

**Department of Soil and Water Sciences College of Agricultural Engineering Sciences Salahaddin University- Erbil**

**Subject: Water Harvesting and Pond Construction**

**Course Book – Second Stage / Fall Semester Lecturer's Theoretical name: Kamyar M. Mohammed Lecturer's Practical name: Mr. Hedi Mahmud Academic Year: 2023/2024**

**Course Book**

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| **1. Course name** | **Water Harvesting and Pond Construction** |
| **2. Lecturer's in charge** | **Dr Kamyar M. Mohammed** **Mr. Hedi Mahmud**  |
| **3. Department/ College** | **Soil and Water\ Agricultural Engineering Sciences** |
| **4. Contact** | **Kamyar.mohammed@su.edu.krd** **Tel: 07504612509** |
| **5. Time (in hours) per week** | **Theoretical 2 hrs practical: 4 hrs** |
| **6. Office hours** | **Wednesday and Thursday 9.00 am to 1:00 pm** |
| **7. Course code** |  |
| **8. Teacher's academic profile** | Kamyar Mutalib MohammedMy name is Kamyar M. Mohammed. I have B.Sc. in Soil and Water Science at Salahaddin University in 2006 and getting Master degree in Soil Physics at Salahaddin University in 2012. I am Ph. D. in Soil and Water Conservation branch. |
| **9. Keywords** | Water harvesting, Types, Components, Uses of water harvesting, Advantages and disadvantages  |
| **10. Course overview:**This course will provide the student with some detailed knowledge regarding time-tested and reliable methods of collecting, storing, transferring and treating rain water for use as a substitute for potable water supplies. Rainwater harvesting is a technique to store rainwater and reuse it for further use. Many houses have built special spaces for collecting the rainwater, which is usually collected at the place where the rainwater falls. Rainwater harvesting is a global phenomenon which is an essential activity. The course will provide an overview of rainwater as a resource, conditions in a cistern “water column” that either help or inhibit water health. Final treatment if the stored rainwater will be described with a typical schematic. Finally, a sample calculation method will be described to determine optimal cistern sizing as well as the quantity of rainwater that can be captured and used in an average year. |
| 1. **Course objective:**

To gain understanding of:* Understand the importance of the treatment of rain water before it enters a cistern for storage;
* Understand the natural microbial processes that occur within the cistern that help water quality or inhibit water quality;
* Be familiar with the processes and components used to effectively collect quality rain water;
* Understand the function and benefits of the vertical mesh screening process used before storage in a cistern;
* Understand how rainwater capture is incorporated into LEED template calculations for water use reduction credits
* This would facilitate the availability of uncontaminated water for domestic, industrial, and irrigation needs.
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| 1. **Student's obligation**

The student must have an important role:* 1. Lecture and Lab attendance are compulsory.
	2. The students must contribute in the scientific discussions in the class or teaching hall.
	3. The students must know the importance of quizzes, homework, reports and exams.

It is necessary to contribute the student in presenting a scientific subject.**T**his course includes a multiple-choice quiz at the end, which is designed to enhance the understanding of the course materials. |
| 1. **Forms of teaching**

There are different forms of teaching:* 1. Datashow and power point.
	2. White board. 3-Lectures.
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| **14. Assessment scheme**The course degree was divided as follow %50 of monthly exam, 15M for theoretical part 35M for practical part (15 marks for first exam, 15 marks for second exam and 5 marks for reports and activities) in theoretical part 5 marks for the first exam, 5 marks for second exam, 5 marks for daily quiz and preparing reports. Final exam takes %50, 50 marks for Theory part only. |
| 1. **Student learning outcome:**

Upon completion of the course, students are expected to:* 1. Be familiar with the water harvesting and pond construction
	2. Understand and define the water harvesting, how to pond construction, and components
	3. Be familiar with the factors influencing pond construction.
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| 1. **Course Reading List and References:**
	1. Assessment of Best Practises and Experience in Water Harvesting Rainwater Harvesting Handbook. African Development Bank
	2. <https://www.scribd.com/presentation/410540755/Rainwater-Harvesting>
	3. <https://www.academia.edu/29297727/Civil_Rainwater_harvesting_ppt>
	4. Saeid Eslamian (2021). Handbook of Water Harvesting and Conservation: Basic Concepts and Fundamentals First published:8 January
	5. <https://sswm.info/sites/default/files/ppts/WAFLER%202010%20Rainwater%20Harvesting%20Rural_1.ppt>.
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| **17. The Topics:** | **Lecturer's name** |
| **1st week Introduction Water harvesting definition. (Theory).**How to take water harvesting (Practical). | Lecturer's name **Dr.****Kamyar Mohammed** |
| **2nd week Benefits of Rainwater Collection. (Theory).**Water harvesting can be undertaken through a variety of ways(Practical). | **Mr. Hedi Mahmud** |
|  **3rd week Advantages and Disadvantages of Rainwater Harvesting (Theory).**Water harvesting for agriculture (Practical). |
| **4th week The project on rainwater harvesting components** **(Theory).**Importance of Rainwater Harvesting (Practical). |  |
| **5th week Water Harvesting in Different Uses (Theory).**(Practical). |  |
|  **6th week Rainwater Harvesting (RWH) Techniques (Theory).**Factors play a vital role in the amount of water harvested (Practical). |  |
|  **7th week Types of rainwater harvesting** Types of pond shapes (Practical). |  |
| **8th week scenarios of how much water can be harvested. (Theory).**Factors for Selecting Type of RWH (Practical).**9th week Kinds of pond and Selecting the Pond Site (Theory).** Steps to pond Construction (Practical). |  |
| **10th week Basic Factors in Pond Design (Theory).**Specific Design Considerations (Practical). |  |
| **11th week Technical Consideration on Pond Design and Construction (Theory).** Pond Design and Layout (Practical).**12th course review (Theoretical and Practical).** |  |
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| **11th week Plant Nutrition (Theory).** |  |

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| **18. Practical Topics (If there is any)** |  |
| There are three main and important skills the students should learn, which are M. PowerPoint , M. Excel and M. Word that led them dealing with computer and internet | Lecturer's name Dr. Kamyar MohammedMr. Hedi Mahmud |
| 1. **Examinations:**
	1. ***Compositional:***
		1. 1-Definition?
		2. 2-give the reason of …..?
		3. 3- What are the differences between.. ?
		4. 4- Fill-in the blanks?
		5. Enumerate factors that affect......
	2. ***True or false type of exams:***
	3. ***Calculation:***
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| **20. Extra notes:** |
| **21. Peer review Assist Prof. Dr Abdulrahman P. Haydarهاوهڵ پێداچوونهوهی**. |