Course Description Form

1. Course Name:
Hydrology I
2. Course Code:
WCV-41-05
3. Semester / Year:
First semester/ 2024-2025
Description Preparation Date:
23/9/2024
4. Available Attendance Forms:
Lectures are in person at the university only
5. Number of Credit Hours (Total) / Number of Units (Total)
Number of Credit Hours (Total) 3 / Number of Units (Total) 2
6. Course administrator's name (mention all, if more than one name)
Name: Asst. Lect. Zahraa Kareem Kadhim Email: zahraa.kareem@uowa.edu.iq
7. Course Objectives

Course Objectives	• Introduce and learn about the movement of water in nature • The hydrological cycle and its components • Rain, storms and formation methods • Rainfall measurement methods and monitoring stations and their spatial distribution • Measurement of evaporation from water surfaces • Bio evapotranspiration of forest and living organisms • Infiltration process and base flow formation • Surface runoff formation and its equations • Methods for measuring surface runoff • Follow the flood wave routing • Ground water hydrology

8. Teaching and Learning Strategies	
Strategy	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering a type of simple experiments involving some sampling at homework section.

9. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
16	3	1. What are the rains and how does it affect public life 2. How to calculate the amount of rain expected	1. Introduction: Definition of hydrology, Engineering hydrology; Hydrologic cycle and its elements; Water budget concept, world water	Lectures are in person at the university only	(exam1 = 15), (exam2 = 15) (Quizzes = 4%), (Activities= 4%), (Attendance=2%) (Final exam = 60%)

		from a rainstorm 3. Methods of measuring the diameters of the network planned to deal with the amount of rainfall 4. Flood wave movement and routing its track 5. Ground water formation 6. Removing ground water from site work	budget; Applications of hydrology in engineering. 2. Weather and Hydrology: Definition of climate and weather; Solar and earth radiation, measurements, thermal circulation; Temperature, measurements, terminology; Humidity, measurements, vapor pressure, latent heat; Wind, measurements of speed and direction. 3. Precipitation: Definition of precipitation and its occurrence; Forms of condensation and precipitation; Types of precipitation; Measurements, rain gage networks, density, and adequacy; Preparation of data, missing data, test of consistency records; Average precipitation over area; Analysis of rainfall data, IDF relationship, Hydrograph. 4. Evaporation: Definition of evaporation and evapotranspiration; Estimation of evaporation (analytical solution — water budget, energy budget), Dalton equation; Empirical equations, Thornthwaite and Penman formula; Estimation of reservoir evaporation, Pan evaporation and Pan coefficient. 5. Abstraction losses: Infiltration and infiltration losses; infiltration index φ and W- index. 6. Stream flow: Stream gage, manual, automatic and recorded gages; Estimation of stream discharge, direct and indirect measurements; Current meter, Calculation of discharge using area-velocity methods; Stage discharge relationship; Permanent and shifting control stages. 7. Runoff: Direct runoff and base flow; Water year; Runoff volume; Rainfall-runoff correlation; Flow mass curve; droughts.		

10. Course Evaluation

(exam1 = 15),
(exam2 = 15),
(Quizzes = 4%),

(Activities= 4%), (Attendance=2%), (Final exam = 60%)
11. Learning and Teaching Resources

Main references (sources)	1. K. Subramanya, 2009 Engineering Hydrology.
	2. Bedient P B Huber, W C And Vieux, B E 2008 Hydrology And Floodplain Analysis.
	3. Gupta, R.S., 2016 Hydrology And Hydraulic Systems.