

Time: 12:30 PM -01:20 PM Monday, Wednesday, and Friday

Location: Seng-Liang Wang Hall 2555

Instructor:

Prof. Vikas Tomar, Ph.D.
3205 ARMS

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Teaching Assistant (TA): Bing Li (li1825@purdue.edu);

Office hours (Begin Thursday, August 22):

Place: ARMS 2119

Times: Thursdays 4 PM - 5 PM

Place: ARMS 2119

Times: Fridays 3 PM- 4 PM

I'll be in my office during office hours. TA will be in the office hour room. Feel free to drop by. USE PIAZZA for Homework and Exam Discussions (one in-class and one take home mid term exam; one final project)

EMERGENCY

Public announcement from Purdue

(Please enroll at: <http://www.purdue.edu/emergency/>)

PLEASE NOTE THAT Purdue's home page (www.purdue.edu) is the official source of emergency information.

See syllabus and guidelines for report writing instructions (due 12/9, 11:59 pm). Final report is the final exam.

Preliminary report (due 11/18, 11:59 pm) will not be graded. Its only for confirming with me your project conforms to course requirements. If report does not conform to course requirements you will loose 25 points In finals.

You can simply write with your hands and send me a phone snap. Just show figure, boundary conditions, what you want to solve, what are the physical insights you aim to gain.

DATE	TOPIC
8/19	Introduction-Background And Applications of FEM
8/21,8/23, 8/26, 8/28, 8/30, 9/4, 9/6, 9/9	Direct Approach for Discrete Systems
9/04..Homework 1 is due, Wednesday 9/09..Homework 2 is due Monday	
09/11, 9/13, 9/16, 9/18, 9/20, 9/23	Approximation of Trial Solutions, Weight Functions and Gauss Quadrature, Finite Element Formulation for One Dimensional Problems
EXAM 1 ON SEPTEMBER 30 (MONDAY) IN CLASS (SEPARATE ARRANGEMENT FOR DISTANCE STUDENTS TO BE NOTIFIED BY EMAIL) 9/16....Homework 3 is due 9/23....Homework 4 is due	
9/25,9/27,9/30,10/02,10/04,10/09	Finite Element Formulation for Beams, Formulation: Strong and Weak Forms in 1-D
10/09 Homework 5 is due 10/21 Homework 6 is due 10/28 Homework 7 is due EXAM 2 ON NOVEMBER 04 TAKE HOME (EXAM POSTED 1 WEEK BEFORE)	
10/11,10/14, 10/16, 10/18, 10/21, 10/23, 10/25, 10/28	ABAQUS Training-Part 1, Strong and Weak Forms in Multidimensional Problems
10/30, 11/1	Abaqus training
11/4, 11/6, 11/8	Finite Element Formulation for Multidimensional Scalar Field Problems Including Linear Elasticity
11/11 Homework 8 is due 11/18 preliminary report is due	
11/11, 11/13, 11/15	Error Estimation Convergence
12/9 FINAL PROJECT REPORT IS DUE	
11/18, 11/20, 11/22, 11/25, 12/02, 12/04	Three Dimensional Finite Element Analyses, Beam and plate bending problems, Modeling Considerations and Software Use, Special situations such as fracture mechanics
ABAQUS Guest Lecture-12/06	

GRADES AVAILABLE BY 12/17

Holidays: Sept 2 (Labor Day), October 7-8 (Fall Break), November 27-29 (Thanksgiving Break)

NOTE: ADDITION/DELECTION/CHANGES COULD BE MADE THROUGHOUT THE SEMESTER WITH ADVANCE ANNOUNCEMENTS.

REPORT WRITING GUIDELINES

GENERAL COMMENTS

- FOLLOW THE REPORT WRITING GUIDELINES WHICH ARE IN THE SYLLABUS

IMPORTANT ITEMS TO BE INCLUDED IN EXAMS:

- FORM FE EQUATIONS AND SOLVE
- EXPERIMENT WITH DIFFERENT NUMBER OF ELEMENTS TO MAKE SURE SOLUTION IS CORRECT (CONVERGENCE STUDY)
- COMPARE WITH ANALYTICAL SOLUTION
- ASSESS ERROR (DIFFERENCE BETWEEN FE SOLUTION WITH DIFFERENT SUBDIVISIONS VS. ANALYTICAL SOLUTION)

POINT DIVISION DURING REPORT GRADING (OUT OF 100)

FORMATING HAS 10 POINTS DIVIDED AS:

IS NUMBER OF PAGE GUIDELINES FOLLOWED PROPERLY: 3 POINTS
AT MOST 5 PLOTS WITH PROPER ILLUSTRATION: 3 POINTS
ARE ALL REQUIRED REPORT SECTIONS PRESENT: 4 POINTS

TECHNICAL CONTENT CARRIES 90 POINTS DIVIDED AS:

1. FE MODEL: 20 POINTS

1.A. IS PROBLEM MATHEMATICALLY AND FIGUATIVELY SPECIFIED WITH BOUNDARY CONDITIONS PROPERLY? AND ELEMENT PLACEMENT DESCRIBED (10 POINTS)

1.B. IS PROBLEM OBJECTIVE SPECIFIED MATHMATICALLY IN A WAY AS DISCUSSED IN CLASS (5 POINTS)

1.C. ARE LIMITATIONS OF SOLVING THE PROBLEM WITH GIVEN ELEMENT SIZE AND TYPE DISCUSSED (5 POINTS)

2. RESULTS: (15 POINTS)

2.A DO RESULTS SUPPLY QUANTITATIVE DATA TO SUPPORT OBJECTIVE ACHIEVEMENT (7.5 POINTS)

2.B HOW WELL IS DATA REPRESENTED USING ANALYSES AND PLOTS (7.5 POINTS)

3. FE EQUATIONS: (20 POINTS)

3.A IS WEAK FORM AT ELEMENT LEVEL GIVEN? (10 POINTS) (NEEDS TO BE PROBLEM SPECIFIC)

3.B IS A DESCRIPTION OF HOW GLOBAL FE EQUATIONS RELATED TO LOCAL FE EQUATIONS PROVIDED? (10 POINTS)

4. CONVERGENCE ANALYSES: (20 POINTS)

4.A HOW IS THE STUDY PERFORMED (SYMMETRIC VS. RANDOM; ASPECT RATIO USE, ELEMENT SHAPES DISCUSSION) (10 POINTS)

4.B ARE ELEMENT SHAPES DISCUSSED AND ANALYSES CORRECTNESS JUSTIFIED? DID ONE USE RIGHT PARAMETERS TO JUSTIFY CONVERGENCE? (10 POINTS)

5. ANALYTICAL SOLUTION COMPARISON (15 POINTS)

5.A WHAT PART OF FE CHOSEN TO COMPARE WITH ANALYTICAL SOLUTION..HOW THE CHOICE IS JUSTIFIED? HOW WELL IS THE COMPARISON POSED (10 POINTS)

5.B IS THERE A DIRECT CORRESPONDENCE BETWEEN ANALYTICAL MODEL AND MODEL SOLVED? (5 POINTS)