

교과목번호 Course No.	459.732	강좌번호	-	Title	전산암반공학 Numerical Methods in Rock Engineering	credit	3
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담당교수 Instructor	Name: Min, Ki-Bok (Associate Professor) Department of Energy Resources Engineering		Homepage : http://rockeng.snu.ac.kr	
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	Office Hours : Through prior appointment			

강의목표 Objective	<ul style="list-style-type: none"> - This course intends to provide essential concepts of various numerical methods applied in rock mechanics for geo-environmental, civil, mining, and petroleum applications. - This course will cover a wide variety of numerical methods but focus will be given to the finite element methods and discrete element methods. - Much emphasis is placed on the hands-on experience of applying numerical methods to rock engineering applications of students' own choice. - Students are expected to improve their oral and written communication skills through the preparation of term papers.
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교재 Textbook and references	<ul style="list-style-type: none"> - Lecture notes are the main textbook with the following supplementary references. - Jing, L., 2003, A review of techniques, advances and outstanding issues in numerical modelling for rock mechanics and rock engineering. Int J Rock Mech Min Sci, 40(3): p. 283-353. - Burnett DS, 1987, Finite Element Analysis - from concepts to applications, Addison-Wesley Publishing Company, 844p - Jing, L. and O. Stephansson, 2007, Fundamentals of Discrete Element Methods for Rock Engineering: Theory and Applications. Elsevier Science
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평가방법 Evaluation	Participation	Home Assignment	Final Exam	Term-paper	Sum
	10 %	40 %	25 %	25 %	100%
	비고				

수강생 참고사항 Note to the students	<ul style="list-style-type: none"> - Lectures: Monday 9:00 - 11:45 - Lecture will be given in English with some explanations in Korean from time to time. - Students will select their own topics, submit their term papers, and present their work during the student conference. - Home Assignments and exercises include the review of landmark papers on numerical methods, 1D coding of numerical method and modeling exercise using commercial or bespoke numerical codes. - Teaching Assistant: Bona Park (38-324), tel. 880-7232, tautou37@snu.ac.kr - In order to maintain the optimal size of the class, this course is limited to the students in the department of energy resources engineering (this year only) - This course will open again probably in 2017. <p style="text-align: right;">Syllabus last updated: 27 Oct 2014</p>
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부정행위자에 대한 처리 Note about Plagiarism	<ul style="list-style-type: none"> - Plagiarism is strictly prohibited. - Home assignments and term papers must include 'statement of originality'.
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강의 계획 Schedule	주(기간)	강의내용
	week 1 9/1	- Introduction of the course - Numerical approach in rock engineering
	week 2	- 9/8 (public holidays) 9/12 1 Submission of Assignment #1 (Paper reading)
	week 3 9/15	- Finite Element Method (Gallerkin FEM)
	week 4 9/22	- Finite Element Method (1D)
	week 5 9/29	- Finite Element Method (2D)
	week 6 10/6	- FEM Exercise (comsol) 10/10 Submission of Home Assignment #2 (FEM exercise)
	week 7 10/13	- No lecture (ARMS Symposium in Sapporo)
	week 8 10/20	- Finite Element Method (2D elastic problem) - Discrete Element Method (explicit method: Distinct Element Method in granular material and blocky rock) 10/24 Term paper proposal
	week 9 10/27	- Discrete Element Method (explicit method: Distinct Element Method in granular material and blocky rock) 10/27 Submission of Home Assignment #3 (paper reading)
	week 10 11/3	- Explicit DEM in blocky system
	week 11 11/10	- DEM Exercise (UDEC) 11/14 Submission of Home Assignment #4 (PFC or UDEC exercise)
	week 12 11/17	- Presentation of progress of term paper & Consultation with instructor 11/17 Submission of progress term paper
	week 13 11/24	- Discrete Element Method (implicit method: Discontinuous Deformation Analysis and Numerical Manifold Method) by Prof Tomofumi Koyama (Kansai University, Japan)
	week 14 12/1	- Presentation of term papers
week 15 12/8	- Final Exam 12/14 Submission of Term paper & Home Assignment #5 (FEM/DEM 1D/2D coding)	