

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<b>Soil Mechanics II</b>		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	<b>CIV018</b>		
ECTS Credits	6		
SWL (hr/sem)	<b>150</b>		
Module Level	UGIV	Semester of Delivery	
Administering Department	CV101	College	Civil Engineering College
Module Leader	Dr. Muayad A. Al-Sharrad	e-mail	Muayad.alsharrad@uoanbar.edu.iq
Module Leader's Acad. Title	Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Dr. Junaid Aziz	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Soil Mechanics-I	Semester	5
Co-requisites module	None	Semester	

## Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p><b>Module Aims</b> أهداف المادة الدراسية</p>	<p>1. introduce various aspects of problematic Geomaterials behavior and their impact on civil constructions.</p> <p>2. introduce principles of treatment and stabilization of cohesive and cohesionless soils.</p> <p>3. describe various ground improvement techniques.</p>																										
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<p>1. identifying problematic soils and their potential risk on civil infrastructures.</p> <p>2. developing proper solutions to geotechnical problems.</p>																										
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding-left: 20px;">Introduction</td> <td style="text-align: right;">[3 hrs]</td> </tr> <tr> <td style="padding-left: 20px;">Problematic soils/ expansive soils</td> <td style="text-align: right;">[3 hrs]</td> </tr> <tr> <td style="padding-left: 20px;">Problematic soils/ collapsible soils</td> <td style="text-align: right;">[3 hrs]</td> </tr> <tr> <td style="padding-left: 20px;">Problematic soils/ liquefiable soils</td> <td style="text-align: right;">[3 hrs]</td> </tr> <tr> <td style="padding-left: 20px;">Ground improvement techniques/ an overview</td> <td style="text-align: right;">[6 hrs]</td> </tr> <tr> <td style="padding-left: 20px;">Mid semester exam</td> <td style="text-align: right;">[3 hrs]</td> </tr> <tr> <td style="padding-left: 20px;">Ground improvement techniques/ traditional compaction</td> <td style="text-align: right;">[3 hrs]</td> </tr> <tr> <td style="padding-left: 20px;">Ground improvement techniques/ rapid impact compaction</td> <td style="text-align: right;">[6 hrs]</td> </tr> <tr> <td style="padding-left: 20px;">Ground improvement techniques/ deep dynamic compaction</td> <td style="text-align: right;">[3 hrs]</td> </tr> <tr> <td style="padding-left: 20px;">Ground improvement techniques/ vibro-compaction</td> <td style="text-align: right;">[3 hrs]</td> </tr> <tr> <td style="padding-left: 20px;">Ground improvement techniques/ ground drainage</td> <td style="text-align: right;">[3 hrs]</td> </tr> <tr> <td style="padding-left: 20px;">Ground improvement techniques/ ground dewatering</td> <td style="text-align: right;">[3 hrs]</td> </tr> <tr> <td style="padding-left: 20px;">Ground improvement techniques/ ground consolidation</td> <td style="text-align: right;">[3 hrs]</td> </tr> </table>	Introduction	[3 hrs]	Problematic soils/ expansive soils	[3 hrs]	Problematic soils/ collapsible soils	[3 hrs]	Problematic soils/ liquefiable soils	[3 hrs]	Ground improvement techniques/ an overview	[6 hrs]	Mid semester exam	[3 hrs]	Ground improvement techniques/ traditional compaction	[3 hrs]	Ground improvement techniques/ rapid impact compaction	[6 hrs]	Ground improvement techniques/ deep dynamic compaction	[3 hrs]	Ground improvement techniques/ vibro-compaction	[3 hrs]	Ground improvement techniques/ ground drainage	[3 hrs]	Ground improvement techniques/ ground dewatering	[3 hrs]	Ground improvement techniques/ ground consolidation	[3 hrs]
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## Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

<b>Strategies</b>	Soil Mechanics II courses require effective learning and teaching strategies to ensure students develop a strong understanding of complex concepts and their practical applications. These strategies include lecture-based teaching, practical applications, problem-solving assignments, group work and discussions, technology integration, field trips and site visits, guest speakers, assessments and feedback, continuous learning, and encouraging self-directed learning. By incorporating these strategies, educators can create an engaging and comprehensive learning environment that equips students with the knowledge, skills, and critical thinking abilities necessary for success in the field of ground improvement.
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<b>Student Workload (SWL)</b> الحمل الدراسي للطالب			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	93	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعياً	6.2
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	57	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعياً	3.8
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	150		

<b>Module Evaluation</b> تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	4	10% (10)	3, 6,10,14	LO #1, and 2
	<b>Assignments</b>	2	5% (5)	2, 12	LO #1, and 2
	<b>Projects / Lab.</b>	2	15% (15)	2-13	LO #1, and 2
	<b>Report</b>	-	-		
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	20% (20)	7	LO #1, and 2
	<b>Final Exam</b>	3hr	50% (60)	16	LO #1, and 2
<b>Total assessment</b>			100% (100 Marks)		

<b>Delivery Plan (Weekly Syllabus)</b> المنهاج الاسبوعي النظري	
	Material Covered
<b>Week 1</b>	Introduction
<b>Week 2</b>	Problematic soils/ expansive soils
<b>Week 3</b>	Problematic soils/ collapsible soils

<b>Week 4</b>	Problematic soils/ liquefiable soils
<b>Week 5</b>	Ground improvement techniques/ an overview
<b>Week 6</b>	Ground improvement techniques/ an overview
<b>Week 7</b>	Mid semester exam
<b>Week 8</b>	Ground improvement techniques/ traditional compaction
<b>Week 9</b>	Ground improvement techniques/ rapid impact compaction
<b>Week 10</b>	Ground improvement techniques/ rapid impact compaction
<b>Week 11</b>	Ground improvement techniques/ deep dynamic compaction
<b>Week 12</b>	Ground improvement techniques/ vibro-compaction
<b>Week 13</b>	Ground improvement techniques/ ground drainage
<b>Week 14</b>	Ground improvement techniques/ ground dewatering
<b>Week 15</b>	Ground improvement techniques/ ground consolidation
<b>Week 16</b>	<b>Preparatory week before the final Exam</b>

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
<b>Week 1</b>	Identification of problematic soils
<b>Week 3</b>	Liquid and plastic limit of expansive soils
<b>Week 5</b>	Shrinkage factors of cohesive soil
<b>Week 7</b>	Laboratory compaction characteristics of soil
<b>Week 9</b>	Density of soil in place by the sand replacement method
<b>Week 11</b>	Unconfined compressive strength of improved soil
<b>Week 13</b>	One-dimensional swell or collapse of soils
<b>Week 15</b>	Direct shear test of improved soil under consolidated drained conditions

### Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	1. Coduto D.P., Kitch W. A. and Yeung A. R., 2016, "Foundation design: Principles and practices", 3 <sup>rd</sup> edition, , USA, Pearson, ISBN 0-13-	Yes

	341198-3. 2. Han J., 2015, "Principles and Practices of Ground Improvement", John Wiley & Sons, Inc., Hoboken, New Jersey.	
<b>Recommended Texts</b>	Koerner R. M., (2012), Designing with Geosynthetics, 6th edition, Xlibris Corporation.	Yes
<b>Websites</b>	<a href="https://www.uoanbar.edu.iq/Bank-Section.php">https://www.uoanbar.edu.iq/Bank-Section.php</a>	

<b>Grading Scheme</b> مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
<b>Success Group (50 - 100)</b>	<b>A</b> - Excellent	امتياز	90 - 100	Outstanding Performance
	<b>B</b> - Very Good	جيد جدا	80 - 89	Above average with some errors
	<b>C</b> - Good	جيد	70 - 79	Sound work with notable errors
	<b>D</b> - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	<b>E</b> - Sufficient	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group (0 – 49)</b>	<b>FX</b> – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F</b> – Fail	راسب	(0-44)	Considerable amount of work required
<p><b>Note:</b> Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.</p>				