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 – civil engineering technologies / surveying branch

2026

Introduction:

The educational program is a coordinated and structured package of courses that include procedures and experiences that are organized in the form of a vocabulary of study whose main purpose is to build and refine the skills of graduates to make them qualified to meet the requirements of the labor market, which is reviewed and evaluated annually through internal or external audit procedures and programs such as the external examiner program.

The description of the academic program provides a brief summary of the main features of the program and its courses, indicating the skills that are being worked on to acquire students based on the objectives of the academic program, and the importance of this description is evident because it represents the cornerstone of obtaining program accreditation and is co-written by the teaching staff under the supervision of the scientific committees in the scientific departments.

This manual, in its second edition, includes a description of the academic program after updating the vocabulary and paragraphs of the previous guide in light of the developments and developments of the educational system in Iraq, which included the description of the academic program in its traditional form (annual and quarterly), as well as the adoption of the description of the academic program circulated under the

letter of the Department of Studies M3/2906 on 3/5/2023 regarding the programs that adopt the Bologna track as the basis for their work.

In this regard, we can only stress the importance of writing descriptions of academic programs and courses to ensure the smooth functioning of the educational process.

Concepts and Terms:

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

Course Description: It provides a contingent summary of the most important characteristics of the course and the learning outcomes expected of the student to

achieve and demonstrate whether he or she has made the most of the available learning opportunities. It is derived from the program description.

Program Vision: An ambitious vision of the future of the academic program to be a cutting-edge, inspiring, stimulating, realistic and viable program.

Program Mission: Briefly outlines the goals and activities needed to achieve them and outlines the program's development paths and directions.

Program Objectives: These are phrases that describe what the academic program intends to achieve over 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 (semester, yearly, Bologna track), whether they are a requirement (ministry, university, college and scientific department) with the number of study units.

Learning Outcomes: A consistent set of knowledge, skills, and values that the student has acquired after the successful completion of the academic program and must define the learning outcomes of each course in a way that achieves the goals of the program.

Teaching and Learning Strategies: These are the strategies used by a faculty member to develop student teaching and learning, and they are plans that are followed to reach learning goals. That is, they describe all classroom and extra-curricular activities to achieve the learning outcomes of the program.

Academic Program Description Form

University Name: Middle Euphrates Technical University

College/Institute: Technical Institute – Najaf

Scientific Department: Department of Civil Technologies / Survey Technologies Branch

Academic or Professional Program Name: Academic

Final Certificate Name: Technical Diploma

Curriculum: Annual

Description Preparation Date: 18/1/2026

File Filing Date: 27/1/2026

Signature : Dr. Nabeel Kathem

Head of Department Name :

Date :

Signature :

Scintific Associate Name

Date :

Department: Director of the Quality Assurance and University Performance

Dr. Zaid Abdulkareem ALhamidawi

History

Signature

Approval by the Dean

Prof. Dr. Haider Hassan Abd Hussein

1. Program Vision

Excellence and modernity in qualifying technical cadres specialized in the field of surveying technologies scientifically and practically to meet the needs of the labor market and keep pace with modern developments in the fields of measurement and spatial analysis.

2. Program Mission

Preparing scientifically and practically qualified human cadres in the field of surveying techniques and geomechanical engineering, capable of competing in the labor market according to approved international quality standards, and capable of using the latest cadastral devices and software to support construction, urbanization and planning projects.

3. Program Objectives

Qualifying a graduate of the Department of Surveying Technologies to be an applied technician who has the ability to carry out surveying applications through The use of traditional and modern techniques in the design, implementation, preparation and production of maps of all kinds from ground and aerial surveys, remote sensing, and conducting high-precision surveys of engineering projects (dams, reservoirs, bridges, tunnels, laboratories, roads and airports), as well as excellence and quality in performance and achieving leadership in the graduates of the department to provide the community with technical engineers in their field of specialization.

4. **Program Accreditation**
ABET Accredited Accreditation Program

5. **Other External Influences**
Private and Government Sector Work Projects

6. **Program Structure**				
Notes*	**Percentage**	**Study Unit**	**Number of Courses**	**Program Structure**
			2	**Enterprise Requirements**
			4	**College Requirements**
			16	**Department Requirements**
				Summer Training
				Other

* It is possible to include notes on whether the course is basic or elective.

7. **Program Description**				
Credit Hours		**Course or course name**	**Course or course code**	**Year/Level**
practical	**theoretical**			
6	4	Area /1	STD111	First

3	2	Aerial Photogrammetry	STD112	The first
-	2	Mathematics and spherical triangles	STD113	The first
-	2	Remote Sensing	STD114	The first
-	1	Earth Surface Science	STD115	The first
2	2	Computers	STD116	The first
-	2	Quantitative Survey	STD117	The first
3	-	Workshop	STD118	The first
-	2	Human Rights and Democracy	STD119	First
6	2	Area/2	STD211	The second
2	2	Digital photogrammetry	STD212	The second
3	2	Map Technology	STD213	The second
3	2	Engineering and Cadastre Survey	STD214	The second
3	-	Computer Applications	STD215	The second
3	1	GIS and Geospatial Techniques	STD216	The second
3	-	Project	STD217	The second

8. Expected Learning Outcomes of the Program

Knowledge

1 - The ability and knowledge to work on all aspects of surveying and obtaining knowledge in the fields of mathematics, computers, engineering sciences and humanities, and knowing how to employ them, and preparing the student for continuous scientific research.

2-The ability to diagnose engineering problems within the civil/cadastral jurisdiction, know their causes, and develop appropriate solutions.

3- Students should be familiar with the basic and modern theories in the various field and process engineering.

4 - The student should be familiar with the basics of using specialized surveying devices and digital technologies and their applications.
5 – Knowledge of project management with on-site surveys and leadership of work groups within professional ethics and principles of engineering economics.

Skills

1 - Surveying projects
2 - Making tables of quantities and calculating the areas and volumes of the surveying and projection works
3 - Making cadastral maps of all kinds

Values

Oral exams, written tests, direct questions during the lecture, and making mini-engineering projects for multiple groups of students.

9. Teaching and Learning Strategies

Making scientific reports that are discussed during the conch and using modern techniques. Encourage the completion of assignments and classroom tasks, as well as practice the use of the English language in expression, in addition to programming skills and their various applications. Focus on developing research skills included in curricula and graduation projects.

10. Evaluation Methods

Written and oral exams, semester exams, final exams, daily assessment, assignments, student behavior and scientific activity, and helping the rest of his colleagues during the theoretical and practical lecture.

11. Faculty

Faculty Members							
Preparing the teaching staff		Special requirements/skills (if applicable)		Specialization		Academic Rank	Teaching Name
Lecturer	Angel			Special	General		
	✓			Soil Engineering	Civil Engineering	Assistant Professor	Hussein Ali Mohammed
	✓			Geotechnic	Civil Engineering	Assistant Lecturer	Nabil Kaftfan Lotti
	✓					Teacher	Emad Eddine
	✓			Soil and Foundation Engineering	Soil and Foundation Engineering	Teacher	Munqith Sadiq Mohammed
	✓			Civil Engineering	Civil Engineering	Assistant Lecturer	Marwa Hamid Abdullah
	✓			English	English	Assistant Lecturer	Freeze Kazem Salman
	✓			Water Resources	Water Resources	Assistant Lecturer	Zainab Ahmad Abd
	✓					Teacher	Hussam
	✓					Assistant Lecturer	Ghaith
	✓					Assistant Lecturer	Marwa
	✓			Geotechnic	Civil Engineering	Teacher	Russell Hussein Ali

Professional Development
Mentoring new faculty members
Guided through direct meetings and meetings with the head of the department or line supervisor
Faculty Professional Development
1- Skills in the use of references andterminology . 2- Skills in collecting and analyzing data on topics. 3- Skills to exploit the available possibilities. 4- Skills of making comparisons about thesubject . 5- Skills of preparing special concepts about thesubject . 6- The student acquires job performance skills .

12. **Admission Criteria**
through the admission lists issued by the Ministry of Higher Education and Scientific Research .

13. **Key sources of information about the program**
Methodological Books. Electronic and printed scientific sources in Arabic and English in the specialization. Educational documents for the use of cadastral devices with educational videos on how to use them in practice. Lectures.

14. Program Development Plan
1- Working to develop technical education through the development of curricula, updating laboratories according to the internationally approved quality laboratory standards, and involving the department's employees in specialized

qualifying courses.

2- Contributing to the service of the community by holding courses and workshops in various civil engineering applications and advancing the movement of construction and reconstruction at a high level of quality. 3- Exchanging theoretical and practical technical experiences with the corresponding technical institutes and colleges with the corresponding specialization and the labor market in the private sector.

4- Providing an appropriate environment that stimulates learning and training.

5- Providing engineering and technical consultations to all government departments and institutions and the private sector.

The department aims to graduate qualified technical staff to carry out implementation works related to the fields of civil engineering, such as drawing and implementing plans, monitoring road projects and construction projects, conducting laboratory and field tests, surveys, and calculating the quantities and arms of civil works projects.

Program Skills Outline															
Learning Outcomes Required from the Program															
Values				Skills				Knowledge				Basic or Optional	Course Name	Course Code	Year / Level
C4	C3	C2	A1	B4	B3	B2	B1	A4	A3	A2	A1				
									√			Basic	Area /1)	STD111	First Year
√					√					√		Basic	Aerial Photogrammetry	STD112	
	√		√	√	√		√			√	√	Basic	Mathematics and spherical triangles	STD113	
√	√			√	√		√		√	√	√	Basic	Remote Sensing	STD114	

√	√			√	√					√	√	**Basic**	**Earth Surface Science**	STD115	
√					√					√	√	**Basic**	**Computers**	STD116	
√	√			√	√		√		√	√	√	**Basic**	**Quantitative Survey**	STD117	
												Basic	**Workshop**	STD118	
								√				**Basic**	**Human Rights and**	STD119	

													Democracy		
√	√	√	√	√	√	√	√	√	√	√	√	Basic	Area (2)	STD211	Second Year
√	√	√	√	√	√	√	√	√	√	√	√	Basic	Digital photogrammetry	STD212	
√	√	√	√	√	√	√	√	√	√	√	√	Basic	Map Technology	STD213	
	√	√			√				√	√		Basic	Engineering and cadastral survey	STD214	

√					√					√	√	**Basic**	**Computer Applications**	STD215	
√	√			√	√		√		√	√	√	**Basic**	**GIS and Geospatial Techniques**	STD216	
√	√	√	√	√	√		√		√	√	√	**Basic**	**Project**	STD217	

√Please indicate the boxes corresponding to the individual learning outcomes from the program being assessed

Course Description Form

Course Description

This course description provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve and demonstrate whether they have made the most of the available learning opportunities. It should be linked to the program description.;

1. Educational Institution	Middle Euphrates Technical University
2. Scientific Department / Center	Civil Technologies Department/ Survey Branch
3. Course Name/Code	Area -1 - Done 11
4. Available Forms of Attendance	Theoretical + practical
5. Semester/Year	Annual
6. Number of Hours (Total)	4 Theoretical Hours + 6 Practical Hours
7. Date this description was prepared	18/11/2025
8. Course Objectives	
The aim of the study of surveying is to understand the basics of the flat area and to find the relationship between the location of the points near or above the surface of the earth, and to be able to measure the horizontal and vertical distance of the observed target and measure the directions, as well as perform mathematical calculations to find the real measurements of distances, angles, and levels, and calculate the areas and volumes from the field data. Sign it on paper with a certain drawing scale.	

10. Course Outcomes, Teaching, Learning and Assessment Methods
A. Cognitive Objectives **A1. Identifying ground survey devices.** **A2- How to install ground survey devices** **A3. Types of Calculation Methods Used in Field Work** **A4. Types of Measuring Tapes**
b. Skill objectives of the course. **B1 – Installation of cadastral devices in the field** **B2 – Healthy methods for field measurements** **B3 – Accuracy of measuring angles and distances** **B4. Calibration of Devices**
Teaching and Learning Methods
1- Theoretical Lectures **2- Practical Lectures**
Evaluation Methods
1- Theoretical tests **2- Practical Tests**
C. Emotional and Values Goals **A1-How to maintain and maintain devices** **A2. Increasing the spirit of cooperation among students** **C3-Preserving Public Funds**
d. Transferred general and qualifying skills (other skills related to employability and personal development). **D1. Correct Methods in Preparing Practical Reports** **D2. Seminars and seminars** **D3. Scientific Research Writing**

11. Infrastructure

Theoretical vocabulary	
The week	**Vocabulary details**
The first	**An introduction to the area and its definition and a summary of the various works presented by the sections of the survey (planar area, geodetic area) and the definition of each of them explains the hypotheses of plane and geodesic area, the types of area according to the uses and purposes provided by (topographic area), cadastral and photographic, hydrographic, road surveying and mining surveying, determining the position of a point on the ground, orientation and designating a point on the straightness of a line (or along it).**
The second	**Units of measurement (units of length, area, volume) in the metric (French) and foot (English) systems, conversion from one unit to another within the same system, conversion from one system to another, measuring angles in hexagon and percentile and radius and converting from one system to another calculating the area in the real estate registration system (dunam, olk, meter).**
The third	**Drawing scale, its types (numerical scale with its fractional type, geometric representation). Conversion from geometric to fractional and vice versa Schematic scale (simple schematic scale, comparative linear scale, grid scale) Explain the design of the schematic scale, choose the scale according to the survey type, calculate the appropriate scale for the drawing and the unknown scale in a variety of ways.**
Fourth	**Measuring the distance on flat ground (flat and uneven), field measurement accuracy (relative accuracy), design accuracy, choosing the measurement method according to the required accuracy represented by a table (from the methodology) Comparison between the accuracy representation formula and the fractional scale formula for indirect measurement to calculate the distance in terms of other measuring sides.**
Fifth	**Measuring distance on inclined ground (regular inclination, irregular inclination, correcting for horizontal inclination when the slope is in terms of (angle of elevation or decline, difference in the plane between the two ends of the measuring line, percentage of inclination or slope, magnitude of the ground)). Measuring distance on a slanted surface with a bar in a horizontal position,**

	methods of correcting horizontal inclined distance (using triangular ratios, right triangle method, ratio and proportion method, and using a force sequence decoder to correct for height (one or two limits depending on the precision).
Sixth	Some of the engineering processes that take place during the measurement with the bar include the erection of columns from points on the route, the lowering of columns from points outside the tread, and the designation of the parallel to the treadmill.
Seventh	Potential obstacles during distance measurement: 1. Steering obstacles Not seeing the beginning and end from a midpoint. 2. Measurement obstacles (when the wrap is around the extended viewer). 3. Steering and measurement obstacles.
Eighth	Erase the details of the area (polygon and filling) using tape, draw the polygon (distribute the acceptable locking line by the graphical and mathematical method, draw the details on the corrected polygon).
Ninth	Leveling, definitions of basic terms (planar line, flat surface, horizontal line, comparison plane, mean sea level, attribution, leveling number, and types, difference of view, clarification of the target image, line of sight, optical axis, line of application, line of shape, height of leveler, leveling difference, backward reading, forward reading, midpoint reading, turning or turning point, other necessary definitions, types of leveling, direct leveling (by tape or by leveler).
Tenth	The purpose of the leveling, degrees of accuracy, the leveling device, its types, its parts, the installation of the leveling device, the types of leveling procedures, the reading of the leveling ruler, the calculation of the difference between two points, the calculation of the level of an unknown point in terms of a known point, the methods of settlement, the differential method, its definition, the steps of work, the methods of calculation (the method of the height of the level).
Eleventh	Complement the calculation methods (the rise and fall method), the comparison between them, the settlement table, the mathematical investigation of the table, possible errors in the settlement process, the methods of auditing the fieldwork (ending the settlement process at the starting point of the work, ending the settlement process at another known point).

XII	Vertical closing error, allowable error, correction of vertical closing error levels relative to the distance of the turning point from the beginning, the effect of the earth's sphericality and refraction on the ruler reading, verifying the validity of the device to work in the wedge method.
Thirteenth	Longitudinal and transverse sections, their definition, purpose, how they work in the field, assigning stations at regular and irregular distances, longitudinal sectional leveling, leveling the longitudinal section, for longitudinal and transverse section, arithmetic investigation, field work and correction, measuring cross-section levels, calculating the leveling of the construction line, lateral slopes, drawing the longitudinal section on which the construction line is fixed.
Fourteenth	Plotting the section and calculating the cross-sectional area (calculating the volumes between the identical station(s) using the mean of the two bases (the volumes between the transition stations are calculated according to the law of the pyramid).
Sixteenth	(Contour period) Factors affecting the selection of the contour period, giving a table showing the relationship between the purpose of preparing the map and its scale on the one hand and the contour period on the other hand, and a table showing the relationship between the scales and the contour period with the nature of the land.
Seventeenth	Preparing the contour map by the indirect method (the square grid method, the radial method) and drawing the contour lines by the method (arithmetic, estimating method).
Eighteenth	Theodolite devices and learn about its main parts and the function of each part, learn how to read horizontal and vertical circles and record them in a field book.
Nineteenth	How to read and calculate vertical angles and marginal error (inference or pointer error) and clarify which locations are used
Twenty	Learn the types of north (real, magnetic, and hypothetical) and calculate the directions of the sides through the angles observed in the field.
Twenty first	Learn how to observe horizontal angles.
Twenty two	Types, uses, and degrees (classification) of polygons with ribbed fieldwork and types of angles used in closed circular polygons.

	(Closed Loop Trav., Closed Connected Trav.).
Twenty Three	Making corrections for angles of various types in closed circular polygons and calculating the correct directions through them.
Twenty fourth	Calculation of horizontal and vertical compounds in closed circular polygons and their correction methods (Compass Rule & Transit Rule).
Twenty Fifth	Forward accounts and reverse calculations for point locations.
Twenty–sixth	Calculate coordinates (point locations) using corrected horizontal and vertical compounds and correct coordinates using horizontal and vertical compounds with closure error using compass and crossing methods.
Twenty Seventh	The student learns how to select the points of a Connected Traverse polygon and observe all angles (to the right and the corners of the turn).
Twenty Eight	Learn how to correct the angles of the connecting polygon in my method (Deflection angle – angle to the right)
Twenty Ninth	Calculations The student learns how to perform a closed link polygon (horizontal and vertical compounds) and calculate coordinates
Thirty	Make corrections using the compass and transit methods, and how to overcome (correct) the lock error, with how to draw a closed link polygon.

1 Required Textbooks	
2 Main References (Sources)	Sources: 1- Rymond E .davis Joe Wkelly. Elementary plan surveying 2- Singh , Narindr Surveying_ Tata MC Graw – Hill publishing Company limited – New Delhi 1982 3- Ziad Abdul-Jabbar Al-Bakr, Ibrahim Daoud Alwan Practical Survey. 4- Razan Ibrahim, 2011, Origins of Surveying, Amman, Community Library. 5- Yousef Siam, 2001, Surveying, Faculty of Engineering, University of Jordan.

	6- Yassin Obaid Ahmed 1990 Engineering Surveying - Faculty of Engineering, Al-Baho University.
Recommended books and references (scientific journals, reports,....)	
in Electronic References, Websites	

12. Course Development Plan
Use the video presentation with a 2% curriculum update

Course Description Form

Course Description

This course description provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve and demonstrate whether they have made the most of the available learning opportunities. It should be linked to the program description.;

9. Educational Institution	Middle Euphrates Technical University
10. Scientific Department / Center	Civil Technologies Department/ Survey Branch
11. Course Name/Code	Aerial Photogrammetry Survey / TM 12
12. Available Forms of Attendance	Theoretical + practical
13. Semester/Year	Annual
14. Number of Hours (Total)	2 Theoretical Hours + 3 Practical Hours
15. Date this description was prepared	18/11/2025
16. Course Objectives	
The student should be able to identify the principles of photographic aerial surveying, types of aerial photographs and cameras, find the scale of aerial images of all kinds, form the holographic model, calculate the levels of the landmarks, as well as design the airlines, make mosaics, use of filler devices in the preparation of detailed maps from aerial photographs, and deal with the two modern programs Erdas-Imagine in terms of radiological and spatial correction of digital data and images and the preparation of maps from them.	

13. Course Outcomes, Teaching, Learning and Assessment Methods
A. Cognitive Objectives **A1. Identifying aerial survey devices.** **A2. How to install aerial surveying devices** **A3- Types of Calculation Methods Used in Applied Work** **A4. Types of Aerial Surveying Devices** **A5-** **A6-**

b. Skill objectives of the course. **B1 – Operation of aerial surveying devices** **B2 – Healthy methods of measurements from images** **B3 – Accuracy of measuring angles and distances** **B4. Calibration of Devices**
Teaching and Learning Methods
3- Theoretical Lectures **4- Practical Lectures**
Evaluation Methods
1- Theoretical tests **2- Practical Tests**
C. Emotional and Values Goals **A1-How to maintain and maintain devices** **A2. Increasing the spirit of cooperation among students** **C3-Preserving Public Funds**
d. Transferred general and qualifying skills (other skills related to employability and personal development). **D1. Correct Methods in Preparing Practical Reports** **D2. Seminars and seminars** **D3. Scientific Research Writing** **D4-**

14 – Infrastructure

14. Infrastructure	
Theoretical vocabulary	
The week	Vocabulary details
The first	A brief history of aerial surveying and remote sensing, its development and uses in the present time, and the relationship between aerial survey and remote sensing, types of projections and types of images.
The second	The difference between aerial photographs, a map, and some important terms in the subject of aerial surveys

	related to the image and the information appearing on aerial photographs.
The third	Vertical aerial photographs, geometric relationships, coordinate systems, vertical aerial image scale over flat ground and over different terrain and medium scale graph.
Fourth	Other methods of calculating the scale of vertical aerial photographs, ground coordinates from vertical aerial photographs and calculating horizontal and oblique distances between points. Terrain displacement and elevation calculation
Fifth	Stereoscopic vision and its foundations, depth perception using both eyes, stereoscopic vision through images and their conditions, and ways of seeing the stereoscopic model using images. Using a stereoscope with mirrors in the baseline method for the two images. Y distancing, vertical hypertrophy.
Sixth	Flight Design, Flight Altitude, Local Scale, Longitudinal and Lateral Interference, Baseline Calculation of the total number of images of an area .
Seventh	Stereoscopic Distance, the Relationship between Distance and Points Height, Distance Difference, Spectrum Mark, Methods of Measuring Distance, Stereometer and How to Work with it.
VIII + IX	Finding the distance of the two basepoints of two consecutive aerial images, the equations of the distance, and finding the relationship between the distance and the height of the points.
Tenth	Types of aerial photography machines "Digital andAnaloge"

	Angle of Field of View and Classification of Aerial Photography Machines in Relation to Field of View Angle and its Uses, Parts of an Aerial Photography Machine.
Eleventh+XII	Oblique Aerial Images, Rotational Orientation in the System (Tilt, Turn, Deviation), Auxiliary Axis System for Tilt Images, Scale of Tilted Images, Ground Coordinates of Tilted Images, Engineering Analysis of Tilted Aerial Images.
Thirteenth	Calendar of oblique aerial images/Foundations of calendar/Calendar methods.
Fourteenth	Mosaics, their advantages, disadvantages and uses – types.
Fifteenth	Establish stereoscopic aerial surveying using filler devices. Internal Directive – Steps to Implement it: 1 - Preparing the positive glass image 2- Compensation for distortion caused by the camera lens 3- Positioning the positive glass image in the projector. 4- Placing the correct base distance in the projector.
Sixteenth	Relative orientation, possible movements of the projector (transitional movements of the parent and the runner), the distribution of the points used in the orientation of the holographic model, and the study of the effect of transitional and rotational movements on the movement of projected images in the filler.
Seventeenth	Methods of performing proportional guidance using the different elements of the filler device and focusing on the proportional steering procedure using only rotary elements.
Eighteenth	Absolute Guidance:

	-Sample Drawing Scale Selection - Adjust the scale of the form drawing –Form Adjustment
XIX-XXIII	Using the "Erdas-Imagine" program in accordance with the student's needs to deal with digital data, and this is done by clarifying the following titles: -The viewer -Image info -Histogram pixel data- Inquire cursor - Measurement tools - Inquire box - Tile viewers- Link viewers - Arrange layers viewer - Flicker- Blend fed - Swipe - Raster attribute editor - Image subset - Geometric correction - Filtering - Mosaic Images- Vector- Raster to vector- Map composer -

1 Required Textbooks	
2 Main References (Sources)	1. CALCULUS, George B. Thomas. 2. TRIGONOMETRY, P. ABBOTT, B.A.. 3. The Book of Applied Mathematics, by Yacoub Sabagha. 4. The Book of Spherical Triangles, by Yacoub Sabagha.

Recommended books and references (scientific journals, reports,....)	
in Electronic References, Websites	

15. Course Development Plan
Use the video presentation with a 2% curriculum update

Course Description Form

Course Description

This course description provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve and demonstrate whether they have made the most of the available learning opportunities. It should be linked to the program description.**;**

17. Educational Institution	Middle Euphrates Technical University

18. Scientific Department / Center	Civil Technologies Department/ Survey Branch
19. Course Name/Code	**Remote Sensing** / Done 13
20. Available Forms of Attendance	Theoretical aspect
21. Semester/Year	Annual
22. Number of Hours (Total)	2 Hours of Theory
23. Date this description was prepared	18/11/2025
24. Course Objectives	
The student should be able to identify the foundations and principles of remote sensing, identify the sources of remote sensing information, and identify the basic principles in correcting errors and distortions in space data, and then analyze and interpret space data.	

16. Course Outcomes, Teaching, Learning and Assessment Methods
A. Cognitive Objectives **A1. Identifying aerial survey devices.** **A2- How to run engineering software for image analysis** **A3- Types of Calculation Methods Used in Office Work** **A4. Types of software for image analysis** **A5-** **A6-**
b. Skill objectives of the course. **B1 – Properly operating the aerial surveying devices** **B2 – Hygienic methods for office measurements** **B3 – Accuracy of measuring angles and distances** **B4. Calibration of Devices**
Teaching and Learning Methods
5- Theoretical Lectures
Evaluation Methods
1- Theoretical tests

C. Emotional and Values Goals **A1-How to maintain and maintain devices** **A2. Increasing the spirit of cooperation among students** **C3-Preserving Public Funds** **C4-**
d. Transferred general and qualifying skills (other skills related to employability and personal development). **D1. Correct Methods in Preparing Practical Reports** **D2. Seminars and seminars** **D3. Scientific Research Writing** **D4-**

17. Infrastructure

Theoretical vocabulary	
The week	**Vocabulary details**
1	**Introduction to Remote Sensing Including a Brief History of Remote Sensing Science, Definition of Remote Sensing**
2-3	**The basic elements of a remote sensing system include the electromagnetic radiation source** **Electromagnetic Energy , Electromagnetic Spectrum) , Radiation Transmission Path (Dispersion , Absorption and Penetration) , Observed Target , Radiation Device**
4	**Digital Image Components**
5-6	**Information Sources in Remote Sensing, First: Photographic Sources include (Normal Black and White Films, Black and Infrared Films, Regular Color Films, Near-Infrared Colored Films, Multispectral Images)**
7-9	**Information sources in remote sensing, second: non-photographic sources, including aerial means (multispectral receiver, thermal linear infrared receiver, microwave sensors). Space means (manned space means, unmanned space means)**
10-11	**Some of the terms used in remote sensing science are (Resolution), (Spatial Coverage), (Satellite Orbits), (Accuracy)**
12-13	**Satellites include satellites (IKONOS, Quick Bird, NOAA, SPOT-5, LANDSAT-7) and future satellites.**
14-16	**Initial processing of space data, including** **1 Geometric correction** **2 Radiometric correction** **3 Noise removal**
17-18	**Spatial Data Enhancement**

19-20	Integration of Spatial Data Image Merging and Image Mosaic
21	Image interpretation and analysis Traditional analysis and interpretation includes: size, shape, tone of color, pattern, shade, time of day and year, position, texture.
22-23	What some phenomena look like on the pictures (terrain, rocks and soil, natural vegetation, agricultural crops, transportation, cities and urban areas, archaeological sites)
24-25	Automated Analysis and Interpretation: Includes 1 Supervised classification 2 Unsupervised classification
26-27	Various Applications in Remote Sensing: 1. Urban Applications: These include (detailed mapping of cities, study of traffic and parking lots, planning and distribution of parks and parks, study of land use, urban expansion and its direction, study of industrial complexes).
28	2. Agricultural Applications: These include (study of types of agriculture and crops, study of natural plants, study of plant diseases)
29	3 Military Applications: It includes (Intelligence and Enemy Surveillance, Pilot Training)
30	Other Applications: (Environmental Pollution Study, Natural Disaster Study)

18. Course Development Plan	
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1 Required Textbooks	
2 Main References (Sources)	1 Murad Al-Sheikh, Makram Anwar, (1991), "The Science of Remote Sensing", Technical Institutes Authority, Ministry of Higher Education and Scientific Research, Iraq. 2 Al-Dagestani, Nabil Sobhi, (2003), "Remote Sensing: Basics and Application", Al-Balqa University. 3. Swain , P.f Davis S.M. , (1978) " Remote sensing the Quantities approach " ,New York . 4. Sabin's , F.F.Jr. (1987), " Remote sensing Principles and Interpretation " ,2nd Ed. , New York . 5. Lillesand, T.M. & Kiefer, R.W. (2000), "Remote Sensing and Image Interpretation",4th ed., New York.
Recommended books and references (scientific journals, reports,....)	
in Electronic References, Websites	
19. Course Development Plan	
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Course Description Form

Course Description

This course description provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve and demonstrate whether they have made the most of the available learning opportunities. It should be linked to the program description.;

25. Educational Institution	Middle Euphrates Technical University
26. Scientific Department / Center	Department of Surveying Technologies
27. Course Name/Code	Earth Surface Science / Done 14
28. Available Forms of Attendance	Theoretical aspect
29. Semester/Year	Annual
30. Number of Hours (Total)	1 hour of my view
31. Date this description was prepared	18/11/2025

32. Course Objectives
The student will be able to identify the geomorphological phenomena that he surveys and draws, and how to identify them in geological maps and aerial photographs, as well as identify the types of sediments, minerals, atmospheric mantles, the movement of land masses and their prevention, in addition to the geology of the locations of dams and reservoirs.

20. Course Outcomes, Teaching, Learning and Assessment Methods
A. Cognitive Objectives **A1. Identifying the types of rocks and soils.** **A2. How to install aerial surveying devices** **A3- Types of computational methods used in applied work** **A4. Types of Aerial Surveying Devices**
b. Skill objectives of the course. **B1 – Operation of aerial surveying devices** **B2 – Healthy methods of measurements from images** **B3 – Accuracy of measuring angles and distances** **B4. Calibration of Devices**
Teaching and Learning Methods
6- Theoretical Lectures
Evaluation Methods
1- Theoretical tests
C. Emotional and Values Goals **A1-How to maintain and maintain devices** **A2. Increasing the spirit of cooperation among students** **C3-Preserving Public Funds**

d. Transferred general and qualifying skills (other skills related to employability and personal development).
D1. Correct Methods in Preparing Practical Reports
D2. Seminars and seminars
D3. Scientific Research Writing

14 – Infrastructure

21. Infrastructure

Theoretical vocabulary

The week	Vocabulary details
1	Introduction to the topic of Earth surface science and its relationship to other sciences and surveying.
2	Main features of the earth's crust, subsoil and atmospheres
3	Minerals, their natural properties with examples.
4	Rocks, their definition, types, and their cycle in nature. Igneous Rocks0
5–6	Sedimentary rocks, their types, crumbs, chemical and life.
7–8	Metamorphism, Types, Metamorphic Rocks, Texture and Types.
9–11	Weathering, Types, Mechanical, Chemical and Effect of Climate, Rock Texture and Mineral Composition on Weathering Processes
12 –14	Soils, its segment, the factors controlling its composition, its types, the soil classification triangle.
15–17	Erosion, rivers, geomorphological purifications of river erosion, geomorphological phenomena of river sedimentation process, river drainage systems 0
18–20	Contour maps, drawing them, drawing profiles , and interpreting the topographical phenomena from these maps.
21–22	Geological maps, their importance and the drawing of oblique layers on contour maps.
23–24	Structural geology, types of rock formations, folds, faults and dividers.
25	The movement of land masses, their causes, prevention, slips and dips.

26	**Iraq's natural resources, oil, and the most important oil fields in Iraq.**
27-28	**Geology of the locations of dams, reservoirs and tunnels.**
29-30	**Interpretation of Geomorphological Phenomena from Aerial Photographs.**

1 Required Textbooks	
2 Main References (Sources)	1 Principles and Applications of Engineering Geology, by Majeed Aboud Jassim Al-Taie, University of Basra, 2001. 2 Engineering Geology, Miqdad Hussein Ali, Bassem Rushdi Hijab, Sinan Hashem Al-Jassar, University of Baghdad, 1990. 3 Foundations of Geology for Engineers, Kinana Muhammad Thabet, Muhammad Omar Al-Asho, University of Mosul, 1993 4 Principles of Geology and Geomorphology, Ghada Muhammad Salim, Muhammad Mahdi Abbas, Fadel Noumas Al-Saadouni, Technical Institutes Foundation, 1984
Recommended books and references (scientific journals, reports,....)	
in Electronic References, Websites	

22. Course Development Plan
Use the video presentation with a 2% curriculum update

Course Description Form

Course Description

This course description provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve and demonstrate whether they have made the most of the available learning opportunities. It should be linked to the program description.;

33. Educational Institution	Middle Euphrates Technical University
34. Scientific Department / Center	Civil Technologies Department/ Survey Branch
35. Course Name/Code	Computers – 15
36. Available Forms of Attendance	Theoretical + practical
37. Semester/Year	Annual
38. Number of Hours (Total)	2 Theoretical Hours + 2 Practical Hours
39. Date this description was prepared	18/11/2025
40. Course Objectives	
1- Teaching the student the components of the calculator, studying the Windows 7 operating system , and getting to know the system's commands and windows. **2- Teaching the student to write and prepare texts in Word 2010.**	

3- Teaching the student to create tables, manage graphic objects and geometric shapes, and deal with databases in Excel 2010.

4- Teach the student to prepare slides for texts and graphic shapes and prepare an interactive slide presentation in the Power Point 2010 program.

5- Teaching the student to use the Auto CAD 2010 drawing program and to get to know the program interface, drawing and modifying commands, writing commands, adding dimensions, subtracting and forming layers.

23. Course Outcomes, Teaching, Learning and Assessment Methods

A. Cognitive Objectives
A1. Identifying computers.
A2- How to operate computers
A3. Types of Calculation Methods Used in Field Work
A4. Software Types

b. Skill objectives of the course.
B1 – Running the computer correctly
B2 – Healthy Methods of Measurements
B3 – Accuracy of measuring angles and distances
B4. Calibration of Devices

Teaching and Learning Methods

1. Theoretical lectures
2. Practical Lectures

Evaluation Methods

1- Theoretical tests
2- Practical Tests

C. Emotional and Values Goals
A1-How to maintain and maintain devices
A2. Increasing the spirit of cooperation among students
C3-Preserving Public Funds

d. Transferred general and qualifying skills (other skills related to employability and personal development).
D1. Correct Methods in Preparing Practical Reports
D2. Seminars and seminars
D3. Scientific Research Writing

24. Infrastructure

Theoretical vocabulary

The week	Details
First	- General Introduction to the Basics of Computers and its Hardware and Software - Windows 7 (System Launch, Desktop Components, Icon Concept Icons, Desktop Arrangement Change, Screen Size and Screen Resolution Control, Taskbar and Components, Time, Date & Sound Control, System Exit, Computer Shutdown)
The second	- The concept of a window for any program and its main components, changing the size of windows, moving them, closing them, and navigating between open windows - Learn about the Start menu and its contents - Identify the My computer icon, its features and basic information about the computer (processor speed, processor type, memory size, operating system and version number)
The third	- Folders and files (configure, move, clone, rename, delete, retrieve from the trash, empty the trash) - Use the Find command to select a file or folder - The concept of compression and decompression of files or folders - Control the Folder Option
Fourth	Control Panel Settings))[System and security, Network and internet,] [Appearance and personalization, User accounts and family safety,] [Programs(uninstall a program), Hardware and sound]
Fifth	Word 2010 - Program introduction, program call, Introduction to the main interface and its elements (Command bar, Ribbons, Tools, Default Business File Name, Name Change, Field of View Measurement Changed, Store a New File for the First Time) - Word Art main text (insert text, change text, rotate text, change font size, format bar)
Sixth	General settings (flip page from portrait to landscape mode, page frame, show ruler, pagination, header & footer, pre-print preview, print)
Seventh	- Text } 1- Direct text (text writing, text settings, adding symbols and mathematical equations) 2- Text box, keyboard shortcuts {
Eighth	- Graphics (Basic Shapes, Picture Pictures, Clip Art, Illustrations and Statistics - Tables (Draw a table, change the scale of a table, cram a line or column into a table, merge several cells into a table, split a cell, ascend and descend order of table lines, delete lines and columns)
Ninth	Excel 2010

	- Running the program, recognizing the main interface and bars - Create a Table table (enter values for cells, move between cells, zoom in and out of cells, merge cells, select cells, lines and columns, select all page, move cells, cram a line or column, clear a line or column) - File storage - Modify the text format from the Home bar - Frame drawing for Boarders cells and adjusting settings for the frame
Tenth	- Change page name, add new page, clear page, move or copy page, protect page from edits, hide page - Change of heading direction (making the page from right to left) - Series Creation - Creating a function (creating a function manually, using ready-made mathematical, statistical and logical functions)
Eleventh	- Print settings - Data management (write code, change cell content format, find value, replace values, sort, filter filter, freeze panes) - Dealing with databases (importing data from the Internet, importing data from databases, importing data from text files)
XII	Object Management (Clip Art, Geometric Shapes, Add Text Box, Word Art Effects , Smart Art, Statistical Chart, Header and Footer
Thirteenth	Power Point 2010 - Run the program and get to know the program interface - Slide Setup (Word Art, Shapes, Text Box, Back ground)
Fourteenth	- Animate elements in the Custom Animation slide (add animation to any item on the slide, add sound to the animation, browse the project within the storyboard, browse the project on the whole screen, clear the animation, change the sequence of motion, add an implicit animation)
Fifteenth	- Set up a multi-slide project (add a new slide, edit slides, delete slides) - Setting up an interactive show slideshow using hyperlinks
Sixteenth	Auto CAD 2010 Program Operation and General Concepts (Program Operation, Program Workspace Recognize, Display Cube, Steering Wheel, Display Movement, Ribbon Ribbon, Menus, Toolbars, Closing the Program)
Seventeenth	- Open a previous drawing file, control the display of the contents of the drawing file using the Zoom command and its options, Pan command, close the drawing file, create a new file, save the file - Units and Limits
Eighteenth	Precision drawing and drawing aids (Grid, Snap, Ortho, Polar, Osnap)

Nineteenth	Draw commands (Point, Line, Point Coordinates Definition Formulas, Multiline)
Twenty	Draw Orders (Polyline, Rectangle, Polygon)
Twenty first	Draw commands (Circle, Arc, Ellipse)
Twenty two	Drawing Elements Identification , Grips
Twenty Three	Modify commands (Erase, Move, Rotation, Copy, Offset)
Twenty fourth	Modify commands (Mirror, Array, Scale, Break, Extend)
Twenty Fifth	Modify commands (Fillet, Chamfer , Trim, Explode)
Twenty-sixth	Text commands (single line text, multiline text, making new style forms for writing
Twenty Seventh	Sectors and Fragmentation
Twenty Eight	- Control the drawing specifications (Line type, Line weight, color) - Modify Drawing Properties
Twenty Ninth	Dimension (Linear Dim., Aligned Dim., Radial Dim., Diameter Dim., Angular Dim., Quick Dim., Baseline Dim., Continuous Dim., Dimension Style)
Thirty	Layers (Create a new layer, change layer name, delete layer, show and hide layers, melt layers, lock and unlock layers, change color, font type, view font, print layer, layer filter

1 Required Textbooks	
2 Main References (Sources)	Sources: 1- The Book of Computer Basics by the Author Ahmed Muhammad Ibrahim Muhammad (PDF) 2- Windows 7 Book By Shereen Elmasry 3- The book of learning and professionalism of Windows 7 by the author Muhammad Nazih Muhammad 4- Office 2010 by Ihsan Muhammad Abdullah Al-Haysmi 5. Microsoft Office books on the www.kutub.info/library/category/47 website 6 7- AutoCAD Basics Booklet 2010 Prepared by Assistant Lecturer Ali Mahdi Muften / Al-Nahrain University
Recommended books and references (scientific journals, reports,....)	

in Electronic References, Websites	1- AutoCAD 2009 by the author Engineer George Mawas, download at the link http://www.kutub.info/Library/book/6686 2. The Learning Lieutenant Kit for Windows 7 and Office 2010 in an easy way Download on the following links: http:/www.4shared.com/document/TCXX0vb/Windows_7_Learning_in_Arabic_.html http:/www.4shared.com/document/5r_zEuZ/Learning_word_2010_in_Arabic_.html http:/www.4shared.com/document/kyygWceL/Excel_2010 _Learning_in_Arabic_.html 1- http:/www.4shared.com/document/UZR9pxgM/Learning_PowerPoint_2010_.html

25. Course Development Plan
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Course Description Form

Course Description

This course description provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve and demonstrate whether they have made the most of the available learning opportunities. It should be linked to the program description.;

41. Educational Institution	Middle Euphrates Technical University
42. Scientific Department / Center	Civil Technologies Department/ Survey Branch
43. Course Name/Code	Quantitative Survey /Done 16
44. Available Forms of Attendance	Theoretical aspect
45. Semester/Year	Annual
46. Number of Hours (Total)	2 Hours of Theory
47. Date this description was prepared	18/11/2025
48. Course Objectives	
The student should be able to identify the types of materials, machinery, equipment, and methods of implementation of various engineering projects (buildings, roads, railways, tunnels, canals, and airports).	

26. Course Outcomes, Teaching, Learning and Assessment Methods
A. Cognitive Objectives **A1. Identifying ground survey devices.** **A2- How to install ground survey devices** **A3. Types of Calculation Methods Used in Field Work** **A4. Types of Engineering Machinery and Equipment in Surveying Works**
b. Skill objectives of the course. **B1 – Installation of cadastral devices in the field** **B2 – Healthy methods for field measurements** **B3 – Accuracy of measuring angles and distances** **B4- Read the maps correctly**
Teaching and Learning Methods

1. Theoretical lectures
Evaluation Methods
1- Theoretical tests
C. Emotional and Values Goals **A1-How to maintain and maintain devices** **A2. Increasing the spirit of cooperation among students** **C3-Preserving Public Funds**
d. Transferred general and qualifying skills (other skills related to employability and personal development). **D1. Correct Methods in Preparing Practical Reports** **D2. Seminars and seminars** **D3. Scientific Research Writing**

27. Infrastructure

Theoretical vocabulary	
The week	Vocabulary details
First	Introduce the student to the types of construction materials used in engineering projects.
The second	Raw materials: cement (its properties, types), sand and gravel, calculation of the quantities of cement, sand and gravel in concrete mixtures.
The third	Bricks(types, properties) and calculating quantities.
Fourth	Types of mortar (calculating the size of mortar used in construction), blocks (its characteristics and calculating quantities).
Fifth	Tiles (types, calculating the number of tiles in floors), Sticker.
Sixth	Moisture repellents (types and uses), iron, wood.
Seventh	Plaster (its uses, calculating the amount of plaster needed to whiten the walls, calculating the amount of cement and sand needed to spray the walls.
Eighth	Construction Machinery, Use, Efficiency (Drilling Machines, Bulldozers, Cranes, Transport Machinery, Stacking Machines and Hammers, Hammers).
Ninth	Estimation (definition, purpose, types), table of quantities, units of measurement used for all construction paragraphs.
Tenth	Calculating the amount of earthworks on the foundations of the buildings and explaining the table of quantities thereof.
Eleventh	Calculation of the quantity of structural paragraphs under the level of the moisture seal (squared, foundation concrete, brick construction under the level of the moisture sealant)
XII	Continuation of the previous week.
Thirteenth	Calculating the quantity of moisture wicker concrete, calculating the quantity of the paragraphs above the level of the moisture wicker and explaining the table of quantities thereof
Fourteenth	Continuation of the previous week.

Fifteenth	Calculation of the quantities of reinforced roof concrete and reinforced concrete of Rabat.
Sixteenth	Continuation of the previous week.
Seventeenth	Calculate the quantity of finishing works (ficus, whitewashing, scattering, dyeing) and explain the table of quantities thereof.
Eighteenth	Calculating the quantity of flooring, tiles, flooring and quantity table.
Nineteenth	Apply the above paragraphs using a computer.
Twenty	Types of foundations for buildings, their forms and uses.
Twenty first	Types of roads.
Twenty two	Guessing and Arms for Road Works, Methods of Calculating the Volumes of Earthworks.
Twenty Three	Various exercises to calculate the volumes of earthworks.
Twenty fourth	Continuation of the previous week.
Twenty Fifth	Types of joints in roads.
Twenty-sixth	Guessing and Arms for Canal Works (for Irrigation and Puncture).
Twenty Seventh	Railways, tunnels, estimating the cost of completing tunnels.
Twenty Eight	Types of Airports.
Twenty Ninth	Traffic Signs.
Thirty	Movie Show.

2 Main References (Sources)	1 Quantitative Survey / Mowaffaq Nasser Al-Saour / Ministry of Education / Technical Institutes Foundation 2 Quantitative Survey / Sami Miri Kadhim, Abdel Karim Al-Shammaa / Ministry of Education / Technical Institutes Authority, 1994. 3 Construction Materials / Jalal Bashir Sarsam / Ministry of Education / Technical Institutes Authority, 1992. 4 Estimation and Specifications of Construction Works / Ghanem Abdulrahman Bakr , 1985.
Recommended books and references (scientific journals, reports,....)	

in Electronic References, Websites	

28. Course Development Plan
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Course Description Form

Course Description

This course description provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve and demonstrate whether they have made the most of the available learning opportunities. It should be linked to the program description.;

49. Educational Institution	Middle Euphrates Technical University
50. Scientific Department / Center	Civil Technologies Department/ Survey Branch
51. Course Name/Code	Workshop / TUM 17
52. Available Forms of Attendance	Practical side

53. Semester/Year	Annual
54. Number of Hours (Total)	3 Hours Practical
55. Date this description was prepared	18/11/2025
56. Course Objectives	
Acquire manual skills from the use of manual tools and measuring tools, the ability to work, operate the machines in the optimal way, and acquire skills in construction, health and electrical works 0	

29. Course Outcomes, Teaching, Learning and Assessment Methods
A. Cognitive Objectives **A1. Identifying the turning devices.** **A2- Identifying Woodworking Devices** **A3. Types of Calculation Methods Used in Field Work** **A4. Types of measurement methods**
b. Skill objectives of the course. **B1 – Installation of cadastral devices in the field** **B2 – Healthy methods for field measurements** **B3 – Accuracy of measuring angles and distances** **B4. Calibration of Devices**
Teaching and Learning Methods
1. Theoretical lectures **2. Practical Lectures**
Evaluation Methods
1- Theoretical tests **2- Practical Tests**
C. Emotional and Values Goals **A1-How to maintain and maintain devices** **A2. Increasing the spirit of cooperation among students** **C3-Preserving Public Funds**
d. Transferred general and qualifying skills (other skills related to employability and personal development). **D1. Correct Methods in Preparing Practical Reports** **D2. Seminars and seminars**

D3. Scientific Research Writing

30. Infrastructure

Theoretical vocabulary

The week	Vocabulary
1	**Filers** **Focusing on training the student on the work of filings correctly and how to use measuring tools, coolers, cutting with a saw, hole and a shovel** **A- Occupational Safety Inside the Workshop** **B- Measuring Tools: (Inserted Ruler - Tape Measure - Paper Fore and How to Use and Maintain It) 0** **C- The planning process (shankara): the basic surfaces of the number used, which are (the man of justice, the man of planning, the guilt and the manner of guilt, the material of the manifestation, the right angle, the ordinary calligrapher, the sensitive calligrapher, the height scale, the protractor, the universal protractor, and the measurement of angles.** **D. Refrigerators - Types - Forms - How to use, maintain and clean them 0** **E- Sickles types and methods of attaching artifacts on them, a simple exercise on cooling operations and planning and according to the executive drawing 0**
2	**Cutting with a hand saw and a hand saw weapon – fixing the saw weapon – the conditions to be met in the deployment process** **An exercise that includes refrigeration – planning – publishing and according to the dimensions given in the executive drawing**
3	**Drills: Types of drills – Types of primes and how to use them – Methods of extracting broken screws** **The exercise includes filings, planning, and drilling, according to the dimensions given in the executive drawing.**
4	**Welding :** **The training in the welding workshop is focused on the various tools, tools and devices inside the workshop in the optimal way** **A- Occupational Safety Inside the Workshop** **B- Tools and tools used** **E- Electric Power Welding Machines – Their Parts – How They Operate** **D. Welding wires of their types, measurements, selection, and execution of exercises (straight lines, compact lines, angled dictation).**
5	**Execution of welding exercise (gates - molds - pipes)**
6	**Gas welding and oxyacetylene** **A- Occupational Safety at Work** **B- Types of gases used in gas welding and how to use them** **C. Performing self-welding exercises – welding with an iron wire – welding with a brass wire)**

7	**Plumbing:** **Focusing on training the student on how to plan on metal sheets, how to cut and assemble, and the process of welding sheets using planing tools, manual and mechanical cutting, bending tools, and manual and mechanical welding tools.** **A- Occupational Safety Inside the Workshop** **B- Measuring Instruments** **C. Planning Tools** **D. Plate types and measurements** **Practical exercise using the mentioned tools (a simple exercise using the mentioned tools)**
8	**A- Cutting & Bending Machines** **B- Dotted Welding Machines** **Carrying out an exercise on planning, cutting, bending and welding processes (molds - gates)**
9	**Connecting Road - Manual Roller - American Roller** **Carrying out an exercise on planning, cutting and connecting processes (cooling duct – water tank)**
10	**Turning** **The focus is on training the student on the different turning machines and training on the measuring tools necessary to carry out various exercises, how to work the external and internal teeth, and how to choose cutting pens.** **A- Occupational Safety Inside the Turning Workshop** **B- Lathe parts and how to work on it – Speed schedules – Types of turning pens – Tying the crafts – Adjusting the center – Tools** **C. Executing turning operations (level, adjusted, graded) with the use of measuring instruments.**
11	**Explanation of the laws of external and internal robbed turning** **Performing a turning exercise for an external and internal method**
12	**External and internal dental laws explained** **Performing external and internal dental turning exercises**
13	**Carpentry & Prototyping** **The student is trained in the use of tools, carpentry tools, used measuring tools, and learning about different woodworking machines, safety procedures, and maintenance of machines.** **A- Occupational Safety Inside the Workshop** **B- Types of Wood, Their Sources and Uses** **E - Hand measuring and counting tools used in the carpentry workshop** **Carry out a parallelogram shape drill, hexagon shape cylinder**

14	**Identifying the machines in the carpentry workshop and the necessary safety and maintenance parts – doing exercises on how to connect the wood parts Performing the exercise of hanging it in the shape of (t and t)**
15	**Introducing the student to the methods of painting wood, paragraphs (their types, forms), performing a variety of drilling exercises.**
16	**Planning, excavation, burial, and dropping a map on the ground**
17	**Brick, block and thermostone construction works**
18	**Types of Bonding in Bricks**
19	**Making molds for bridges, ceilings and columns**
20	**Reinforcement works for bridges, roofs and columns**
21-22	**Concrete work – pouring driveways – roofs and bridges**
23-24	**Finishing works including ficus, whitewashing, scattering and marplex**
25-26	**The application with tiles for floors, the application with regular tiles, and the application of the sticker**
27	**Painting works with pentlight, paint and damlok**
28-29	**Sanitary works including water and sewer pipe installations, pipe teeth opening, and hot and cold water network installation – general idea of cooling duct installations**
30	**Electrical Installations – General Overview of Electrical Installations**

1 Required Textbooks	
2 Main References (Sources)	
Recommended books and references (scientific journals, reports,....)	
in Electronic References, Websites	

31. Course Development Plan
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Course Description Form

Course Description

This course description provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve and demonstrate whether they have made the most of the available learning opportunities. It should be linked to the program description.;

57. Educational Institution	Middle Euphrates Technical University
58. Scientific Department / Center	Civil Technologies Department/ Survey Branch
59. Course Name/Code	Human Rights and Democracy / 18
60. Available Forms of Attendance	Theoretical aspect
61. Semester/Year	Annual
62. Number of Hours (Total)	2 Hours of Theory
63. Date this description was prepared	18/11/2025
64. Course Objectives	
The student should have the attitudes and values contained in the curriculum of education on human rights and democracy, and teach the student what human rights are throughout the stages of human history until modern and contemporary history, the problems of democracy, and what are freedoms and their types.	

32. Course Outcomes, Teaching, Learning and Assessment Methods

A. Cognitive Objectives
A1. Recognize human rights.

b. Skill objectives of the course.
B1 – Dealing with people according to legitimate rights

Teaching and Learning Methods

1. Theoretical lectures

Evaluation Methods

1- Theoretical tests

C. Emotional and Values Goals
A1. Respect for the rights of others

d. Transferred general and qualifying skills (other skills related to employability and personal development).
D1. Correct Methods in Preparing Practical Reports
D2. Seminars and seminars
D3. Scientific Research Writing
D4-

33. Infrastructure

Theoretical vocabulary	
Vocabulary details	**The week**
Human rights. Definition. Objectives Human Rights in Ancient Civilizations, Especially the Mesopotamian Civilization	**The first**
Human Rights in Divine Laws with a Focus on Human Rights in Islam	**The second**
Human Rights in Contemporary and Modern History: International Recognition of Human Rights since World War I and the League of Nations	**The third**
Regional recognition of human rights The European Convention on Human Rights 1950, the American Convention on Human Rights 1969 and the African Charter on Human Rights 1981. Arab Charter on Human Rights 1994	**Fourth**
NGOs and human rights (ICRC, Amnesty International, Human Rights Watch, National Human Rights Organizations)	**Fifth**
Human Rights in Iraqi Constitutions	**Sixth**

The Relationship between Human Rights and Public Freedoms in the Universal Declaration of Human Rights in Regional Charters and National Constitutions	**Seventh**
Economic, social, cultural human rights and civil and political human rights	**Eighth**
Modern human rights The right to development. The right to a clean environment. The right to solidarity. The Right to Religion	**Ninth**
Guarantees of respect and protection of human rights at the national level. Guarantees in the Constitution and Laws Guarantees in the Principle of the Rule of Law Guarantees in Constitutional Oversight Guarantees in Freedom of the Press and Public Opinion The Role of Non-Governmental Organizations in Respecting and Protecting Human Rights	**Tenth**
Guarantees, respect and protection of human rights at the international level – the role of the United Nations and its specialized agencies in providing safeguards	**Eleventh**
The general theory of freedoms is the origin of rights. The Project's Position on the Declared Rights and Freedoms. Use of the term public freedoms	**XII**
The Shari'a Rule of Law	**Thirteenth**
Regulation of public freedoms by public authorities	**Fourteenth**
Equality: The Historical Development of the Concept of Equality The modern development of the idea of gender equality and equality Equality between individuals, their beliefs and their race	**Fifteenth**
Democracy Definition and Types	**Sixteenth**
Concepts of Democracy	**Seventeenth**
Democracy in the Third World	**Eighteenth**
The World's Democracies	**Nineteenth**
The Concept of Freedoms Classification of Public Freedoms	**Twenty**
Fundamental freedoms Intellectual freedoms Economic and social freedoms	**Twenty first**
Freedom of security and a sense of reassurance Freedom of going and going	**Twenty two**
Freedom of education Freedom of the press Freedom of assembly or consensus	**Twenty Three**
Freedom of association Freedom of work	**Twenty fourth**
Freedom of Ownership	**Twenty Fifth**
Freedom of Trade and Industry	**Twenty-sixth**
Women's Freedom	**Twenty Seventh**
Political Parties and Public Freedoms	**Twenty Eight**
Scientific and technical progress and public freedoms	**Twenty Ninth**
The Future of Public Freedoms	**Thirty**

1 Human Rights (Their Development, Contents, and Protection) by Prof. Dr. Riad Aziz Hadi 2 Human Rights, Democracy and Public Freedoms / D0 Maher Sabri Kazim .	2 Main References (Sources)
	Recommended books and references (scientific journals, reports,....)
	in Electronic References, Websites ....

34. Course Development Plan
Use the video presentation with a 2% curriculum update

Course Description Form

Course Description

This course description provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve and demonstrate whether they have made the most of the available learning opportunities. It should be linked to the program description.;

65. Educational Institution	Middle Euphrates Technical University
66. Scientific Department / Center	Civil Technologies Department/ Survey Branch
67. Course Name/Code	Area -2 / Done 21
68. Available Forms of Attendance	Theoretical + practical
69. Semester/Year	Annual
70. Number of Hours (Total)	2 Theoretical Hours + 6 Practical Hours
71. Date this description was prepared	18/11/2025
72. Course Objectives	
The aim of studying surveying is to understand the basics of flat area and find the relationship between the location of points near or above the ground surface, and to be able to measure the horizontal and vertical distance of the observed target and measure directions0, as well as perform mathematical calculations to find the real measurements	

of distances, angles, and levels, and calculate areas and volumes from field data. On paper with a certain scale

35. Course Outcomes, Teaching, Learning and Assessment Methods

A. Cognitive Objectives
A1. Identify electronic ground survey devices.
A2- How to install electronic ground surveying devices
A3. Types of Calculation Methods Used in Field Work
A4. Types of Measuring Tapes

b. Skill objectives of the course.
B1 – Installation of cadastral devices in the field
B2 – Healthy methods for field measurements
B3 – Accuracy of measuring angles and distances
B4. Calibration of Devices

Teaching and Learning Methods

7- Theoretical Lectures
8- Practical Lectures

Evaluation Methods

1- Theoretical tests
2- Practical Tests

C. Emotional and Values Goals
A1-How to maintain and maintain devices
A2. Increasing the spirit of cooperation among students
C3-Preserving Public Funds
C4-

d. Transferred general and qualifying skills (other skills related to employability and personal development).
D1. Correct Methods in Preparing Practical Reports
D2. Seminars and seminars
D3. Scientific Research Writing

36. Infrastructure

Theoretical vocabulary

The week	Vocabulary details
The first	An introduction to the area and its definition and a summary of the various works presented by the sections of the survey (planar area, geodetic area) and the definition of each of them explains the hypotheses of plane and geodesic area, the types of area according to the uses and purposes provided by (topographic area), cadastral and photographic, hydrographic, road surveying and mining surveying, determining the position of a point on the ground, orientation and designating a point on the straightness of a line (or along it).
The second	Units of measurement (units of length, area, volume) in the metric (French) and foot (English) systems, conversion from one unit to another within the same system, conversion from one system to another, measuring angles in hexagon and percentile and radius and converting from one system to another calculating the area in the real estate registration system (dunam, olk, meter).
The third	Drawing scale, its types (numerical scale with its fractional type, geometric representation). Conversion from geometric to fractional and vice versa Schematic scale (simple schematic scale, comparative linear scale, grid scale) Explain the design of the schematic scale, choose the scale according to the survey type, calculate the appropriate scale for the drawing and the unknown scale in a variety of ways.
Fourth	Measuring the distance on flat ground (flat and uneven), field measurement accuracy (relative accuracy), design accuracy, choosing the measurement method according to the required accuracy represented by a table (from the methodology) Comparison between the accuracy representation formula and the fractional scale formula for indirect measurement to calculate the distance in terms of other measuring sides.
Fifth	Measuring distance on inclined ground (regular inclination, irregular inclination, correcting for horizontal inclination when the slope is in terms of (angle of elevation or decline, difference in the plane between the two ends of the measuring line, percentage of inclination or slope, magnitude of the ground)). Measuring distance on a slanted surface with a bar in a horizontal position, methods of correcting horizontal inclined distance (using triangular ratios, right triangle method, ratio and proportion method, and using a force sequence decoder to correct for height (one or two limits depending on the precision).
Sixth	Some of the engineering processes that take place during the measurement with the bar include the erection of columns from points on the route, the lowering of columns from points outside the tread, and the designation of the parallel to the treadmill.
Seventh	Potential obstacles during distance measurement: 4. Steering obstacles Not seeing the beginning and end from a midpoint. 5. Measurement obstacles (when the wrap is around the extended viewer). 6. Steering and measurement obstacles.
Eighth	Erase the details of the area (polygon and filling) using tape, draw the polygon (distribute the acceptable locking line by the graphical and mathematical method, draw the details on the corrected polygon).
Ninth	Leveling, definitions of basic terms (planar line, flat surface, horizontal line, comparison plane, mean sea level, attribution, leveling number, and types, difference of view, clarification of the target image, line of sight, optical axis, line of application, line of shape, height of leveler, leveling difference, backward reading, forward reading, midpoint reading, turning or turning point, other necessary definitions, types of leveling, direct leveling (by tape or by leveler).

Tenth	The purpose of the leveling, degrees of accuracy, the leveling device, its types, its parts, the installation of the leveling device, the types of leveling procedures, the reading of the leveling ruler, the calculation of the difference between two points, the calculation of the level of an unknown point in terms of a known point, the methods of settlement, the differential method, its definition, the steps of work, the methods of calculation (the method of the height of the level).
Eleventh	Complement the calculation methods (the rise and fall method), the comparison between them, the settlement table, the mathematical investigation of the table, possible errors in the settlement process, the methods of auditing the fieldwork (ending the settlement process at the starting point of the work, ending the settlement process at another known point).
XII	Vertical closing error, allowable error, correction of vertical closing error levels relative to the distance of the turning point from the beginning, the effect of the earth's sphericality and refraction on the ruler reading, verifying the validity of the device to work in the wedge method.
Thirteenth	Longitudinal and transverse sections, their definition, purpose, how they work in the field, assigning stations at regular and irregular distances, longitudinal sectional leveling, leveling the longitudinal section, for longitudinal and transverse section, arithmetic investigation, field work and correction, measuring cross-section levels, calculating the leveling of the construction line, lateral slopes, drawing the longitudinal section on which the construction line is fixed.
Fourteenth	Plotting the section and calculating the cross-sectional area (calculating the volumes between the identical station(s) using the mean of the two bases (the volumes between the transition stations are calculated according to the law of the pyramid).
Sixteenth	(Contour period) Factors affecting the selection of the contour period, giving a table showing the relationship between the purpose of preparing the map and its scale on the one hand and the contour period on the other hand, and a table showing the relationship between the scales and the contour period with the nature of the land.
Seventeenth	Preparing the contour map by the indirect method (the square grid method, the radial method) and drawing the contour lines by the method (arithmetic, estimating method).
Eighteenth	Theodolite devices and learn about its main parts and the function of each part, learn how to read horizontal and vertical circles and record them in a field book .
Nineteenth	How to read and calculate vertical angles and marginal error (inference or pointer error) and clarify which locations are used
Twenty	Learn the types of north (real, magnetic, and hypothetical) and calculate the directions of the sides through the angles observed in the field.
Twenty first	Learn how to observe horizontal angles.
Twenty two	Types, uses, and degrees (classification) of polygons with ribbed fieldwork and types of angles used in closed circular polygons. (Closed Loop Trav., Closed Connected Trav.).
Twenty Three	Making corrections for angles of various types in closed circular polygons and calculating the correct directions through them.
Twenty fourth	Calculation of horizontal and vertical compounds in closed circular polygons and their correction methods (Compass Rule & Transit Rule).

Twenty Fifth	Forward accounts and reverse calculations for point locations.
Twenty-sixth	Calculate coordinates (point locations) using corrected horizontal and vertical compounds and correct coordinates using horizontal and vertical compounds with closure error using compass and crossing methods.
Twenty Seventh	The student learns how to select the points of a Connected Traverse polygon and observe all angles (to the right and the corners of the turn).
Twenty Eight	Learn how to correct the angles of the connecting polygon in my method (Deflection angle – angle to the right)
Twenty Ninth	Calculations The student learns how to perform a closed link polygon (horizontal and vertical compounds) and calculate coordinates
Thirty	Make corrections using the compass and transit methods, and how to overcome (correct) the lock error, with how to draw a closed link polygon.

1 Required Textbooks	
2 Main References (Sources)	Sources: 1- Rymond E .davis Joe Wkelly. Elementary plan surveying 2- Singh , Narindr Surveying_ Tata MC Graw – Hill publishing Company limited – New Delhi 1982 3- Ziad Abdul-Jabbar Al-Bakr, Ibrahim Daoud Alwan Practical Survey. 4- Razan Ibrahim, 2011, Origins of Surveying, Amman, Community Library. 5- Yousef Siam, 2001, Surveying, Faculty of Engineering, University of Jordan. 6- Yassin Obaid Ahmed 1990 Engineering Surveying - Faculty of Engineering, Al-Baho University.
Recommended books and references (scientific journals, reports,....)	
in Electronic References, Websites	

37. Course Development Plan
Use the video presentation with a 2% curriculum update

Course Description Form

Course Description

This course description provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve and demonstrate whether they have made the most of the available learning opportunities. It should be linked to the program description.;

73. Educational Institution	Middle Euphrates Technical University
74. Scientific Department / Center	Civil Technologies Department/ Survey Branch
75. Course Name/Code	Digital Photogrammetry / Done 22
76. Available Forms of Attendance	Theoretical + practical
77. Semester/Year	Annual
78. Number of Hours (Total)	2 Theoretical Hours + 3 Practical Hours

79. Date this description was prepared	18/11/2025

80. Course Objectives

The student should be able to deal with spatial data, digital aerial images, and mosaic work through software, as well as direct digital aerial images to form the holographic model, holographic representation of the earth's surface, extract information and measurements of the earth's surface manifestations through stereoscopic vision, and use modern software to conduct the process of aerial triangulation and the process of evaluating three-dimensional digital images and extracting the (DEM)) of the holographic model and its applications in the field of other software, and to identify the basic concepts of remote sensing, types of satellites, and the handling of space data, its specifications, processing and interpretation.

38. Course Outcomes, Teaching, Learning and Assessment Methods

A. Cognitive Objectives
A1. Identifying aerial survey devices.
A2. How to install aerial surveying devices
A3. Types of Calculation Methods Used in Field Work
A4. Types of Measuring Tapes
A5. Identifying modern software in the field of aerial surveying
A6-

b. Skill objectives of the course.
B1 – Running programs on computers
B2 – Healthy methods for measurements from aerial photographs
B3 – Accuracy of measuring angles and distances
B4. Calibration of Devices

Teaching and Learning Methods

1. Theoretical lectures
2. Practical Lectures

Evaluation Methods

1- Theoretical tests

2- Practical Tests
C. Emotional and Values Goals **A1-How to maintain and maintain devices** **A2. Increasing the spirit of cooperation among students** **C3-Preserving Public Funds** **C4-**
d. Transferred general and qualifying skills (other skills related to employability and personal development). **D1. Correct Methods in Preparing Practical Reports** **D2. Seminars and seminars** **D3. Scientific Research Writing** **D4-**

39. Infrastructure

Theoretical vocabulary	
The week	Vocabulary details
The first	Reflection of Earth's surface phenomena and natural response patterns to them, spectral reflexivity curves of earth-surface phenomena.
The second	Aerospace sensors, satellites (American, French, European..... etc.).
The third	Interpretation of Images and Spatial Data, Features of Shape, Size, Pattern, Shadows, Texture, Location, Basic Factors in the Interpretation of Aerial Images for Analysis of the Earth's Surface.
Fourth	Digital processing, radiologically evaluation, distortion, optimization and engineering evaluation of space data (images) "Two dimensional Image Rectefication"

Fifth	Execute mosaic work from digital aerial photographs or spatial data using Erdas .
Sixth	Digital images, image resolution types, pixel coordinate system, image coordinate system, and ground coordinate system, cutting out part of digital images in different formats using Erdas.
VII + VIII	Foundations of Stereoscopic Aerial Survey : Interior orientation Exterior orientation and its elements "omega,phi,kappa" Absolute orientation
Ninth	Recognize the "Stereo Analyst " icon within the program "Erdas" and Exploring the Toolbar "stereo analyst toolbar".
X+Eleventh	Configure the initial digital hologram model, obtain the initial holographic vision, and store the hologram. "Creating a nonoriented digital stereo model and saving to an image file" Under the steps process, select the left digital image with the "Band combination" setting Contrast and brightness intensity, selection and adjustment of the right digital image, routing and rotating the digital images to be parallel to the flight line, removing the y-sided distance and adjusting the sigmogram distance, placing the floating point on the

	surface of the targets, storing the initial stereoscopic model.
XII+XIII	Configure and store the guided digital stereo model "Greating an oriented digital stereo model (DSM) and saving to an image file" Within the implementation of the steps, add digital images of the hologram and configure the "Blok file" enter the projection information "Projection" Input flight altitude, focal length and digital camera information for the internal and external orientation of the left and right image respectively and then store it.
Fourteenth+Fifteenth	Verify the accuracy of the digital holographic model "Checking the accuracy of digital stereo model(DSM)"
Sixteenth+Seventeenth	Obtaining information and measurements from the digital holographic model "measuing 3D information" Through the stereoscopic vision, the measurement is made from the digital holographic model, which includes drawing the points, determining their coordinates "X, Y, Z", drawing the polyline lines, determining their lengths, inclination, angle, elevation difference, the level of the starting and ending point of the line, the rate of the total plane, as well as determining and drawing the polygon, calculating the area of the polygon and the lengths of its sides,

	determining the angles between each three points, and then storing the information.
Eighteenth + Nineteenth + Twentieth	Familiarize yourself with the program's featured toolbar Stereo analyst feature toolbar"" Drawing and mapping from the digital holographic model and editing GIS data Collecting and editing 3D GIS data"" By forming a new project, and identifying the groups and items related to the landmarks and their characteristics, drawing buildings, roads, rivers, forests..... etc. One of the figurative landmarks through stereoscopic vision.
Twenty-first-party	Creating a project from digital aerial photographs, conducting the aerial triangulation process and the 3D image calendar process Greating a new project and performingn aerial triangulation and orthorectify the images (by usin LPS) Its implementation shall be through the following basic steps: -creat anew project -Add imagery to the block file -Define the camera model -measure Gcps and check points -use the automatic tie point collection function

	-Triangulate the images -Orthorectify the images -view the ortho images -save the block file
XXIV - XXVI	Automatic extraction of the digital model of the Earth's surface Automatic terrain extraction"" The above topic can be implemented through the following basic steps: Open an exisiting block file- - Check the automatically extracted tie - Points in the point measurement tool - Set DTM extraction options - Edit the general tab contents - View and manipulate images in the image pair tab - Edit the area selection tab contents - Edit the accuracy tab contents - Extract and view the DTM- - View the out put contour map- - View the output DTM point status image - Save the block file - Check the DTM extraction report

Twenty Seven Thirty	Applications for the use of DTM in the field of information systems Geographic, three-dimensional model configuration, contour lines and longitudinal sections through the application (Arc scene). As well as in the field of applications Other software such as surfer and global mapper

	1 Required Textbooks
Sources: 1. "Stereo Analyst",User'sguid ,Leica Geospatial Imaging,USA,2008 2. "Leica photogrammetry suite project manager",Users guide Leica Geosystem Geospatial Image, USA,2008 3. "LiecaPhotogrametry Suite, Automatic Terran Extraction", Users guide Leica Geosystem Geospatial Image, USA,2008 4. " Manual of photogrammetry" ,Us Army Crops of Engineers. 5. "Digital photogrammetry A Parctical Course", Wilfried Linder, Springer ,2009 6. "Baisc of Geomatics ", Mario A. Gomarasca, Springer ,2009 7. " Manual of Remote Sensing " , US Army Crops of Engineers , EM 1110-2-2907,2003	2 Main References (Sources)

8. "Introuduction to the Physics and Technigues of remote Sensing ",Charles Elachi, Jakob Van Zyl ,John Wily & Sons ,2006 9. "GIS"GIS" Foundations and Applications", Dr. Ali Abd Abbas Al-Azzawi, University of Mosul 2009 10. "Geoinformation Remote Sensing, Photogrammetry and Geographic Information System", Gottfried Konecny, Taylor & Francis Croup, London, 2003. 11. ERDAS IMAGINGE Tour Guide , Leica Geosystems Geospatial Imaging ,USA ,2006 12. Aerial Survey , Labib Nassif, Louise Khalil, Khaled Hilal Sarhan, Technical Education Authority, Second Edition 1999	
	Recommended books and references (scientific journals, reports,....)
	in Electronic References, Websites ....

40. Course Development Plan
Use the video presentation with a 2% curriculum update

Course Description Form

Course Description

This course description provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve and demonstrate whether they have made the most of the available learning opportunities. It should be linked to the program description.;

81. Educational Institution	Middle Euphrates Technical University
82. Scientific Department / Center	Civil Technologies Department/ Survey Branch
83. Course Name/Code	Mapping Technology / TM 23
84. Available Forms of Attendance	Theoretical + practical
85. Semester/Year	Annual
86. Number of Hours (Total)	2 Hours Theoretical + 3 Hours Practical
87. Date this description was prepared	18/11/2025

88. Course Objectives
The student will be able to learn about the principles of cartography and its integration with the topics of specialization such as surveying and aerial survey in preparing maps and raising the student's efficiency (performance) in the preparation, design, drawing and production of maps.

39. Course Outcomes, Teaching, Learning and Assessment Methods
A. Cognitive Objectives **A1. Identify mathematical equations.** **A2- How to solve integral equations** **A3- Types of Arithmetic Methods Used in Mathematical Solution** **A4. Types of differential** **A5-** **A6-**
b. Skill objectives of the course. **B1 – Mathematical Solution of Mathematical Equations** **B2 – Healthy Methods of Mathematical Differential Solution** **B3 – Accuracy of Solving Equations and Comparing Results**
Teaching and Learning Methods
1. Theoretical lectures
Evaluation Methods
1- Theoretical tests **2- Practical Tests**
C. Emotional and Values Goals **A1-How to maintain and maintain devices** **A2. Increasing the spirit of cooperation among students** **C3-Preserving Public Funds** **C4-**

d. Transferred general and qualifying skills (other skills related to employability and personal development).
D1. Correct Methods in Preparing Practical Reports
D2. Seminars and seminars
D3. Scientific Research Writing
D4-

The week	**39. Infrastructure**
The first	The principles of cartography technology, its nature, and its relationship to ground surveying.
The second	Types of maps, the characteristics of each, and their classification.
The third	The scale and its relationship with the land area represented on maps that are similar in dimensions, the accuracy of the map and its purpose, the details of the landmarks, and the number of landmarks represented. And the size of the landmark represented on the map (according to the scale).
Fourth	Methods of minimizing and enlarging maps (changing the scale of the map) and methods of measuring distances and areas on maps according to scale.
Fifth and sixth	Geographical and quadratic coordinates.
Seventh	Map projections (definition, classification, deviations).
Eighth	Roller Projectors Muscat Merkiter (TM) and Muscat Mercater Universal (UTM)
Ninth	Conical projections, identical Lambert projection (standard and two standard latitudes).
Tenth	Conical projections, iso-area projections.
Eleventh	Networking and indexing of topographic maps.
XII	The Role of Colors and Their Importance in Maps,Color Systems, Color Value Contrast,Color Sizes Choice of Colors
Thirteenth	Topographic Symbols (Locational, Linear and Cadastral Symbols) and their Classification
Fourteenth	Topographic maps and calligraphy specifications, methods of its implementation in maps .

Fifteenth	Map design (topographic map elements and functions) and visual balance between map components.
Sixteenth	Map Design (Design Concept and Principles), Raster and Linear Patterns and Contrast Shapes
Seventeenth	How to prepare the base map (the method of engraving and inking (separating and composing colors)).
Eighteenth	Copying and printing maps.
Nineteenth	Cartographic Summarization (Generalization) and Summarization Operations.
Twenty	Cartographic summation (positional displacement and demarcation exaggeration) and interpretation and analysis of topographic maps.
Twenty first	Thematic maps (their definition, sources, types) and statistical maps and the application of colors in them.
Twenty two	Charts, Types and Importance
Twenty Three	Electronic combs, digital maps, their specifications, types of file extensions, network and vector data.
Twenty fourth	Contour Maps and the (),(Installation,Interface,Menus)
Twenty Fifth	Modifying the specifications of the digital contour map (sorting the main and secondary lines, fixing the contour period, and adding map elements).
Twenty-sixth	Preparing a 3D Digital Contour Map
Twenty Seventh	GIS10 concept, its components, interface and capabilities.
Twenty Eight	Prepare a project using Arc Catalog, choose the appropriate WGS1984 and projection system and scope by location, and prepare layers according to feature types.
Twenty Ninth	Delineation of topographical features of their types in the form of layers and modification of their specifications
Thirty	Engaging the Surfer program and GIS in the preparation of objective maps to represent the topography of the earth's surface

	1 Required Textbooks
Sources:- 1- Dr. Hashem Yahya Al-Baniq, Principles of Cartographing, First Edition, 1982, Baghdad 2- Dr. Hashem Yahya Al-Bank, Applied Exercises in Cartographing, 1986, Baghdad. 3- Dr. Khader Al-Abbadi, Cartographer, Map Projections, 1980, Baghdad 4- Robinson,J,S.,"Elements of cartography",5th Ed.,1980 5- Keats,J,S.,"Cartography Design and Production",3rd Ed.,1980	2 Main References (Sources)
	Recommended books and references (scientific journals, reports,....)
	in Electronic References, Websites ....

40. Course Development Plan
Use the video presentation with a 2% curriculum update

Course Description Form

Course Description

This course description provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve and demonstrate whether they have made the most of the available learning opportunities. It should be linked to the program description.;

89. Educational Institution	Middle Euphrates Technical University
90. Scientific Department / Center	Civil Technologies Department/ Survey Branch
91. Course Name/Code	Engineering & Cadastre Survey / TAM 24
92. Available Forms of Attendance	Theoretical + practical
93. Semester/Year	Annual
94. Number of Hours (Total)	2 Theoretical Hours + 3 Practical Hours
95. Date this description was prepared	18/11/2025
96. Course Objectives	
Teach and train students how to calculate and measure areas, find the volumes of soil quantities, perform calculations for horizontal and vertical curves, drop them to the ground, drop installations, perform the necessary calculations to find the lost lengths and directions of the boundaries of plots and their coordinates and calculate their areas, solve	

problems in intersections of all kinds, back intersections, and in the division of lands using advanced devices such as the complete station device and the global positioning device.

41. Course Outcomes, Teaching, Learning and Assessment Methods

A. Cognitive Objectives
A1. Identifying ground survey devices.
A2- How to install ground survey devices
A3. Types of Calculation Methods Used in Field Work
A4. Types of Measuring Tapes
A5-
A6-

b. Skill objectives of the course.
B1 – Installation of cadastral devices in the field
B2 – Healthy methods for field measurements
B3 – Accuracy of measuring angles and distances
B4. Calibration of Devices

Teaching and Learning Methods

9- Theoretical Lectures
10- Practical Lectures

Evaluation Methods

1- Theoretical tests
2- Practical Tests

C. Emotional and Values Goals
A1-How to maintain and maintain devices
A2. Increasing the spirit of cooperation among students
C3-Preserving Public Funds
C4-

d. Transferred general and qualifying skills (other skills related to employability and personal development).
D1. Correct Methods in Preparing Practical Reports
D2. Seminars and seminars
D3. Scientific Research Writing
D4-

The week	39. Infrastructure
1	An introduction to geometric surveying, cadastral surveying, and the scale of the drawing used for each case, with an explanation of the different methods of calculating areas **in the field** , including: areas of regular shapes, division into regular geometric shapes such as triangles, squares, rectangles, trapezoids, circles, and their parts.
2	Erecting columns at equal intervals (trapezoidal and Simpson's method), erecting columns at unequal intervals on the survey line of a plot of land and calculating its areas in all the methods shown
3	Using the coordinate method in calculating the areas, the Hawaiger longitude multiplier (D.M.D) method .
4	The different methods of calculating the areas of a map include: dividing into regular geometric shapes such as triangles or squares, using line sheets, using slides, and using an electronic planometer to calculate the areas (when the fixing point is inside or outside the shape). Mathematical and demarcation methods for calculating the areas of different shapes and slopes of the earth's surface.
5	Calculating the Volumes of Soil Quantities Using the Law of Mean of the Two Bases and the Minus Wedge Method (Or Moshurani) and the approximate method of the longitudinal section, calculating the size of the quarry and reservoir for dams by means of contour lines, and calculating and drawing the curve of the transport of dust. And using the map to make the necessary calculations for the areas and volumes in different ways.
6	Road Survey Identification: It includes the ground survey and aerial survey methods used to determine the route of the central line of the road. Types of vertical curves used in roads: symbols, terms and laws related to them and for calculating their levels (geometric method), asymmetric vertical curves (their elements and calculations), calculating the soil quantities of a road section that contains convex and concave vertical curves and a fixed slope.

7	Identifying the types of vertical curves: (convex curve and concave curve) and the equation for the parabola to calculate the level (analytical method) and how to drop them on the ground – its specifications in terms of the relationship between its length and visibility distance, velocity, and the algebraic difference between the two slopes and its equivalent radius.
8	Horizontal Curves: The simple circular horizontal curve, its symbols, terms, laws and specifications in terms of the relationship between radius **and speed, vehicles, coefficient of friction for tires** , and additional inclination or (lateral lift)

1 Required Textbooks	
2 Main References (Sources)	Arabic Sources: 1- Engineering and Cadastre Survey (Methodology) / Written by Ziyad Abdul Jabbar Al-Bakr / Dar Al-Kutub and Publishing / University of Mosul 1993. 2- The Survey (Part One) / Written by B. C.Z. Binmia / Translated by Ziad Abdul-Jabbar Al-Bakr (in print since 1988). 3- Engineering Survey (Parts I and Two) / Written by W. Scofield / Translated by Riad Sha'an / 1983. Foreign Sources: 4- Surveying Vol .1 & Vol. 2) / B.C. Punmi a/Standard Book House, Delhi, India. 1978. 5- Engineering Surveying (Vol. I & Vol.2)/ W.Scho field / Newness – Butter Woths/ London / Britain. 1978. 6. Surveying for Engineers / J. Uren. & W.F. Price / MacMillan / London / Britain 1985.

	7-manual of GPS,Total station,Autocad disk land,Auto diskCivil 3D
Recommended books and references (scientific journals, reports,....)	
in Electronic References, Websites	

42. Course Development Plan
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Course Description Form

Course Description

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97. Educational Institution	Middle Euphrates Technical University
98. Scientific Department / Center	Civil Technologies Department/ Survey Branch
99. Course Name/Code	Computer Applications / Theme 25
100. Available Forms of Attendance	Practical side
101. Semester/Year	Annual
102. Number of Hours (Total)	3 Hours Practical
103. Date this description was prepared	18/11/2025
104. Course Objectives	
The student will be able to use the (Land desktop) program for the purpose of representing the observed data in the field in modern monitoring devices that deal with points such as (Total station, DGPS) and showing them in the form of a map and according to the purpose of that work.	

43. Course Outcomes, Teaching, Learning and Assessment Methods
A. Cognitive Objectives **A1. Identifying ground survey devices.** **A2- How to install ground survey devices** **A3. Types of Calculation Methods Used in Field Work** **A4. Types of Measuring Tapes** **A5-** **A6-**
b. Skill objectives of the course. **B1 – Installation of cadastral devices in the field** **B2 – Healthy methods for field measurements** **B3 – Accuracy of measuring angles and distances** **B4. Calibration of Devices**

Teaching and Learning Methods
11- Theoretical Lectures **12- Practical Lectures**
Evaluation Methods
1- Theoretical tests **2- Practical Tests**
C. Emotional and Values Goals **A1-How to maintain and maintain devices** **A2. Increasing the spirit of cooperation among students** **C3-Preserving Public Funds** **C4-**
d. Transferred general and qualifying skills (other skills related to employability and personal development). **D1. Correct Methods in Preparing Practical Reports** **D2. Seminars and seminars** **D3. Scientific Research Writing** **D4-**
Infrastructure

The week	Applied vocabulary
1	Introduction:Comparison of Normal AutoCAD and Landdesktop,Main Menus,File Types
2	Draft project creation within design specifications
3	Working with raster beams
4	Points Configuration
5	Points Configuration
6	Organize Points
7	Import Points

8	Biblical Appendix Label
9	Configure Tag Labels and Tables
10	Working with Terrain Model Explorer
11	Surface model Edit
12	Contour Lines Industry
13	Making Clips
14	Making Clips
15	Calculating On-Site Volumes
16	Straightness
17	Straightness
18	Natural Land Modeling
19	Civil Design/Sectional Representation Program
20	Vertical Straightness
21	Templatelet
22	Templatelet Edit
23	Clips
24	Edit clips
25	Calculating Dirt Works
26	Side road slopes
27	Road Route Transfer
28	Final Publication
29	Final Publication
30	Final Publication

	1 Required Textbooks
Sources: 1- Auto Cad Land Desktop Tutorial /Autodesk co./2009 2- Practical Reference in the Program Autodesk Land Desktop/ Saad Yahya Haniyeh / SHUAA Publishing & Science /2008	2 Main References (Sources)
	Recommended books and references (scientific journals, reports,....)
	in Electronic References, Websites ....

44. Course Development Plan
Use the video presentation with a 2% curriculum update

Course Description Form

Course Description

This course description provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve and demonstrate whether they have made the most of

the available learning opportunities. It should be linked to the program description.;

105. Educational Institution	Middle Euphrates Technical University
106. Scientific Department / Center	Civil Technologies Department/ Survey Branch
107. Course Name/Code	**: GIS and Ground Control Techniques / TAM 26**
108. Available Forms of Attendance	Theoretical + practical
109. Semester/Year	Annual
110. Number of Hours (Total)	1 Theoretical Hour + 3 Practical Hours
111. Date this description was prepared	18/11/2025
112. Course Objectives	
The student will be able to employ the principles of Geographic Information System (GIS) by using spatial, descriptive, network, and directed data for the purpose of preparing maps of all types (objective, topographical, and cadastric) and producing them in the final form as digital or paper maps with reports.	

45. Course Outcomes, Teaching, Learning and Assessment Methods
A. Cognitive Objectives **A1. Identifying ground survey devices.** **A2- How to install ground survey devices** **A3. Types of Calculation Methods Used in Field Work** **A4. Types of Measuring Tapes** **A5-** **A6-**

b. Skill objectives of the course.
B1 – Installation of cadastral devices in the field
B2 – Healthy methods for field measurements
B3 – Accuracy of measuring angles and distances
B4. Calibration of Devices

Teaching and Learning Methods

13- Theoretical Lectures
14- Practical Lectures

Evaluation Methods

1- Theoretical tests
2- Practical Tests

C. Emotional and Values Goals
A1-How to maintain and maintain devices
A2. Increasing the spirit of cooperation among students
C3-Preserving Public Funds
C4-

d. Transferred general and qualifying skills (other skills related to employability and personal development).
D1. Correct Methods in Preparing Practical Reports
D2. Seminars and seminars
D3. Scientific Research Writing
D4-

46. Infrastructure

The week	
The first	The concept of the Geographic Information System (GIS), its components, capabilities, and related programs (such as Arc catalog Arc globe10, arc scene10, arc GIS Administrator) and the types of data it deals with (spatial and meta-data, network and vector data), and familiarizing the program interface and its installation.
The second	Methods of data entry (aerial images and satellite images) by adding data and methods of displaying data through the Extent Full or zoom to Layer icon , and using the Effects bar, which includes adjusting contrast, transparency, lighting, and sliding images horizontally and vertically (Layer Swipe & Flicker).

The third	Engineering Correction of the Topographic Map and Finding Out the Amount of Allowed Error (RMSE)
Fourth	Geometric correction of the satellite image and finding out the amount of error allowed (RMSE)
Fifth and sixth	How to set up a new project using Arc Catalog and introduce it to the global projection systemWGS1984 projection, the appropriate range of data used, and how to change the projection and scope) Stratification of Geographical Features (Locational, Linear, Cadastral Areas), Contract (Edit and delete Vertices), Method of Storing Layers and Project
Seventh and eighth	Drawing Tools Application (trace tool,End point Arc segment, Point, Intersection tool, Midpoint tool, Split tool, Cut polygon tool).)
Ninth	Apply additional drawing tools (Advanced Editing Tools) such as (Copy Feature, Extent Tool, Trim Tool, Line Intersection, Generalized, Smooth).
Tenth	Ways to zoom in and out of features and ways to select drawn-out features (zoom to select) select feature, Pan to select Features, and Delete Select Add and delete vertices
Eleventh	Preparing descriptive tables for the features of each drawn layer (how to add fields to tables and delete fields) and methods of entering data for tables.
XII	The Layer Properties window, including Labeling according to the data of the Distribution Table fields, Transparency (Trancperancy), View the Image Data Source (Spatial Reference), View the Specifications of Any Feature by (Show Map Tips, andIdentify Icon).
Thirteenth	Selection checklist, access to the feature via the layers spreadsheet fields and by locations (Selection by attributes & by location**).**
Fourteenth	Preparation of thematic maps (contours and field data).
Fifteenth	Final Setup of All Map Elements (Layout, Title, Border, Grid, Scale, Legend, Index, Map source**).**
Sixteenth	Definition of GPS and GNSS
Seventeenth	Identify the types of satellite systems currently available and in the future
Eighteenth	Components of theGPS system and an explanation of each part (the space part, the control and control systems, as well as the part of the user system)
Nineteenth	Identify the GPS navigation device and its uses
Twenty	Identifying the Sources of Errors in theGPS System
Twenty first	Understanding the Working Principleof GPS
Twenty two	Identify the principles of geodetic (geo, spheroid, coordinate systems)
Twenty Three	Explain the methods of monitoring using the GNSS system and explain each method
Twenty fourth	Explanation of the parts ofthe GNSS system (Leica Viva)
Twenty Fifth	How to work (job) and configure the device (GS10, GS15)
Twenty-sixth	How to configure the Base GS10 and Rover GS15 for Post Processing
Twenty Seventh	Creating ground control points in the field by post-processing and processing the observed data in the (LGO) program
Twenty-eighth and twenty-ninth	Configure the Base GS10 and Rover GS15 device to work in the RTK way and lift the beams in this way. Pull the data observed in the above way from the device to the computer and export it to the (Land Desktop) or (GIS) software

Thirty	Find and process the coordinates of an unknown point (X, Y, Z) by sending them to the debugging sites via the Internet

1 Required Textbooks	
2 Main References (Sources)	Sources 1- GISGIS), General Directorate of Curriculum Design and Development, Kingdom of Saudi Arabia, 2010 0 2- Foundations of Geodetic Surveying and GPS D0Juma Muhammad Daoud 1433 /2012 3- Fundamentals of Global Positioning System / Ministry of Higher Education and Scientific Research / University of Mosul 0 Remote Sensing Center / Prepared by Sabah Hussein Ali 4- GISGIS Complete Scientific Guide to ARCVIEW System / Translated and prepared by Dr. Eng. Haitham Yousef Zarqata0 5- About GIS GIS /D0Mohamed Yaqoub Mohamed Saeed/United Arab Emirates University0 6- Lectures by Dr. Mohammed Muhanna Al-Sahli in Introduction to Geographic Information Systems / Kuwait University / College of Social Sciences.
Recommended books and references (scientific journals, reports,....)	
in Electronic References, Websites	

47. Course Development Plan
Use the video presentation with a 2% curriculum update

Course Description Form

Course Description

This course description provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve and demonstrate whether they have made the most of the available learning opportunities. It should be linked to the program description.**;**

113. Educational Institution	Middle Euphrates Technical University
114. Scientific Department / Center	Civil Technologies Department/ Survey Branch
115. Course Name/Code	Project / TAMM 27
116. Available Forms of Attendance	Practical side
117. Semester/Year	Annual
118. Number of Hours (Total)	3 Hours Practical
119. Date this description was prepared	18/11/2025
120. Course Objectives	

Students implement a project within the specialized subjects in the survey, conduct all field and office work, and submit a final report with all the necessary plans and maps.

48. Course Outcomes, Teaching, Learning and Assessment Methods

A. Cognitive Objectives
A1. Identifying ground survey devices.
A2- How to install ground survey devices
A3. Types of Calculation Methods Used in Field Work
A4. Types of Measuring Tapes
A5-
A6-

b. Skill objectives of the course.
B1 – Installation of cadastral devices in the field
B2 – Healthy methods for field measurements
B3 – Accuracy of measuring angles and distances
B4. Calibration of Devices

Teaching and Learning Methods

15- Theoretical Lectures
16- Practical Lectures

Evaluation Methods

1- Theoretical tests
2- Practical Tests

C. Emotional and Values Goals
A1-How to maintain and maintain devices
A2. Increasing the spirit of cooperation among students
C3-Preserving Public Funds
C4-

d. Transferred general and qualifying skills (other skills related to employability and personal development).
D1. Correct Methods in Preparing Practical Reports
D2. Seminars and seminars
D3. Scientific Research Writing
D4-

49. Infrastructure

Theoretical vocabulary	
The week	**Vocabulary details**
1-5	**Conducting research and reviewing the available references and resources related to the subject of the project, reviewing specialists and departments to increase knowledge in that subject, and writing briefs on how to plan the project and program its timings.**
6-15	**Revising the available information and the above abbreviations, preparing the requirements such as equipment, devices, boards, symbols and other accessories, and starting the implementation of the project in its field or laboratory stages first, then the demarcation and the subsequent calculations, plans and maps.**
16-25	**Complement the field, laboratory or graphic work of the project and under the directives of the supervising teacher.**
26-29	**Conducting the final calculations, drawings, drawings, and maps and presenting the final report of the project to the competent supervisor.**
30	**Conducting the final interview to evaluate the project and giving it the final grade.**

1 Required Textbooks	
2 Main References (Sources)	Method of Implementation of the Project: 1- The students are divided into groups of 3-5 students, each according to the requirements of the implemented project and the effort required, field work, and calculations. 2- Each teacher with the specialization of the area is assigned one or two groups or more according to the number of teachers and the number of groups, and thus there is a supervisor for the project on the school of the year to follow up on its implementation. 3- The topics of the project selected from the specialized subjects shall be (1) and (2) / photogrammetry / engineering survey and cad strain / mapping technology, and the teachers of the above subjects will select the different topics of the projects at the beginning of the year and present them to the students for the purpose of selecting a topic for each group.

	4- A committee for project evaluation is tested at the end of the academic year, consisting of the project supervisor, another teacher from the department, and a teacher or expert from outside the department or institute.
Recommended books and references (scientific journals, reports,....)	
in Electronic References, Websites	

50. Course Development Plan
Use the video presentation with a 2% curriculum update