KOMAR UNIVERSITY OF SCIENCE AND TECHNOLOGY
(KUST)

Water Resources Syllabus			
Course Title	**Water Resources**		
Course Code	**CVE4345**	**No. of Credits**	**3 CH**
Department	**Civil Engineering Department**	**Faculty**	**Engineering**
Pre-requisites Course Code	**Environmental Engineering Fundamentals; and Fluid Mechanics**	**Co-requisites Course Code**	
Course Coordinator(s)	**Dr. Ibrahiem Abdul Razak Al-Ani**		
Email	**Ibrahiem.abdulrazaq@komar.edu.iq**	**IP No.**	**115**
Other Course Teacher(s)/Tutor(s)	**None**		
Learning Hours	**Section 1: Sunday & Tuesday (14:00 to 15:30)** **Section 2: Monday & Wednesday (14:00 to 15:30)**		
Contact Hours	**Sunday, Monday & Tuesday (13:00 to 14:00)**		
Course Type	**Departmental Requirement**		
Offer in Academic Year	**Fall 2015**		

COURSE DESCRIPTION

Water and Water Resources are critical issues for the sustenance of nearly every society. This course provides the students with an exposure to the Water Resources Engineering in two major processes (i.e. hydrologic and hydraulic processes). The topics involved are introduction to water resources engineering, Pressurised Pipe Flow, Open Chanel Flow, Hydrologic Processes, Surface Runoff, Water Withdrawals & Uses, Water Distribution, Stormwater Control for Streets & Highways, and Design of Spillways and Energy Dissipation. This course style has been taken from Arizona State University.

COURSE OBJECTIVES

Course objectives are as follows:

1. Understand the basic concepts of water resources engineering.
2. Conduct hydrology and hydraulic analysis.
3. Design of spillways and energy dissipation structures.

COURSE LEARNING OUTCOMES

After participating in the course, students would be able to:

1. Solve simple water resources engineering problems and apply knowledge of mathematics, science, and engineering [ABET OUTCOME A & E].

2. Use standard techniques and data used by engineers in conducting hydrologic and hydraulic analysis [ABET OUTCOME E & K].

3. Estimate surface runoff and flood control alternatives [ABET OUTCOME E].

4. Calculate the water requirements for irrigation and supply [ABET OUTCOME E].
5. Design of spillways and energy dissipation structures for flood control storage & conveyance systems [ABET OUTCOME C].

Grading Scale:

Points	Percentage Scores
A	95-100
A-	90-94
B+	87-89
B	83-86
B-	80-82
C+	75-79
C	70-74
C-	65-69
D+	60-64
D	55-59
D-	50-54
F	0-49
W	Withdrawal
I	Incomplete

Note: The minimum passing grade to pass this course is C-which is equivalent to 65%.

COURSE CONTENT

Course Topics Include:

Chapter 1: Introduction to Water Resources Engineering
Chapter 2: Hydraulic Processes: Pressurised Pipe Flow
Chapter 3: Hydraulic Processes: Open Channel Flow
Chapter 4: Hydrologic Processes
Chapter 5: Surface Runoff
Chapter 6: Water Withdrawals and Uses
Chapter 7: Water Distribution
Chapter 8: Stormwater Control: Street & Highway Drainage
Chapter 9: Design of Spillways and Energy Dissipation

Adding more chapters is governed by the time.

COURSE TEACHING AND LEARNING ACTIVITIES

Course Teaching and Learning Activities: (short description)

1. Interactive class discussion
2. Hands- on Exercises
3. Assignments, Home work
4. Tests and Quizzes

COURSE ASSESSMENT TOOLS		
Assessment Tool	**Description**	**Weight**
Quizzes	There will be five quizzes as scheduled in the course schedule.	15 %
Assignments	Two assignments will be given as scheduled in the course schedule.	5 %
Midterm	The midterm exam will be conducted after week 7 that covers Chapters 1 to 5 as scheduled in the course schedule.	25 %
Participation	This includes student's participation in class brainstorming sessions, recalling previous topics and participation for the next classes.	5 %
Test	There will be test after week 11 that covers Chapters 6, 7, and 8	20 %
Final Exam	The final exam will be conducted after week 15 that covers all the chapters of this course.	30 %

ESSENTIAL READINGS: (Journals, textbooks, website addresses etc.)

References:

Textbook:
Mays, L. W. (2011). Water Resources Engineering. 2nd Edition. John Wiley & Sons, Inc.

Other References

1- Asawa, G. L. (2008). Irrigation and Water Resources Engineering. New Age International, Ltd.
2- Sturm, T. W. (2010). Open Channel Hydraulics. 2nd Edition. McGraw. Hill, New York.
3- David, A. Chin. (2013). Water Resources Engineering, 3rd Edition. Pearson Education.

COURSE POLICY *(including plagiarism, academic honesty, attendance etc)*

Attendance Policy:
Students are expected to attend each class for the entire semester. Students are responsible for material present in lectures. Only students with official KUST absence, family crises, and illness are excused from class. Three occasions of lateness count as one absence. The student who misses 10 percent of the classes will be placed on probation.

Make up Policy:
Since all examination are announced in advance, zero grade will be given to any missed examination unless a student's has an acceptable reason, such as illness, for not being able to take the examination during all those days when the examination was announced.

Academic Dishonesty:
Any type of dishonesty (Plagiarism, Copying another's test or home-work, etc) will Not be tolerated. Students found guilty of any type of academic dishonesty are subject to failure in this course, plus further punishment by the University Consul.

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Note: Supplementary problems will be given either as homework in the text book and which are posted in the Google Classroom and during the class.

Week	Beg/End Dates	Topics (Chapters)	Course Assignments per chapter
1	**28-9 to 1-10 / 2015**	**Chapter 1: Introduction to Water Resources Engineering** • **World's water resources** • **Water resources sustainability** • **Urbanisation**	
2	**4-10 to 8-10 / 2015**	**Chapter 2: Hydraulic Processes: Pressurised Pipe Flow** • **Classification of flow** • **Pressurized pipe flow** • **Head losses**	
3	**11-10 to 15-10 / 2015**	**Chapter 3: Hydraulic Processes: Open Channel Flow** • Steady uniform flow • Steady gradually varied flow	**Quiz 1**
4	**18-10 to 22-10 / 2015**	**Chapter 3: Hydraulic Processes: Open Channel Flow (Cont.)** • Gradually varied flow for natural channels • Rapidly varied flow	**Assignment 1**
5	**25-10 to 29-10 / 2015**	**Chapter4: Hydrologic Processes** • **Introduction to hydrology** • **Precipitation** • **Evaporation** • **Infiltration**	**Quiz 2**
6	**1-11 to 5-11 / 2015**	**Chapter 5: Surface Runoff** • **Drainage basins & Storm Hydrograph** • **Hydrologic Losses**	**Quiz 3**
7	**8-11 to 12-11 / 2015**	**Chapter 5: Surface Runoff (Cont.)**	
		• **Rainfall- Runoff Analysis** • **Curve Number Estimation**	
	16-11 to 21-11 / 2015	**Mid Term Exam**	

8	22-11 to 26-11 / 2015	Chapter 6: Water Withdrawal & Uses • Water use data • Water for irrigation	
9	29-11 to 3-12 / 2015	Chapter 6: Water Withdrawal & Uses (Cont.) • Water supply • Water demand	
10	6-12 to 10-12 / 2015	Chapter 7: Water Distribution • Water distribution systems • System configuration & operation	Quiz 4
11	13-12 to 17-12 / 2015	Chapter 8: Stormwater Control: Street & Highway Drainage • Drainage of street & highway pavements	
		Test	
12	20-12 to 24-12 / 2015	Chapter 9: Design of Spillways & Energy Dissipation • Hydrologic considerations • Dams	Assignment 2
	27-12 to 31-12 / 2015	New Year Holiday	
13	3-1 to 7-1 / 2016	Chapter 9: Design of Spillways & Energy Dissipation (Cont.) • Spillways • Hydraulic jump	Quiz 5
14	10-1 to 14-1 / 2016	Chapter 9: Design of Spillways & Energy Dissipation (Cont.) • Stilling basins • Energy dissipation	
15	17-1 to 21-1 / 2016	Review Week for Academic Courses	
16	24-1 to 31-1 / 2016	Final Examination for Academic Courses	