

Ministry of Higher Education and Scientific research



Department of Geomatics (Surveying)

College of Engineering

University of Salahaddin-Erbil

Spring Semester

Subject: Engineering Surveying Network

Lecturer's name: Rojgar Qarani Ismael

Academic Year: 2021-2022

Course Book

1. Course name	Engineering Surveying Network
2. Lecturer in charge	Rojgar Qarani Ismael
3. Department/ College	Geomatics (Surveying) Engineering Department
4. Contact	e-mail: rojgar.ismael@su.edu.krd Tel: +9647504463111
5. Time (in hours) per week	For example Theory: 3 Practical: 3
6. Office hours	Mon:9:00-2:00, Wed:9:30-1:30,Thu: 9:30-11:30
7. Course code	
8. Teacher's academic profile	
9. Keywords	2D-Coordinates, Bearing, Traverse, Resection, Triangulation
10. Course overview:	The course introduces the principles of: <ul style="list-style-type: none"> ▪ Methods of coordinate determination ▪ Control Surveying ▪ Total Station
11. Course objective:	The objective of this course is to provide the students the basic theory of what control surveys are and why these are essential part of surveying, to be able to establish points of known coordinates for projects and to use methods such Traversing, Triangulation, Intersection, Resection and Trilateration in the field and to learn calculations and adjustments required for each method, a and to able to derive transformation parameters for converting coordinates from one plan rectangular to another, and Control networks are established in control survey. Also Performing the calculations necessary to determine the areas of parcels of land, which are enclosed by straight lines, irregular boundaries and combination of both. To learn to calculate the area of cross sections and using them for volume determination and use of regular grid of spot heights taken on the ground surface to calculate the volume of materials to be excavated and to determine the volume of water contained within proposed reservoir using contour lines and to have the knowledge about using computer for volume determination. Moreover, the students will be able to differentiate between types of horizontal curves and to understand the terminology and geometry of circular and transition curves, to calculate data required for setting out circular curves and to practice the actual lay out using different methods. Vertical curves to appreciate how vertical curves can be used in joining different gradients, to understand what gradients are the limitation that are imposed on their values, to know the terminology and geometry of vertical curves and to calculate reduced levels along the center line of the curve and to practice methods of setting out. Finally, the students will understand how total station measure distances, angles and coordinates and to identify all components of total station that are used in these measurements, to discuss the various methods by which survey data can be stored and transferred between total station and computer, to practices field procedures of data collection and layout programs and to

know how total station is used in trigonometric leveling.

12. Student's obligation

The students has to attend the lectures and labs, also he has to prepare all necessary homework that is assigned to him, in addition to that, the students are necessary to work for the quizzes which is held along the study course. At the end of each term the student has to attend exams. Each student has to attend at least two exams and final exam in order to evaluate his knowledge. In addition to the oral exam the student has to test for a practical exam too.

13. Forms of teaching

The means that are used in the teaching, to deliver the subjects to the students, are Mainly, lectures and few labs. Theory and practical samples will be covered in the lecture. In addition to that home workers are given to the students in order to motivate them to evolve thinking about the subject. Lecture notes will be available on the personal web site in order to download the required lessons.

14. Assessment scheme

Midterm exam 25%
 Assignments and quizzes 10%
 Field practical exercises 15%
 Final Exam 50%

15. Student learning outcome:

The students at the end of the course will learn how to determine the coordinates (Easting and Northing) and heights of unknown points. Also compute the area of land parcel and cross-sectional area in the roads as well as the volume estimation of the earthworks from road profiles. Moreover, he/she will gain the ability to stake out the horizontal and vertical curves of roads utilizing both the Theodolite and Total station instruments.

16. Course Reading List and References:

- Surveying for Engineers, 5th edition, By: John Uren & Bill Price.
- Construction Surveying and Lay Out, 3rd edition, By: Wesley G. Crawford.
- Surveying with construction application, 5th edition By: Barry F. Kavanagh.
- Fundamentals of surveying, By: S.K. Roy, 2010 India.
- Surveying I, By: Punmia, Ashor and Aron, 2005, India.
- Surveying II, By: Punmia, Ashor and Aron, 2005, India.
- Engineering Surveying, 6th edition, By W.Schofield and M.Breach.

17. The Topics:

Lecturer's name

Week-1	Methods of coordinate determination	Rojgar Q. Ismael (3 hrs)
Week-2	Coordinate methods	
Week-3	Bearing and North	
Week-4	Closed loop traverse method	
Week-5	Link Traverse method	
Week-6	Intersection method	

Week-7	Trilateration method	
Week-8	Resection method	
Week-9	Triangulation method	
Week-10	Total Station	
Week-11	Total Station	
Week-12	Control survey	
Week-13	Basics of Data Collection	
Week-14	Solution by triangles	
Week-15	Solution by triangles	
18. Practical Topics (If there is any)		Lecturer's name
Week-1	Closed traverse	Rojgar Q. Ismael (3 hrs)
Week-2	Open controlled traverse	
Week-3	Open Link Traverse	
Week-4	Intersection from two points	
Week-5	Three point resection (outer)	
Week-6	2nd trial three point resection	
Week-7	Three point resection (inner)	
Week-8	Setting up of Total Station	
Week-9	Basic measurement by Total Station	
Week-10	Coordinate measurement by Total Station	
Week-11	Coordinate system by Total Station	
Week-12	Resection by Total Station	
Week-13	Resection and measurement by Total Station	
Week-14	Resection and staking out by Total Station	
Week-14	Setting out H. curve using Total station	
19. Examinations:		
<p>1. <i>Compositional:</i> In this type of exam the questions usually starts with Explain how, What are the reasons for...?, Why...?, How....? With their typical answers Examples should be provided</p>		
<p>2. <i>True or false type of exams:</i></p> <p>In this type of exam a short sentence about a specific subject will be provided, and then students will comment on the trueness or falseness of this particular sentence. Examples should be provided</p>		
<p>3. <i>Multiple choices:</i></p> <p>In this type of exam there will be a number of phrases next or below a statement, students will match the correct phrase. Examples should be provided.</p>		

20. Extra notes:

Here the lecturer shall write any note or comment that is not covered in this template and he/she wishes to enrich the course book with his/her valuable remarks.

21. Peer review

پیداچوونہوی ھاوہل

This course book has to be reviewed and signed by a peer. The peer approves the contents of your course book by writing few sentences in this section.

(A peer is person who has enough knowledge about the subject you are teaching, he/she has to be a professor, assistant professor, a lecturer or an expert in the field of your subject).

ئەم كۆرسىبووكە دەبىت لەلايەن ھاوہلىكى ئەكادىمىيە سەير بىكرىت و ناوئروكى باپتەكانى كۆرسەكە پەسەند بىكات و جەند ووشەيەك بنووسىت لەسەر شياوى ناوئروكى كۆرسەكە و واژووى لەسەر بىكات. ھاوہل ئەو كەسەيە كە زانىارى ھەبىت لەسەر كۆرسەكە و دەبىت پلەى زانستى لە مامۇستا كەمتر نەبىت.