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<tr><td colspan="2">Academic Year: 2023-2024</td><td>Semester: Spring</td><td>Starting Date: 20-2-2024</td></tr>
<tr><td>Course Name</td><td colspan="3">Rock Mechanics</td></tr>
<tr><td>Module Language</td><td colspan="3">English</td></tr>
<tr><td>Instructor</td><td colspan="3">Professor Dr. Yousif Ismael Mawlood</td></tr>
<tr><td>Teaching Assistance(s)</td><td colspan="3">None</td></tr>
<tr><td>College/University</td><td colspan="3">College of Engineering – Salahaddin University-Erbil</td></tr>
<tr><td>Department</td><td colspan="3">Civil Engineering</td></tr>
<tr><td>Semester Duration</td><td colspan="3">15 weeks</td></tr>
<tr><td>Course Overview</td><td colspan="3">This course is the basic course in the area of Rock Mechanics. This will provide the knowledge of overall behavior of rocks and rock masses. This course will enable the students to acquire basics of analysis and design of tunnels, caverns, slopes, and foundations on rocks.</td></tr>
<tr><td>Course Objectives</td><td colspan="3">The objectives of the course are for the students to develop an understanding of the engineering properties of rocks, geological and engineering rock classifications, rock failure theories, in-situ stresses in rock, and the fundamental concepts and principles of rock mechanics. The applications of rock mechanics principles in the design of foundations.</td></tr>
<tr><td>Course Contents</td><td colspan="3">
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<tr><td>Week</td><td>Lecture</td></tr>
<tr><td>1st</td><td>Introduction</td></tr>
<tr><td>2nd</td><td>Fundamentals of engineering geology, Rock Formations and Types, Structure of Rock: Intact Rock</td></tr>
<tr><td>3rd</td><td>Geological Structures and Discontinuities, examples</td></tr>
<tr><td>4th</td><td>Orientations Of Planes and Lines</td></tr>
<tr><td>5th</td><td>Rock properties and laboratory testing, Rock coring, Rock quality designation, Specimen preparation</td></tr>
<tr><td>6th</td><td>Standards, Uniaxial Compressive Strength Test, Indirect Tensile Strength Test, Point Load Strength Test, Slake Durability Test, Schmidt Hammer Test</td></tr>
<tr><td>7th</td><td>Factors Affecting Discontinuities</td></tr>
<tr><td>8th</td><td>Block size, Rock Mass Classification, Rock Mass Rating, Tunnelling Quality Index: Q-System</td></tr>
<tr><td>9th</td><td>Midterm Exam</td></tr>
<tr><td>10th</td><td>Tunnelling Quality Index: Q-System</td></tr>
<tr><td>11th</td><td>Rock Slope Stability</td></tr>
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	12th: Foundations On Rock, Shallow Foundations, Estimation of Load-Bearing Capacity 13th: Deep Foundations, Estimation of Load-Carrying Capacity 14th: Seminar Presentation 15th: Final Exam
Textbooks and References	1. Sivakugan N, Shukla SK, Das BM. Rock mechanics: an introduction: Crc Press; 2013. 2. Wyllie DC. Rock slope engineering: civil applications: CRC Press; 2017. 3. Wittke W. Rock mechanics based on an anisotropic jointed rock model (AJRM): John Wiley & Sons; 2014.
Teaching Style	3 hrs. in Class
Requirements for credit points	For the award of credit points, it is necessary to pass the module exam. It contains: An examination during the academic semester, Quizzes, Assignments, Practical part, Article review, and Final examination. **Student's attendance is required in all classes**.
Credit ECTS	6
Grade Distribution	The following grade system is used for the evaluation of the module exam: The module exam is based on the summation of two categories of evaluations: **First: (50%)** of the mark is based on the academic semester effort which includes - Midterm Exam = 20%. - Quiz = 5% - Lab reports (Seminar) = 10% - Review Article = 15% **Second: (50%)** of the mark is based on the final examination that is comprehensive for the whole of the study materials reviewed during the academic semester.
Workload	Workload 10hrs/w (150hrs/s): Contact face-to-face 3hrs/w (45hrs/s) and Non-Contact Self learning 7hrs/w (105hrs/s)