



The Hashemite University
Faculty of Engineering
Course Syllabus
Department of Mechanical Engineering

Course Title:	Finite Element Analysis	Course Number:	110402531
Designation:	Compulsory	Prerequisite(s):	110402303
Instructor:	Dr. Mahmoud Rababah	Instructor's e-mail:	m_rababah@hu.edu.jo
Office Hours:	10:00 – 11:00: Sun. ~ Thu.		

Course Description (catalog): Stiffness matrices, spring elements, truss elements, Beam elements, method of weighted residuals, interpolation function for general element formulation, and applications in solid mechanics.

Textbook(s) and/or Other Supplementary Materials:

Fundamental of finite element analysis" by David V. Hutton, first edition, McGraw-Hill, 2004.

References:

- 1- Finite element modeling for stress analysis, Robert D cook, Wiley, 1995.
- 2- CATIA V5 FEA tutorials, N. Zamani, schroff development corp, 2009.

Major Topics Covered:

Topic	# Weeks	# Contact hours*
Basic concepts of the finite element methods	1	3
Stiffness matrices spring and bar elements	1	3
Truss structures, the direct stiffness method.	2	6
Flexure Element.	2	6
Method of weighted residuals.	2	6
Interpolation functions for general element formulation.	3	9
Applications in solid mechanics.	2	6
FEA using software programs	2	6
Total	15	45

Specific Outcomes of Instruction (Course Learning Outcomes):

After completing the Finite Element Design course, the student will:

1. Understand the basic concept of the finite element method. (a)
2. Use the interpolation functions for general element formulation (a, e)
3. Design a certain structure with optimal weight to withstand a specific load (c, k)
4. Understand the basics regarding the finite element programming (i)

Student Outcomes (SO) Addressed by the Course:

#	Outcome Description	Contribution
General Engineering Student Outcomes		
(a)	an ability to apply knowledge of mathematics, science, and engineering	H
(b)	an ability to design and conduct experiments, as well as to analyze and interpret data	
(c)	an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability	M
(d)	an ability to function on multidisciplinary teams	
(e)	an ability to identify, formulate, and solve engineering problems	M
(f)	an understanding of professional and ethical responsibility	
(g)	an ability to communicate effectively	
(h)	the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context	
(i)	a recognition of the need for, and an ability to engage in life-long learning	M
(j)	a knowledge of contemporary issues	
(k)	an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.	M
H=High, M= Medium, L=Low		

Grading Plan:	First Exam	20 Points	Sun./12/11/2017 [14:30 ~ 16:00]
	Second Exam	20 Points	Sun./17/12/2017 [14:30 ~ 16:00]
	Project	20 Points	Due 27/12/2017
	Final exam	40 Points	To be announced

Prepared by: Dr. Mahmoud Rababah **Date:** 18th Sept. 2017