

Date:	Examination No.:	Version: 2/1/2024	Start: 7/1/2024																																
Module Name - Code	Geotechnical Engineering- 1145																																		
Module Language:	English																																		
Responsible:	Assistant professor Dr. Rizgar Ali Hummadi & Hawkar Hashim Ibrahim																																		
Lecture (s):	Assistant professor Dr. Rizgar Ali Hummadi & Hawkar Hashim Ibrahim																																		
College:	College of Engineering – Salahaddin University																																		
Duration:	15 week – 2 nd semester																																		
Course outcomes:	<p>Upon successful completion of this module, students will be able to:</p> <ol style="list-style-type: none"> Demonstrate Proficiency in Geo5 Software: Gain a comprehensive understanding of the Geo5 software interface, tools, and functionalities. Effectively navigate and utilize the software for geotechnical engineering applications. Analyze Geotechnical Cases: Apply Geo5 software to analyze a variety of geotechnical cases. This includes the ability to input relevant data, select appropriate analysis methods, and interpret the outcomes accurately. Design Geotechnical Solutions: Employ software to design effective geotechnical solutions. This encompasses using Geo5 and other software (CSI SAFE) for tasks such as slope stability analysis, foundation design, retaining wall construction, and soil settlement calculations. Integrate Theoretical Knowledge with Practical Application: Bridge the gap between theoretical geotechnical engineering principles and practical application by using Geo5 software. This includes understanding how software algorithms correspond to real-world geotechnical phenomena and engineering standards. Critically Evaluate Software Outputs: Develop the ability to critically assess and validate the results provided by the Geo5 software. This involves understanding the limitations of the software and the need for professional judgement in interpreting results. 																																		
Course Content:	<table border="1"> <tr> <td colspan="2">Week lectures</td> </tr> <tr> <td>1st</td> <td>Course book + Introduction</td> </tr> <tr> <td>2nd</td> <td>Classifications of Foundations</td> </tr> <tr> <td>3rd</td> <td>Introduction to Geo5 Software and Geotechnical Engineering Basics</td> </tr> <tr> <td>4th</td> <td>Design of Footings</td> </tr> <tr> <td>5th</td> <td>Design of Footings</td> </tr> <tr> <td>6th</td> <td>Retaining Wall Design</td> </tr> <tr> <td>7th</td> <td>Retaining Wall Design</td> </tr> <tr> <td>8th</td> <td>Mid-Term Exam</td> </tr> <tr> <td>9th</td> <td>Design and Analysis of Sheet Piles</td> </tr> <tr> <td>10th</td> <td>Pile foundations</td> </tr> <tr> <td>11th</td> <td>Pile foundations</td> </tr> <tr> <td>12th</td> <td>Settlement Analysis</td> </tr> <tr> <td>13th</td> <td>Slope Stability and Overall Stability Analysis</td> </tr> <tr> <td>14th</td> <td>Slope Stability and Overall Stability Analysis</td> </tr> <tr> <td>15th</td> <td>Final Examination</td> </tr> </table>			Week lectures		1 st	Course book + Introduction	2 nd	Classifications of Foundations	3 rd	Introduction to Geo5 Software and Geotechnical Engineering Basics	4 th	Design of Footings	5 th	Design of Footings	6 th	Retaining Wall Design	7 th	Retaining Wall Design	8 th	Mid-Term Exam	9 th	Design and Analysis of Sheet Piles	10 th	Pile foundations	11 th	Pile foundations	12 th	Settlement Analysis	13 th	Slope Stability and Overall Stability Analysis	14 th	Slope Stability and Overall Stability Analysis	15 th	Final Examination
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Literature:	<ol style="list-style-type: none"> Fine Software. (2020). Geo5: Geotechnical Software Suite - User's Guide_ Edition 2018. Fine Ltd. Ayaydeh, T. and Listyawan, A.B., 2018. <i>The Design of Footing Foundation Using Program Geo 5 In Hj Sudalmiya Rais UMS Mosque Surakarta</i> (Doctoral dissertation, Universitas Muhammadiyah Surakarta). 																																		

	<ol style="list-style-type: none"> 3. SHOKR, M., 2019. The Impact of Using Specialist Geotechnical Software in Modeling of Pile Raft Foundation (PRF) (Doctoral dissertation, The British University in Dubai (BUiD)). 4. Chhabra, S., Kanwar, D. and Singh, L., 2015. Stability Analysis and Foundation Design using Geo5 Software. 5. Nischal, N., 2020. Design And Stability Study of Cantilever Retaining Wall Using Geo-5 Software (Doctoral dissertation). 6. Ayayda, O.M., 2020. Re-Design of Foundation of Edutorium UMS by Manual Calculations and Calculations using GEO5 Software (Doctoral dissertation, Universitas Muhammadiyah Surakarta). 7. Khursheed, A. and Sharma, A., A Comparative Study of Slope Stability Methods Using Gotechnical Software Geo5. 8. Nayan, M., 2021. Analysis of Foundation Using GEO 5 Software. SPAST Abstracts, 1(01). 9. Al-Taie, E., Al-Ansari, N. and Knutsson, S., 2015. Estimation of Settlement under Shallow Foundation for Different Regions in Iraq Using SAFE Software. Engineering, 7(07), p.379. 10. Al-Taie, E., Al-Ansari, N. and Knutsson, S., 2014. Bearing capacity affecting the design of shallow foundation in various regions of Iraq using SAP200 & SAFE softwares. Journal of Earth Sciences and Geotechnical Engineering, 4(4), pp.35-52. 										
Type of Teaching:	3 hrs. of theory +1 hr. tutorial lectures in class										
Pre-requisites:	Soil Mechanics										
Frequency:	Yearly in the fall and/or spring semester										
Requirements for credit points:	For the award of credit points, it is necessary to pass the module exam. Classroom activities + Quizzes + Homework The module (Mid-term and final) exams:(Written 120 min for the theoretical exam) Student attendance is required in all classes.										
Credit point:	5										
Grade Distribution:	<p>The Grade is generated from the examination result(s) with the following:</p> <table border="1"> <thead> <tr> <th>Activity</th> <th>Marks (%)</th> </tr> </thead> <tbody> <tr> <td>Assignment, Project, Quiz, Homework, and Report</td> <td>20</td> </tr> <tr> <td>Mid-term exam</td> <td>20</td> </tr> <tr> <td>Final exam</td> <td>60</td> </tr> <tr> <td>Total</td> <td>100</td> </tr> </tbody> </table>	Activity	Marks (%)	Assignment, Project, Quiz, Homework, and Report	20	Mid-term exam	20	Final exam	60	Total	100
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Assignment, Project, Quiz, Homework, and Report	20										
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Total	100										
Workload:	The workload is 135 hrs. It is the result of 60 hrs. attendance and 75 hrs. self-studies.										