



Salahaddin University-Erbil

College of Science

Department of Earth Science and Petroleum

Subject: Practical Hydrology

Course: 1st Semester / 2nd Stage

Lecturer's name: Shevan Jameel Jirjees

**Ph.D. Degree in Watershed Management
(Hydrology)**

Academic Year: 2023-2024

Course Book

1. Course name	Hydrology
2. Lecturer in charge	Lecturer: Mr. Shevan Jameel Jirjees
3. Department/ College	Department of Geology/ College of Science
4. Contact	e-mail: Shevan.jirjees@su.edu.krd Tel: (0750-452-0939)
5. Time (in hours) per week	Practical:8
6. Office hours	5 hr
7. Teacher's academic profile	I graduated from University of Salahaddin on 2010-2011, I employed in the geology department on 2011, then I got the M.Sc. in water resource management (Hydrology) from the same university on 2015. After that, I got the Ph.D. degree in water resource management (Hydrology) from the same university on 2023. Since that time I gave many courses in the Department of Geology such as Practical Hydrology and Hydrogeology ,Practical Geomorphology ,practical structural Geology and practical petroleum geology with Petrel software .
8. Course overview: This course focuses on the important of surface water. In Hydrology a wide study of surface water is done from view of occurrence, movement of water, relation with climate elements, determining of stream discharge, infiltration and chemistry of surface water.	
9. Course objective: In this course, the students will be able to understand the important of Water, where Water is the solution of life, without it life is possible. People use surface water in places where there is a source of it such as rivers, streams, lakes and so. Students will be interested from where the water comes and the processes effect the water by studying the water cycle. The most important processes are precipitation, evaporation and evapotranspiration, infiltration and percolation. Also student will understand the important of quantity and quality of water by studying water balance and hydrochemistry, this study let the student to be responsible to save water and leave it clean. This course is very important for all geology students in their practical life after they graduate most places need a Hydrologist such as Dam directory, Groundwater directory and water resources companies in public and private sectors and other directories.	
10. Student's obligation The student's obligation during the course is attendance in the class or lab for about two hours for studying the practical part of the course. Every lab there are many exercise to solve after a brief explaining for the theoretical part and then students must write a report with a discussion of what they did in the lab. There are marks on the attendance of the students and on the work of the students and on there reports.	

11. Forms of teaching

In this course different forms of teaching are used such as power point presentations, whiteboard also is used. Figures that related to the lectures also are used to help student to understand the objects. Furthermore, students will be asked to prepare a report in each lab and there will be classroom discussions at the end of the presentations. I suggest to get best results of this course, students must read the theoretical lectures and teacher's notes before they attend the lab, and always try participate in classroom discussions as much as possible.

12. Assessment scheme

The students are required to do one exam in this course (20 marks from 35) after six or seven labs of practical hydrology. The attendance, classroom activities, and reports count 15 marks from the 35 marks.

13. Course Reading List and References:

➤ List of reference:

- Fetter, C.W. ,1994. Applied Hydrogeology, Prentice Hall Inc., Englewood Cliffs, N.J.691 p.
- Kruseman ,G. P. and de Ridder , N. A.,1994 . Analysis and evaluation of pumping test data. International Institute for Land Reclamation and Improvement, Wageningen, Netherlands, 377p.
- Serrano, S. E., 1997. Hydrology for engineers, geologists and environmental professionals Hydro. Sci. Inc. USA, 452p.
- Todd, D.K., 2005. Groundwater Hydrology (3rd edition). John Wiley and Sons, New York, USA, 650p.
- World Health Organization (WHO), 2008. Guidelines for drinking-water quality. 3rd ed., Vol.1, Recommendations, Geneva, 668 p.

➤ Magazines and review (internet):

- Iraqi Journal of Earth Science
- Journal of hydrology

13. The Topics:

Lecturer's name

<p><u>Week 1</u>: Water (Hydrologic) Cycle.</p> <p><u>Week 2</u>: Recognizing of Hydrometeorological Elements and The Main Instruments for Recording and Data interpretation.</p> <p><u>Week 3</u>: Estimation of Rain gauge station number and Estimation of Missing Rainfall Data</p> <p><u>Week 4</u>: Determining the effective depth precipitation for a basin by using the Arithmetic mean, Isohyetal and Thiessen polygon methods.</p> <p><u>Week 5</u>: Determining the potential evapotranspiration by using Thornthwaite, Blany Cridle and Kharrufa method. Then determining the water surplus and water deficit.</p> <p><u>Week 6</u>: Climate Classification.</p> <p><u>Week 7</u>: What is Runoff surface and methods to determine runoff.</p> <p><u>Week 8</u>: Exercises to determine infiltration rates and infiltration capacity by using Davis or Horton equation with illustrating the relation between infiltration rates and time on normal graph paper.</p> <p><u>Week 9</u>: Determining the total discharge for a cross sectional area of a stream by using data of velocity and depth for several stations and by using Mean and Mid-section methods.</p> <p><u>Week 10</u>: Exercises to separate base flow for a stream discharge hydrograph by using Straight line method, Fixed base length method.</p> <p><u>Week 11</u>: Presentation of chemical analysis results for groundwater by using several diagrams.</p> <p><u>Week 12</u>: Determining the Accuracy and Precision for chemical analysis of water samples.</p> <p><u>Week 13</u>: Drought analysis by SPI and RAI.</p>	<p>Lecturer's name Shevan Jameel ex: (2hrs* 4groups)</p> <p>• Course Degree (35)</p> <ol style="list-style-type: none">1. 15/35 mark (Midterm Exam).2. 5/35 mark (Report about topics).3. 5/35 mark (Seminar about report (point 2)).4. 10/35 mark (Lab report, Activity and Quiz).
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