Department of Geomatics (Surveying)

College of Engineering

University of Salahaddin-Erbil

Fall Semester

Subject: Engineering Surveying

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	Trigonometry, Tacheometry, Area, Volume, Horizontal and Vertical Curve.

10. Course overview:

The course introduces the principles of:

- Trigonometric levelling
- Distance measurement using Tacheometry
- Area and Volumes for earthwork estimation.
- Horizontal and Vertical Curves.

11. Course objective:

The objective of this course is to provide the students the basic theory of how to performing the calculations necessary to determine the difference in heights using trigonometric levelling. To understand of how horizontal distances can be calculated based on the tacheometry method. Determination of 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 alone the centreline of the curve and to practice methods of setting out.

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 midterm exam and final exam in order to evaluate his knowledge.

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 calculate difference in height as well as elevations of unknown points. Determine the horizontal distance between two points or more. 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	Introduction to methods of angle measurement with Theodolite	Rojgar Q. Ismael (3 hrs)
Week-2	Trigonometric levelling	
Week-3	Tacheometry	
Week-4	Area computation by Trapezoid	
Week-5	Area computation by Simpson	
Week-6	Area of cut and fill: 1, 2, and 3 level section	
Week-7	Volume determination by End area method	
Week-8	Volume determination by Simpson method	
Week-9	Horizontal curves	
Week-10	Deflection angle calculation by chord method	
Week-11	Deflection angle calculation by arc method	
Week-12	Methods of layout horizontal curve	
Week-13	Layout of curve using coordinate method	
Week-14	Vertical curves	

Week-15	Reduced level calculation on the curve.	
18. Practical Topics (If there is any)		**Lecturer's name**
Week-1	Overview to setting up the Theodolite	Rojgar Q. Ismael (3 hrs)
Week-2	Angle measurement using FL and FR method	
Week-3	2nd trial angle measurement using FL and FR	
Week-4	Angle measurement using HR and HL method	
Week-5	2nd trial angle measurement using HR and HL	
Week-6	Angle measurement using 0set method	
Week-7	2nd trial angle measurement using 0set	
Week-8	Trigonometric leveling.	
Week-9	Tacheometry leveling	
Week-10	Distance measurement of remote points	
Week-11	Layout of horizontal angles and distances	
Week-12	Data collection using theodolite	
Week-13	Layout of horizontal curve using theodolite	
Week-14	Layout of horizontal curve using theodolite	
Week-14	Layout of horizontal curve using TS	

19. Examinations:

1. Compositional: 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

2. True or false type of exams:

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

3. Multiple choices:
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.

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 پێداچوونەوەی هاوەڵ

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).