TAM 251: Introductory Solid Mechanics - Spring 2012

Lectures

Section AL1, MWF 9:00, 100 Materials Science & Eng Bld
Dr. Richard D. Keane, 224 MEB, 333-3750, rdkeane@illinois.edu

Section AL2, MWF 10:00, 100 Materials Science & Eng Bld
Dr. Mariana Silva, 346 MEB, mfsilva@illinois.edu

Discussion sections

AD1, M 12:00-12:50PM, 260 MEB
AD2, M 5:00-5:50PM, 260 MEB
AD3, T 9:00-9:50AM, 256 MEB
AD4, T 12:00-12:50PM, 260 MEB
AD5, T 12:00-12:50PM, 336 MEB
AD6, W 12:00-12:50PM, 260 MEB
AD7, W 5:00-5:50PM, 260 MEB
AD8, R 9:00-9:50AM, 256 MEB
AD9, R 11:00-11:50AM, 252 MEB
ADA, R 12:00-12:50PM, 256 MEB
ADB, R 5:00-5:50PM, 260 MEB
ADC, M 5:00-5:50PM, 243 MEB

Teaching assistants

Nikhil Karanjgaokar, nkaranj2@illinois.edu (AD3, AD8, ADC)
Souvik Roy, sroy8@illinois.edu (AD2, AD6, AD7)
Harishankar Manikantan, manikan2@illinois.edu (AD5)
Ankit Saharan, saharan1@illinois.edu (AD1, AD4, ADB)
Kallol Das, das7@illinois.edu (AD9, ADA)

Graders

Assigned graders for Dr. Keane

Andrew Lee, lee522@illinois.edu
Joseph Latimer, latimer1@illinois.edu
Xin Chen, xinchen3@illinois.edu

Assigned graders for Dr. Silva

Xiaoyue Chen, chen359@illinois.edu
Ruobing Ma, ma17@illinois.edu
Megan Kubacki, kubacki3@illinois.edu

Textbook

F.P. Beer, E.R. Johnston, J.T. DeWolf and D.F. Mazurek,*Mechanics of Materials*, 6th ed. (McGraw-Hill, 2012)

Reference books

J. M. Gere, *Mechanics of Materials*, 6th edition
Roy R Craig Jr., *Mechanics of Materials*, Wiley 2nd ed.

Course website

Available on "Compass"

Office hours: TAs and graders

Held in 429 Grainger Library according to the schedule bellow.

Nikhil Karanjgaokar, Thursdays 12-2pm
Souvik Roy, Wednesdays 11am-12pm and 1pm-2pm
Harishankar Manikantan, Thursdays 11am-12pm
Ankit Saharan, Thursdays 2-4pm
Andrew Lee, Thursdays 5-6pm
Joseph Latimer, Wednesdays 2-3pm
Xin Chen, Wednesdays 5-6pm
Xiaoyue Chen, Wednesdays 4-5pm
Ruobing Ma, Wednesdays 3-4pm
Megan Kubacki, Thursdays 4-5pm

Office hours: Instructors

Dr. Richard Keane, 429 Grainger Library
Thursdays 9am-12pm

Dr. Mariana Silva, 346 MEB
Mondays 2-3pm
Wednesdays 11am-1pm
Fridays 11-12pm

Evaluation

The grade average (GA) for the course will be computed as follows:

GA = 0.40 *Tests + 0.40 *Final + 0.10 *Hmwk + 0.10 *B

where B is the best of the test average and the final exam. The grade average will be converted to a final letter grade in the usual way according to the following table

96 - 100 A+	92 - 96 A	89 - 92 A-
86 - 89 B+	82 - 86 B	79 - 82 B-
76 - 79 C+	72 - 76 C	69 - 72 C-
66 - 69 D+	62 - 66 D	59 - 62 D-
	0 - 59 F	

Homework

1. Homework will be collected each week on Friday at the start of class. You must submit your assignment in the section in which you are registered.
2. Place your submission in the appropriate folder according to your discussion section. Papers will not be accepted more than 10 minutes after the start of lecture.
3. Late homework will only be accepted with a with a major documented excuse.
4. Of the 6 problems on each homework assignment, at most 3 will be graded.
5. Your name, lecture section and discussion section numbers must be printed (legibly) in the upper right-hand corner of each page included in your assignment.
6. Begin each problem on a new page. Staple your problem-set solutions together in the upper left corner, with the problems ordered in the assigned sequence. Your work must be arranged neatly so that it is easily read by the TA's and graders.
7. For each solution use the format: Given..... Find..... Solution

Hour Exams

1. Hour exams will be held on three occasions during the semester as indicated on the accompanying schedule and will account for at least 40% of the final assessment.
2. Hour exams are "closed book" and "closed notes" in-class exams.
3. You must take the hour exam in the section in which you are registered.
4. Your name and section label must appear in the upper right hand corner of each page of the exam.
5. Make-up exams will only be allowed with a major documented excuse.

Date	Topic	Reading
W 1/18	Introduction and review	-
F 1/20	Normal and shear stresses	1.1 - 1.6
M 1/23	Analysis and design	1.8 - 1.10, 1.13
W 1/25	Stress on oblique plane; general loading	1.11 - 1.12
F 1/27	Normal strain; Hooke's law; diagrams	2.1 - 2.6
M 1/30	Deformations under axial loading	2.8
W 2/1	Indeterminate structures	2.9
F 2/3	Temperature effects	2.10
M 2/6	Lateral strain; shear strain; generalized Hooke's law	2.11 - 2.15, 2.17
W 2/8	Torsion of circular shafts	3.1-3.5
F 2/10	Torsion of circular shafts	3.1-3.5
M 2/13	Indeterminate shafts; design	3.6 - 3.7
W 2/15	Thin-walled torsion members	3.13
F 2/17	S.F. and B.M. Diagrams	5.1 - 5.3
M 2/20	S.F. and B.M. Diagrams	5.1 - 5.3
W 2/22	Beams in bending	4.1 - 4.5; A1 - A5
F 2/24	Review	-
M 2/27	Hour exam 1	-
W 2/29	Beams in bending	4.1 - 4.5; A1 - A5
F 3/2	Non-homogeneous beams	4.6; A1 - A5
M 3/5	Shear stress in beams	6.1 - 6.4
W 3/7	Shear stress in beams	6.6 - 6.7
F 3/9	EOH	-
M 3/12	Transformation of plane stress	7.1 - 7.2
W 3/14	Principal stresses; maximum shear	7.3
F 3/16	2D Mohr's Circle	7.4
	SPRING BREAK	
M 3/26	2D Mohr's Circle	7.4 - 7.6
W 3/28	Pressure vessels	7.9
F 3/30	Plane strain	7.10 - 7.12
M 4/2	Principal stresses in beams	8.1 - 8.2
W 4/4	Stresses under combined loading	8.4
F 4/6	Deflection of Beams	9.1 - 9.2
M 4/9	Integration Methods	9.3 - 9.4
W 4/11	Statically indeterminate beams	9.5
F 4/13	Superposition methods	9.7

Date	**Topic**	**Reading**
M 4/16	Superposition methods	9.8
W 4/18	Review	-
F 4/20	Hour exam 2	-
M 4/23	Buckling: Euler buckling load	10.1 - 10.3
W 4/25	Buckling: effect of end conditions	10.4
F 4/27	Strain energy	11.1 - 11.4
M 4/30	Course Review and Trial Exam	
W 5/2	More Course Review	
R 5/3	Reading Day	
M 5/7	8-11am AL1 FINAL EXAM (9am Lecture)	
T 5/8	8-11am AL2 FINAL EXAM (10am Lecture)	
5/20	FINAL RESULTS POSTED	