

## **Department of Soil and Water Sciences**

# **College of Agriculture**

# University of Salahaddin, Erbil

**Subject: Water Resources.** 

Course Book – *For* (2<sup>nd</sup> year students)

#### Lecturer's name :Prof.Dr. Akram Othman

# Esmail

B.Sc. 1980 University of Sulaimani

MSc. 1986 University of Salahaddin

## PhD. 1992 University of Baghdad

**Academic Year: (2022-2023)** 

## **Course Book**

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1. Course	Fall Spring semester 2022-2023		
name	Prof. Dr. Almon Othmon Esmoil		
2. Lecturer in	Prof . Dr. Akram Othman Esmail		
charge			
3.	Soil and Water Sciences, Agricultural Engineering sciences.		
Department/			
College			
4. Contact	e-mail: akram.esmail@su.edu.krd		
	Tel: 07504672975		
5. Time (in	Theory: 2 hours per week		
hours) per	Practical: 3 hours per week		
week			
6. Office	6 hours/week		
hours			
7. Course			
code			
8. Teacher's	The main points in my academic profile can be summarize as follow:		
academic	1- Teaching B.Sc. M.Sc and Ph.D students.		
profile	2- Doing scientific researches.		
prome	<ul><li>3- Member of some scientific committees in the soil and water</li></ul>		
	department and college of Agriculture.		
	<ul><li>4- Supervising (12) Ph.D. students and 26 MSc. students.</li></ul>		
	5- Contributing in		
	6- More than 300 examine committee for MSc and Ph.D students either		
	as a member or chairman.		
	6-Evalution of numerous researches for scientific journals in Kurdistan,		
	Iraqi and international journals.		
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	8-Doing statistical analysis for numerous post graduate students.		
	9–Teaching students in other Universities.		
0.17			
9. Keywords	Water resources, management of water resources, water harvesting		
	,Hydrograph , Water quality.		
	1. Course name Water resources.		
	2. Lecturer in charge lect. Kahzin Sarbaz Rajab and Assit.Lect. Aveen Sabir		
	Kareem		
	3. Department/ College, Soil and water/ College of Agricultural engineering		
	sciences		
	BSc . 2010 , MSc. 2015 Salahaddin UnivErbil		
	4. Contact e-mail: kahzin.rajab@su.edu.krd		
	Tel: (07504635810)		
	5. Time (in hours) per week Practical: 3h. (35) Marks.		

6. Office hours	10hr/week
7. Course code	

**10**-water is so important for life that we cannot imagine life without it. The evolution of life itself took place in the water. In the evolution of all kinds of life, water has played an important role. The amount of water found in the living beings is 65 per cent and 65 to 99 percent in plants. This clearly shows the need and utility of water. Water which is a precious gift of the nature has several uses. Water is very essential for the development. It is a matter of great concern for all of us. Besides coordinating the demand and supply of the water, there is a need to keep the balance among different sources of water. Hence conservation of water resources is an essential requirement.

#### 11. Course objective: Goals of the course or Goals of studying water resources:

The main goals of studying water resources can be summarizing as follow: After studying this lesson, the student will be able to

1- Know different sources of water;

2- Explain the meaning of water budget;

3- Explain the uneven distribution of water;

4- Know the utility of water;

5- Understand the utility and distribution of different sources of irrigation;

6- Locate important river valley projects on the map;

7- Explain the need of the water management;

8- Explain the impact of flood and draught on the life of the people;

9- Explain the meaning of watershed development;

10- Explain the methods of conservation of water resources

11-drawing hydrograph.

12-Water harvesting and management.

12. Student's obligation:

The student must have an important role:

1- The students must contribute in the scientific discussions in the class or teaching hall.

2- The students must know the importance of quizzes, homework, reports and exams.

3- It is necessary to contribute the student in presentation a scientific subject.

13. Forms of teaching:

There are different forms of teaching:

1-Datashow and power point.

2- White board.

3-Lectures.				
<ul> <li>14. Assessment scheme</li> <li>Breakdown of overall assessment and examination:</li> <li>1-Monthly exam 9 marks.</li> <li>2-Quizzes 2 marks.</li> <li>3-Present and contributing in scientific discussions 2 mark</li> <li>4-Seminar 2 marks.</li> </ul>	s.			
15. Student learning outcome: Explaining and training on determining properties water resources, their uses, management, harvestin hydrographs.	1			
<ul> <li>16. Course Reading List and References:</li> <li>Groundwater – the processes and global s Google.com. 2003-12-29. doi:10.1098/rstb.2003.1</li> <li>Hoekstra, A.Y. 2006. The Global Dimension of Global Arrangements in Order to Cope with Lo Report Series No. 20 UNESCO-IHE Institute fo</li> <li>Homer-Dixon, Thomas. "Environment, Scarcity Press. (1999).</li> <li>McMahon, T.A. and Finlayson, B.L.; Global Annual Flows and Peak Discharges. ISBN 3-923</li> <li>Rasler, Karen A. and W. R. Thompson. "Conte Conflict Escalation." International Studies Qua</li> <li>The World's Water 2006-2007 Tables, Pacific 2009-03-12.</li> </ul>	1380. Retrieved 2009-03-12. Water Governance: Nine Reasons for cal Problems. Value of Water Research r Water Education. y, and Violence." Princeton University Runoff: Continental Comparisons of 381-27-1 sted Territory, Strategic Rivalries, and rterly. 50. 1. (2006): 145-168.			
Magazines:				
<ul><li>1American J. of Hydrology.</li><li>2- Journal of Soil Science.</li></ul>				
17. The Topics:	Lecturer's name			
1- Introduction, definition of water resources in Kurdistan,	Dr.Akram Othman 1 <sup>st</sup> week or meeting (2) h.			

1-Water sampling from different water resources for analysis.

	1st week or meeting (3) h
2-Quantity and quality of water resources in Kurdistan Region.	Dr.Akram Othman
2-Comparison between TDS , EC and, TSS and pH for	$2^{nd}$ and $3^{rd}$ meeting (4) h.
water samples taken from springs , rivers and wells.	Kahzin Sarbaz Rajab
	Aveen Sabir Karem
	$2^{nd}$ and $3^{rd}$ week or meeting (6) h
3-The problems of water in south Kurdistan.	Dr.Akram Othman
	4 <sup>th</sup> week (2) h.
<b>3-Visting to Efraz Project for Studing practical steps of water purification and Jar test in Efraz project lab.</b>	Kahzin Sarbaz Rajab
	Aveen Sabir Karem
	$4^{\text{th}}$ meeting (3) h.
4-Uses of water resources.	Dr.Akram Othman
	5 <sup>th</sup> meeting (2) h.
4-Vsiting to College of Education, Dept. of Physics for Radon determination and its relation with water resources.	Kahzin Sarbaz Rajab
Raton ucter mination and its relation with water resources.	5 <sup>th</sup> meeting (3) h.
5-and 6- Classifications of water resources for different	Dr. Akram Othman
purpose especially agricultural purpose.	6 <sup>th</sup> and 7 <sup>th</sup> meeting (4) h.
Vesting to Bardarash abd Akre for two purposes:	Kahzin Sarbaz Rajab
a- Practical water harvesting for one of MSc students in our department.	Aveen Sabir Karem
b- Vesting to see practically Artesian well.	$5^{\text{th}}$ and $6^{\text{th}}$ meeting (6) h.

7-Water harvesting.	Dr. Alzana Otherson
7- water har vesting.	Dr. Akram Othman
	7 <sup>th</sup> meeting (2) h.
7- Vesting to college of science for some chemical analysis of waters.	Kahzin Sarbaz Rajab
	Aveen Sabir Karem
	$7^{\text{th}}$ meeting (7) h.
8- and 9- Types of springs and drawing	Dr.Akram Othman
<ul><li>hydrographs.</li><li>9- Vesting to sulphate or hot springs in Smaquli Jali village.</li></ul>	8 <sup>th</sup> and 9 <sup>th</sup> (4) h.
	Kahzin Sarbaz Rajab
Sampling the water from hot springs then and analysing it.	Aveen Sabir Karem
	$8^{th}$ and $9^{th}$ meeting (6) h
10-Definition of hydrograph and factors affecting it.	Dr.Akram Othman
10- Radar analysis for some of practical results.	10 <sup>th</sup> meeting (2) h.
	Kahzin Sarbaz Rajab
	Aveen Sabir Karem
	10 <sup>th</sup> meeting (3) h
11-and 12 - Drawing hydrographs and discussing them.	Dr.Akram Othman
•	$11^{\text{th}}$ and $12^{\text{th}}$ meeting (4) h.
11-Determining ionic strength.	Kahzin Sarbaz Rajab
	Aveen Sabir Karem
12- Practical exam.	11 <sup>th</sup> meeting (3) h
	Kahzin Sarbaz Rajab
	12 <sup>th</sup> meeting (3) h

13- Dams in Kurdistan region.	Dr.Akram Othman
Advantage and disadvantage of dams	13 <sup>th</sup> meeting (2)h.
13- Vesting to one of the dams I n Kurdistan region.	Kahzin Sarbaz Rajab
	Aveen Sabir Karem
	$13^{\text{th}}$ meeting (3) h .
14 and 15- The problems of water resources in	Dr.Akram Othman
Iraq and Kurdistan region and methods for solving them.	$14^{th} \text{ and } 15^{th}$ (4)h.
14 and 15-Sdrawing the relation between ionic	Kahzin Sarbaz Rajab
strength and electrical conductivity for different water resources.	Aveen Sabir Karem
	$13^{\text{th}}$ and $^{15\text{th}}$ meeting (6) h
<b>18 Extra notes:</b> Nothing	