Faculty of Engineering & Technology

Hydraulic Engineering

Information :

Course Code :	SCM 461	**Level :**	Undergraduate	**Course Hours :**	4.00- Hours

Department : Department of Structural Engineering & Construction Management

Instructor Information :

Title	Name	Office hours
Associate Professor	Yasser Mohamed Sadek Abdel Aziz El Saie	7
Teaching Assistant	Ahmed Taher Abdelhamed Mohamed Yousef	

Area Of Study :

This course aims to:
1. Estimate the elements of the hydrologic cycle and river hydrology and
annual and long term storage in reservoirs, flow measurements, and data analysis.
2. Describe the operating characteristics of pumps and the factors affecting their operation and specifications.
3. Investigate engineering design principles for pipe networks and open channel systems.
4. Define and solve practical Civil Engineering problems of water conveyance in pipes, pipe networks and open channel.

Description :

Open channel flow: types of flow, conservation laws of mass and energy, specific energy concept, flow resistance in channels, sketching and calculations of water surface profile for gradually varied flow, design of cross sections in open channels, momentum equation and specific force concept, design of stilling basins downstream of gates and pipe outlets, physical models, Introduction to river engineering and sediment transport, Pumps: types and characteristics of pumps, pumps and pipeline systems, Hydraulics of groundwater: types of aquifers, groundwater flow.

Course outcomes :

a.Knowledge and Understanding: :	
1 -	List the types of open channel flow
2 -	Define the open channel properties
3 -	Explain the energy principle in open channels
4 -	Draw the water surface profile in open channels
5 -	Explain the hydraulic jump phenomenon in open channels
6 -	Detect the water hammer phenomenon in pipe system
7 -	Describe the operating characteristics of pumps and the factors affecting their operation and specifications
b.Intellectual Skills: :	
1 -	Design canal and drain cross sections
2 -	Calculate Energy of open channels

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3 -	Deduce the water surface profile
4 -	Solve pipe network problems
5 -	Analyze experimental data
d.General and Transferable Skills: :	
1 -	Manage time and meet deadlines

Course Topic And Contents :

Topic	No. of hours	Lecture	Tutorial / Practical
Design Of Open Channel	15	9	6
Specific Energy	12	6	6
Rapidly and Gradually Varied Flow	15	9	6
Pipes Network	12	6	6
Water Hummer	12	6	6
Pumps	15	9	6

Teaching And Learning Methodologies :

Class Lectures

Tutorials

Course Assessment :

Methods of assessment	Relative weight %	Week No	Assess What
Mid Term Examinations	20.00		
Practical Examination.	10.00		
Semester Work	30.00		
Final Examination	40.00		

Course Notes :

Lecture Notes

Recommended books :

Water Hwang, N. H. C.; "Fundamentals of Hydraulic Engineering Systems". Prentice Hall, 1981
French R.H.; "Open Channel Hydraulics"; McGraw Hill, 1984
Chow V.T.; "Open Channel Hydraulics"; McGraw Hill, 1977
Ray Linsley, Joseph Franzini, David Freyberg, George Tchobanoglous; "Water Resources Engineering", 1988

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