

Republic of Iraq

The Ministry Of Higher  
Education

& Scientific Research

بسم الله الرحمن الرحيم



University: Diyala

College: Agriculture

Department: Soil Sciences and  
Water Resources

Stage: Three

Lecturer name: Ibraheem A.  
Hedras

Qualification: PhD

Place of work: Soil Sciences and  
Water Resources

## Flow up of implementation celli pass play

|                    |  |
|--------------------|--|
| Course Instructor  | Ibraheem Ahmad Hedras  |
| E-mail             | <b>ibraheehamad@uodiyala.edu.iq</b>  |
| Title              | <b>Drainage</b>  |
| Course Coordinator | Spring Semester  |
| Course Objective   | <ol style="list-style-type: none"><li>1- Drilling examines the sources of irrigation water and methods of controlling it in agricultural fields</li><li>2- It includes planning, designing and implementing puncture networks</li><li>3- Transporting drainage water and studying methods of disposal</li><li>4- Studying problems related to adding water, such as salinization, drainage, and soil reclamation</li><li>5- Calculating the cost of puncture maintenance as part of production costs</li></ol> |
| Course Description | <ol style="list-style-type: none"><li>1- The student gets to know the concept of puncture</li><li>2. The student should classify the sources of drainage water in nature</li><li>3. The student should differentiate between irrigation with salt water and fresh water and methods of draining them</li><li>5. The student should evaluate the cost of maintaining drilling projects</li></ol>  |
| Textbook           | Inspection, investigations, designs, implementation and -1 -1 maintenance. Written by Dr. Mohsen Muhareb Al-Lami and Dr. Alaa Saleh Al-Janabi. 1991  |

|                    |   |            |         |         |            |
|--------------------|---|------------|---------|---------|------------|
|                    | Irrigation and drainage, written by Dr. Laith Khalil Ismail, -2 -2<br>2000, Ministry of Higher Education and Research Scientific -<br>University of Mosul |            |         |         |            |
| Course Assessments | Term Tests  | Laboratory | Quizzes | Project | Final Exam |
|                    | (20%)   | (15%)      | (5%)    |         | (60%)      |
| General Notes      |   |            |         |         |            |

### Teaching plan form for the subject

| Notes | Practical material   | Theoretical material   | the date  | the week |
|-------|--|--|-----------|----------|
|       | Investigations required to establish trocars   | The student gets to know the concept of puncture   | 31/1/2024 | 1        |
|       | Exploratory and operational investigations   | The student gets to know the justifications for abolishing pits, and the relationship of punctures to plant growth and productivity  | 7/2/2024  | 2        |
|       | Surveys, adjustment and settlement procedures and their calculations                   | The student will be familiar with the physical properties of soil related to drilling  | 14/2/2024 | 3        |
|       | Measurement of saturated water conductivity in the laboratory                          | The student gets to know the hydrological cycle and the location of irrigation and drainage in it                                    | 21/2/2024 | 4        |
|       | Measurement of saturated water conductivity in the field above the groundwater level   | The student gets to know the flow of water in the soil, its forms, and its relationship to the concept of drainage and flow analysis | 28/2/2024 | 5        |
|       | Measurement of saturated water conductivity in the field below the groundwater level   | The student will be familiar with drainage, soil salinity, washing requirements, and salt balance                                    | 6/3/2024  | 6        |
|       | Measuring ground water levels  | The student will be familiar with the investigations required to establish trocars, exploratory and design investigations            | 13/3/2024 | 7        |
|       | Calculation of water drainage in open trocars  | The student will be familiar with measuring saturated water conductivity above and below the groundwater level                       | 20/3/2024 | 8        |
|       | Open trocar design   | The student gets to know the types of trowels, their classification, and the objectives of their construction                        | 27/3/2024 | 9        |
|       | Design of covered trocars  | The student will be familiar with open trocars   | 3/4/2024  | 10       |
|       | Applications in calculating the distance between trocars, under stable flow conditions | The student gets to know the covered trocars   | 10/4/2024 | 11       |

|  |  |  |                  |           |
|--|--|--|------------------|-----------|
|  | Applications in calculating the distance between trocars, under unstable flow conditions | The student gets to know the incisal and vertical trocars  | <b>17/4/2024</b> | <b>12</b> |
|  | Using the electronic computer to design puncture systems                                 | The student will be familiar with the designs of open and covered puncture systems and calculate the distances between the trocars | <b>24/4/2024</b> | <b>13</b> |
|  | Horizontal, vertical and radial flow of water into the trocars                           | The student will be familiar with the mechanization of trowels and the requirements for implementing trowels                       | <b>1/5/2024</b>  | <b>14</b> |
|  | A field visit to one of the puncture projects  | The student will be familiar with the maintenance of open and covered trocars  | <b>8/5/2024</b>  | <b>15</b> |

توقيع العميد:

توقيع الاستاذ: