CVEN 305-502 Syllabus
MECHANICS OF MATERIALS
Spring 2015 - C.E. Room 110
MWF 8:00 am - 8:50 am - CRN: 10723

FAQ: Quick Answers to student questions

Professor: Lee L. Lowery, Jr., PhD, P.E.

Office: Old CE Building, Room 139C
Phone: 979-845-4395 (Office), 979-775-5401 (Home)
e-mail: Lowery@tamu.edu

Office Hours:

NOTE: Office hours listed below are suspended on the day before major exams and finals, giving me time to make them out. Do not wait until the day before a major exam for help, unless the tutor has office hours and can help you on that day.

- Click here for office hours

Half of my time is spent teaching CVEN 305. During the remaining hours I serve as a departmental adviser for about 100 C.E. students and another 100 CHEM students. Since I have limited time for tutoring please plan on assistance either during my office hours, or visit the help desk. Don't wait until just before class or a quiz to get help or you likely won't get any, especially around quiz days.

It will always be in your best interest to call to make sure I have not been unexpectedly called out before you come by, unless you are already in the area.

Help Desk:

Office: 
Hours: 
Desk: 
Email: 

Grader:

Textbook: The textbook is excellent - one of the best:

  Note that you can sometimes find a much cheaper paperback version, but it has to be the 7th edition.

Looking for a used textbook? Starting Fall 2104: ISBN number: 9780073398235
Catalog Description:

Stress/deformation relationships for continuous media to structural members; axially loaded members; thin-walled pressure vessels; torsional and flexural members; shear; moment; deflection of members; combined loadings; stability of columns; non-symmetrical bending, shear center; indeterminate members; elastic foundations. Prerequisite Satisfactory completion of CVEN 221 or equivalent (Statics).

Course Objectives:

- To introduce students to applications of stress and deformation relationships for structural members subjected to axial, torsional, and bending loads, and thin-walled pressure vessels. Students will study stress and deformation of structural members under combined loadings, stability of columns, nonsymmetrical bending, including indeterminate members.

Learning Outcomes - This course emphasizes the following ABET Learning Outcomes. Note that the letters refer to those used by ABET.

- (a) Ability to apply knowledge of basic mathematics, science, and engineering.

Course Prerequisites:

To take CVEN 305, you must have been admitted to upper level in Civil Engineering, and have received a passing grade (no D's, F's or I's) in CVEN 221 or MEEN 221 or equivalent, and completed MATH 251.

Course Assessment:

- Graded major exams (Quiz A, Quiz B, Final Exam = 3 @ 30% each)
- Graded homework assignments, Readiness Assessment Tests (RATs), Class Participation, Attendance, Projects (all of equal value) totaling 10%

Syllabus Information:

- Homework
- General Information Regarding Format for Exams, Quizzes, and Homework

https://ceprofs.civil.tamu.edu/llowery/cven305/Syllabi/305-15a-threeaweek.htm 1/20/2015
Where to get help for 305
- Grading
- Major exams
- Make-up exams
- Attendance
- Illness
- Academic Dishonesty Policy
- Finally, click here!

Resources available to the student:
- Instructor of record: Dr. Lee L. Lowery, Jr.
- eCampus.tamu.edu
- Computer software (Excel, EES)
- EES (Engineering Equation Solver) What it is, how to get it, video example on using it, user's manual, short tutorial
- Computers in the Civil Engineering Computer Labs
- Old Exams and this semester's exam solutions
- Chances of making what grade in Lowery's 305 class after Quiz A and after Quiz B
- First few homework problems assigned for use until texts come in are here

NOTE
- **Spring 2015 class lectures and notes** posted during this semester
- Summer 2014 class lectures and notes
- Tutoring and Student use of the solution manual
- Access to the Civil Engineering Apps Server
- Some good videos on plane stress, principal stresses, Mohr's circle, failure theories, pressure vessels
- Typical point deductions you can expect on exams and pop quizzes
- Class seating Chart
- Video examples/Flipped classes - Strength of materials problems

The correct time (to the nanosecond)

Course Schedule:

**NOTE ON HOMEWORK:**
The homework assignments may have to be modified from that shown below, depending on our progress during the semester. Please check the list for changes each day before you work them.

<table>
<thead>
<tr>
<th>Week</th>
<th>Text Reading Assignment</th>
<th>Homework Assignments</th>
</tr>
</thead>
<tbody>
<tr>
<td>(WEEK)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1) 1/21-1/23</td>
<td>Sections 1.1 - 1.5</td>
<td>Wednesday Assignment: A1 1.1, 1.2, 1.3, 1.4, 1.5 (Due on 1/28)</td>
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<tr>
<td></td>
<td></td>
<td>Friday Assignment: A2 1.14, 1.15, 1.16, 1.19, 1.21 (Due on 1/30)</td>
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<td>Sections 2.1A - 2.1G Flipped Class Assignment: Design of a shaft to resist power Be ready to discuss and take an exam on this material one week from today in class. At this point, students are strongly encouraged to study Appendix A. Interactive practice with moments of inertia</td>
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<tr>
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<td>Monday Assignment: A3 1.23, 1.30, 1.37, 1.47, 1.51 (Due on 2/2)</td>
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<td>Wednesday Assignment: A4 2.3, 2.4, 2.7, 2.9, 2.10 (Due on 2/4)</td>
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<td></td>
<td>Friday Assignment: A5 2.13, 2.14, 2.18, 2.24, 2.27 (Due on 2/6)</td>
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<td>Monday Assignment: A6</td>
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1/20/2015
2/18/15
Wednesday
QUIZ A

Flipped Class Assignment:

Moment diagram for a concentrated moment applied on a simply supported beam.

Be ready to discuss and take an exam on this material one week from today in class.

Wednesday Assignment: A7
2.47, 2.49, 2.51, 2.58, 2.61
(Due on 2/11)

Monday Assignment: A9
2.94, 2.95, 2.97, 2.99, 2.100
(Due on 2/16)

Wednesday Assignment: A10
3.11, 3.13, 3.15, 3.21, 3.23
(Due on 2/18, but hand in on 2/20 to minimize distractions during Quiz A.)

Friday Assignment: A11
3.36, 3.37, 3.48, 3.53, 3.55
(Due on 2/20)

Monday Assignment: A12
3.64, 3.67, 3.72, 3.84, 3.90
(Due on 2/23)

Wednesday:
Quiz A - Given in class from 8:00 to 8:50 a.m. during regular class time. Covers through homework problem 2.81.

You are permitted to bring one 8.5" x 11" cheat sheet to the quiz, hand written by you (no copies) on TWO SIDES, no example problems. Equations only.

You may also bring a copy of the F.E. Exam Reference Manual. No notes of any kind are permitted on these sheets.

Friday Assignment: A13
4.2, 4.4, 4.5, 4.7, 4.9
(Due on 2/27)

Monday Assignment: A14
4.10, 4.15, 4.17, 4.21, 4.23
(Due on 3/2)

Wednesday Assignment: A15
4.33, 4.34, 4.37, 4.40, 4.61
(Due on 3/4)

Friday Assignment: A16
4.63, 4.102, 4.104, 4.106, 4.108
(Due on 3/6)

Monday Assignment: A17
4.127, 4.132, 4.133, 4.144, 4.146
(Due on 3/9)

Wednesday Assignment: A18
5.3, 5.5, 5.9, 5.11, 5.16

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(Due on 3/11)

**Friday Assignment: A19**
5.22, 5.44, 5.54, 5.57, 5.60
(Due on 3/13)

**Monday Assignment: A20**
5.74, 5.76, 5.77, 5.79, 5.81
(Due on 3/23)

**Wednesday Assignment: A21**
6.1, 6.2, 6.3, 6.5, 6.7
(Due on 3/25)

**Friday Assignment: A22**
6.9, 6.11, 6.13, 6.16, 6.21
(Due on 3/27)

**Monday Assignment: A23**
6.29, 6.33, 6.36, 6.37, 6.41, 6.45
(Due on 3/30)

(8) 3/9 - 3/13  Sections 6.1A - 6.1C, 6.3, 6.4

(9) 3/23 - 3/27  Sections 7.1A - 7.1B, 72

(10) 3/30 - 4/1  Sections 7.2 - 7.6

(11) 4/6 - 4/10  **Monday QUIZ B**
8:00 - 9:20

Sections 9.1, 9.1A, 9.2

**Monday Assignment: A30**
9.1, 9.2, 9.4, 9.5, 9.6

You are permitted to bring one 8.5" x 11" cheat sheet to the quiz, hand written by you (no copies) on **TWO SIDES**, no example problems, equations only, and your copy of the **E.E. Exam Reference Manual** with no notes of any kind written on it.

**Wednesday Assignment: A27**
7.27, 7.28, 7.49, 7.51, 7.52
(Due on 4/8. Don't ask!)

**Quiz B**
Given in our regular classroom during regular class time. Covers everything through homework problem 6.21.

Closed book
Approximate target coverage:
≈25% on Quiz A material
≈75% on Quiz B material

**Friday Assignment: A29**
7.93, 7.104, 7.109, 7.115, 7.117, 7.120 - Note that tank is pressurized, twisted, and bent.
(Due on 4/17)

**Wednesday Assignment: A28**
7.54, 7.55, 7.56, 7.68, 7.70
(Due on 4/14)
Section 9.3

(12) 4/13-4/17

Section 9.4A

(13) 4/20-4/24

5:00 pm Tuesday April 21st 2015

Last day to Q-drop or Withdraw

Flipped Class Assignment:

Design of a shaft to resist power

Be ready to discuss and take an exam on this material one week from today in class.

At this point, students are strongly encouraged to study Appendix A.

Interactive practice with moments of inertia

Monday Assignment: A33

9.35, 9.36, 9.45, 9.46

(Due on 4/27)

Wednesday Assignment: A34

9.49, 9.50, 9.53, 9.54

(Due on 4/29)

Friday Assignment: A35

9.73, 9.75, 9.76, 9.77, 9.78

(Due on 5/1)

Monday Assignment: A36

9.81, 9.86, 9.88, 9.90, 9.92

(Due on 5/4)

Wednesday Assignment: A37

10.9, 10.10, 10.12, 10.13, 10.15

(Due on 5/5)

Friday Assignment: A38

10.19, 10.20, 10.23

(Due on 5/5. Don't ask!)

Detailed procedure for drawing shear and moment diagrams

(14) 4/27-5/1

Sections 9.4B, 10.1, 10.1A, 10.1B, 10.3

Interactive practice drawing shear and moment diagrams

(15) 5/4-5/5

Pick up any old homework outside of my office.

Final Exam

Given in our regular classroom

Closed book

The exam will cover everything in the course. Approximate target coverage:

~25% on Quiz A material
~25% on Quiz B material
~50% on material after Quiz B

You are permitted to bring one 8.5" x 11" cheat sheet to the quiz, hand written by you (no copies) on TWO SIDES, no example problems, equations only, and a copy of the F.E. Exam Reference Manual with no notes of any kind written on it.

CLICK HERE TO VERIFY THE FINAL EXAM DATE LISTED BELOW

5/7/2014

Final Exam:
Thursday 5/7/2015
10:00 a.m. to noon in CE Room 110

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact the Department of Student Life, Services for Students with Disabilities, in Cain Hall or call 845-1637.

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1/20/2015
The following is the University required Academic Integrity Statement:

"An Aggie does not lie, cheat, or steal or tolerate those who do."

All syllabi and examinations shall contain a section that states the Aggie Honor Code and refers the student to the Honor Council Rules and Procedures on the web: http://www.tamu.edu/agghonor

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- 10 kN

\[ E = 30 \times 10^6 \, \text{N/m}^2 \]

\[ D = 0.8 \text{ cm} \]

\[ 200 \, \text{GPa} \]

\[ \sigma = \frac{P}{A} \]

Tension Compressive NORMAL

SHEAR

\[ \tau = \frac{V}{A} \]

0.3"

0.2"

Diameter = 0.125"

1" BOLT A36

\[ \tau_{\text{bolt}} = \frac{V}{A} = \frac{60 \text{k}}{\pi \left(0.125\text{ in}\right)^2} \]

60 k
A\text{BEARING} = (DB)_{\text{plate}}

A_{\text{PLATE}}

\text{TAXING} = \frac{P}{A_{\text{BEAR}}} = \frac{60K}{(1\text{"})(0.2\text{")}} = \frac{60K}{(1\text{"})(0.2\text{")}}

A = (2.5\text{" wide} - 1\frac{1}{16}\text{"})(0.2\text{")}

\text{TENSION} = \frac{P}{A}$
Pop Quiz

[Diagram with labeled 60K and 2" and 1"]