construction Material Eng.			1	
Assistant Lecturer	Surveying Engineering	Surveying Engineering			1	
Assistant Lecturer	Agricultural machinery and equipment	Agricultural machinery and equipment			1	
Assistant Lecturer	English	English			1	

	Translation	Translation				
Assistant Lecturer	English Translation	English Translation			1	
Assistant Lecturer	General Law	General Law			1	

Professional Development

Mentoring new faculty members

- **Specialized Courses:**
    - Surveying Software (AutoCAD, ArcGIS)
    - Hardware Training (Total Station, Drones)
    - Modern Surveying Techniques

- **Educational Courses:**
    - Effective Teaching Strategies
    - Using Technology in Education
    - Student Performance Assessment

- **Research Courses:**
    - Writing and Publishing Research
    - Publishing in International Databases
    - o Managing Research Projects

Professional development of faculty members

1. Specialized Training Courses:

- Precision measurement instruments
- Geographic Information Systems (GIS) software
- Aerial photography and scanning technologies

2. Research Skills Workshops:

- Writing scientific papers according to international standards
- Selecting appropriate academic journals
- Publication mechanisms in global databases

3. Academic Excellence Programs:

• Implementing modern teaching methodologies

• Effective student assessment techniques

• Technology integration in education

4. Research Skills Development:

• Efficient research project management

• Research funding acquisition methods

• Enhancing teamwork in research groups

5. Continuous Professional Development:

• Participation in scientific conferences

• Tracking latest field developments

• Knowledge exchange with specialists

11. Acceptance Criterion

1. **Minimum GPA**
2. **Science/Vocational Stream**

12. The most important sources of information about the program

1- Curriculum Guide

2- Ministry of Higher Education Portal

13. Program Development Plan

The Surveying Technology Department adopts an integrated developmental approach to ensure the quality of its academic program and its alignment with contemporary requirements. This methodology is based on:

1. **Curriculum Development:**

- Periodic updating of academic content to meet labor market needs
- Incorporation of modern technologies (e.g., LiDAR scanning, drones, advanced GIS systems)
- Enhancement of practical applications in coursework

2. Educational Infrastructure Modernization:

- Upgrading scientific laboratories with state-of-the-art surveying equipment
- Providing specialized surveying software and technologies
- Establishing a comprehensive training field for practical surveying exercises

3. Learning Environment Enhancement:

- Developing practical training fields covering all surveying types
- Implementing simulation models for precise surveying measurements
- Creating an integrated field training system

4. Industry Collaboration:

- Forming partnerships with surveying firms and companies
- Organizing field visits and applied workshops
- Hosting industry experts to participate in the educational process

Required learning outcomes of the program															
Year/Level	Course code	Course name	Essential or optional?	**Knowledge**				**Skills**				**Values**			
				A1	**A2**	**A3**	**A4**	**B1**	**B2**	**B3**	**B4**	**G1**	**G2**	**G3**	**G4**
	NTU 100	**Democracy and human rights**	**essential**	*								*			
	NTU 101	**English language**	**essential**					*							
	NTU 102	**Computer**	**essential**						*				*		
	NTU 103	**Arabic**	**essential**					*							
	NTU 104	**Sports(Optional)**	**optional**						*				*		
2025	**TIMO 110**	**Mathematics 1**	**essential**		*					*					
	TIMO 111	**Mechanics lab**	**essential**			*			*						
-	**SUT 120**	**Surveying 1**	**essential**	*					*		*		*		
2026	**SUT 122**	**Aerial Survey 1**	**essential**	*					*				*		
Level 1	**SUT 128**	**Computer engineering drawing 1**	**essential**		*					*					
	SUT 124	**Remote Sensing 1**	**essential**		*										
	SUT 130	**Spherical triangles**	**essential**		*				*						
	SUT 121	**Surveying using theodolite**	**essential**												
	SUT 129	**Drawing using AutoCAD**	**essential**		*				*						

	SUT 123	**Photogrammetry**	**essential**			*				*					
	SUT 125	**Image processing**	**essential**			*				*					
	SUT 126	**Earth surface science**	**essential**			*						*			
	SUT 127	**Workshops**	**essential**		*					*					

Year/Level	Course code	Course name	Essential or optional?	Knowledge				Skills				Values			
				A1	A2	A3	A4	B1	B2	B3	B4	G1	G2	G3	G4
2025 - 2026 Level 2	NTU 200	English language	essential					*							
	NTU 204	Professional ethics	essential	*								*			
	NTU 203	Crimes of the Baath regime in Iraq	essential	*									*		
	NTU 202	Arabic	essential					*							
	NTU 201	Computer	essential						*						
	SUT 206	Photogrammetry2	essential							*					
	SUT 202	Plane Surveying	essential						*				*		
	SUT 203	Engineering survey	essential		*							*			
	SUT 204	Mapping principles	essential			*							*		
	SUT 208	Specifications and Estimates	essential			*									
	SUT 205	Global Positioning System	essential			*			*						
	SUT 207	Computer mapping	essential		*										
	SUT 213	Digital Scan	essential			*									

	SUT 209	**Surveying using the total station device**	**essential**						*			*			
	SUT 210	**cadastral survey**	**essential**		*							*			
	SUT 211	**Map design and preparation**	**essential**												
	SUT 215	**Quantity survey**	**essential**			*			*			*			
	SUT 212	**Geographic Information Systems GIS**	**essential**		*										
	SUT 214	**Computer aided road design**	**essential**		*					*					
	SUT 216	**The project**	**essential**		*			*					*		

Course Description Form

1. Course Name:
Computer
2. Course Code:
NTU 102
3. Semester / Year:
First Courses 2024-2025
4. Description Preparation Date:
2025/6/25
5. Available Attendance Forms:
1. Weekly lesson schedule (theoretical + practical). 2. Scientific discussions, seminars, and other extracurricular activities.
6. Number of Credit Hours (Total) / Number of Units (Total)
(1 theoretical + 1 practical) per week * 15 weeks = 30 hours / 2 units
7. Course administrator's name (mention all, if more than one name)
Name: alaa ayman Email: mti.lec04.alaa@ntu.edu.iq
8. Course Objectives

Course Objectives	1. Basic understanding of computer components. 2. Familiarization with operating systems. 3. Learning to use basic software. 4. Understanding the fundamentals of networks and the internet. 5. Developing digital skills.
9. Teaching and Learning Strategies	
Strategy	1. Theoretical lectures 2. Practical lectures 3. Interactive discussions

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Knowledge And Application	Introduction to Computers	Theoretical + practical	Tests and reports

2	2	Knowledge And Application	Computer Components	Theoretical + practical	Tests and reports
3	2	Knowledge And Application	Computer Components	Theoretical + practical	Tests and reports
4	2	Knowledge And Application	Operating System and Graphical User Interface	Theoretical + practical	Tests and reports
5	2	Knowledge And Application	Operating System and Graphical User Interface	Theoretical + practical	Tests and reports
6	2	Knowledge And Application	Microsoft Word	Theoretical + practical	Tests and reports
7	2	Knowledge And Application	Microsoft Word	Theoretical + practical	Tests and reports
8	2	Knowledge And Application	Microsoft Excel	Theoretical + practical	Tests and reports
9	2	Knowledge And Application	Microsoft Excel	Theoretical + practical	Tests and reports
10	2	Knowledge And Application	Microsoft PowerPoint	Theoretical + practical	Tests and reports
11	2	Knowledge And Application	Microsoft PowerPoint	Theoretical + practical	Tests and reports
12	2	Knowledge And Application	Introduction to the Internet and Browsers	Theoretical + practical	Tests and reports
13	2	Knowledge And Application	Introduction to the Internet and Browsers	Theoretical + practical	Tests and reports
14	2	Knowledge And Application	Communications and Email	Theoretical + practical	Tests and reports
15	2	Knowledge And Application	Cloud Computing and Services	Theoretical + practical	Tests and reports

11. Course Evaluation

50 degrees Theoretical
40 degrees practical
5 degrees attendance
5 degrees reports

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	New headway /beginner
Main references (sources)	The scientific books in the Free Education Division
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	Sites concerned with the computing

Course Description Form

1. Course Name:
Engineering drawing By Computer 1
2. Course Code:
SUT 128
3. Semester / Year:
Course system (first level / first semester)
4. Description Preparation Date:
6/25/2025
5. Available Attendance Forms:
A- Practical lectures according to Weekly lesson schedule (2 hours per week). For -Discussions, scientific seminars and other extracurricular activities
6. Number of Credit Hours (Total) / Number of Units (Total)
60 hours (2 hours per week) / 2 units
7. Course administrator's name (mention all, if more than one name)
Name: Shakir Ahmed Khudhair E-mail: shakir.alkhufajjy@ntu.edu.iq

8. Course Objectives

Course Objectives	1. The student is able to draw diagrams and no Shape and produce maps easily and quickly, surpassing traditional manual drawing and work. 2- After learning The student The b Program bad Leads to speed unless Accomplish and save time For no Zam no Perfection of plans and Unless Geometric shapes and precisely and accurately according to unless Far away no Modernizations obtained from fieldwork for no Various engineering workers. 3- Also producing maps for various urban Projects.

9. Teaching and Learning Strategies

Strategy	((Lectures for the process Using computer and AutoCAD drawing programs))

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1	2	Knowledge and application	Uses of the program2010 Auto CAD Gives a general introduction to the basics of the 2010 Auto CAD program.	Practical	Monthly and Daily exams, participation and interaction in lecture
2	2	Knowledge and application	AutoCAD interface: Getting to know program's workspace, display cube, steering wheel, display moveme ribbon Ribbon, Menu, Toolbars, Close Program	Practical	Monthly and Daily exams, participation and interaction in lecture
3	2	Knowledge and application	Fine Drawing and Drawing Aids Introd students to fine drawing and draw aids.Grid, Snap, Ortho, Polar, Osnap	Practical	Monthly and Daily exams, participation and interaction in lecture
4	2	Knowledge and application	Drawing commands Draw (Point,Line).	Practical	Monthly and Daily exams, participation and interaction in lecture
5	2	Knowledge and application	Drawing commands Polygon, Rectan Polyline	Practical	Monthly and Daily exams, participation and interaction in lecture
6	2	Knowledge and application	Commands for drawing circles, arcs, and ovals Ellipse, Arc, Circle.	Practical	Monthly and Daily exams, participation and interaction in lecture
7	2	Knowledge and application	Edit list (Modify) and its contents: Off Copy, Rotation, Move, Erase	Practical	Monthly and Daily exams, participation and interaction in lecture
8	2	Knowledge and application	Edit list (Modify) and the contents of Scale, Extend, Mirror, Array Break	Practical	Monthly and Daily exams, participation and interaction in lecture
9	2	Knowledge and application	Fees Graphics Modify menu and contents: Explode, Trim, Fillet, Chamfe	Practical	Monthly and Daily exams, participation and interaction in lecture
10	2	Knowledge and application	Writing commands(Text) Text line Sin text Multiline, create new style models writing.	Practical	Monthly and Daily exams, participation and interaction in lecture
11	2	Knowledge and	Identify sectors, segmentation and h they work	Practical	Monthly and Daily exams, participation

		application			and interaction in lecture
12	2	Knowledge and application	Drawing propertiesProperties) Control drawing specifications: type, Line, weight, Line, Color	Practical	Monthly and Daily exams, participation and interaction in lecture
13	2	Knowledge and application	Aligned Dim. ,Linear Dimension. (Dimension,Quick Dim., Angular Dim.,Diameter Dim.,Radial Dim.) Dimension Style, Continuous Dim. ,Baseline Dim	Practical	Monthly and Daily exams, participation and interaction in lecture
14	2	Knowledge and application	Layers (Layers) How to create a new layer, change the layer name, delete layer, show and hide layers, dissolve layers, lock and unlock layers, change color, font type, font width, print the layer, layer filter	Practical	Monthly and Daily exams, participation and interaction in lecture

11. Course Evaluation

monthly exam 20%
Second monthly exam 20%
Practical assignments and daily tests Practical 10%
Annual striving 50%
Final exam 50%

12. Learning and Teaching Resources

Free education textbooks in the Survey Technology Department	Engineering drawing (Hashem Aboud Al-Moussawi) Engineering drawing (Fathi Sharif)
websites	Learn AutoCAD from beginner professional (autocad course)

Course Description Form

1. Course Name:
Aerial Photogrammetry 1
2. Course Code:
SUT 122
3. Semester / Year:
First semester, First level
4. Description Preparation Date:
15/6/ 2025
5. Available Attendance Forms:
1- Weekly lesson schedule (theoretical and practical) 2- Discussions, scientific seminars, and other extracurricular activities
6. Number of Credit Hours (Total) / Number of Units (Total)
(4 hours per week) / Number of units (4 units for the first course)
7. Course administrator's name (mention all, if more than one name)
Name: Mr. Mohammed Abdulghani Qasim Email: mohammad_survey@ntu.edu.iq

8. Course Objectives	
Course Objectives	The student will be able to work with aerial and satellite images, including the principles of photogrammetry, types of aerial images, cameras, and projections, as well as determine the scales and displacements of various types of aerial images. They will also be able to calculate ground coordinates and levels, interpret aerial photographs, and identify the specifications of digital aerial photographs and work with them to draw thematic plans and maps.

9. Teaching and Learning Strategies	
Strategy	((Theoretical lectures / practical lectures /)).

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1	2	Knowledge and application	Introduction: A historical overview of the history of aerial surveying and remote sensing, and the relationship of sensing to the specialization of aerial surveying, the science of aerial surveying and the uses of aerial surveying, the difference between aerial photographs and maps, and some general terms in the subject of aerial surveying related to the image and information appearing on aerial photographs.	Theoretical	Test and reports
2	2	Knowledge and application	Vertical aerial photographs, geometric relationships for vertical aerial photographs, coordinate systems on vertical aerial photographs	Theoretical	Test and reports
3	2	Knowledge and application	Types of projections, types of images, terrestrial images, aerial images, satellite images, the difference between an aerial image and a map, some general terms in aerial images, especially oblique ones, information appearing on aerial images.	Theoretical	Test and reports
4	2	Knowledge and application	Other methods for calculating the scale of vertical aerial photographs include ground coordinates from vertical aerial photographs, and calculating horizontal and oblique distances between points. Displacement due to terrain and elevation calculations	Theoretical	Test and reports
5	2	Knowledge and application	Other methods for calculating the scale of vertical aerial photographs include ground coordinates from vertical aerial photographs, and calculating horizontal and oblique distances between points. Displacement due to terrain and elevation calculations	Theoretical	Test and reports
6	2	Knowledge and application	Stereoscopic vision and its foundations, depth perception using both eyes, stereoscopic vision using images and its	Theoretical	Test and reports

			conditions, and methods of viewing a stereoscopic model using images. Using a mirrored stereoscope using the baseline method for two images. Echoic divergence, vertical amplification.		
7	2	Knowledge and application	Oblique photographic scale, ground coordinates from oblique photographs with solved examples, geometric analysis of oblique aerial photographs, rotational guidance using the Omega, Phi, and Kappa systems.	Theoretical	Test and reports
8	2	Knowledge and application	Types of aerial cameras (digital and analog), field of view angle and classification of aerial cameras according to field of view angle and their uses, parts of aerial cameras, oblique aerial photographs, rotational guidance in the (pitch, roll, yaw) system, auxiliary axes system for oblique photographs, oblique photograph scale, ground coordinates from oblique photographs, geometric analysis of oblique aerial photographs	Theoretical	Test and reports
9	2	Knowledge and application	Types of aerial cameras (digital and analog), field of view angle and classification of aerial cameras according to field of view angle and their uses, parts of aerial cameras, oblique aerial photographs, rotational guidance in the (pitch, roll, yaw) system, auxiliary axes system for oblique photographs, oblique photograph scale, ground coordinates from oblique photographs, geometric analysis of oblique aerial photographs	Theoretical	Test and reports
10	2	Knowledge and application	Mosaic, its advantages, disadvantages and uses - its types.	Theoretical	Test and reports
11	2	Knowledge and application	Mosaic, its advantages, disadvantages and uses - its types.	Theoretical	Test and reports
12	2	Knowledge and application	Relative orientation, possible movements of the projector (translational and rotational movements), distribution of points used in guiding the three-dimensional model, and studying	Theoretical	Test and reports

			the effect of translational and rotational movements on the movement of projected images in the infill device.		
13	2	Knowledge and application	Relative orientation, possible movements of the projector (translational and rotational movements), distribution of points used in guiding the three-dimensional model, and studying the effect of translational and rotational movements on the movement of projected images in the infill device.	Theoretical	Test and reports
14	2	Knowledge and application	Aerial photographs taken by airborne digital sensors. 1. Their specifications, comparison with film images, their use, production methods, and comparison with conventional image production. The effect of central projection and longitudinal interference compared with conventional imaging methods. 2. The spectral curve of features on the Earth's surface.	Theoretical	Test and reports
15	2	Knowledge and application	Aerial photographs taken by airborne digital sensors. 1. Their specifications, comparison with film images, their use, production methods, and comparison with conventional image production. The effect of central projection and longitudinal interference compared with conventional imaging methods. 2. The spectral curve of features on the Earth's surface.	Theoretical	Test and reports
Practical part					
1	2	Knowledge and application	Examining students' stereoscopic vision using a pocket stereoscope, identifying the signs appearing on an aerial photograph and how to find the base point.	Practical	Test and reports
2	2	Knowledge and application	Finding the area of the aerial photograph and the area of the longitudinal and lateral overlapping region, finding the drawing scale of the vertical aerial photograph of flat lands.	Practical	Test and reports
3	2	Knowledge	Finding the area of the aerial	Practical	Test and

		and application	photograph and the area of the longitudinal and lateral overlapping region, finding the drawing scale of the vertical aerial photograph of flat lands.		reports
4	2	Knowledge and application	Finding the area of the aerial photograph and the area of the longitudinal and lateral overlapping region, finding the drawing scale of the vertical aerial photograph of flat lands.	Practical	Test and reports
5	2	Knowledge and application	Finding ground coordinates in a vertical aerial photograph, finding the height of points in the displacement resulting from the ground terrain on the vertical photograph.	Practical	Test and reports
6	2	Knowledge and application	Finding ground coordinates in a vertical aerial photograph, finding the height of points in the displacement resulting from the ground terrain on the vertical photograph.	Practical	Test and reports
7	2	Knowledge and application	Learn about the mirror stereoscope and how to use it. Use the mirror stereoscope using the airbase line method (flight line).	Practical	Test and reports
8	2	Knowledge and application	Learn about the mirror stereoscope and how to use it. Use the mirror stereoscope using the airbase line method (flight line).	Practical	Test and reports
9	2	Knowledge and application	Scale drawing extraction application with solved examples.	Practical	Test and reports
10	2	Knowledge and application	Scale drawing extraction application with solved examples.	Practical	Test and reports
11	2	Knowledge and application	Finding the height of points using the laws of divergence with solving examples.	Practical	Test and reports
12	2	Knowledge and application	Finding the height of points using the laws of divergence with solving examples.	Practical	Test and reports
13	2	Knowledge and application	Prepare and configure a drawing board for different scales using a grid of squares.	Practical	Test and reports
14	2	Knowledge and application	Prepare and configure a drawing board for different scales using a grid of squares.	Practical	Test and reports
15	2	Knowledge and application	Design airline routes and draw an airline chart to a suitable scale.	Practical	Test and reports

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

1- Theoretical exam 20%
2- Practical exam 20%
3- Daily preparation + daily exam + lecture interaction + reports = 10%
4- Final practical exam 10%
5- Final theoretical exam 40%

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Aerial Survey Booklet 1
Main references (sources)	1- Aerial Photogrammetry - Labib Nassif, Technical Education Authority, Second Edition, 1999. 2- Manual of Photogrammetry - American Society of Photogrammetry by Moffitt. 3- Elements of Photogrammetry - Paul R. Wolf, Second Edition. 4- Erdas Imagine Tour Guides, Leica Geosystems Geospatial Imaging, 2006.
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name:
Mathematics1
2. Course Code:
TIMO 110
3. Semester / Year:
First semester, First level
4. Description Preparation Date:
2025
5. Available Attendance Forms:
Weekly class schedule (theoretical), discussions, scientific seminars, and oth extracurricular activities
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hour per week = 30 hours per semester / 2
7. Course administrator's name (mention all, if more than one name)
Name: Ghada Yousif Ismael Email:
8. Course Objectives

Course Objectives	• Mathematics aims to enable the learner in the areas of research, interpretation, the ability to make sound decisions based on a solid foundation of measurement prediction, with risk calculations, and anticipating the probabilities of success failure.. • The aim of mathematics is to develop and improve ways and methods of thinking how to deal with different problems.. • It aims to provide the learner with the mathematical skills that enable him to work in the fields of economics, trade, production, and consumption.

9. Teaching and Learning Strategies	
Strategy	1- Delivery: Lecture 2- Discussion: Group Discussion 3- Thinking and Development: Creative Thinking and Problem Solving 4- Group: Cooperative Learning 5- Self-Learning: Educational Kit 6- Role-Play: Cognitive Map

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1	2	Knowledge and application	Review of solving equations, first degree equation, second degree equation using the general law, solving two first degree equations simultaneously and stating.	theoretical	Participate and interact in the lecture
2	2	Knowledge and application	Matrices, their types, adding and subtracting matrices	theoretical	Participate and interact in the lecture
3	2	Knowledge and application	Matrix transpose, matrix inverse, matrix multiplication.	theoretical	Participate and interact in the lecture
4	2	Knowledge and application	Determinants, binary and ternary	theoretical	Participate and interact in the lecture
5	2	Knowledge and application	Solving Simultaneous Equations Using Determinants	theoretical	Participate and interact in the lecture
6	2	Knowledge and application	Equation of a straight line, perpendicularity of two lines, parallelism of two lines, Distance from a point to a straight line, the distance between two points.	theoretical	Participate and interact in the lecture
7	2	Knowledge and application	For triangles, some important laws in trigonometric ratios, solving a right triangle	theoretical	Participate and interact in the lecture
8	2	Knowledge and application	Solving a triangle, some rules used in solving a triangle, law of pockets And the pocket is perfect	theoretical	Participate and interact in the lecture
9	2	Knowledge and application	Various exercises in solving the triangle	theoretical	Participate and interact in the lecture
10	2	Knowledge and application	Circular sector, circular segment, finding area and perimeter	theoretical	Participate and interact in the lecture
11	2	Knowledge and application	Derivative, Polynomial Functions, Implicit Functions	theoretical	Participate and interact in the lecture
12	2	Knowledge and application	Derivative of trigonometric functions	theoretical	Participate and interact in the lecture
13	2	Knowledge and application	Derivative applications / Finding the tangent equation	theoretical	Participate and interact in the lecture

14	2	Knowledge and application	Integration, integration of algebraic functions	theoretical	Participate and interact in the lecture
15	2	Knowledge and application	Integration of trigonometric functions	theoretical	Participate and interact in the lecture

11. Course Evaluation

((Oral exams / Written exams / Weekly reports / Daily attendance / Participation and interaction in lectures / Midterm and final exams))

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Lieutenants are available in the free education section.
Main references (sources)	Available in free education and the institute's library
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	Internet

Course Description Form

1. Course Name:
Mechanical Workshops
2. Course Code:
TIMO111
3. Semester / Year:
2025
4. Description Preparation Date:
30/1/2025
5. Available Attendance Forms:
mandatory
6. Number of Credit Hours (Total) / Number of Units (Total)
7. Course administrator's name (mention all, if more than one name)
Name: Email:
8. Course Objectives

Course Objectives	Focus on training the student on how to plan on metal sheets, how to cut, assemble and weld sheets using planning tools, manual and mechanical cutting, bending tools and manual and mechanical welding tools.
9. Teaching and Learning Strategies	
Strategy	1. Apply theoretical topics practically. 2. Summer training 3. Graduation research.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	Knowledge and	Refrigerator (3 weeks): Focus on training the student on correct filing work and how to use measuring tools, files, saws, drills and screws.	Theoretical and practical	Tests, assignments and reports

		applic ation	A- Occupational safety inside the workshop. B- Measuring tools: (graduated ruler - measuring tape - vernier caliper and how to use and maintain them). C- The planning process (the shankara): The basic surfaces used are: (the straight compass - the planning compass - the tail and how to tail - the material of the display - the right angle - the regular compass - the sensitive compass - the height gauge - the universal protractor and the angle measurement). D- Files: Types, shapes, how to use, maintain and clean them. E- Sickles, types and methods of attaching work to them. Simple exercise on cold and planning operations according to the executive drawing.		
2	4	Knowl edge and applic ation	Air and space sensors, satellites American, French and European ..... et	Theoretical and practical	Tests, assignments and reports
3	4	Knowl edge and applic ation	Interpreting spatial images and data, shape and size features	Theoretical and practical	Tests, assignments and reports
4	4	Knowl edge and applic ation	Saw Cutting: Hand Saw and Chainsaw- Installing the saw weapon - Conditions that must be met in the sawing process. Exercise involving the refrigerator- Planning - publishing according to the dimensions given in the executive drawing.	Theoretical and practical	Tests, assignments and reports
5	4	Knowl edge and applic ation	Drilling: Types of Drills- Types of primers - How to use them - Methods for extracting broken screws. An exercise that includes filing, planning, drilling and according to the given dimensions, with the executive drawing.	Theoretical and practical	Tests, assignments and reports
6	4	Knowl	The training in the welding workshop focuses on the various tools, equipment	Theoretical and	Tests, assignments

		edge and applic ation	and devices available in the workshop in the best way: A- Occupational safety inside the workshop. B- The number and tools used in the workshop. C- Electric welding machines, their parts, how to operate them. Performing welding exercises (straight lines, with straight lines, filling an angle).	practical	and reports
7-8	4	Knowl edge and applic ation	Perform welding exercise (gates, molds, pipes).	Theoretical and practical	Tests, assignments and reports
9	4	Knowl edge and applic ation	Oxyacetylene gas welding. A- Occupational safety at work. B- Types of gases used in gas welding and how to use them. Perform exercises (self-welding, welding with iron wire, welding with brass wire).	Theoretical and practical	Tests, assignments and reports
10-11	4	Knowl edge and applic ation	Focus on training the student on how to plan on metal sheets, how to cut, assemble and weld sheets using planning tools, manual and mechanical cutting, bending tools and manual and mechanical welding tools. A- Occupational safety inside the workshop. B- Measuring tools. C- Planning tools. D- Types of plates and their measurements. Practical exercise using the mentioned tools (simple exercise using the mentioned tools).	Theoretical and practical	Tests, assignments and reports
12-13	4	Knowl edge and applic ation	A- Cutting and bending machines. B- Spot welding machines. Implementation of an exercise on planning, cutting, bending and welding operations (molds, casting, gates).	Theoretical and practical	Tests, assignments and reports
14-15	4	Knowl edge	Linking path:	Theoretical and	Tests, assignments

		and application	Hand pusher, American pusher. Conducting an exercise on planning, cutting and connecting operations (cooling duct, water tank).	practical	and reports
14-15	4	Knowledge and application	The focus is on training the student on different lathe machines and training on the measuring tools needed to perform various exercises or how to make external and internal teeth and how to choose cutting pens. A- Occupational safety inside the lathe workshop. B- The lathe, its parts and how to work on it, speed tables, types of lathe pens, connecting the workpieces, adjusting the center, tools. C- Carrying out lathe operations (level, straight, graduated) using measuring tools. Explanation of the laws of external and internal robbed lathe. Perform a mapping exercise for an external and internal staircase. Explaining the laws of external and internal teeth. Performing external and internal dental lathe exercises.	Theoretical and practical	Tests, assignments and reports

11. Course Evaluation

12. Learning and Teaching Resources

Course development plan.	1- Updating lectures. 2- Using modern methods in education.
Infrastructure	

Course Description Form

1. Course Name:
Remote Sensing1
2. Course Code:
SUT 124
3. Semester / Year:
Decisions
4. Description Preparation Date:
2025
5. Available Attendance Forms:
Weekly class schedule (theoretical), discussions, scientific seminars, and oth extracurricular activities
6. Number of Credit Hours (Total) / Number of Units (Total)
1 hour per week = 15 hours per semester / 1
7. Course administrator's name (mention all, if more than one name)
Name: Othman Abduljabar Email:

8. Course Objectives	
Course Objectives	1. Students will learn the fundamentals of remote sensing and its relevance to surveying work. 2. Students will be able to distinguish between types of electromagnetic energy, the properties of electromagnetic energy, electromagnetic fields, sources of electromagnetic energy, and blackbody radiation. 3. Students will learn about satellites: high-resolution satellites, medium-resolution satellites, and low-resolution satellites.

9. Teaching and Learning Strategies	
Strategy	1- Delivery: Lecture 2- Discussion: Group Discussion 3- Thinking and Development: Creative Thinking and Problem Solving 4- Group: Cooperative Learning 5- Self-Learning: Educational Kit 6- Role-Play: Cognitive Map

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	1	Knowledge and application	Introduction to Remote Sensing, Historical Overview, Definition	theoretical	Participate and interact in the lecture
2 +3	1	Knowledge and application	Basic elements of a remote sensing system. Remote sensing. It includes the source of electromagnetic radiation, the path of the radiation, the observed target, the sensor.	theoretical	Participate and interact in the lecture
4 +5	1	Knowledge and application	electromagnetic energyElectromagnetic Energy, Properties of Electromagnetic Energy, Electromagnetic Field, Sources of Electromagnetic Energy, Blackbody Radiation	theoretical	Participate and interact in the lecture
6	1	Knowledge and application	Remote sensing devices	theoretical	Participate and interact in the lecture
7	1	Knowledge and application	Characteristics of aerial photographs and satellite images	theoretical	Participate and interact in the lecture
8	1	Knowledge and application	Sources of remote sensing information, first: photographic sources, including) regular films Black and white, non-red films Black and white, regular color films, non-red films Close-up color, multispectral images(	theoretical	Participate and interact in the lecture
9	1	Knowledge and application	sources Information in Sensitivity far away, secondly: Sources not Photography It includes means Air)The receiver Multiple Spectra, The receiver linear Thermal For rays Without red, Devices Sensing Microwave (, means (Space) means Space Inhabited, means Space not Inhabited)	theoretical	Participate and interact in the lecture
10+11	1	Knowledge and application	some Terminology used in Sensitivity Far away)Accuracy Discriminatoryresolution,Coverage Spatial, Orbits Moons Industrial, health	theoretical	Participate and interact in the lecture

			Adjustmentaccuracy)		
12+ 13	1	Knowledge and applicatio n	Satellites) High spatial resolution satellites, medium spatial resolution satellites, low spatial resolution satellites	theoretical	Participate and interact in the lecture
14	1	Knowledge and applicatio n	Various applications in remote sensing: 1 Urban applications: These include) detailed mapping of cities, study of traffic and parking Cars, Parks and Gardens Planning and Distribution, Land Use Study, Urban Expansion And its direction, the study of industrial complexes	theoretical	Participate and interact in the lecture
15	1	Knowledge and applicatio n	Various applications in remote sensing	theoretical	Participate and interact in the lecture

11. Course Evaluation

((Oral exams / Written exams / Weekly reports / Daily attendance / Participation and interaction in lectures / Midterm and final exams))

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Lieutenants are available in the free education section.
Main references (sources)	Available in free education and the institute's library
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	Internet

Course Description Form

1. Course Name:	
Surveying 1	
2. Course Code:	
SUT 120	
3. Semester / Year:	
First Semester / First Year	
4. Description Preparation Date:	
22 – 6 – 2025	
5. Available Attendance Forms:	
Theoretical and Practical	
6. Number of Credit Hours (Total) / Number of Units (Total)	
72	
7. Course administrator's name (mention all, if more than one name)	
Name: dr. Mohammed Fathi Mohammed Email: m_almoula@yahoo.com	
8. Course Objectives	
Course Objectives	1- Students will be able to Carry out surveying work using various methods. 2- The student will learn about different surveying devices and how to install and operate them. 3- Students will be able to read surveying instruments. 4- Students will be able to Calculate the levels for different points
9. Teaching and Learning Strategies	
Strategy	((Theoretical and practical lectures / assignments and encouragement to participate in lectures))

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1	2 + 4	Knowledge and application	Introduction about surveying, its definition, and a summary of the various works provided by surveying types (plane surveying, geodetic surveying)	Theoretical and practical	Tests, assignments and reports
2	2 + 4	Knowledge and application	Units Measure in two systems Metric (French) And the foot (English), Measuring angles systems.	Theoretical and practical	Tests, assignments and reports
3	2 + 4	Knowledge and application	Scales and their types. How to choose Scale.	Theoretical and practical	Tests, assignments and reports
4	2 + 4	Knowledge and application	Distance measurement on plane land (Flat).	Theoretical and practical	Tests, assignments and reports
5	2 + 4	Knowledge and application	Distance measurement on inclined land (Regular and not Regular)	Theoretical and practical	Tests, assignments and reports
6	2 + 4	Knowledge and application	Engineering Operations that Running during Measurement With tape	Theoretical and practical	Tests, assignments and reports
7	2 + 4	Knowledge and application	Measurement Obstacles	Theoretical and practical	Tests, assignments and reports
8	2 + 4	Knowledge and application	Place surveying details (polygon And the stuffing) Using The tape	Theoretical and practical	Tests, assignments and reports
9	2 + 4	Knowledge and application	Levelling, Definitions, Its types and methods	Theoretical and practical	Tests, assignments and reports
10	2 + 4	Knowledge and application	Levelling instruments, Its types	Theoretical and practical	Tests, assignments and reports
11	2 + 4	Knowledge and application	Calculation of elevation for points	Theoretical and practical	Tests, assignments and reports

12	2 + 4	Knowledge and application	Closing error, permissible Error and corrections	Theoretical and practical	Tests, assignments and reports
13	2 + 4	Knowledge and application	Longitudinal And cross sections, Grade line calculation	Theoretical and practical	Tests, assignments and reports
14	2 + 4	Knowledge and application	Volumes of the earth works for cut and fill	Theoretical and practical	Tests, assignments and reports
15	2 + 4	Knowledge and application	Topographic and Contouring Maps	Theoretical and practical	Tests, assignments and reports

11. Course Evaluation

Oral tests / written tests / observation / student's cumulative record

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Practical Surveying, Plane Surveying
Main references (sources)	Topographic and Plane Surveying, Constructional Surveying
Recommended books and references (scientific journals, reports...)	Topographic Surveying
Electronic References, Websites	**https://www.youtube.com/watch?v=dMwsddalJ60** **https://www.youtube.com/watch?v=JyWuQEh3MBo**

Course Description Form

1. Course Name:
Professional ethics
2. Course Code:
NTU 204
3. Semester / Year:
Decisions
4. Description Preparation Date:
5. Available Attendance Forms:
Weekly class schedule (theoretical), discussions, scientific seminars, and oth extracurricular activities
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hour per week = 30 hours per semester / 2
7. Course administrator's name (mention all, if more than one name)
Name: Othamn Abduljabar Mohammed Email: Othman.abd@ntu.edu.iq
8. Course Objectives

Course Objectives	1- Understanding the concept of ethics and the general rules of ethics 2- Understanding ethical values 3-Understanding the importance of ethics for the individual a society
9. Teaching and Learning Strategies	
Strategy	1- Delivery: Lecture 2- Discussion: Group Discussion 3- Thinking and Development: Creative Thinking and Problem Solving 4- Group: Cooperative Learning 5- Self-Learning: Educational Kit 6- Role-Play: Cognitive Map

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1+2	2	Knowledge and application	Unit (1) – Ethics • The concept of ethics and its origin. • General rules of ethics. • Sources of ethics. • Moral values. The importance of ethics for the individual and society.	theoretical	Participate and interact in the lecture
3	2	Knowledge and application	Unit (2) –Work and profession • Work and its importance. • Work behaviors. • The concept of profession. • Definition of profession. • The difference between the concept of work, profession and craft. The standards on which the profession should be based.	theoretical	Participate and interact in the lecture
4	2	Knowledge and application	Unit (3) - Professional Ethics • What is professional ethics? • Positive feedbackTo commitWith professional ethics. • Characteristics of work ethics. • Professional ethics qualities. Steps to the acceptable level of professional ethics.	theoretical	Participate and interact in the lecture
5+6	2	Knowledge and application	Unit (4) - Values and Professional Ethics • Trust. • Honesty. • Advice. • Justice. • Good dealing. mastery of work.	theoretical	Participate and interact in the lecture
7+8	2	Knowledge and application	• Unit (5) – PatternsUnethical behavior in the profession	theoretical	Participate and interact in

			• Administrative corruption. • Unethical administrative behavior. • Definition of administrative corruption. • Types of administrative corruption. • Bribery. • The concept of bribery. • Types of bribery. • The difference between a gift and a bribe. • The reasons and motives behind bribery. • Cheating. • The concept of cheating. • The nature of cheating at work. • ManifestationsCheating on the job.		the lecture
9+10	2	Knowledge and application	Unit (6) - Means and methods of establishing professional ethics values • Method of establishing professional ethics. • Levels of construction and consolidationProfessional ethics. • Means and methods of consolidationProfessional ethics. • Things to consider when drafting the professional code of ethics. How to promote ethical behavior at work according to (Kreitner and Kinnicki).	theoretical	Participate and interact in the lecture
11+12	2	Knowledge and application	• Ethics of practicing engineering professions (specific to technical and technological institutes) • Unit (7) - Engineering Professional Ethics • The importance of technology in society. • Technical and technological ethics. • Professional technician requirements.	theoretical	Participate and interact in the lecture

			• Characteristics of a professional technician. • Articles of the Professional Practice Regulations of the Workers' Union. The Islamic view of professional ethics, compared to the Western and American view.		
13+14	2	Knowledge and application	• Unit (8) - Charter of the Federation of Arab Engineers (Model of Ethics of the Engineering Profession) • The basic foundations of the engineering code of ethics. • The relationship of the technician with himself and his colleagues. • The nature of the technician's relationship with his organization. • The relationship of the technician with the employer. • The relationship of the technician with his engineering work. • The role of the technician and his relationship with society. • The nature of the technician's relationship with the environment, sustainable development, health and public safety. • The relationship of the technician with laws, legislation, regulations, and labor and workers' laws. The relationship of the technician with the issues of the homeland, the nation and humanitarian issues.	theoretical	Participate and interact in the lecture
15	2	Knowledge and application	• Unit (9) - Technician Ethics in EducationAnd continuous training	theoretical	Participate and interact in

			• The importance of participation in educationAnd continuous training ethically. • Rules of conduct that a technician must adhere to towards himself in the field of education. • Rules of conduct of the technician towards his subordinates in the field of educationAnd continuous training. • Code of Conduct for Technicians towards Unions in the Field of EducationAnd continuous training. Technical Code of Conduct towards Training Centres in the Field of EducationAnd continuous training.		the lecture

11. Course Evaluation

((Oral exams / Written exams / Weekly reports / Daily attendance / Participation and interaction in lectures / Midterm and final exams))

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Lieutenants are available in the fr education section.
Main references (sources)	Available in free education and t institute's library
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	Internet

Course Description Form

1. Course Name:
Photogrammetry2
2. Course Code:
SUT 202
3. Semester / Year:
Courses First
4. Description Preparation Date:
30/1/2025
5. Available Attendance Forms:
mandatory
6. Number of Credit Hours (Total) / Number of Units (Total)
(2 theoretical) per week * 15 weeks = 30 hours
7. Course administrator's name (mention all, if more than one name)
Name: Mohammed Fathi Mohammed Email: m_almoula@ntu.edu.iq

8. Course Objectives	
Course Objectives	The student should be able to deal with space data, digital aerial images and mosaic work through software, as well as directing digital aerial images to form a stereoscopic model and stereoscopic view of the earth's surface and extracting information and measurements of the appearance of the earth's surface through stereoscopic vision, and using modern (DEM) software to perform the process of aerial triangulation and ortho rectification of three-dimensional digital images and extract for the stereoscopic model and its applications in other software fields. He should familiarize himself with: the basic concepts of remote sensing
9. Teaching and Learning Strategies	
Strategy	1. Apply theoretical topics practically. 2. Summer training 3. Graduation research.

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1	4	Knowledge and application	Reflectivity of Earth's surface phenomena and natural response patterns	Theoretical and practical	Tests, assignments and reports
2	4	Knowledge and application	Air and space sensors, satellites American, French and European ..... etc.		
3	4	Knowledge and application	Interpreting spatial images and data, shape and size features		
4	4	Knowledge and application	Digital processing, radiometric correction, de-distortion, optimization and geometric correction of space data (images)		
5	4	Knowledge and application	Perform a mosaic from digital aerial images or spatial data using the Erdas		
6	4	Knowledge and application	Digital images and types of Resolution		
7-8	4	Knowledge and application	The foundations of stereo aerial surveying are interior, exterior, and absolute orientation.		
9	4	Knowledge and application	Recognize the icon "stereo analyst" within the program **“Erdas"**		
10-11	4	Knowledge and application	Theory with hands-on practice Monthly exam(n+p) 10th-11th 8 Learning, understanding and training Stereoscopic modeling Initial digital, getting the initial stereoscopic view and storing the stereoscopic model		

12-13	4	Knowledge and application	Configuring and storing the guided digital holographic model		
14-15	4	Knowledge and application	Configuring and storing the guided digital holographic model		
14-15	4	Knowledge and application	Checking the accuracy of the digital holographic model		

11. Course Evaluation

Conduct an evaluation of each survey team individually in terms of accuracy and speed in accomplishing the field work and also an evaluation of each individual in the team
in terms of his work performance and the way he deals with all students present with him within the survey team.

12. Learning and Teaching Resources

Course development plan.	1- Updating lectures. 2- Using modern methods in education.
Infrastructure	للتعليم العامة المؤسسة/السعودية العربية المملكة التصويري، التقني .المناهج وتطوير لتصميم العامة الادارة/المهني والتدريب ERDAS IMAGINGE Tour Guide , Leica Geosystems Geospatial Imaging ,USA ,2006 3.

Course Description Form

1. Course Name:

plane Surveying

2. Course Code:

SUT 202

3. Semester / Year:

First semester, second level

4. Description Preparation Date:

2025

5. Available Attendance Forms:

6. Number of Credit Hours (Total) / Number of Units (Total)

1- Weekly lesson schedule (theoretical and practical).
2- Discussions, scientific seminars and other extracurricular activities

7. Course administrator's name (mention all, if more than one name)

Name: Mr. Mohammed Abdulghani Qasim
Email: mohammad_survey@ntu.edu.iq

8. Course Objectives

Course Objectives	The student should be able to carry out all measurements and calculations in the work of polygonaling, triangulation, and tachymetric measurements, and work on implementing surveying work, including raising and dropping point coordinates, using the total station devices, as well as implementing some of the work that the total station device can provide.

9. Teaching and Learning Strategies

Strategy	((Theoretical lectures / practical lectures /)).

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Knowledge and application	Measuring horizontal and vertical distances us the tachymetric method	Theoretical	Test and reports
2	2	Knowledge and application	tachymetric surveying	Theoretical	Test and reports
3	2	Knowledge and application	Types of ground control networks (triangulati	Theoretical	Test and reports
4	2	Knowledge and application	Triangulation networks and their calculations	Theoretical	Test and reports
5	2	Knowledge and application	Triangulation networks and their calculations	Theoretical	Test and reports
6	2	Knowledge and application	Closed cyclic polygon and its calculations	Theoretical	Test and reports
7	2	Knowledge and application	Closed cyclic polygon and its calculations	Theoretical	Test and reports
8	2	Knowledge and application	Dealing with devices (device definition, gener device settings, and project concept)	Theoretical	Test and reports
9	2	Knowledge and application	Surveying	Theoretical	Test and reports
10	2	Knowledge and application	Stake out	Theoretical	Test and reports
11	2	Knowledge and application	Free station and finding distant height using to station device	Theoretical	Test and reports
12	2	Knowledge and application	Transfer data from the total station to the computer and vice versa.	Theoretical	Test and reports
13	2	Knowledge and application	Calculating areas and volumes in two and thre dimensions.	Theoretical	Test and reports
14	2	Knowledge and application	Calculating the slop and vertical distances between two points (Tie Distance) in two ways: 1-Polygon 2-Radial	Theoretical	Test and reports
15	2	Knowledge and application	A scientific trip to one of the projects under construction	Theoretical	Test and reports
Practical part					
1	6	Knowledge and application	Measuring vertical and horizontal distance usi stadia and shadows	Practical	Test and reports
2	6	Knowledge and application	Measuring vertical and horizontal distance usi a reduced tachymeter	Practical	Test and reports
3	6	Knowledge and application	Triangulation and its calculations	Practical	Test and reports
4	6	Knowledge and application	Triangulation and its calculations	Practical	Test and reports
5	6	Knowledge and application	Triangulation and its calculations	Practical	Test and reports

6	6	Knowledge and application	Closed circular polygon angles detection field	Practical	Test and reports
7	6	Knowledge and application	Line up the angles of the closed polygon and i calculations	Practical	Test and reports
8	6	Knowledge and application	Identify the device and its settings	Practical	Test and reports
9	6	Knowledge and application	Implementation of the survey using the total station device	Practical	Test and reports
10	6	Knowledge and application	Implementation of the survey signature by coordinates and by longitude and direction	Practical	Test and reports
11	6	Knowledge and application	Implementation of the free station and finding distant height using the total station device	Practical	Test and reports
12	6	Knowledge and application	Transferring data from the total station to the computer and vice versa with practical examp	Practical	Test and reports
13	6	Knowledge and application	Calculating areas and volumes in two and thre dimensions.	Practical	Test and reports
14	6	Knowledge and application	Application to calculate the oblique and vertic distances between two points (Tie Distance) ir two ways 1- Radial 2- Polygon.	Practical	Test and reports
15	6	Knowledge and application	A scientific trip to one of the projects under construction	Practical	Test and reports

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

1- Theoretical exam 20%
2- Practical exam 20%
3- Daily preparation + daily exam + lecture interaction + reports = 10%
4- Final practical exam 10%
5- Final theoretical exam 40%

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Plane surveying Workbook
Main references (sources)	1) Surveying, Principle and Applications, Barry F, Kavanagh, 6 th edition (2003). 2) Elementary Surveying and Introduction Geomatics (Paul R. wolf & Charles D. Ghila (2002). 3)Charles, D. G., 1999, "Geodetic Models fo the Earth", Penn State Surveying Program, U.S.A, pp.1-15.
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	Dr. Jumaa Muhammad Daoud's channel

Course Description Form

1. Course Name:

Engineering surveying

2. Course Code:

SUT 203

3. Semester / Year:

Course system (first level / first semester)2024-2025

4. Description Preparation Date:

5. Available Attendance Forms:

mandatory

6. Number of Credit Hours (Total) / Number of Units (Total)

(2 theoretical +2 practical) per week * 15 weeks = 60 hours

7. Course administrator's name (mention all, if more than one name)

Name: Dr. Abdulbasit Abdulaziz Muhmood
Email: abdulbasit@ntu.edu.iq

8. Course Objectives

Course Objectives	• **The aim of studying the engineering surveying of the course is:** • **Practice calculating different types of regular and irregular areas.** • **Training in the calculation of various types of regular and irregular volume earthworks in road works and canal projects, in addition to the calculation of va volumes in lakes and dam reservoirs, in addition to various types of materia mines.** • **How to calculate different types of horizontal and vertical curves (elements, sta and symbols used) and how to design spatial projection tables** • **Understand and learn how to use surveying tools in construction surveying.** • **Understand and learn how to correct polygons in the Bowdage and Transit meth as well as how to use intersection techniques to find unknown lengths a directions.** • **Spatial and mathematical training and practice to divide land and calculate the a of each part and its location…..**

9. Teaching and Learning Strategies

Strategy	
	• . Apply theoretical topics practically. • . Summer training • . Graduation research.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1.	2 theoritical+2 practical	Knowledge and application	Introduction to Engineerin Surveying. The first Setting up columns at equal intervals (trapezoidal and Simpson's method), and setting up columns at unequal intervals The survey line of a plot of land and calculating its areas by all the methods indicated on.	Theoretical , tutorial and practical	Test and reports
2.	42 theoritical+2 practical	Knowledge and application	Using the coordinate method to calculate areas, the line multiplier method (D.M.D.)	Theoretical , tutorial and practical	Test and reports
3.	2 theoritical+2 practical	Knowledge and application	The different methods of calculating areas from a map include: Dividing into regular geometric shapes such as triangles or squares, using graph paper, using slides, using planimeters, using Electronic Spaces (when the anchor point is inside or outside the arithmetic and graphing lines to calculate the cross-sectional areas of	Theoretical , tutorial and practical	Test and reports

			a calculation.) Roads of different shapes and different slopes of the earth's surface		
4.	2 theoritical+2 practical	Knowledge and application	Calculation of the volume of earth quantities using the law of the average of two bases, the method of the missing wedge (or Maharani) and the approximate method from the cross-sectional area of the dams and reservoirs. And the reservoir for dams by contour lines and calculations of the soil transfer curve and the use of the necessary calculations of areas and volumes in different ways.	Theoretical , tutorial and practical	Test and reports
5.	2 theoritical+2 practical	Knowledge and application	Familiarize yourself with road surveying: It includes the ground and airborne survey methods used to designate the route of the road and the types of vertical curves used in road surveying. Types of vertical curves used in roads: Symbols and terminology and laws for them and for calculating their proportions (geometric method). asymmetric vertical curves (their elements and calculations), calculation of dirt quantities for a road section containing convex vertical curves concave and a constant	Theoretical , tutorial and practical	Test and reports

			gradient. A scientific trip to some state departments.		
6.	2 theoritical+2 practical	Knowledge and application	Recognize the types of vertical curves: (convex curve and concave curve) and the parabolic equation for calculating the ratio (analytical method).) and how it is projected onto the ground - its specifications in terms of its length in relation to sight distance, speed and difference the algebraic difference between the two slopes and the equivalent radius an educational movie showing the types of curves in real life. buildings	Theoretical , tutorial and practical	Test and reports
7.	2 theoritical+2 practical	Knowledge and application	Horizontal curves: The simple circular horizontal curve, symbols symbols, terminology, laws, and specifications in terms of radius to vehicle speed, coefficient of friction for tires, and slope additional or) lateral lift	Theoretical , tutorial and practical	Test and reports
8.	2 theoritical+2 practical	Knowledge and application	Horizontal curves, compound circular and inverted horizontal curves, their types and calculation their elements and their use in highways and intersections. Calculate the coordinates of key stations and points on	Theoretical , tutorial and practical	Test and reports

			curves .		
9.	2 theoritical+2 practical	Knowledge and application	Different methods for smoothing and finishing a simple circular curve: Tangent angle (or deflection) method using theodolites or the curve using only two theodolites and the use of electronic devices to project this curve or by the coordinates of control points and points.(the method of modern positioning techniques	Theoretical , tutorial and practical	Test and reports
10.	2 theoritical+2 practical	Knowledge and application	- The method of using columns in the projection of curves (columns on the tangent and columns on the large chord) and the method of projection from the intersection point Obstacles to projection and how to overcome them (on the arc or main stations or during construction	Theoretical , tutorial and practical	Test and reports
11.	2 theoritical+2 practical	Knowledge and application	Types, Usage and Calculations (parabolic, parabolic truncation and spiral) Using tangent angles and chords or coordinates, calculate their flattening the coordinates of major stations and points on curves	Theoretical , tutorial and practical	Test and reports

12.	2 theoritical+2 practical	Knowledge and application	An amazing, road-changing graphic: Perform the necessary calculations for enough vertical and horizontal curves (defining vertical and horizontal curves) to identify the elements and stations on them	Theoretical , tutorial and practical	Test and reports
13.	2 theoritical+2 practical	Knowledge and application	Calculate the cross-sectional areas of the project and the volumes of earth quantities, draw the earth transfer curve and show the width of the excavation and backfill on both sides of the The centerline of the act project. A lecture using Land program to calcul the soil quantities a compare them with manual calculations	Theoretical , tutorial and practical	Test and reports
14.	2 theoritical+2 practical	Knowledge and application	Structural Surveying -: Surveying works related to the construction of houses and large buildings, stabilization of pipes, electrical transmission, trenches, pipes, pipes, electrical transmission, trenches, pipes, pipes, pipes, electrical transmission, trenches, pipes,	Theoretical , tutorial and practical	Test and reports
15.	2 theoritical+2 practical	Knowledge and application	Surveying works for the construction of houses and large buildings, stabilization of pipes, electrical transportation, long trenches and stabilization of their alignments. Pipelines, electrical transportation, long trenches and	Theoretical , tutorial and practical	Test and reports

			stabilization.		

1. Course Evaluation

First monthly exam 20%	Second monthly exam 20%	Practical assignments and daily tests Practical 10%	Annual striving 50%	Final exam 50%

2. Learning and Teaching Resources

1.engineering surveying. Zeyad Albakr	
2. surveying for engineers. Uren	
3. construction surveying. William Ervin	

Course Description Form

1. Course Name:	
Principles of Cartography	
2. Course Code:	
SUT 204	
3. Semester / Year:	
First Semester / Second Year	
4. Description Preparation Date:	
22 – 6 – 2025	
5. Available Attendance Forms:	
Theoretical and Practical	
6. Number of Credit Hours (Total) / Number of Units (Total)	
72	
7. Course administrator's name (mention all, if more than one name)	
Name: dr. Mohammed Fathi Mohammed Email: m_almoula@yahoo.com	
8. Course Objectives	
Course Objectives	• Students will learn how to design maps and understand their different types: linear, area and point. • Students will be able to find the geographic and quadratic coordinates of maps. • Students will be able to: Preparing a contour map of a specific area to know the nature of its terrain. • Students will be able to: Drawing types of scales used in maps
9. Teaching and Learning Strategies	
Strategy	((Theoretical and practical lectures / assignments and encouragement to participate in lectures))

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2 + 3	Knowledge and application	Principles of cartography, its nature and its relationship to land surveying.	Theoretical and practical	Tests, assignments and reports
2	2 + 3	Knowledge and application	Types of maps, their characteristics and classification.	Theoretical and practical	Tests, assignments and reports
3+ 4	2 + 3	Knowledge and application	Scale and its relation to the land area represented on maps of similar dimensions, to the accuracy of the map and its purpose	Theoretical and practical	Tests, assignments and reports
5 + 6	2 + 3	Knowledge and application	Methods of reducing and enlarging maps (changing the map scale) and methods of measuring distances and areas on maps at different scales.	Theoretical and practical	Tests, assignments and reports
7	2 + 3	Knowledge and application	Geographic and quadratic coordinates.	Theoretical and practical	Tests, assignments and reports
8 + 9	2 + 3	Knowledge and application	Map projections (definition, classification, deviations).	Theoretical and practical	Tests, assignments and reports
10 + 11	2 + 3	Knowledge and application	Cylindrical projections Mercator projection (TM) and Universal Mercantile Exchange (UTM)	Theoretical and practical	Tests, assignments and reports
12 + 13	2 + 3	Knowledge and application	Conic projections, Lambert congruent projection (with one standard latitude and two standard latitudes). Bonn equal-area projection.	Theoretical and practical	Tests, assignments and reports
14 + 15	2 + 3	Knowledge and application	Azimuth projections,	Theoretical and practical	Tests, assignments and reports

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	
Main references (sources)	1- **Robinson,J,S.,"Elements of cartography",5th Ed.,1980.** 2- **Keats,J,S.,"Cartography Design and Production",3rd Ed.,1980**
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name:
Specifications and Estimation
2. Course Code:
NTU208
3. Semester / Year:
Courses First
4. Description Preparation Date:
30/1/2025
5. Available Attendance Forms:
mandatory
6. Number of Credit Hours (Total) / Number of Units (Total)
(2 theoretical) per week * 15 weeks = 30 hours
7. Course administrator's name (mention all, if more than one name)
Name: Fadia A. Sulaiman Email: mailto:fadiah@ntu.edu.iq

8. Course Objectives

Course Objectives	The aim of studying the **Specifications and Estimation** of course is: After having a knowledge base of construction, its methods and techniques, the learner will be able to prepare the construction project, methods of calculating quantities, and estimating the costs of various types of projects. He will also discuss the scheduling of time and financial projects, and the specifications of materials and workers for projects.

9. Teaching and Learning Strategies

Strategy	1. Apply theoretical topics practically. 2. Summer training 3. Graduation research.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Knowledge and application	A general introduction to estimation and construction Definition and purpose of estimation Estimation sections	Theoretical and practical	Tests, assignments and reports
2	2	Knowledge and application	Construction materials for buildings: earth excavations for strip foundations Earthen excavations, cleaning and leveling the site, placing	Theoretical and practical	Tests, assignments and reports

			crushed stone under the foundation.		
3	2	Knowledge and application	Pouring concrete foundations and mat foundation Construction materials used in concrete production and calculating their quantities (sand, gravel, and additives).	Theoretical and practical	Tests, assignments and reports
4	2	Knowledge and application	Reinforced concrete (properties, types)	Theoretical and practical	Tests, assignments and reports
5	2	Knowledge and application	Types of mortar: cement mortar and plaster mortar Calculating the volume of mortar used in construction and the materials used in its production.	Theoretical and practical	Tests, assignments and reports
6	2	Knowledge and application	Calculating quantities of floor covering materials (Traditional materials) such as alabaster, granite, and kashi, and modern (non-traditional) materials such as modern wooden floors and modern surfacing materials available in the labor market (types, calculation of quantities in flooring) along with surface covering materials for buildings.	Theoretical and practical	Tests, assignments and reports
7	2	Knowledge and application	Cubing works Cubing using different building materials	Theoretical and practical	Tests, assignments and reports
8	2	Knowledge and application	Ficus with plaster and other materials Its uses: Calculating the amount of plaster needed to whitewash the walls, calculating the amount of cement and sand needed to finish the walls.	Theoretical and practical	Tests, assignments and reports
9	2	Knowledge and application	Modern packing materials for walls, ceilings, and building facades, and calculating their quantities	Theoretical and practical	Tests, assignments and reports

10	2	Knowledge and application	Building walls Types of materials used in building walls	Theoretical and practical	Tests, assignments and reports
11	2	Knowledge and application	Calculating the quantity of earthworks, boulders, and mixed sand (space) and explaining its quantity table	Theoretical and practical	Tests, assignments and reports
12	2	Knowledge and application	Calculating the amount of structural sections below the moisture barrier level Excavation and use of boulder stone, types of foundation concrete, building with bricks.	Theoretical and practical	Tests, assignments and reports
13	2	Knowledge and application	Continuation of the previous week.	Theoretical and practical	Tests, assignments and reports
14	2	Calculating the quantity of moisture-preventing concrete and additives, calculating the quantity of items above the moisture-preventing level and explaining its quantity table	Terminations Types of ficus used.	Theoretical and practical	Tests, assignments and reports

11. Course Evaluation

1. Follow up on attendance and absence.
2. Theoretical and practical tests
3. Monitoring behavior and behavior inside the classroom.
4. Submitting and discussing reports.

12. Learning and Teaching Resources

Course development plan.	1- Updating lectures. 2- Using modern methods in education.

Infrastructure	1.Civil Engineering and Costing, S.P. Mahajan, 624. 1042, M214. 2. Estimating Building and Construction, 692.5, H816, 73-119. 3. Civil Engineering Estimating and Costing, V.N. VANZIRANI, S.P. CHANDOLA, first edition, 1982.

Course Description Form

1. Course Name:
Global Positioning System (GPS)
2. Course Code:
SUT 205
3. Semester / Year:
Second Semester / Academic Year 2024-2025
4. Description Preparation Date:
2025
5. Available Attendance Forms:
Theoretical and Practical (Lectures, Labs, Field Work)
6. Number of Credit Hours (Total) / Number of Units (Total)
4 Units (1 Theory, 3 Practical)
7. Course administrator's name (mention all, if more than one name)
Name: AbdulSattar Mohammed Khidhir Email: abdulsattarmk@ntu.edu.iq
8. Course Objectives

Course Objectives	• Introduce students to the concepts and applications of Global Navigation Satellite Systems (GNSS). • Identify the three main components of the space-based system (space, ground control, user). • Apply fundamental equations to calculate positions using satellite signals. • Understand various spatial coordinate systems such as WGS84. • Analyze sources of error in satellite measurements and suggest solution reduce them.
9. Teaching and Learning Strategies	
Strategy	• Presentations using visual aids. • Interactive explanation on smart/traditional whiteboard. • Open discussions and encouraging questions. • Practical training in labs and field. • Use of simulation programs and GPS data processing software.

10. Course Structure: (1 hour theory + 3 hours practical each week)

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	1theory 3practical	Geoid, Ellipsoid, Differences	Introduction to Geodesy and Earth Shape	Presentation, 3D Maps, Computer	Oral Q&A, Calculations
2	1theory 3practical	Spherical & Geographic Coordinates, Conversion, WGS84	Geodetic and Earth Coordinate Systems	Smartboard, Conversion Software	Applied Assignments
3	1theory 3practical	GNSS, GPS, Development Phases, Positioning	Introduction to GNSS	Videos, Slides, Mobile Apps	Short Quiz
4	1theory 3practical	GPS, GLONASS, Galileo, BeiDou, Comparison	Global GNSS Systems	Slides, Globe Model, Simulation	Discussion + Mini Research
5	1theory 3practical	Carrier, C/A, P, Modulation, Errors	Satellite Signals and Codes	Board, Signal Simulation	Practical Exercise on C/A Code
6	1theory 3practical	Three Segments + Timing	GNSS System Components	Slides, Navigation Messages	Written Test
7	1theory 3practical	Pseudorange, Timing, Code Measurement	Distance Measurement in Space	Board, Lab Software	Worksheet on Positioning
8	1theory 3practical	Solving Pseudorange Equations, Approximation	User Positioning (Trilateration)	Matlab/Excel	Applied Exercises
9	1theory 3practical	Fixed & Mobile Receivers, SBAS	Differential Navigation (DGPS)	Video, Interactive Map	Comparison Question
10	1theory 3practical	Carrier Phase, Static & Kinematic Modes	Real-Time Kinematic (RTK)	RTK Simulator, Real Data	Mini Assignment: DGPS vs RTK
11	1theory 3practical	Ionosphere, Troposphere Effects	Space Error Sources	Board, Slides, Interaction	Correction Questions
12	1theory 3practical	Satellite, Multipath, Receiver Errors	Other Error Sources	Images, Diagrams, Lab	Multipath Exercise
13	1theory 3practical	EGNOS, WAAS, PPP	Enhancement Systems (SBAS, PPP)	Simulations, Case Studies	Mini Research on SBAS
14	1theory 3practical	Agriculture, UAVs, Photogrammetry, Marine	GNSS Applications	Digital Maps, Videos	Short Report / Mini Project
15	1theory 3practical	Field Survey + Summary	General Review Field Application	GNSS Devices, Simulatio	Field Evaluation Final Report

11. Course Evaluation

Item	Score
Attendance and Participation	10
Assignments	10
Short Quizzes	20
Reports and Projects	10
Final Theory Exam	40
Final Practical Exam	10
Total	100

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Ministry of Education - Saudi Arabia, General Directorate of Curricula, (SURV004) Global Navigation Satellite Systems.
Main references (sources)	MIT Technology Review – Global Satellite Navigation System
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name:

Computer drawing of maps (Civil 3D)

2. Course Code:

SUT 207

3. Semester / Year:

Decisions

4. Description Preparation Date:

(2025 / 6/ 16)

5. Available Attendance Forms:

1. Weekly lesson schedule (practical).
2. Practical experiments, extracurricula experiments, pop quiz.

6. Number of Credit Hours (Total) / Number of Units (Total)

90 hours

7. Course administrator's name (mention all, if more than one name)

Name: isam kahdir idres khaled hazem ibrahem taha yaseen taha
Email: isam.khidir759@ntu.edu.iq

8. Course Objectives

Course Objectives	1. Providing students with basic concepts related to the programCivil 3D. 2. Knowing the basic methods of drawing and designing roads. 3. Enabling the student to solve the problems he faces within the program during design.

9. Teaching and Learning Strategies

Strategy	Lectures prepared by the engineering professors supervising the course in practical teaching using the Civil 3D program

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	6	Knowledge and application	Install and configure the program Civil 3D with its standard versions and Surfer installed	practical	Tests and reports
2	6	Knowledge and application	Introduction to the program Civil 3D	practical	Tests and reports
3	6	Knowledge and application	Adjust the drawing settings for the worksheet.	practical	Tests and reports
4	6	Knowledge and application	Preparing the surveying (points) for the program	practical	Tests and reports
5	6	Knowledge and application	Methods of Entering data into The program Civil 3D	practical	Tests and reports
6	6	Knowledge and application	Edit points and their shapes Edit point	practical	Tests and reports
7	6	Knowledge and application	Create a group pointsCreate Point Group	practical	Tests and reports
8	6	Knowledge and application	General review previous experiences.	practical	Tests and reports
9	6	Knowledge and application	Create the surface	practical	Tests and reports
10	6	Knowledge and application	Analytical maps Analyses map	practical	Tests and reports
11	6	Knowledge and application	Retina Griding	practical	Tests and reports
12	6	Knowledge and application	Border Boundary	practical	Tests and reports

13	6	Knowledge and application	Export project data and details outside the program	practical	Tests and reports
14	6	Knowledge and application	Quantity calculation	practical	Tests and reports
15	6	Knowledge and application	Show results for calculating soil quantities	practical	Tests and reports

11. Course Evaluation

Attendance	Monthly Exam	Reports	Annual Attempt	Final Exam	Final Grade
10	30	10	50	50	100

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Available in free education and the institute's library
Main references (sources)	Using modern methods in education.
Recommended books and references (scientific journals, reports…)	Available in free education and the institute's library
Electronic References, Websites	

Course Description Form

1. Course Name:
Computer
2. Course Code:
NTU201
3. Semester / Year:
Second Courses2024-2025
4. Description Preparation Date:
2025/6/25
5. Available Attendance Forms:
1. Weekly lesson schedule (theoretical + practical). 2. Scientific discussions, seminars, and other extracurricular activities.
6. Number of Credit Hours (Total) / Number of Units (Total)
(1 theoretical + 1 practical) per week * 15 weeks = 30 hours / 2 units
7. Course administrator's name (mention all, if more than one name)
Name: alaa ayman Email: mti.lec04.alaa@ntu.edu.iq
8. Course Objectives

Course Objectives	1. Basic network components, security and threats. 2. Learn different types of E-commerce. 3. Solve common software and hardware problems. 4. Learn about AI, definition, application, tools and challenges.
9. Teaching and Learning Strategies	
Strategy	1. Theoretical lectures 2. Practical lectures 3. Interactive discussions

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Knowledge And Application	Security and networking	Theoretical + practical	Tests and reports

2	2	Knowledge And Application	Security and networking (cont.)	Theoretical + practical	Tests and reports
3	2	Knowledge And Application	E-commerce	Theoretical + practical	Tests and reports
4	2	Knowledge And Application	Computer troubleshooting	Theoretical + practical	Tests and reports
5	2	Knowledge And Application	Computer troubleshooting (cont.)	Theoretical + practical	Tests and reports
6	2	Knowledge And Application	Introduction to AI	Theoretical + practical	Tests and reports
7	2	Knowledge And Application	Introduction to AI (cont.)	Theoretical + practical	Tests and reports
8	2	Knowledge And Application	The role of AI in modern smartphones	Theoretical + practical	Tests and reports
9	2	Knowledge And Application	The role of AI in modern smartphones (cont.)	Theoretical + practical	Tests and reports
10	2	Knowledge And Application	Applications and tools of AI	Theoretical + practical	Tests and reports
11	2	Knowledge And Application	Applications and tools of AI (cont.)	Theoretical + practical	Tests and reports
12	2	Knowledge And Application	Applications and tools of AI (cont.)	Theoretical + practical	Tests and reports
13	2	Knowledge And Application	AI and society	Theoretical + practical	Tests and reports
14	2	Knowledge And Application	Ethical challenges in AI	Theoretical + practical	Tests and reports
15	2	Knowledge And Application	The future of AI	Theoretical + practical	Tests and reports

11. Course Evaluation	
50 degrees Theoretical 40 degrees practical 5 degrees attendance 5 degrees reports	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	New headway /beginner
Main references (sources)	The scientific books in the Free Education Division
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	Sites concerned with the network and AI

Course Description Form

1. Course Name:	
Digital surveying	
2. Course Code:	
SUT 202	
3. Semester / Year:	
Courses First	
4. Description Preparation Date:	
30/1/2025	
5. Available Attendance Forms:	
mandatory	
6. Number of Credit Hours (Total) / Number of Units (Total)	
(2 theoretical) per week * 15 weeks = 30 hours	
7. Course administrator's name (mention all, if more than one name)	
Name: Mohammad Abdulghani Qasim Email: mohammad_survey@ntu.edu.iq	
8. Course Objectives	
Course Objectives	The student should be able to deal with space data, digital aerial images and mosaic work through software, as well as directing digital aerial images to form a stereoscopic model and stereoscopic view of the earth's surface and extracting information and measurements of the

	appearance of the earth's surface through stereoscopic vision, and using modern (DEM) software to perform the process of aerial triangulation and ortho rectification of three-dimensional digital images and extract for the stereoscopic model and its applications in other software fields. He should familiarize himself with: the basic concepts of remote sensing

9. Teaching and Learning Strategies

Strategy	1. Apply theoretical topics practically. 2. Summer training 3. Graduation research.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	Knowledge and application	Reflectivity of Earth's surface phenomena and natural response patterns	Theoretical and practical	Tests, assignments and reports
2	4	Knowledge and application	Air and space sensors, satellites American, French and European etc.	Theoretical practical	Tests, assignments and reports
3	4	Knowledge and application	Interpreting spatial images and data, shape and size features	Theoretical practical	Tests, assignments and reports
4	4	Knowledge and application	Digital processing, radiometric correction, de-distortion, optimization and geometric correction of space data (images)	Theoretical practical	Tests, assignments and reports
5	4	Knowledge and application	Perform a mosaic from digital aerial images or spatial data using the Erdas	Theoretical practical	Tests, assignments and reports

6	4	Knowledge and application	Digital images and types of Resolution	Theoretical practical	Tests, assignments and reports
7-8	4	Knowledge and application	The foundations of stereo aerial surveying are interior, exterior, and absolute orientation.	Theoretical practical	Tests, assignments and reports
9	4	Knowledge and application	Recognize the icon "stereo analyst" within the program **“**Erdas"	Theoretical practical	Tests, assignments and reports
10-11	4	Knowledge and application	Theory with hands-on practice Monthly exam(n+p) 10th-11th 8 Learning, understanding and training Stereoscopic modeling Initial digital, getting the initial stereoscopic view and storing the stereoscopic model	Theoretical practical	Tests, assignments and reports
12-13	4	Knowledge and application	Configuring and storing the guided digital holographic model	Theoretical practical	Tests, assignments and reports
14-15	4	Knowledge and application	Configuring and storing the guided digital holographic model	Theoretical practical	Tests, assignments and reports
14-15	4	Knowledge and application	Checking the accuracy of the digital holographic model	Theoretical practical	Tests, assignments and reports

11. Course Evaluation

Conduct an evaluation of each survey team individually in terms of accuracy and speed in accomplishing the field work and also an evaluation of each individual in the team in terms of his work performance and the way he deals with all students present with him within the survey team.

12. Learning and Teaching Resources

Course development plan.	1- Updating lectures. 2- Using modern methods in education.
Infrastructure	**للتعليم العامة المؤسسة/السعودية العربية المملكة التصويري، التقني** **.المناهج وتطوير لتصميم العامة الادارة/المهني والتدريب** ERDAS IMAGINGE Tour Guide , Leica Geosystems Geospatial Imaging ,USA ,2006 3.

Course Description Form

1. Course Name:

Surveying using the total station device

2. Course Code:

SUT 209

3. Semester / Year:

second semester, second level

4. Description Preparation Date:

15/ 6/ 2025

5. Available Attendance Forms:

6. Number of Credit Hours (Total) / Number of Units (Total)

1- Weekly lesson schedule (theoretical and practical).
2- Discussions, scientific seminars and other extracurricular activities

7. Course administrator's name (mention all, if more than one name)

Name: Mr. Mohammed Abdulghani Qasim
Email: mohammad_survey@ntu.edu.iq

8. Course Objectives

Course Objectives	The student should be able to perform advanced surveying work using the Total Station.

9. Teaching and Learning Strategies

Strategy	((Theoretical lectures / practical lectures /)).

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Knowledge and application	Finding the coordinates of a set of points (Reference Element) in two ways: 1- If the reference is (Line) Reference Line	Theoretical	Test and reports

			Drop a single point. -Drop a set of points in the form of a grid.		
2	2	Knowledge and application	- If the reference is (arc) Reference Arc Drop a point away from a curve. -Drop arcs at equal distances.	Theoretical	Test and reports
3	2	Knowledge and application	If the reference is (arc) Reference Arc Projecting an arc given a chord. Projecting an arc given a centra angle.	Theoretical	Test and reports
4	2	Knowledge and application	Dropping and surveying through the construction line in two ways: Layout. As Built	Theoretical	Test and reports
5	2	Knowledge and application	Defining the functions of CoGo discussing its four details (gene presentation). Then presenting them in detail in the following weeks, as follows:	Theoretical	Test and reports
6	2	Knowledge and application	Invers & Travers Invers: Two known points, and the unknown angle and distance between them. Travers: The first point is know and the distance and direction, a the unknown coordinates of the second point.	Theoretical	Test and reports
7	2	Knowledge and application	Intersection, which has four functions: Brg-Brg: Two points with known coordinates and a known forward direction to the third point (the unknown coordinates of the third point). Brg-Dist: Two points, one of which has known coordinates a	Theoretical	Test and reports

			direction and the second (the known location and distance to first point and unknown coordinates).		
8	2	Knowledge and application	Dist-Dist: The distances are known. Ln-Ln: The coordinates are known.	Theoretical	Test and reports
9	2	Knowledge and application	offset, and it has three functions: Dist. Off.: Three coordinates are known, and the required perpendicular lengths are required. Set Pt: The coordinates of two points on a straight line are known, and the required coordinates of the perpendicular point are required. Plane: Three coordinates are known, and the required is to fi the point resulting from the intersection of three perpendiculars on their chords	Theoretical	Test and reports
10	2	Knowledge and application	Extension: Finding a point that lies along a given straight line.	Theoretical	Test and reports
11	2	Knowledge and application	Road 2D, and in three types: Line: Straight road. Curve: Curved road (arch).	Theoretical	Test and reports
12	2	Knowledge and application	Spiral: A spiral road (compound curves)	Theoretical	Test and reports
13	2	Knowledge and application	3D roads	Theoretical	Test and reports
14	2	Knowledge and application	Getting to know the Precise Geodetic GPS GR5 and its accessories	Theoretical	Test and reports
15	2	Knowledge and application	Surveying using differential scanning system	Theoretical	Test and reports
Practical part					
1	6	Knowledge and	Projecting the coordinates of a set of points (Reference	Practically	Test and reports

		application	Element) in two ways: 1- If the reference is (Line) Reference Line Projecting a single point. Projecting a set of points in the form of a grid (Grid).		
2	6	Knowledge and application	Reference Arc Drop a point away from a curve. Drop arcs at equal distances	Practically	Test and reports
3	6	Knowledge and application	Reference Arc Projection Arc Projection Given Chord. Arc Projection Given Central Angle	Practically	Test and reports
4	6	Knowledge and application	Dropping and surveying through the construction line in two ways: Layout. As Built	Practically	Test and reports
5	6	Knowledge and application	Implementation of polygons	Practically	Test and reports
6	6	Knowledge and application	Implementation of polygons	Practically	Test and reports
7	6	Knowledge and application	Implementation of straight line intersections	Practically	Test and reports
8	6	Knowledge and application	Implementation of straight line intersections	Practically	Test and reports
9	6	Knowledge and application	Implement point shifts	Practically	Test and reports
10	6	Knowledge and application	Implement point shifts	Practically	Test and reports
11	6	Knowledge and application	Implementation of straight line extensions	Practically	Test and reports
12	6	Knowledge and application	How to work with roads Sign a straight street and sign horizont curves in 2D	Practically	Test and reports
13	6	Knowledge and application	Spiral road signature (compoun curves)	Practically	Test and reports
14	6	Knowledge and application	Implementation of road works experiment in 3D	Practically	Test and reports
15	6	Knowledge and application	Identify the parts and settings o the differential system device a its accessories	Practically	Test and reports

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

1- Theoretical exam 20%
2- Practical exam 20%
3- Daily preparation + daily exam + lecture interaction + reports = 10%
4- Final practical exam 10%
5- Final theoretical exam 40%

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Geodetic surveying Workbook
Main references (sources)	1) Surveying, Principle and Applications, Barry F, Kavanagh, 6 th edition (2003). 2) Elementary Surveying and Introduction Geomatics (Paul R. wolf & Charles D. Ghilani), (2002). 3)Charles, D. G., 1999, "Geodetic Models fo the Earth", Penn State Surveying Program, U.S.A, pp.1-15.
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	Dr. Jumaa Muhammad Daoud's channel

Course Description Form

1. Course Name:	
Cadastral survey	
2. Course Code:	
SUT 210	
3. Semester / Year:	
Courses 2	
4. Description Preparation Date:	
30/1/2025	
5. Available Attendance Forms:	
mandatory	
6. Number of Credit Hours (Total) / Number of Units (Total)	
(2 theoretical) per week * 15 weeks = 30 hours	
7. Course administrator's name (mention all, if more than one name)	
Name: Shaker Ahmed Email: shakir.alkhufajjy@ntu.edu.iq	
8. Course Objectives	
Course Objectives	1- Training on calculating different types of regular and irregular areas.. 2- Training in calculating different types of regular and irregular areas for earthworks in road works and canal projects, in addition to calculating water volumes in lakes and dam reservoirs, in addition to different types of materials in mines. 3- How to calculate different types of horizontal and vertical curves (elements, stations and symbols used) and how to design spatial projection tables 4- Understand and learn how to use surveying tools in structural surveying.. 5- Understand and learn how to correct polygons in the Bodage and Transit methods, as well as how to use intersection techniques to find unknown lengths and directions.. 6- Training and mathematical and spatial practice to divide the land and calculate the area of each part and its location.
9. Teaching and Learning Strategies	
Strategy	1- Lectures 2- Practical application of theoretical topics 3- Summer training 4- Graduation research Evaluation1- Submitting weekly reports on experiments 2- Mont tests (theoretical and practical)

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1	4	Knowledge and application	Calculate the cross-sectional areas and volumes of the soil quantities for the above project and draw a Horizontal and longitudinal section as well as soil transport curve.	Theoretical and practical	Tests, assignments and reports
2	4	Knowledge and application	Conducting a field visit to some construction sites. Projects vary fr buildings, road works, canals, sew and pipes..	Theoretical practical	Tests, assignments reports
3	4	Knowledge and application	Solve exercises for closed circular and connected polygons and make the necessary corrections to angles and coordinates, and correct.	Theoretical practical	Tests, assignments reports
4	4	Knowledge and application	Completion of the above calculations with the calculation of lengths and directions corrected by the inverse calculations of lengths in a graphical manner using the least effort and axis methods...	Theoretical practical	Tests, assignments reports
5	4	Knowledge and application	Solve various exercises using the first intersection to find two unknown rafts (from two known locations and two known directions as well, and use the triangles and polygons laws for the purpose of solving.	Theoretical practical	Tests, assignments reports
6	4	Knowledge and application	Solve the previous exercises using the first intersection, but using the analytical geometry and rotation methods.	Theoretical practical	Tests, assignments reports
7-8	4	Knowledge and application	Solve various exercises using the second intersection to find the length of one side and the direction of another side (from two known locations and a known direction of the side and a known	Theoretical practical	Tests, assignments reports

			length of the other side and use the triangle		
9	4	Knowledge and application	Solve various exercises using the third intersection to find the directions of two sides (from two known locations and two known lengths using the trigonometric method for the purpose of solving).	Theoretical practical	Tests, assignments reports
10-11	4	Knowledge and application	- Solving exercises on circular polygons and a connection with unknown dimensions: (lengths and directions) using intersections: None. Also solving exercises on the intersection of straight lines or straight lines with circles or the intersection of circles.	Theoretical practical	Tests, assignments andreports
12-13	4	Knowledge and application	Solve exercises for the three expected cases in the back intersection to find the location of the chosen point (from three known locations and two measured angles)	Theoretical practical	Tests,assignme and reports
14-15	4	Knowledge and application	Prepare tables with logical steps to solve various problems with unknown measurements using intersections, forward and inverse calculations..a	Theoretical practical	Tests, assignments reports
14-15	4	Knowledge and application	Land division project: Providing the necessary information about the areas of the plots to be established, the dimensions of the streets and their radii, and some of the dimensions and	Theoretical practical	Tests, assignments reports

11. Course Evaluation

Oral exams / written exams / weekly reports / daily attendance / participation and interaction in lectures / semester and final exams

12. Learning and Teaching Resources	
Course development plan.	1- Updating lectures. 2- Using modern methods in education.
Infrastructure	1- Engineering Survey. Ziad Al-Bakr 2- Engineering Survey for Oren Engineers 3- Structural Survey William Irvine

Course Description Form

1. Course Name:	
Design and preparation of maps	
2. Course Code:	
SUT 211	
3. Semester / Year:	
Second / Second	
4. Description Preparation Date:	
22 – 6 – 2025	
5. Available Attendance Forms:	
Theoretical and Practical	
6. Number of Credit Hours (Total) / Number of Units (Total)	
72	
7. Course administrator's name (mention all, if more than one name)	
Name: dr. Mohammed Fathi Mohammed Email: m_almoula@yahoo.com	
8. Course Objectives	
Course Objectives	• Students will learn how to design maps and understand their different types: linear, area and point. • Students will be able to find the geographic and quadratic coordinates of maps. • Students will be able to prepare a contour map of a specific area to learn about the nature of its terrain. • Students will be able to draw the types of scales used in maps.
9. Teaching and Learning Strategies	
Strategy	((Theoretical and practical lectures / assignments and encouragement to participate in lectures))

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1	2 + 3	Knowledge and application	design Maps (concept Design And its principles)	Theoretical and practical	Tests, assignments and reports
2	2 + 3	Knowledge and application	Map design and colors	Theoretical and practical	Tests, assignments and reports
3+ 4	2 + 3	Knowledge and application	Maps networking and indexing	Theoretical and practical	Tests, assignments and reports
5 + 6	2 + 3	Knowledge and application	Copy and print maps	Theoretical and practical	Tests, assignments and reports
7	2 + 3	Knowledge and application	Thematic maos	Theoretical and practical	Tests, assignments and reports
8 + 9	2 + 3	Knowledge and application	Digital Maps	Theoretical and practical	Tests, assignments and reports
10 + 11	2 + 3	Knowledge and application	Contouring Maps	Theoretical and practical	Tests, assignments and reports
12	2 + 3	Knowledge and application	Topographic maps	Theoretical and practical	Tests, assignments and reports
13	2 + 3	Knowledge and application	Geographic Information System (GIS)	Theoretical and practical	Tests, assignments and reports
14	2 + 3	Knowledge and application	Preparing a project with the GIS system	Theoretical and practical	Tests, assignments and reports
15	2 + 3	Knowledge and application	Preparing a map with the GIS system	Theoretical and practical	Tests, assignments and reports
11. Course Evaluation					
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc					

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	
Main references (sources)	1- Robinson,J,S.,"Elements of cartography",5th Ed.,1980. 2- Keats,J,S.,"Cartography Design and Production",3rd Ed.,1980
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name:
Quantity surveying
2. Course Code:
NTU215
3. Semester / Year:
Courses second
4. Description Preparation Date:
30/1/2025
5. Available Attendance Forms:
mandatory
6. Number of Credit Hours (Total) / Number of Units (Total)
(2 theoretical) per week * 15 weeks = 30 hours
7. Course administrator's name (mention all, if more than one name)
Name: Fadia A. Sulaiman Email: mailto:fadiah@ntu.edu.iq
8. Course Objectives

Course Objectives	After having a knowledge base of construction, its methods and techniques, the learner will be able to prepare the construction project, methods of calculating quantities, and estimating the costs of various types of projects. He will also discuss the scheduling of time and financial projects, and the specifications of materials and workers for projects.
9. Teaching and Learning Strategies	
Strategy	Students will be able to learn about traditional construction materials and modern building materials. - The student will be able to learn about traditional and modern construction methods and methods, such as dry construction. •-Students will be able to know and master methods for estimating the quantities of construction materials available in the labor market. Students will learn how to estimate and operate construction machinery and equipment, and calculate and implement methods for various engineering projects.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Knowledge and application	Calculating the longitudinal sections and sizes of earthworks for cutting and backfilling	Theoretical and practical	Tests, assignments and reports
2	2	Knowledge and application	Various exercises for calculating the volume of earthworks	Theoretical and practical	Tests, assignments and reports
3	2	Knowledge and application	Calculating the amount of finishing work using traditional and modern materials	Theoretical and practical	Tests, assignments and reports
4	2	Knowledge and application	Calculating the quantity of flooring works, cashiers, skirting and a table of quantities	Theoretical and practical	Tests, assignments and reports
5	2	Knowledge and application	Calculate quantities and schedule work progress on the computer	Theoretical and practical	Tests, assignments and reports
6	2	Knowledge and application	Using a computer and applying a program to calculate quantities and schedule work progress	Theoretical and practical	Tests, assignments and reports
7	2	Knowledge and application	Types of roads Estimation and dimensions for road works, methods for calculating the volumes of earthworks	Theoretical and practical	Tests, assignments and reports
8	2	Knowledge and application	Scientific visit	Theoretical and practical	Tests, assignments and reports
9	2	Knowledge and application	Modern building materials, such as dry building materials, packaging materials for walls, floors, and building facades, available in the labor market, and methods for calculating them.	Theoretical and practical	Tests, assignments and reports

10	2	Knowledge and application	Applying an exercise in calculating quantities on a map of a residential house, residential complex, or building under construction, and introducing the student on the ground to the obstacles on a real construction site.	Theoretical and practical	Tests, assignments and reports
11	2	Knowledge and application	Calculating the amount of structural sections below the moisture barrier level Excavation and use of boulder stone, types of foundation concrete, building with bricks.	Theoretical and practical	Tests, assignments and reports
12	2	Knowledge and application	Continuation of the previous week.	Theoretical and practical	Tests, assignments and reports
13	2	Knowledge and application	Calculating the quantity of moisture-preventing concrete and additives, calculating the quantity of items above the moisture-preventing level and explaining its quantity table	Theoretical and practical	Tests, assignments and reports
14	2	Knowledge and application	Terminations Types of ficus used.	Theoretical and practical	Tests, assignments and reports

11. Course Evaluation

First monthly exam 20%	Second monthly exam 20%	Practical assignments and daily tests Practical 10%	Annual striving 50%	Final exam 50%

12. Learning and Teaching Resources

Course development plan.	1- Updating lectures. 2- Using modern methods in education.
Infrastructure	1.Civil Engineering and Costing, S.P. Mahajan, 624. 1042, M214. 2. Estimating Building and Construction, 692.5, H816, 73-119. 3. Civil Engineering Estimating and Costing, V.N. VANZIRANI, S.P. CHANDOLA, first edition, 1982

Course Description Form

1. Course Name:

Geographic Information Systems

2. Course Code:

SUT 212

3. Semester / Year:

Second Semester / 2024–2025

4. Description Preparation Date:

2025

5. Available Attendance Forms:

Theoretical and Practical Attendance

6. Number of Credit Hours (Total) / Number of Units (Total)

4 (1 Theory, 3 Practical)

7. Course administrator's name (mention all, if more than one name)

Name: Dr. AbdulSattar Mohammed Khidhir
Email: abdulsattarmk@ntu.edu.iq

8. Course Objectives

Course Objectives	- Introduce students to the foundations and use of GIS software. - Enable students to analyze and produce spatial and descriptive maps. - Equip students with practical skills in using ArcMap and handling GIS data.

9. Teaching and Learning Strategies

Strategy	• Presenting lectures using data show with visual effects. • Using the board to clarify difficult concepts. • Interactive Q&A sessions with students. • Hands-on training using computers. • Weekly reports and map analysis tasks.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	Understand GIS fundamentals	Definition Components of GIS	Lecture + Lawı	Participation
2	4	Install and explore ArcGIS	Installing and Explor ArcGIS	Presentation Practice	Daily Quiz

3	4	Georeferencing maps	Reference points converting maps	Presentation Examples	Lab Applicati
4	4	Aerial image correcti	Satellite and ae images	Discussion Practice	Report
5	4	Coordinate systems	UTM – WGS84	Discussion Practice	Report
6	4	Measurement tools	Zoom, Measure tools	Practice	Report
7	4	Editing features	Drawing features	Practice	Report
8	4	Advanced tools	Cut, Paste, Transforn	Practice	Report
9	4	Advanced edit menus	Advanced elements	Q&A + Pract	Participation
10	4	Data tables	Spatial and attrib data	Discussion Practice	Daily Quiz
11	4	Map layout technique	Scales and line types	Examples Practice	Quiz
12	4	Labels	Titles and componen	Examples Practice	Practical Assessment
13	4	Symbols	Shapes and sizes	Discussion Practice	Report
14	4	Topographic maps	Types of maps	Discussion Practice	Lab Evaluation
15	4	Map output	Printing and export maps	Practice	Final Report

11. Course Evaluation

- Daily preparation: 10%
- Class participation: 10%
- Monthly quizzes: 20%
- Lab reports: 10%
- Final exam: 50%

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	- GIS - Foundations and Applications – Ali Abdul Abbas Al-Azzawi - GIS – Diyaa Qutaishat
Main references (sources)	- GIS – Technical and Vocational Training Corporation – KSA
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name

Design of road in computer (Civil 3D)

2. Course Code:

SUT 214

3. Semester / Year:

Decisions.

4. Description Preparation Date:

(2025 / 6/ 16)

5. Available Attendance Forms:

1. Weekly lesson schedule (practical).
2. Practical experiments, extracurricula experiments, pop quiz.

6. Number of Credit Hours (Total) / Number of Units (Total)

90 hours

7. Course administrator's name (mention all, if more than one name)

Name: isam kahdir idres Khaled hazem ibrahem Taha yassen taha
Email: isam.khidir759@ntu.edu.iq

8. Course Objectives

Course Objectives	1- Providing students with basic concepts related to the programCivil 3D. 2- Knowing the basic methods of drawing anddesigning roads. 3- Enabling the student to solve the problems he faces within the program during design.

9. Teaching and Learning Strategies

Strategy	Lectures prepared by the engineering professors supervising the course in practical teaching using the Civil 3D program.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	6	Knowledge and application	Enter the aerial image and link it to global coordinates in	practical	Tests and reports

			the program.		
2	6	Knowledge and application	Drawing and designing paths	practical	Tests and reports
3	6	Knowledge and application	Modify paths	practical	Tests and reports
4	6	Knowledge and application	Superelevation	practical	Tests and reports
5	6	Knowledge and application	Profile Drawing	practical	Tests and reports
6	6	Knowledge and application	Profiles Edit	practical	Tests and reports
7	6	Knowledge and application	Design Grid line	practical	Tests and reports
8	6	Knowledge and application	General Review	practical	Tests and reports
9	6	Knowledge and application	Band	practical	Tests and reports
10	6	Knowledge and application	Assembly	practical	Tests and reports
11	6	Knowledge and application	Corridor	practical	Tests and reports
12	6	Knowledge and application	Section View	practical	Tests and reports
13	6	Knowledge and application	Edit Section View	practical	Tests and reports
14	6	Knowledge and application	Calculate earthy quantities Edit Section View	practical	Tests and reports
15	6	Knowledge and application	Out put	practical	Tests and reports

11. Course Evaluation

Attendance	Monthly Exam	Reports	Annual Attempt	Final Exam	Final Grade
10	30	10	50	50	100

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Available in free education and the institute's library
Main references (sources)	Using modern methods in education.
Recommended books and references (scientific journals, reports…)	Available in free education and the institute's library
Electronic References, Websites	