Finite Element Analysis of Structures

Fall 2024, TUE/THU 10:30-11:45, Room 410, Creative Learning Bldg. (E11)

Instructor:	Phill-Seung Lee, phillseung@kaist.edu, 010-9105-3694
Teaching Assistants:	SeungGyu Lee, leeseunggyu@kaist.ac.kr, 010-6261-4188

Prerequisites:	Undergraduate Solid Mechanics and Mathematics
Textbook:	Finite Element Procedures, K.J. Bathe, 1996
	Finite Element Procedures - 2nd edition, K.J. Bathe, 2014
Exams.	Midterm Exam. (OCT), Final Exam. (DEC)
Grades:	Homework (20%) + Midterm Exam. (40%) + Final Exam. (40%) + Reading Assignments

The objective of this course is to teach the fundamentals of finite element analysis of linear/nonlinear problems in solids and structures. This course includes the theoretical foundations, computation techniques, and appropriate use of finite element methods. Specially, the computer programming of finite element procedures will be taught. The methods studied in this course would be practical procedures that are employed extensively in mechanical, ocean, civil and aeronautical industries.

Schedule

1	Review: tensors and solid mechanics	9	Computer programming
2	Principle of virtual work	10	Mathematical aspects - II
3	Finite element formulation	11	Nonlinear analysis & solution procedures
4	ADINA session - I (Linear analysis)	12	Total & updated Lagrangian formulations - I
5	FE solutions and convergence	13	ADINA session - II (Nonlinear analysis)
6	Mathematical aspects – I	14	Total & updated Lagrangian formulations - II
7	Isoparametric finite elements	15	Dynamic analysis or other advanced topics
8	Midterm examination	16	Final examination