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

2024

Introduction:

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

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

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

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

Concepts and terminology:

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

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

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

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

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

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

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

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

Academic Program Description Form

University Name: *Southern Technical University*
Faculty/Institute: *Technical Institute of Amara*
Scientific Department: *Department of Surveying Techniques*
Academic or Professional Program Name: *Diploma in Surveying technology*
Final Certificate Name: *Diploma in Surveying technology*
Academic System: *quarterly*
Description Preparation Date: *19.10.2023*
File Completion Date: *15.3.2024*

Signature:
Head of Department
Name: *Dr.Muhamed M. Mutlaq*

Date: *20.3.2024*

Signature:
Scientific Associate Name: *Suhad J.Khalefa*

Date: *20.3.2024*

The file is checked by:
Department of Quality Assurance and University Performance
Director of the Quality Assurance and University Performance Department:
Najlaa Kathem Abdel Hassan
Date: 24/3/2024
Signature:

Approval of the Dean

1. **Program Vision**
Program vision is written here as stated in the university's catalogue and website.

2. **Program Mission**
Program mission is written here as stated in the university's catalogue and website.

3. **Program Objectives**
General statements describing what the program or institution intends to achieve.

4. **Program Accreditation**
Does the program have program accreditation? And from which agency?

5. **Other external influences**
Is there a sponsor for the program?

6. **Program Structure**

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements				
College Requirements				
Department Requirements	**33**	**102**		
Summer Training	**yes**			
Other				

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

7. Program Description

Study plan 2023 -2024							
First year ---first semester							
notes	Subject type	Credit hours	Hour no.			subject	no.
			T.	p.	Th.		
	specialized	6	6	4	2	Surveying/ 1	1
	specialized	4	4	2	2	Aerial Photogrammetry/ 1	2
	specialized	2	2	-	2	Remote Sensing/ 1	3
	specialized	2	2	-	2	Quantity Surveying/ 1	4
	Auxiliary	2	2	-	2	Mathematics/ 1	5
	Auxiliary	1	1	-	1	Geomorphology	6
	Auxiliary	2	2	2	-	Computer Fundamentals/ 1	7
	general	2	2	-	2	English Language/ 1	8
	general	-	3	3	-	Workshops	9
		21	24	11	13	Sum	

First year ---second semester							
notes	Subject type	Credit hours	Hour no.			subject	no.
			T.	p.	Th.		
	specialized	6	6	4	2	Surveying/ 2	1
	specialized	4	4	2	2	Aerial Photogrammetry/ 2	2
	specialized	2	2	-	2	Remote Sensing/ 2	3
	specialized	2	2	-	2	Quantity Surveying/ 2	4
	Auxiliary	2	2	-	2	Mathematics/ 2	5
	Auxiliary	2	2	2	-	Computer Engineering Drawing	6
	general	2	2	-	2	Human Rights& Democracy	7
	general	6	3	3	-	Workshops	8
		26	23	11	12	Sum	

Study plan 2023 -2024							
Second year ---first semester							
notes	Subject type	Credit hours	Hour no.			subject	no.
			T.	p.	Th.		
	specialized	6	6	4	2	Advanced Surveying/ 1	1
	specialized	4	4	2	2	Digital Photogrammetry/ 1	2
	specialized	4	4	2	2	Engineering Surveying	3
	specialized	4	4	2	2	Cartography/ 1	4
	specialized	3	3	2	1	Geographic Information System (GIS)	5
	Auxiliary	2	2	2	-	Computer Fundamentals/ 2	6
	general	2	2	-	2	English Language/ 2	7
	specialized	-	2	2	-	Graduation Project	8
		25	27	16	11	Sum	

Study plan 2023 -2024							
Second year ---second semester							
notes	Subject type	Credit hours	Hour no.			subject	no.
			T.	p.	Th.		
	specialized	6	6	4	2	Advanced Surveying/ 2	1
	specialized	4	4	2	2	Digital Photogrammetry/ 2	2
	specialized	4	4	2	2	Cadastral Surveying	3
	specialized	4	4	2	2	Cartography/ 2	4
	specialized	3	3	2	1	Global Navigation Satellite System (GNSS)	5
	specialized	3	3	3	-	Surveying Software	6
	specialized	4	2	2	-	Graduation Project	7
		28	26	17	9	Sum	

8. Expected learning outcomes of the program

Knowledge	
Explanation and clarification-we	
How to view examples-e	
Participation among students and contributing to the collection of ideas and solutions to	
The method of daily examination is	

9. Teaching and Learning Strategies

Teaching and learning strategies and methods adopted in the implementation of the program in general.

10. Evaluation methods
Implemented at all stages of the program in general.

11.Faculty						
Faculty Members						
Academic Rank	**Specialization**		**Special Requirements/Skills (if applicable)**		**Number of the teaching staff**	
	General	**Special**			**Staff**	**Lecturer**

Professional Development
Mentoring new faculty members
Briefly describes the process used to mentor new, visiting, full-time, and part-time faculty at the institution and department level.
Professional development of faculty members
Briefly describe the academic and professional development plan and arrangements for faculty such as teaching and learning strategies, assessment of learning outcomes, professional development, etc.

12.**Acceptance Criterion**
(Setting regulations related to enrollment in the college or institute, whether central admission or others)

13.**The most important sources of information about the program**
State briefly the sources of information about the program.

Course Description Form

1. Course Name:
Surveying/ 1
2. Course Code:
3. Semester / Year: Semester
4. Description Preparation Date:22.10.2023
5. Available Attendance Forms: Attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
288 hours per year. 6 hours a week

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

Name: Ahmed Abdel Moneim Rady
Email: hmdatc@stu.edu.iq

8. Course Objectives

1-the student learned the basic principles of geometric space, which gives the student information on how to measure and calculate the levels of points and calculate the areas of regular and irregular shap **2-teaching the student how to read horizontal and vertical angles, lifting natural and artificial beams and signing them.** **3-teaching students to use various Cadastral devices and tools, such a leveling devices and various measuring tapes.** **4-teaching students to calculate areas on maps using various method**	• ..... • ..... • .....

9. Teaching and Learning Strategies

Strategy	Use the generative learning strategy to teach the space cours to develop maintenance skills Spatial devices and metacognitive thinking in first-graders The strategy of education for solving problems and obstacles the workplace. - Developing the course in twinning with the courses of other engineering departments. - Activating the practical side of the course to apply all concepts, information and methods Calculation, which was studied in The theoretical aspect becomes more understandable a centered in the student's mind .

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	6	Definition	Definitio - Types	A theoretical lecture with Discussions	Monthly exam + Oral exam + Semnrat + Research
2	6		Basic principles Types of errors expected For works		

3	6		Measuring distances, tools and devices Used in measuring distances		
4	6		Difficulties during orientation and distance measurement (obstacles)		
5	6		Tape-specific corrections Metallometry with the solution of examples		
6	6		levelingso, a leveling machine with details of its accessories		
7	6		Leveling between two points, scoring methods		

			Calculations of settlement works with the solution of examples		
8	6		How to calculate it, methods of Correction, sources Errors in settlement work		
9	6		Calculation of the imputed difference between two points, calculation of the imputed unknown point in terms of a known point		
10	6		Supplement the calculation methods (rise and fall method), their comparison,		

			leveling table, arithmetic investigation of the table, possible errors		
11	6		Supplement the calculation methods (rise and fall method), their comparison, leveling table, arithmetic investigation of the table, possible errors		
12	6		Longitudinal and transverse sections, their definition, purpose, how they work in the field, designation of stations at regular and irregular distances, leveling of the		

			longitudinal section،		
13	6		Leveling table, for longitudinal and transverse section, computational Investigation, field work and Correction, measurement of cross-sectional proportions, calculation of the leveling of the construction line, lateral inclinations, drawing of the longitudinal section on which the construction line is installed.		
14			Drawing the section and calculating the cross-sectional area		

			(calculating the volumes between the identical stations (sections) by the method of averaging the two bases (as for the volumes between the switching stations, they are calculated by the pyramid law).		
15			(Contour period) factors influencing the choice of the contour period, giving a table showing the relationship between the purpose of preparing the map and its scale on the other hand and the contour period on the other hand		

1			Theodolite devices and get acquainted with its main parts and the function of each part, learn how to read horizontal and vertical circles and record them in a field notebook .		
2			How to read and calculate vertical angles and marginal error (heuristic or indicator error) and clarify the locations that benefit from it		

3			تعلم أنواع الشمال (الحقيقي والمغناطيسي والافتراضي وحساب اتجاهات الأضلاع من خلال الزوايا المرصودة في الحقل		
4			The student learned about the methods of monitoring horizontal angles		
5			Types of polygons		
6			Make corrections for angles of various kinds in closed circular polygons and calculate the correct directions through them		
			Calculation of horizontal		

7			and vertical compounds in closed circular polygons		
8			Forward calculations and reverse calculations of Point positions		
9			Calculation of coordinates (positions of points) using corrected horizontal and vertical compounds and correction of coordinates using horizontal and vertical compounds containing a locking error (Closure error) by Compass and transit methods.		

10			The student learned how to select the points of a closed Polygon (Connected Traverse) and monitor all angles (to the right and the angles of the detour).		
11			Learn how to correct the angles of the Polygon link in my way (Deflection angle-angle to the right		
12+13			Calculations the student learns how to make a closed link Polygon		

14+15			(horizontal and vertical compounds) and calculate coordinates Making corrections by Compass and transit methods, how to overcome (correct) the locking error, with how to draw the closed link Polygon.		

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

12.Learning and Teaching Resources	
.Bannister and S.Raymond, SURVEYING, fourth edition, 1978	
Fawzi al-Khalisi, the flat space, 1982	
Juma Mohammed Daoud, principles of space, 2012	

Course Description Form

1. Course Name:
Quantitative survey
2. Course Code:
3. Semester / Year: Semester
4. Description Preparation Date: 23/ 02/ 2024

5. Available Attendance Forms: Attendance

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

96 hours per year. 2 hours per week

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

Name: Ahmed Abdel Moneim Rady
Email: hmdatc@stu.edu.iq

8. Course Objectives

1-apply the vocabulary of the lecture on a real example
2-preparation of detailed designs for the construction joints, elements and materials contained therei and the raw materials contained therein.
3-the ability to know the appropriate environmental solutions in the designs and construction of buildings in various conditions.
4-the ability of students to interact with each other within one lecture in a discussion on the topic .

9. Teaching and Learning Strategies

Strategy	* Addressing the problems of the site and investing its characteristics and components to serve the integrated scene * Ability to know the important bonding materials in construction with its special types * The ability to identify the methods of heat transfer in buildin the most important expansion joints, types of wood and oth topics

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Introduce the student to the types of structural materials used in engineering projects.	General introduction / definition The student is on The lesson with its practical part And theoretical	Theoretical lecture Then make a summary About the topics And an entrance to the material Process and theory	
2	2		Raw materials: cement (properties,		

			types), sand and gravel, calculation of the quantities of cement, sand and gravel in concrete mixtures.		
3	2		Bricks (types, properties) and calculation of quantities		
4	2		Types of mortar (calculation of the volume of mortar used in construction), blocks (its features and calculation of quantities).		
5	2		Tiles (types, counting the number of tiles in the floors), shteiker .		
6	2		Moisture-proof materials (types, uses) , iron, wood		
7	2				

8	2		Plaster (its uses, calculate the amount of plaster needed to whiten the walls, calculate the amount of cement and sand needed to spray the walls. Construction machines, their use, efficiency, (drilling machines, bulldozers, cranes, transport machines, stacking machines, plowshares).		
9	2		Guesswork (definition, purpose , types), tables of quantities, units of measurement used for all paragraphs of the construction .		
10	2		Calculate the amount of earthworks for the foundations		

			of buildings and explain the table of quantities for them.		
11	2		Calculation of the amount of structural paragraphs below the moisture barrier level (quadrature, foundation concrete, brickwork below the moisture barrier level)		
12	2		Calculation of the amount of concrete moisture blocker		
13	2		Calculate the amount of paragraphs above the moisture barrier level and explain their table of quantities		
14	2				

15	2		Calculation of the quantities of reinforced ceiling concrete		
1	2		Calculation of the quantities of reinforced concrete Rabat		
2	2		Calculate the amount of finishing works (focus, whitewash, scattering, dyeing) and explain its table of quantities.		
3	2		Calculation of the quantity of flooring works, cashier, Department and table of quantities.		
			Applying the above paragraphs using a computer		

4	2		Types of foundations for buildings, their forms and uses		
5	2		Types of routes		
6	2		Guesswork and arms for roadworks		
7	2		Methods for calculating the volumes of earthworks		
8	2		Various exercises for calculating the volumes of earthworks		
9	2		Types of joints in roads		
10	2		Guesswork and arms for canal works (for irrigation and puncture)		

11	2		The railway		
12	2		Tunnels, guess the cost of completing tunnels		
13	2		Types of airports		
14	2		Traffic signs		
15	2		Demonstration films		

11.Course Evaluation	
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc	
12.Learning and Teaching Resources	
Required textbooks (curricular books, if any)	The book of construction of buildings . By Zuhair Sako
Main references (sources)	The book of the construction of the buildings of Talif Anis Jawad
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	Special periodicals and websites

Course Description Form

1. Course Name:
Cartography
2. Course Code:
3. Semester / Year: Semester
4. Description Preparation Date: : 23/ 02/ 2024
5. Available Attendance Forms: Attendance

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

120 hours per year. 4 hours per week

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

Name: Ahmed Abdel Moneim Rady
Email: hmdatc@stu.edu.iq

8. Course Objectives

Course Objectives	*** To learn a large part of the skills and art of cartography and cartographic analysis** *** The student should know the concepts of thematic maps**

9. Teaching and Learning Strategies

Strategy	1-the student should know what maps are and their types 2-the student should acquire information about the skills and reading of the Thematic Map. 3-the student understands how to make international maps individually 4-the student should understand the regional and international geographical fields

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	Thematic maps	Principles of the science of mapping technology Its nature and relationship to surveying The ground	The lecture Discussion	Written and oral exam
2	4		Types of maps, characteristics of each of them and their classification		
3	4		The scale and its relationship to the land area represented on		

			maps are similar in dimensions and accuracy of the map		
4	4		Ways to minimize and enlarge maps (change the scale of the map)		
5	4		Geographical and quadratic coordinates.		
6	4		Projections of maps (their definition, classification, deviations).		
7	4		Cylindrical projectors Muscat Mercator (TM)		
8	4		Projected Global Mercator (UTM)		
9	4		Conical projectors, Lambert congruent projectors (with a standard viewing circle and two standard viewing circles).		

10	4		Conical projectors, Bonn projectors of equal area		
11	4		Networking and indexing of topographic maps		
12	4		The role of colors and their importance in Maps, color systems, color value variation,color sizes , Election of colors		
13	4		Topographic codes (positional, linear and cadastral codes) and their classification		
14	4		Zoning of topographic maps and line specifications, methods of its implementation in Maps		
			Map design (topographic		

15	4		map elements and functions) and visual balance between map components		
1	4		Map design (design concept and principles), raster and linear patterns and various forms		
2	4		How to set up the base map (the base map Operations of copying and printing maps.		
3	4				
4	4		Cartographic summarization (generalization) and summarization operations		
5	4		Cartographic summarization (positional displacement and demarcation		

			exaggeration), interpretation and analysis of topographic maps		
6	4		Thematic maps (their definition, sources, types), statistical maps and the application of colors in them		
7	4		Graphs, their types and importance		
8	4		Electronic Combs, digital maps, their specifications, types of file extensions, network and vector data		
9	4		Contour maps and the (surveye) program, (installation, interface, menus)		

10	4		Modify the specifications of the digital contour map Preparing a 3D digital contour map		
11	4		The gis10 GIS concept, its components, interface and capabilities		
12	4				
13	4		Preparing a project using a program, Arc Catalog and selecting the WGS1984 system		
14	4		Delineation of topographic features with their varieties in the form of layers and modification of their specifications		
15	4		Connecting the Surfer program and Geographic		

			Information System in the preparation of maps		

11.Course Evaluation	
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc	
12.Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Thematic maps/Dr. Falah Shaker black
Main references (sources)	Maps of human distributions, their concept and methods of creation. Nasser bin Mohammed bin Salma
Recommended books and references (scientific journals, reports...)	Access to the GPS/ GPS Global Positioning System. Juma Mohammed Dawood
Electronic References, Websites	Remote sensing basics and applications / Nabil Sobhi Dagestani Visible remote sensing data collection and analysis / Mohammed Abdullah Al-Saleh

Course Description Form

1. Course Name:
Mathematical
2. Course Code:
3. Semester / Year:
semester
4. Description Preparation Date:
5. Available Attendance Forms:
20/2/2024
6. Number of Credit Hours (Total) / Number of Units (Total)
Two hours per week and thirty hours per semester
7. Course administrator's name (mention all, if more than one name)
Name: sarah fawzi ghafel Email: sara4math1996@gamil.com

8. Course Objectives

Course Objectives	**The course aims for the student to be able to ap mathematical equations and methods in the field surveying**

9. Teaching and Learning Strategies

Strategy	Discussion strategy Teamwork strategy

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2		1-A review of solving equation first degree equation second degr equation using the general law solve two first degree equation graphically	Explain the scientifitic material first, then discuss with the student solutions to t examples and give the best mathematicl Methods for solving These examp	Daily exams, Mid-term Exam And end – semester exam
2	2		2-matrix transpose, matrix inverse, matri multiplication		
3	2		3- determinants, bina and ternary		
4	2		4-solve simultaneous equation using determinants		
5	2		5-equation of a straig line, two straight line perpendicular, two		
6	2		straits parallel, the distance of a point fr a straight line, the distance between two point		
7	2		7 Triangles, some important laws in trigonometric ratios,		
8	2		solving a right triangl 8- Solving a triangle: Some of the laws use		
9	2		in solving a triangle: t law of sines and cosi 9- Circular Sector Circular Segment Fin		
10	2		the area and perimet		

11	2		10- Circular Sector Circular Segment Fin the area and perimet 11- Derivative Polynomia Functions Implicit Functions		
12	2		12- Derivative of trigonometric functio		
13	2		13- Derivative applications / finding		
14	2		the tangent equation 14- Integration of		
15	2		algebraic functions. 15- Integration of		
1	2		trigonometric functio 16-definiteintegrratic		
2	2		applications of defini integration 17-area under a curv		
3	2		the area between two curves 18- Numerical metho		
4	2		in integration, 19- finding the area using the trapezoid rule		
5	2		20- Find the area usir Simpson's rule		
6			21- Statistical operations/range, arithmetic mean,		
7	2		standard deviation 22- Spherical triangle its definition,		
8	2		properties, Napier's rules 23- Solve the right		
9	2		spherical triangle 24- Solve the equilate and isosceles spheric triangle		
10	2		25-Oblique spherical triangle, law of sine a		
11	2		cosin 26- The spherical are		
12	2		of a spherical triangle the area of a spherica triangle		

13 14 15	2 2 2		27- Various exercises solving the spherical triangle 28- Matlab program, definition, and some its applications 29- Solving matrices and determinants, derivative, integratio using Matlab 30- Graphs using Matlab		

11.Course Evaluation	
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc	
12.Learning and Teaching Resources	
Required textbooks (curricular books, if any)	
Main references (sources)	1-CALCULUS, George B.Thomas 2-TRLGONOMETRY, P. ABBOTT, B.A… 3-Applied mathematics book written by yacoub sabbagh
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

1. Course Name:
English language
2. Course Code:
3. Semester / Year:
Semester
4. Description Preparation Date:
15/3/2024
5. Available Attendance Forms:
6. Number of Credit Hours (Total) / Number of Units (Total)
Two hours per week and thirty hours per semester

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

Name: Rihab Hannon Jabir
Email: rehabhj7@gmail.com

8. Course Objectives

Course Objectives	• ..... • ..... • .....
It helps them to write scientific reports their field of specialization in English language.	

9. Teaching and Learning Strategies

Strategy	Discussion strategy Homework strategy Quiz strategy

10. Course Structure

Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1	2		1- Hello/	Explain t	Daily exams,
2	2		2- Your world	scientifitic	Mid-term
3	2		3-All about you	material	Exam
4	2		4-Family and friend	first, then discuss	And end –of-semester
5	2		5- The way I live	with	exam
6	2		6- Every day	the student	
7	2		7- My favourites		
8	2		8- Where I live		
9	2		9- Times past		
10	2		10- We had a great time		
11	2		11- I can do that!		
12	2		12- Please and thank you		
13	2		13- Here and now		
14	2		14- It's time to go!		
15	2		15- Exam		

11.Course Evaluation

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

12.Learning and Teaching Resources

Required textbooks (curricular books, if any)	HEAD WAY
Main references (sources)	BIGGENER STUDENT'S BOOKS Liz and John Sears
Recommended books and references (scientific journals, reports...)	English for technicians Wadie M. Hanna, B,A

Electronic References, Websites	https://zlibrary-asia.se/ https://www.researchgate.net/

Course Description Form

13.Course Name:
English language
14.Course Code:
15.Semester / Year:
Semester
16.Description Preparation Date:
15/3/2024
17.Available Attendance Forms:
18.Number of Credit Hours (Total) / Number of Units (Total)
Two hours per week and thirty hours per semester
19. Course administrator's name (mention all, if more than one name)
Name: Rihab Hannon Jabir Email: rehabhj7@gmail.com
20.Course Objectives

Course Objectives It helps them to write scientific reports their field of specialization in English language.	• ..... • ..... • .....
21.Teaching and Learning Strategies	
Strategy	Discussion strategy Homework strategy Quiz strategy

22. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1 2 3 4 5 6	2 2 2 2 2 2		1-Hello everybody 2- Meeting people 3-The world of wo 4- Take it easy 5- Where do you live 6- Can you speak English	Explain t scientific material first, then discuss with the student	Daily exams, Mid-term Exam And end –of-semester exam

7 8 9 10 11 12 13 14 15	2 2 2 2 2 2 2 2 2		7- Then and now 8- how long ago? 9- Food and like! 10- Bigger and better! 11- Looking good! 12- Life's an adventure 13- How terribly clever 14- Have you ever 15- Exam		

23.Course Evaluation	
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc	
24.Learning and Teaching Resources	
Required textbooks (curricular books, if any)	HEAD WAY
Main references (sources)	ELEMENTARY STUDENT'S BOOK John and Liz Sears
Recommended books and references (scientific journals, reports...)	English for technicians Wadie M. Hanna, B,A
Electronic References, Websites	https://zlibrary-asia.se/ https://www.researchgate.net/

Course Description Template

1. Course Name
Digital Imaging
2. Subject Code
3. Subject / Year: Course Code:
Seasonal
4. Date of preparation of this description
2024/3/14
5. Available attendance options:
In-person only
6. Total number of study hours/units 6 -
hours per semester. 60 hours per week.4
7. Name of the course coordinator (if more than one name is mentioned
Elaf falah kalaf

8. General and specific objectives

- .....
- .....
- .....

G: The student should be able to work with spatial data and digital aerial imag
create mosaics using software, direct digital aerial images to form the mo
and display the model of the Earth's surface, extract information a
measurements of surface features using remote sensing, use modern softw
for aerial triangulation and calibration of three-dimensional digital imag
extract the Digital Elevation Model (DEM) of the model, and apply it in ot
software applications. Additionally, the student should understand the ba
concepts of remote sensing, types of satellites, handling spatial d
specifications, processing, and interpretation.

Teaching and Learning Strategie

Strategy

1. Discussion Strategy.
2. Mind Mapping Teaching Strategy.
3. Teamwork Strategy

Course Structure

Assessment Method	Learning Method	Unit or Topic Name	Required Learning Outcomes.	hours	week
Written exams, practical exams, mid-term exams, and end-of-term exams.	First, explain the scientific material, then provide exercises for students to apply using various digital images.	The spectral reflectance curves of Earth's surface phenomena and their natural response patterns. . . Weather and space sensors, satellites (American, French, European, etc.). .(nterpreting aerial images involves analysing the features of shape, size, pattern, shadows, texture, composition, location, and key factors to analyse the Earth's surface...	Ability to work with digital images, spatial data, form a 3D model of the Earth's surface, perform	4 4 4	1 2 3

		Digital processing of spatial data (images), radiometric calibration, distortion removal, enhancement, and geometric correction are essential steps in two-dimensional image rectification. " Executing mosaic work from digital aerial images or satellite data using Erdas software.. Digital images and the different resolutions of image resolution, the pixel coordinate system, the image coordinate system, and the ground coordinate system are all essential aspects of working with digital images. Erdas software enables the extraction of various parts of digital images in different forms.	aerial triangulation, image calibration, and identify types of satellites.	4 4	4 5 6
		Airborne Photogrammetry Fundamentals: • Internal Orientation • External Orientation • Elements: omega, phi, kappa • Absolute Orientation Identifying the "Stereo Analyst" icon within the "Erdas" software and exploring the "Stereo Analyst Toolbar."." Initialise the digital stereo model and obtain the initial stereo vision, then save the stereo model. As part of the process, select the left digital image while adjusting channel merging "Band combination", contrast, and brightness. Choose the right digital image and adjust it, align and rotate the digital images to be parallel to the flight line, remove the nadir deviation and adjust the zenith deviation, place the floating point on the target surface, and save the initial stereo model. Creating an oriented digital surface model (DSM) and saving it as an image file involves the following steps: adding digital images to the surface model, creating a "Block file," entering	+7 9 10+11		

		projection information, inputting the flying height and focal length, along with the digital camera details for the internal and external orientation of the left and right images respectively, and then saving it. "Checking the accuracy of digital stereo model(DSM"(	12+13 14+15 Holiday	

Assessment Method	Learning Method	Unit or Topic Name	Required Learning Outcomes.	hours	week
		Obtaining information and measurements from the digital solid model involves measuring from the solid digital model, which includes drawing points and determining their coordinates (X, Y, Z), drawing polylines with specified lengths, slope, angle, vertical difference, and the elevation difference between the starting and ending points of the line. It also involves calculating the overall elevation difference, specifying and drawing polygons, calculating the area of the polygon, the lengths of its sides, and determining the angles. بين كل ثلاثة نقاط ومن ثم خزن المعلومات		4	2+1
		Identifying the feature toolbar in the program Stereo analyst feature toolbar Drawing and preparing maps from the digital surface model and editing GIS data		4	5+4+3
				4	8+7+6

		Collecting and editing 3D GIS data"" By initiating a new project, exploring the groups and categories related to landmarks and their characteristics, drawing buildings, roads, rivers, forests, and other visual landmarks through a three-dimensional perspective.Create a project from digital aerial images, perform aerial triangulation, and conduct three-dimensional image calibration. Greating a new project and performingn aerial triangulation and orthorectify the images (by usin LPS(: -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 Automatic terrain extraction-:"" 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 Applications of Digital Terrain Model (DTM) in the field of Geographic Information Systems (GIS) include creating three-dimensional models, drawing contour lines, and longitudinal profiles using ArcScene. DTM is also utilised in other software applications like Surfer and Global Mapper.		4 4	11+10+9 15+14+13+12

.12.REFRENCES

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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
8. "Introuduction to the Physics and Technigues of remote Sensing ",Charles Elachi, Jakob Van Zyl ,John Wily & Sons ,2006
9. "نظم المعلومات الجغرافية "GIS"اسس وتطبيقات " ,الدكتورعلي عبد عباس العزاوي ، جامعه الموصل 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. المسح الجوي ،لبيب ناصيف ، لويز خليل ، خالد هلال سرحان ، هيئة التعليم التقني ، الطبعة الثانية 1999

Course description form

1 . Course Name:
Engineering drawing in computer
2. Course Code :
3. Semester/Year:
Semester
4. Date this description was prepared
10/2/2024
5. Available attendance forms :

My presence only
6. Number of study hours (total)/number of units (total):
30 hours per semester, 2 hours per week
7. Name of the course administrator (if more than one name is mentioned)
Frah Abdul Hassan Hanoun
8. Course objectives

• ..... • ..... • ..... •	The student will be able to perform engineering drawing work and use one of the computer engineering drawing programs, which is AutoCAD

Course Description Template

9. Subject Name:
Surveying software
10.Year/Grade:
Chapter
11.Date of preparation of this description
10/2/2024
12.: Available attendance options:
In-person only
13.Total number of study hours/units:
45 hours per semester. 3 hours per week.
14.Name of the course coordinator (if more than one name is mentioned)
Elaf falah kalaf

15.Course Objectives	
• ..... • ..... •	The student will be able to use the software (Civil3D) to represent field-surveyed data from modern surveying devices such as Total Station and DGPS, and display it in the form of a map according to the purpose of the work and the design of urban structures.

.9 Teaching and Learning Strategies					
1- Discussion Strategy. 2- Brainstorming Teaching Strategy.					Strategy
.10 Course Structur					
Evaluation Method	Learning Method	Unit or Topic Name	Required Learning Outcomes	hours	week
Written and practical exams, as well as end-of-semester exams.	Explain the program and then provide students with exercises for practical application using the designated field data.	Introduction to the program Civil3D, its features, applications, a comparison with Autocad, and an explanation of the main menus. Point formation, organization, and importation Create a project draft according to the design specifications (road design) . Creating, editing, and designing contour lines, displaying elevations and slopes. Breakline Road alignment design . Create and design a professional profile . Earthwork calculation Volume Calculation	Mastering the use of the Civil 3D software for drawing and designing buildings and structures based on surveyed field data.	3 3 3 3 3 3 3	1 23+ 4 7-5 8 9+10 11+12 1314+ 15

11. Course Evaluation	
Distribution is as follows: 40 points for the midterm exam, 10 points for daily quizzes in the first semester, and 50 points for the final exams in the first semester.	
Learning and Teaching Resources	
- Required textbooks (methodology if available)(.	
1- Auto Cad Land Desktop Tutorial / Autodesk / 2009 2- Practical Guide to Autodesk Land Desktop / Saad Yahya Hanea / Shuaa 2008/ -3 \	Main References (Sources)
	Recommended supporting books and references (scientific journals, reports, etc.)
	Electronic references, websites.

Course Description Form

1. Course Name:
Engineering and cadastral surveying
2. Course Code:
3. Semester / Year:
Semester
4. Description Preparation Date:
20/2/2024
5. Available Attendance Forms:
Attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
60 hours for term/60 Units
7. Course administrator's name (mention all, if more than one name)
Name: Athraa Abbas Kadhim Email: athraa.kadhim@stu.edu.iq
8. Course Objectives

1-Carrying out topographic and cadastral surveying and projection work necessary for engineering projects and preparing general level and topographical maps. 2- Teaching and training students how to calculate and measure areas, find the volumes of soil quantities, perform calculations for horizontal and vertical curves, project them onto the ground, project structures, and perform the necessary calculations to find the missing lengths and directions of the boundaries of land plots, t coordinates of their corners, and calculate their areas. 3- Teaching and training students how to calculate and solve problems in various types of intersections, and lar division, using advanced devices such as the total statio device and GPS.	• ..... • ..... • .....

9. Teaching and Learning Strategies	
Strategy	1-Discussion strategy. 2- Brainstorming education strategy. 3-Teamwork strategy.
10. Course Structure	

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1 2 3 4 5	4 4 4 4 4	1-Teaching and training students how to calculate ar solve problems in various types of intersections, resection, and lanc division, using advanced devices such as the totsl station device and the global position device. 2--The student learned how to use mathematical equations to calcul the locations and levels of ground points. 3- How to calculate and measure areas find the volumes o soil quantities, perform calculatio for horizontal and vertical curves, project them onto ground, project structures, and perform the necessary calculations to finc the missing length and directions of tl boundaries of plot land, the coordinat of their corners, ar calculate their area	1-An introduction to engineering and cadastral surveying and the drawing scale used for each case, with an explanation of the different methods for calculating areas in the field, including: areas of regular shapes, and division into regular geometric shapes such as triangles, squares, rectangles, trapezoids, circles and their parts. 2 - Establishing columns at equal intervals (with the trapezoidal method and Simpson's method), and erecting columns at unequal intervals on the survey line (a piece of land and calculatir its areas using all the metho shown. 3- Using the coordinate method in calculating areas, the longitude multiplier (D.M.D) method. 4-Different methods for calculating areas from a map including: dividing into regu geometric shapes such as triangles or squares, or usin graph papers, using slices, a using an electronic planome to calculate areas (when the fixing point is inside or outs the shape). Arithmetic and demarcation methods for calculating the areas of cros sections of different shapes and slopes of the Earth's surface.	1-Teaching a training students how to calculate anc solve proble in various types of intersections resection, and land division, usir advanced devices such the total station device and G 2--The stude learned how to use mathematica equations to calculate the locations and levels of ground points. 3- How to calculate anc measure areas, find th volumes of s quantities, perform calculations for horizonta and vertical curves, proje them onto th ground, project structures, a	Written and practical exams mid-semester a end-of-semeste exams

6	4		5- Calculating the volumes o dirt quantities using the law the average of the two bases and the missing wedge meth (or prismatic) and the approximate method from th longitudinal section and calculating the size of the quarry and the reservoir for the dams using contour lines and performing calculations and drawing the dust transport curve. And using the map to perfor the necessary calculations fo areas and volumes in differe methods 6-Getting to know road surveying: It includes groun surveying and aerial surveyi methods used to determine the path of the center line of the road. Types of vertical curves used in roads: their symbols, terms, and laws an	perform the necessary calculations t find the missing leng and direction of the boundaries o plots of land, the coordina of their corners, and calculate their areas.	
7	4		for calculating levels on ther (geometric method), asymmetric vertical curves (elements and calculations), quantitative calculation Dirt surface of a road section containing convex and conca vertical curves and a constar slope. Dirt surface of a road section containing convex and conca vertical curves and a constar slope.		
8	4		7- Identifying the types of vertical curves: convex curve and the concav curve) and the equation for t parabola to calculate the lev (the analytical method) and how to project it to the grou - its specifications in terms o the relationship of its length		

9	4		the viewing distance and speed and the algebraic difference between the two slopes and its equivalent radius. 8- Horizontal curves: the simple circular horizontal curve, its symbols, terms, lav		
10	4		and specifications in terms c the relationship of its radius vehicle speed, the coefficien of friction of tires, and the additional slope or (lateral lift). 9- Compound and inverted circular horizontal curves ar		
11	4		their types, calculating their elements and using them on highways and intersections, calculating the coordinates c main stations and points on the curves. 10- Various methods for projecting a simple circular		
12	4		curve, including: the method tangent angles (or deviation using a theodolite and a tape or using only two theodolite devices, and using electronic devices to project this curve or using the coordinates of control points and curve points (the method of mode site technologies). 11- The method of using columns to project curves		
13	4		(columns on the tangent and the columns on the major chord) and the method of projecting from the point of intersection - the obstacles that hinder projecting and h to overcome them (on the arch, at the main stations, or during construction).		

14	4		12- Transitional or spiral curves: their types, use, and calculations (cleothoids, cub parabolas, and cubic spirals) methods of projecting them using tangent angles, chords or coordinates, calculating t		
15	4		coordinates of main stations and points on the curves. 13- Small road projects: Performing the necessary calculations for vertical and horizontal curves (determining stations and levels, how to draw horizont plans and the longitudinal section of the actual project		
1	4		and indicating all the elemer and stations on them. 14- Calculate the cross-sectional areas of the projec and the sizes of the dirt quantities, draw the dust transfer curve, and indicate the width of the excavation and backfill on both sides of the center line of the actual project.		
2	4		15 Structural survey: Surve work related to constructing houses and large buildings, establishing their levels, straightening lines, canals, sewers, pipes, electrical transmission, and long trenches, and establishing their levels.		
3	4		End First term 1- Traversing calculations: types of angles and directions		
4	4		methods of correctin them and calculating		

5	4		them for the closed circular traverse and the connecting traverse, calculating t coordinates of the corners of the polygo and correcting them (compass method), calculating lengths ar corrected directions (inverse calculations for sides). 2-The intersections unknown measurements in process of and triangulat include: The first intersect (to find two unknown lengt using the methods trigonometry and the laws traverse. 3- Using the methods analytical geometry a coordinate rotati applications in ro intersections and land divisi 4 The second intersection. (find the length of one side a the direction of another si using the trigonome method. 5- Using the laws of ribbi analytical geometry, and th applications in ro intersections and land divisi 6 Third intersection. (To f the directions of the t unknown sides) using trigonometric method. 7- Using the analyti engineering method, applications in ro intersections and land divisi 8- Finding the unkno measurements (lengths a directions) in circular a connected polygons us		
6	4				
7	4				
8	4				
9	4				
10	4				
11	4				
12	4				

			different intersections w examples of the ty mentioned above. 9-Resection or reverse intersection: to find the location of a selected point b		
13	4		observing three points with known horizontal locations three different (or possible) cases. 10- How to prepare a table with logical steps to find the		
14	4		unknown measurements for various problems using the three intercepts, forward an		
15	4		inverse calculations, and resection. 11- Dividing lands: Dividing traverse: Dividing a traverse into two parts using a line w two ends with known locations. Dividing a polygon into two parts using a line w a known direction and starti from a point with a known location (and with a specific width in the case of a road o irrigation canal) and calculating the areas of the parts and uncalculated locations, practical applications in dividing land for multiple cases. 12- Dividing a polygon into two equal parts in area usin line starting from a point wi a known location. Dividing a traverse into two equal part in area using a line with a known direction. Practical applications in dividing land for multiple practical cases. 13- A small project to divide large lands using different calculations and intersection and according to certain		

			specifications for areas, stre dimensions and radii. 14 Complete the project calculations and draw its horizontal plan. 15- Draw its longitudinal section, and conduct discussions about the final results of dividing the plot o land.		

11.Course Evaluation

The distribution is as follows: 40 marks for the mid-term exam and 10 for the daily exams for the first semester. 50 marks for the final exams of the first semester

12.Learning and Teaching Resources

Required textbooks (curricular books, if an	سح الهندسي والكادسترائي (منهجي) / تأليف زياد عبد الجبار البكر / دار الكتب والنشر / جامعة الموصل 1993 .
Main references (sources)	1- المساحة (الجزء الأول) / تأليف بي . سي ز بينميا / ترجمة زياد عبد الجبار البكر (تحت الطبع منذ 1988) . 2- Surveying Vol. 1 & Vol. 2) / B.C. Punmi a/Standard Book House, Delhi, India. 1978. 3- Engineering Surveying (Vol. I & Vol.2)/ W.Scho field / Newness – Butter Woths/ London / Britain. 1978. 4- Surveying for Engineers / J. Uren. & W.F. Price / MacMillan / London/ Britain . 1985.
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

13.Course Name:
Aerial photogrammetry
14.Course Code:
15.Semester / Year:
Semester
16.Description Preparation Date:
20/2/2024
17.Available Attendance Forms:
Attendance
18.Number of Credit Hours (Total) / Number of Units (Total)
60 hours for term/60 Units
19. Course administrator's name (mention all, if more than one name)
Name: Athraa Abbas Kadhim Email: athraa.kadhim@stu.edu.iq
20.Course Objectives

1- The student will be able to learn about the principles of aerial photogrammetry, the types of aerial photographs and cameras, and find the scale of various types of aeria photographs. 2-Creating the three-dimensional model and calculating th levels of ground features, as well as designing airline lir and making mosaics. 3-Using insertion devices to prepare detailed maps from aerial photographs and dealing with modern software such as Erdas-Imagine with regard to radiological and spatial correction of digital data and images and preparing map from them.	• …… • …… • ……

21.Teaching and Learning Strategies

Strategy	1-Discussion strategy. 2- Brainstorming education strategy. 3-Teamwork strategy.

22. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	1-Provide students with the skill of usi aerial photogramme devices to dra maps. 2- Training students to us modern programs suc as Erdas-Imag to process aer and satellite images. 3-The student learned how t use mathematical equations to calculate the drawing scale an aerial photograph a the height of points.	1-Ahistorical over view of the history o aerial photogrammetry and remote sensing, its development and uses at th present time, the relationship of aerial surveying to remote sensing, types of projections, and types of images.	Explain scientific material firstand th Giving examples students a discussing them w the stude to find results solving th examples using mathemat l equation	Writtenand practical exams,mid-semester a end-of-semester exams
2	4		2-The difference between aerial photogrammetry and a map and some important terms in the subject of aerial photography related to the image and information appearing on aerial photographs.		
3+4	4		3+4- Vertical aerial photographs, geometric relationships, coordinate systems, scale of vertical aerial photographs over flat ground and over ground of different levels, and the aver drawing scale.		
5	4		5- Other methods for calculating the sc of vertical aerial photographs, ground coordinates from vertical aerial photographs, and calculating horizonta and diagonal distances between points.		
6	4		6-Relief Displacement and height calculations.		
7	4		7- Stereoscopic vision and its foundatio		
8	4		8- Using mirror stereoscope by the baseline method for the two images. Y parallax.		
9	4		9- parallax stereoscopic, the relationshi between parallax and height of points, parallax difference, floating mark, methods of measuring parallax, stereometer and how to work with it.		
10+11	4		10+11- Finding the parallax of the base points of two successive aerial photographs, equations of parallax, and finding the relationship between the parallax and the height of the points. Reinforcing the topic with solved examples.		
			12-Types of aerial photography camera “Digital and Analog”Angle of field of vie		

12	4		and classification of aerial photography cameras in relation to the angle of field view and its uses, parts of the aerial camera. 13+14 – Tilted photograph, Angular Orientation In Tilt, Swing and Azimuth, auxiliary axis system for a tilted		
13+14	4		photograph, scale of the tilted photograph, ground coordinates from tilted photographs, geometric analysis tilted aerial photographs. 15-Foundations of stereoscopic aeria photogrammetry using filling devices.		
15	4		End first term		
1+2	4		1+2-Rectification Of Tilted Photograp Rectification Foundation, Rectification Methods. 3-Mosaic, its advantages, disadvantages and uses - its types.		
3	4		4-Designing flight lines, flight altitude, local scale, longitudinal and side overla		
4	4		baseline, and calculating the number of total photos of an area. 5-Using the “Erdas-Imagine” program t suit the student’s needs for dealing wit		
5	4		digital data, by clarifying the following headings: -The viewer -Image info -Histogram -pixel data		
6	4		6- Inquire cursor - Measurement tools - Inquire box .		
7	4		7- Tile viewers -Link viewers -Arrange layers viewer -Flicker		
8	4		8-Blend fed -Swipe - -Raster attribute editor		

9-15	4		-Image subset 9-15-Filtering Mosaic Images- Vector- Raster to vector- Map composer		

23.Course Evaluation	
The distribution is as follows: 40 marks for the mid-term exam and 10 for the daily exams for the first semester. 50 marks for the final exams of the first semester	
24.Learning and Teaching Resources	
Required textbooks (curricular books, if any)	المسح الجوي التصويري- لبيب ناصيف،هيئة التعليم التقني ،الطبعة الثانية،1999
Main references (sources)	2-Manual of photogrammetry-American society of photogrammetry By Moffitt 3- Elements of photogrammetry –poulR.wolf 2nd Edition . 4-Erdas-magine Tour Guides ,Leica Geosyste Geospatial Imaging,2006
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

25.Course Name:
Advanced Surveying
26.Course Code:
27.Semester / Year:
Semester
28.Description Preparation Date:
20/2/2024
29.Available Attendance Forms:
Attendance
30.Number of Credit Hours (Total) / Number of Units (Total)

90 hours for each term/90 Units

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

Name: Athraa Abbas Kadhim
Email: athraa.kadhim@stu.edu.iq

32.Course Objectives

1- The student will be able to perform all measurements a calculations in traversing and tacheometry measurements.
2- Working on carrying out surveying work, including raising, laying o and finding the coordinates of points through the complete stat devices, as well as implementing all the work that the complete stat device can provide.
3- Carrying out surveying work such as triangulation, traversing, a levelling for the purpose of establishing horizontal and vertical grou control points , using various surveying devices.

- .....
- .....
- .....

33.Teaching and Learning Strategies

Strategy	1-Discussion strategy. 2- Brainstorming education strategy. 3-Teamwork strategy.

34. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1 2 3 4	6 6 6 6	1-Providing studer with the skill of us surveying equipme of all kinds. 2- Training studen on using surveying equipment in the process of laying o and data collect using theodolite devices and the To Station. 3-The student learned how to use mathematical equations to	1- Review the classification of theodolite devices and learn about its main parts and the function of each part. Learn how to read the horizontal and vertical circuits and record them in the field book for different devices. 2 - Methods of observing horizontal angles. 3- How to read and calculate vertical angles and marginal error (inference or indicator error) and clarify the locations from which they can be used, as well as the sources of errors in measuring vertical circles (angles). 4- Types of north, how to observe true north, magnetic north, and	Explain the scientific material first and then Give examples For students a discuss it with students to fir the results of solving these optimizations using mathematical equations and questions and answers	Written and practical exams mid-semester a end-of-semeste exams

5 6 7 8 9 10 11 12 13 14	6 6 6 6 6 6 6 6 6	calculate the locations and levels of ground points. 4-The student's ability to calculate the locations of unknown points using intersections. 5- The student understands the basics of mathematical calculations to find real measurements of distances and angles, as well as calculate coordinates for the locations of ground points in order to laying out on paper at a specific drawing scale.	asummed, and calculate the directions of the sides through the angles observed in the field. 5- Types of traverses, their use and degrees (classification), along with field works related to traversing and the types of angles used in closed circular traverses. (Closed Loop Trav., Closed Connected Trav.). 6- Making corrections for various types of angles in closed circular traverses and calculating the correct directions from them. 7- Calculating Departura and Latitude in closed circular traverses and methods for correcting them: Compass Rule & Transit Rule. 8-Calculating coordinates (point locations) using the corrected horizontal and vertical components and correcting the coordinates using the horizontal (Departure) and vertical (Latitude) components that contain a closure error in the compass and transit methods. 9- Forward calculations and reverse calculations for point locations. 10- Selecting Connected Traverse points and observing all angles and how to correct them (Deflection angle – angle to the right). 11- How to perform closed link traversal calculations (horizontal and vertical components), calculate coordinates and make corrections using the compass and transit methods, and how to overcome (correct) the closing error. 12-Defining tacheometric survey, its purposes and use, and		

15	6		explaining the possible methods for finding distances and levels of sides and points using tachometric methods.		
1	6		13- Use the theodolite device and a regular ruler to find distances and height differences using the Tangential Method.		
2	6		14- Use the theodolite device and a regular ruler to find distances and height differences using the Stadia Method		
3	6		15- The theoretical foundations of using electronic devices (T.S., EDM), their types, accuracy, ranges, and uses.		
4	6		End First term		
5	6		1- Introducing methods measuring horizontal and verti angles through electronic devi (Total Station).		
6	6				
7	6		2- Measure the height of a rem point using a reflector and withou reflector.		
8	6				
9	6		3- Calculating the diagonal a vertical distances between t points (Tie Distance) in two ways: Polygon. 2-Radial..		
10	6		4- Find the coordinates of a set points (Reference Element) if reference is a line		
11	6		a-laying out one point. b- Laying out a group of points in form of a grid.		
12	6		5-Extension: Finding a point loca along a known straight line.		
13	6		6- Calculating areas and volumes.		
14	6		7- Stakeout. 8 -Surveying.		

15	6		9- Laying out through construction line and the Lay method and surveying (Data colle 10-How to perform first intersect calculations. 11- How to perform secc intersection calculations. 12- How to perform th intersection calculations. 13- Horizontal control networ their types, degrees, accura classification methods, uses, rang establishing a base li specifications of control points a how to select them. 14- The student learned how calculate the strength figure of different ty of networks, the conditions achieving angles, sides, and statio and finding the best paths (R1, I from the possible paths of different triangular network. 15-Corrections different triangu networks and shapes with a differ central point in different ways.		

35.Course Evaluation

The distribution is as follows: 40 marks for the mid-term exam and 10 for the daily exams for the first semester. 50 marks for the final exams of the first semester

36.Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	**1- المسح الهندسي والكادستراني (منهجي) / تأليف زياد عبد الجبار البكر / دار الكتب والنشر / جامعة الموصل 1993 .** **2- المساحة (الجزء الأول) / تأليف بي . سي ز بينميا / ترجمة زياد عبد الجبار البكر (تحت الطبع منذ 1988) .** **-Surveying Vol. & Vol. 2)/B.C. Punmi a/Standard Boo House, Delhi, India. 1978**
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	https://www.academia.edu/32277699/Smart_Notes_For_ tal_Station_Help