

Course Information	
Course title	Numerical Methods in Geotechnical Engineering
Semester	114-2
Designated for	COLLEGE OF ENGINEERING GRADUATE INSTITUTE OF CIVIL ENGINEERING,GEOTECHNICAL ENGINEERING DIVISION
Instructor	TAI-TIEN WANG
Curriculum Number	CIE5004
Curriculum Identity Number	521EU0070
Class	
Credits	3.0
Full/Half Yr.	Half
Required/ Elective	Elective
Time	Friday 2,3,4(9:10~12:10)
Remarks	The upper limit of the number of students: 40.
Course introduction video	
Table of Core Capabilities and Curriculum Planning	Table of Core Capabilities and Curriculum Planning
Course Syllabus	
Please respect the intellectual property rights of others and do not copy any of the course information without permission	
Course Description	Introduce the basics of numerical methods relating to geotechnical engineering.
Course Objective	Clarify the capacity, limitation and validity of numerical tools for analyzing geotechnical problems . Enable the students to conduct numerical analysis appropriately.
Course Requirement	Homework No. 1 & 3: Hand written with part of computer aid HW 1: solving equation, system of equations, interpolation HW 3: formulation of FDM and FEM

	Homework No. 2 & 4 (individual preferred) : HW 2: Slope analysis by slice method, STABL/SLIDE and FLAC HW 4: Lab test simulation by FLAC, PFC (or UDEC/3DEC) and ABAQUS (or either FEM code) Project : Geotechnical related issues simulated using at least one of FLAC, PFC and ABAQUS (or either FEM code) Students have to present their projects proposal in W09, outcomes in W15-16, and to submit a PPT file and related input files in W17																				
Student Workload (Expected weekly study hours before and/or after class)	3-6 hours																				
Office Hours	Appointment required.																				
Designated reading	Theoretical background of numerical analysis Sauer T. Numerical analysis, 3rd Edition, Addison-Wesley Kreyszig E. Advanced engineering mathematics Part E, Chapters 19-21. 10th Edition, For cases study and software practices User manual of respective software's Course handouts and presentation materials																				
References																					
Grading	<table><tr><th>No.</th><th>Item</th><th>%</th><th>Explanations for the conditions</th></tr><tr><td>1.</td><td>HW 1 and 2</td><td>25%</td><td></td></tr><tr><td>2.</td><td>HW 3 and 4</td><td>30%</td><td></td></tr><tr><td>3.</td><td>Project</td><td>35%</td><td></td></tr><tr><td>4.</td><td>Attendance</td><td>10%</td><td></td></tr></table> 1. NTU has not set an upper limit on the percentage of A+ grades. 2. NTU uses a letter grade system for assessment. The grade percentage ranges and the single-subject grade conversion table in the NATIONAL TAIWAN UNIVERSITY Regulations Governing Academic Grading are for reference only. Instructors may adjust the percentage ranges according to the grade definitions. For more information, see the Assessment for Learning Section.	No.	Item	%	Explanations for the conditions	1.	HW 1 and 2	25%		2.	HW 3 and 4	30%		3.	Project	35%		4.	Attendance	10%	
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2.	HW 3 and 4	30%																			
3.	Project	35%																			
4.	Attendance	10%																			

Adjustment methods for students		Teaching methods	Provide students with flexible ways of attending courses
		Assignment submission methods	Extension of the deadline for submitting assignments, Group report replace Personal report, Mutual agreement to present in other ways between students and instructors
		Exam methods	Written (oral) reports replace exams
		Others	Negotiated by both teachers and students
Progress			
Week	Date	Topic	
Week 1		Course introduction and Solving equations	
Week 2		Slope stability, SLIDE & demons.	
Week 3		System of equations and Interpolation	
Week 4		FDM, FLAC & demon.	
Week 5		Least square	
Week 6		FDM, PFC & demon.	
Week 7		No class on holiday	
Week 8		FDM discussion, UDEC/3DEC & demon.	
Week 9		NDI, Project proposal	
Week 10		No class	
Week 11		FEM, ABAQUS & demon. (1/2)	
Week 12		FEM, ABAQUS & demon. (2/2)	
Week 13		Student progress present	
Week 14		Retention time, or special coupling analysis issue	
Week 15		Student project present	
Week 16		Student project present	
Week 17		Project submission due	