

Finite Element Method and Applications 20-149

1. COURSE TITLE

Finite Element Method and Applications 20-149 (2nd Semester 1398-99)

2. INSTRUCTOR

- Lecturer: M. Ghaemian Room 421 Ext. 4242

3. COURSE OUTLINE

Chapter One:

پیش درآمد

Chapter Two:

مقدمه ای بر مکانیک کاربردی و روشهای یافتن معادلات حاکم بر سیستمهای پیوسته

Chapter Three:

روشهای ریاضی در حل تقریبی معادلات

Chapter Four:

نظریه روش اجزاء محدود، مقدمات و مفاهیم پایه

Chapter Five:

روش اجزاء محدود برای المانهای مستقیم

Chapter Six:

روش اجزاء محدود برای المانهای منحنی

Chapter Seven:

روش اجزاء محدود برای مسائل الاستیسیته صفحه ای

Chapter Eight:

روش اجزاء محدود برای مسائل میدانی

Chapter Nine:

روش اجزاء محدود برای مسائل خمش صفحات

Extra ... 2D creeping flow, General procedures for solving nonlinear discrete equations

Applications

Linear elasticity(Plane stress, plane strain, axisymmetric), beam bending, plate bending, shell, transient problem(time dependent), Field problems e.g. fluid flow, heat flow, Numerical analogous for problems with material and geometric (large deflection) nonlinearity

4. CLASS-HOURS

Three (3) hours of lectures per week (Sundays and Tuesdays 13:30 – 15:00)

One (1) hour of tutorial per week

5. OBJECTIVE AND SCOPE

The main objective of the course is to familiarize the students with the basic concepts in finite element method.

6. TEXT

The material, related to the course follows the treatment presented in the course note. The following textbooks are also references for different parts of the note:

Finite Element Analysis By: P. Seshu

Introduction to the finite element method by: Desai and Abel

Introduction to approximate solution techniques, numerical modeling and finite element method By: V.N. Kliaikin

Finite element Procedures by: Bathe

The finite element method, Fifth Edition, By: Zienkiewicz and Taylor

The Finite element Method By: Hughes

Energy methods in applied mechanics, By: Langhaar

7. EVALUATION

The course is consisted of **6 set of assignments, and one mid term** examination which would be held during the term and a **final** examination as well as a term project.

The evaluation scheme is as follows:	points
Six (6) set of assignments	10
Midterm Examination	20
Final Examination	50
Term Project	20
Total	100

Assignments have equal weights and each is marked out of (100). The mid term examination will be held on Tuesday of Ordibehesht 9th and consist of chapters 1, 2, 3, 4 and 5. The final examination consists of all chapter covered in the course.

8. COURSE SCHEDULE

Month/day	Chapters	Assignments
11/20	Chapter 1	پیش درآمد
11/27		
11/29	Chapter 2	مقدمه ای بر مکانیک کاربردی و روشهای یافتن معادلات حاکم بر سیستمهای پیوسته
12/4		
12/6		
12/11		
12/13		
12/20	Chapter 3	روشهای ریاضی در حل تقریبی معادلات
12/25		
1/17		
1/19		
1/24	Chapter 4	نظریه روش اجزاء محدود، مقدمات و مفاهیم پایه
1/26		
1/31		
2/2	Chapter 5	روش اجزاء محدود برای المانهای مستقیم
2/7		
2/9	Midterm Examination	
2/14	Chapter 6	روش اجزاء محدود برای المانهای منحنی
2/16		
2/21	Chapter 7	روش اجزاء محدود برای مسائل الاستیسیته صفحه ای
2/23		
2/28		
2/30	Chapter 8	روش اجزاء محدود برای مسائل میدانی
3/6		
3/11	Chapter 9	روش اجزاء محدود برای مسائل خمش صفحات
3/13		