



**The Hashemite University
Faculty of Engineering
Civil Engineering Program
Course Syllabus**



Course Title:	Fluids and Hydraulics Lab	Course Number:	110401358
Designation:	Compulsory	Prerequisite(s):	
Instructor:	Dr. Zeyad Tarawneh	Instructor's e-mail:	zeyadt@hu.edu.jo
Office Hours:	Refer to posted time table.		
Class schedule:	1 lab per week		

Course Description (catalog): Fluids and hydraulics lab is a basic civil engineering practical course that enables CE students to conduct experiments related to confirming the theoretical aspects of water flow measurements, friction in pipes and open channel flow.

Textbook: Lab instructions.

Major Topics Covered:

Topic	No. of Weeks	Contact hours*
EX1: Hydrostatic pressure and center of pressure.	1	3
EX2: Orifice and jet flow.	1	3
EX3: Bernoulli theorem and Venture meter.	1	3
EX4: Impact of water jet.	1	3
EX5: Friction in pipes and energy loss.	1	3
EX6: Uniform flow and roughness coefficient.	1	3
EX7: Specific energy.	1	3
EX8: Hydraulic Jump.	1	3
EX9: Flow over sharp crested weirs.	1	3
EX10: Flow over broad crested weir.	1	3
Exams	1 (midterm + final)	3
Total	11	33

*Contact hours include: lectures and exams.

Specific Outcomes of Instruction (Course Learning Outcomes):

After completing the course, the student will be able to:

- design and conduct experiments, as well as to analyze and interpret data (**Outcome b**).
- acquire knowledge to identify and solve civil engineering water related problems (**outcome e**)

Student Outcomes (SO) Addressed by the Course:

#	Outcome Description	Contribution
General Engineering Student Outcomes		
(a)	an ability to apply knowledge of mathematics, science, and engineering	
(b)	an ability to design and conduct experiments, as well as to analyze and interpret data	L (10)%
(c)	an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability	
(d)	an ability to function on multidisciplinary teams	
(e)	an ability to identify, formulate, and solve engineering problems	H (90)%
(f)	an understanding of professional and ethical responsibility	
(g)	an ability to communicate effectively	
(h)	the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context	
(i)	a recognition of the need for, and an ability to engage in life-long learning	
(j)	a knowledge of contemporary issues	
(k)	an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.	
H= High, M= Medium, L= Low		



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Course Title:	Surveying	Course Number:	110401365
Department:	Civil Engineering	Designation:	Compulsory
Prerequisite(s):	(110400202) Computer Aided Engineering Drawing		
Instructor:	Dr. TALEB M. AL-ROUSAN	Instructor's Office:	E 3015
Instructor's e-mail:	taleb@hu.edu.jo		
Office Hours:	S, T, W (9:00 – 10:00 am)		
Time: Sec. 1	M,, W (9:30 - 10:30 am)	Class Room:	E 2002
Time Sec. 2	M, W ((11:00 - 12:00 pm)		E 2006
Course description:	<p>Principles of surveying; Tape measurements (procedures, errors, and adjustments); Leveling and its application in contouring, profiles and cross-sections; Areas, volumes, and earthwork; Measurement of angles and directions; traverse surveys, topographic surveys; Electronic distance measurements (EDM); Introduction to GPS and applications. Horizontal and vertical alignment; Setting out horizontal and vertical curves.</p> <p>LAB: Tests on distance measurements, levels and theodolites, directions and angular measurements, topographic surveys, areas and volumes; traverse surveys; Setting out horizontal and vertical curves, Training on Total Station.</p>		
Textbook(s):	Barry Kavanagh and Tom Mastin, 2014, Surveying Principles and Applications, Seventh Edition, Pearson.		
Other required material:	<ul style="list-style-type: none"> • Any elementary surveying book can be a good reference. • Surveying Laboratory Manual 		
Program Learning Outcomes (PLOs)	On successful completion of this program graduates will be able to:		
	#	Outcome Description	Contribution
	General Engineering Student Outcomes		
	a	an ability to apply knowledge of mathematics, science, and engineering.	H
	b	an ability to design and conduct experiments, as well as to analyze and interpret data	
	c	an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability	
	d	an ability to function on multidisciplinary teams	H
	e	an ability to identify, formulate, and solve engineering problems	
	f	an understanding of professional and ethical responsibility	
	g	an ability to communicate effectively	
	h	the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context	
	i	a recognition of the need for, and an ability to engage in life-long learning	
	j	a knowledge of contemporary issues	
	k	an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.	L
H=High, M= Medium, L=Low			
Course Learning Outcomes (CLOs):	<p>Upon completion of this course, the student will be able to:</p> <ol style="list-style-type: none"> 1- Summarize surveying measurements and observations [a.] 2- Find errors of closure and accuracy ratios for survey measurements [a.] 3- Discover the procedures for differential leveling, angular measurements, traverse survey, and the related apparatus [a, d, k] 4- Demonstrate the use of surveying instruments [a, d] 5- Find areas and volumes of Earth works (route survey applications) 		



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	example) [a, k].																																			
Major Topics covered:	<table border="1"> <thead> <tr> <th style="text-align: center;">Topics</th> <th style="text-align: center;">No. of Weeks</th> <th style="text-align: center;">Contact hours*</th> </tr> </thead> <tbody> <tr> <td>Basics of Surveying</td> <td style="text-align: center;">2</td> <td>4 + Lab (3 hrs)</td> </tr> <tr> <td>Tape Measurements,</td> <td style="text-align: center;">2</td> <td>4+ Lab (3 hrs)</td> </tr> <tr> <td>Leveling and Leveling Applications,</td> <td style="text-align: center;">2</td> <td>4+ Lab (3 hrs)</td> </tr> <tr> <td>Angles and Directions</td> <td style="text-align: center;">2</td> <td>4+ Lab (3 hrs)</td> </tr> <tr> <td>Transits and Theodolites,</td> <td style="text-align: center;">1</td> <td>2+ Lab (3 hrs)</td> </tr> <tr> <td>Traverse Surveys.</td> <td style="text-align: center;">2</td> <td>4+ Lab (3 hrs)</td> </tr> <tr> <td>Topographic Surveys,</td> <td style="text-align: center;">1</td> <td>2+ Lab (3 hrs)</td> </tr> <tr> <td>Survey Drafting and Computations,</td> <td style="text-align: center;">2</td> <td>4+ Lab (3 hrs)</td> </tr> <tr> <td>Global Positioning System and its Application.</td> <td style="text-align: center;">1</td> <td>2+ Lab (3 hrs)</td> </tr> <tr> <td style="text-align: center;">Total</td> <td style="text-align: center;">15</td> <td style="text-align: center;">30 + 45 lab</td> </tr> </tbody> </table>			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,	2	4+ Lab (3 hrs)	Angles and Directions	2	4+ Lab (3 hrs)	Transits and Theodolites,	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
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Class/laboratory schedule:	2 class sessions each week; 50 minutes each. 1 Lab sessions each week, 3 hrs each.																																			
Grading Plan:	Midterm Exam	(30 Points)	Wed. 28/3/2018 (11:00 – 12 :30 pm)																																	
	Lab	(30 points)																																		
	Final Exam	(40 Points)	Will be announced by the registrar																																	
	Please note that the grading system that will be used for this class will be as follows:		A+ (90-100), A (86 -89), A- (82-85), B+ (78-81), B (74-77), B- (70-73), C+ (66-69), C (62-65), C- (58-61), D+ (54-57), D (50-53).																																	
General Notes:	<ul style="list-style-type: none"> • The maximum allowed number of absentees from the course is five classes. 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: 28th Jan. 2018