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| Date:  | Examination No.:  | Version: 1/2/2022 | Start: 1/2/2022 |
| **Module Name - Code** | Groundwater Engineering– WRE 6139 |
| **Module Language:** | English |
| **Responsible:** | Prof. Dr. Dana & Dr. Abdulwahd Ali Kassem |
| **Lecture (s):** | Prof. Dr. Dana & Dr. Abdulwahd Ali Kassem |
| **College:** | College of Engineering – Salahaddin University |
| **Duration:** | 15 week – 1 semester |
| **Course outcomes:** | Student is introduced to groundwater hydrology including distribution of groundwater, confined and unconfined aquifer, artesian well , hydraulic conductivity, Darcy law, stratification, Groundwater flow direction, general flow equations, stream flow and groundwater level , well, well construction, well hydraulics, Dupit’s assumptions, Thiem's equation, Theis method, Cooper-Jacob method , specific capacity, groundwater investigations, and artificial recharge of groundwater. |
| **Course Content:** | Introduction, confined and unconfined aquifer, artesian well , hydraulic conductivity, Darcy law, Groundwater flow direction, general flow equations, well construction and well hydraulics, Dupit’s assumptions, Thiem's equation, Theis method, Cooper-Jacob method, groundwater investigations, and artificial recharge of groundwater. |
| **Literature:** | 1- " Groundwater Hydrology ", by D. K. Todd. 2- "Apply Hydrology", by Ven T. Chow.3- " Hydrology", by H. M. Raghunath. |
| **Type of Teaching:** | 4 hrs in lectures  |
| **Pre-requisites:** | Engineering Hydrology |
| **Frequency:** | Yearly in spring semester |
| **Requirements for  credit points:** | For the award of credit points, it is necessary to pass the module exam. The module exam contains:Daily Requirements (Assessments, Quizzes, Daily Activities and etc..)Student's attendance is required in all classes. |
| **Credit point:** | 5 credits |
| **Grade Distribution:** | The Grade is generated from the examination result(s) with the following40% daily exam and activity60% final theoretical Exam |
| **Work load:** | The workload is 240 hr. It is the result of 120 hr attendance and 120 hr self-studies. |