The Hashemite University
Faculty of Engineering
Civil Engineering Program
Course Syllabus

Course Title: Surveying (3,2, 3)	**Course Number:** 110 401365
Designation: Compulsory	**Prerequisite(s):** 110400202
Instructor: Dr. Taleb Al-Rousan	**Instructor' e-mail:** taleb@hu.edu.jo
Office Hour: M &W (11:00 – 12:00 pm)	

Course Description (catalog): Principles of surveying; Tape measurements (procedures, errors, and corrections); Leveling and its application in contouring, profiles and cross-sections; Measurement of angles and directions; Traverse surveys, Topographic surveys; Drafting and computation including calculating earthworks areas and volumes; Introduction to GPS .

LAB: Tests on alignment, distance measurements and error of closure in linear measurements; Training on leveling including differential leveling and contouring; Training on theodolites including directions and angular measurements; Training on Total Station including measurement of horizontal and vertical angles, find coordinates, tie distances and find areas, setup and stake out survey; Use of GPS receivers in surveying.

Textbook(s) and/or Other Supplementary Materials:

- Barry Kavanagh and Tom Mastin, 2014, Surveying Principles and Applications, Seventh Edition, Pearson.
- Any elementary surveying book can be a good reference.
- Surveying Laboratory Manual Notes.

Major Topics Covered:

Topics	No. of Weeks	Contact hours*
Basics of Surveying	2	4 + Lab (3 hrs)
Tape Measurements,	2	4+ Lab (3 hrs)
Leveling and Leveling Applications,	3	6+ Lab (3 hrs)
Transits and Theodolites,	1	2+ Lab (3 hrs)
Angles and Directions,	1	2+ Lab (3 hrs)
Traverse Surveys.	2	4+ Lab (3 hrs)
Topographic Surveys,	1	2+ Lab (3 hrs)
Survey Drafting and Computations,	2	4+ Lab (3 hrs)
Global Positioning System and its Application.	1	2+ Lab (3 hrs)
Total	**15**	**30 + 45 lab**

*Contact hours include lectures, quizzes and exams

Exercises Covered in LAB

Week	Exercise
2	Introduction: Lab Regulations, Report Technical Writing, Procedures, and Policies
3	Alignment of a straight line with the naked eye + determination of individual's pace length + Horizontal
4	Taping**:** Measuring the sides and the diagonals of a quadrilateral
5	Taping: Horizontal control for mapping by linear measurements
6	Level (electronic & digital level): Testing and training on leveling
7	Level: Differential leveling
8	Level: Contouring from grid (or spot) elevations
9	Total Station: Measurement of horizontal and vertical angles
10	Total station: Quick-survey (To find coordinates and measurements quickly without station setup)
11	Total station: Q-survey/ Tie distance / Remote height / Area
12	Total Station: Setup Survey

13	Total station: Stake out
14	Total Station & GPS: Survey Application Using Hi and Prism Height
15	Final Practical Exam

Specific Outcomes of Instruction (Course Learning Outcomes, CLO):
After completing the course, the student will be able to:

- Summarize surveying measurements and observations [1].
- Find errors of closure and accuracy ratios for survey measurements [1]
- Discover the procedures for differential leveling, angular measurements, traverse survey, and the related apparatus [5,6]
- Demonstrate the use of surveying instruments [5,6]
- Find areas and volumes of Earth works (route survey applications example) [1].

Student Outcomes (SO) Addressed by the Course:

#	Outcome Description	Contribution
	General Engineering Student Outcomes	
1	an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics	H
2	an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors	
3	an ability to communicate effectively with a range of audiences	
4	an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts	
5	an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives	M
6	an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions	M
7	an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.	
	H=High, **M**= Medium, **L**=Low	

Grading Plan	Midterm Exam	30 pts	**Wed. 30/11/2022 (12:30 – 13:30 pm)**
	Laboratory	30 pts	
	Final Exam	40 pts	Will be announced by the registrar
General Notes:	• The maximum allowed number of absentees from the course is 5 classes and/or 2 labs. • Exceeding these limits will lead to prevention from attending the final exam. • **NO MAKE-UP EXAMS.** • Beware of Plagiarism: Copying and handing in for credit someone else's work. Any plagiarism case will result in an automatic 'F' for the course.		

Prepared by: *Dr. Taleb M. Al-Rousan* **Date:** 9th Oct. 2022