



زانکۆی سه‌لاحه‌دین - هه‌ولێر
Salahaddin University-Erbil

Department: General G2, G3

College of Agricultural Engineering Sciences

Salahaddin University- Erbil

Subject: Surveying

Course Book – 1st Stage / Spring Semester

Lecturer's name: Dr. Eng. Land. Arch. Kardo Nooruldeen Kareem

M.Sc. Sherwan Hammed Mohammed

Academic Year: 2022/2023

Course Book

1. Course name	Principles of Surveying and Levelling
2. Lecturer in charge	Dr. Eng. Land. Arch. Kardo Nooruldeen Kareem M.Sc. Sherwan Yassin Hammad
3. Department/ College	Horticulture/ Agricultural Engineering Sciences
4. Contact	E-mail: kardo.kareem@su.edu.krd Mr. Sherwan Hammad E-mail: Sherwan.mohammed@su.edu.krd Tel: 07501440007
5. Time (in hours) per week	Theory: 2 and Practical: 3
6. Office hours	5 days a week
7. Course code	
8. Teacher's academic profile	Dr. Eng. Land. Arch. Kardo Nooruldeen Kareem - B.Sc.: 2006/ Plant Production / College of Agriculture/ Salahaddin University -Erbil/ Kurdistan Region/ Iraq. - M.Sc.: 2009/ Landscape Gardening/ College of Natural Science /Lugansk Taras Shevchenko National University Ukraine. - Ph. D.: 2018/ Landscape Architecture / Architecture and Urban Planning/ Faculty of Architecture/ Poznan University of Technology / Poznan/ Poland.
9. Keywords	Surveying, Taping, Pacing, Levelling, contouring, land survey, Theodolite, Global positioning system(GPS), Detail Survey.

10. Course Overview:

Surveying is the art of determining the relative positions of different objects on the surface of the earth by measuring the horizontal distances between them, and by preparing a map to any suitable scale. Thus, in this discipline, the measurements are taken only in the horizontal plane.

Levelling is the art of determining the relative vertical distances of different points on the surface of the earth. Therefore, in levelling, the measurements are taken only in the vertical plane.

Surveying may be used for the following various applications:

- 1- To prepare a topographical map which shows the hills, valleys, rivers, villages towns, forest, landscaping, etc. of a country.
- 2- To prepare a cadastral map showing the boundaries of fields, houses and other properties.
- 3- To prepare an engineering map which shows the details of engineering works such as roads, railways, reservoirs, irrigation canals, etc.
- 4- To prepare a contour map to determine the capacity of a reservoir and to find the best possible routes for roads, railways, etc.

To learn the student about the importance of Surveying tools and material for life; today creating more buildings, bridges, landscape design and parks which build by this process and application. Based on this course student will be able to learn the principles of surveying and how to measure the field areas and design the field regarding their plan. In the future students will be able to get a surveyor's job as an agricultural engineer in their field. However, surveying is very important in the public and the private sectors as well.

11. Course Objective:

UNDERGRADUATE LEARNING OBJECTIVES

These statements are made operational by skills and abilities common to the theory and practice of surveying and levelling that our undergraduate students are expected to acquire:

- Have the ability to apply knowledge of mathematics, science and engineering to understand the measurement techniques and equipment used in land surveying.
- To apply surveying principles in a range of sites and scales.
- To enable students to understand theory and practice of land surveying.
- To enable students in reading and preparing surveying maps.
- To develop skills to use modern survey instruments.

Additionally, it is our philosophy that our students be compelled to bring their creative talent to the public landscape. Further, we hope our students will self-actualize through their educational process while being grounded in theory, methods (including field), construction craft, and studio design.

The aim of surveying is to prepare a map to show the relative positions of the objects on the surface of the earth. The map is drawn to some suitable scale. It shows the natural features of a country, such as towns, villages, roads, railways, rivers, etc. Maps may also include details of different engineering works, such as roads, railways, irrigation canals, landscape architecture, etc.

12. Student's Obligation

The obligation of the students in this academic course includes attendance in the lectures on time and listening to teachers carefully, try as much as possible to read the material and teachers' notes daily participate in-class activities and prepare the assignments to gain the benefits from the course.

Students are required to be attended in all the practical lectures during this course, prepare themselves to go to the field each lecture, data collecting during the practical lectures and prepare the report for each practical lecture and the report should be submitted for the next week.

However, preparation every week they will do quizzes, homework and also encourage all students to participate by giving them questions and giving an opportunity to all of them, attendance the exam by studying the materials.

13. Forms of Teaching

The form of teaching is including the use of whiteboard mostly, However, Projector will be used to display my objectives by PowerPoint to present the lecture, and sometimes, give the lecture to the students by Microsoft word for each lecture. Moreover, the other primary materials surveying and the practical part there will be investigation presentations and also discussions that will encourage teamwork between the students. However, In each lecture, we will be presented a short presentation to explain the lectures today and show the required picture, tools, or video, and the practical procedure that will be implemented in the field in this lecture.

14. Assessment scheme

First exam after five lectures

Second exam after ten lectures

Mark distribution:

Monthly Exam 50% (Theoretical 15% + Practical 35%).

Final Exam 50%

Final Mark 100%

15. Student learning outcome:

Demonstrate a fundamental understanding of the fundamental surveying methodologies in principles of surveying and levelling at appropriate scales: context, strategy, and detail. After finishing this course student will be introduced to the importance of surveying and levelling. They will be got information about surveying and levelling, Taping, Pacing, contouring, land survey as well as Theodolite, Global positioning system(GPS), Detail Survey and scales.

Understanding, interesting and enjoyable in the term of surveying.

Apply fundamental surveying concepts such as datum's, horizontal and vertical coordinate systems, horizontal and vertical angles, and the graphical representation of the three-dimensional information in a plane surveying environment. Implement the concepts and practicalities of differential levelling in a plane surveying environment. Apply the knowledge, techniques, skills and modern tools of mathematics, science, engineering, and technology to solve well-defined surveying problems appropriate to the discipline.

During this course, the students will be able to learn and get sufficient information about land surveying. They will be able to work as a surveyor in the agricultural directorates as an agricultural engineer.

16. Course Reading List and References:

Basak, N. (2014). Surveying and Levelling. Second edition. McGraw hill education (India) private limited.

McCormac, Jack C. (2012). Surveying. 6th edition. Publisher: John Wiley & Sons, Inc.

Michael, M. (2003). Introduction of Surveying. Second Edition. Government of Western Australia.

ÖZENER, H. (2011). Surveying. *Bogazici University*.

Punmia, B.C. Jain, A. and Jain, A. K. (2005). Surveying. Volume one. 6th edition. Laxmi publications LTD.

Rlyadh S. Al Khaffaf. (1986) Principles of plane and topographic Surveying.

SAYILI, İ. (2005). Elementary Surveying.

17. The Topics: Theoretical Part	Lecturer's name Dr. Kardo N. Kareem
Definition Surveying Units of measurements Types of Surveying Accuracy in Surveying Scales Basic Principles of Surveying	2 hours 5/02/2023
DISTANCE MEASUREMENT PACING TAPING TAPING ON LEVEL GROUND Linear Surveying	2 hours 12/02/2023
Levelling	2 hours 19/02/2023
Contouring	2 hours 26/02/2023
First Examination	2 hours 05/03/2023
Vertical Section Longitudinal sections Cross Sections Computer generated sections	2 hours 12/03/2023

Theodolite and total stations	2 hours 26/03/2023
Traverse Surveying Types of traversing	2 hours 2/04/2023
Global positioning system(GPS) Principles of GPS Errors in GPS GPS procedures	2 hours 9/04/2023
Second Examination	2 hours 16/04/2023
Detail Survey	2 hours 23/04/2023
Curve ranging	2 hours 30/04/2023
Setting out construction works	2 hours 7/05/2023
Mensuration – areas Mensuration – volumes.	2 hours 14/05/2023
18. Practical Topics	Lecturer's name MSc. Sherwan
Pacing, Setting out the straight line and Distance Measurements	3 hours 10/02/2020
Setting out Right Angles	3 hours 17/02/2019
Calculating Surface Areas of Irregular Shaped Field	3 hours 24/02/2019
Taping Around Obstacles	3 hours 02/03/2019
Setting up an Optical Level	3 hours 09/03/2019
First Examination	3 hours 16/03/2019
Leveling (Elevations), Open level Traverse Differential Leveling	3 hours 30/03/2019
Leveling (Elevations), Closed loop level traverse	3 hours 06/04/2019
Error correction in Closed loop level traverse Elevation	3 hours 13/04/2019
Profile leveling (longitudinal leveling) and Cross sectional levelling	3 hours 20/04/2019

Topographic Survey (contouring)	3 hours 27/04/2020
Topographic Survey (contouring)	3 hours 04/05/2020
Second Examination	3 hours 11/05/2020

19. Examinations:

1. Compositional: In this type of exam the questions usually start with Explain how, what are the reasons for...? Why...? How....?

Example :

Answer the following.

1. Source of taping errors.
2. Classification of surveying.

2. Define the following terms:

1- Surveying. 2- Fore sight. 3- Turning Point.

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 :

1. Contour lines are:
 - A. Actual lines.
 - B. Imaginary lines
 - C. Opened lines.
 - D. Parallel lines.

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:

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)..