

<b>ACADEMIC INTEGRITY</b>	<b>This is an entirely online course, therefore, it is critical that all students read and understand all Penn State University academic integrity policies (see attached information). Student work will be monitored and academic integrity policies will be vigorously enforced.</b>
<b>SCOPE AND OBJECTIVES:</b>	<i>Structural Analysis</i> is a first course in the analysis of statically determinate and indeterminate civil structures, including trusses, beams and frames. Computation of support reactions, internal member forces, and deflections; energy methods; influence lines; and introduction to matrix analysis.
<b>TEXTS:</b>	R. C. Hibbeler, <i>Structural Analysis</i> , 9 <sup>th</sup> edition, Pearson, Upper Saddle River, NJ, ISBN-13: 978-0133942842, ISBN-10: 0133942848
<b>COMPUTER FACILITIES</b>	Students must have access to the PSU Canvas online course management system and be able to complete all other electronic tasks.
<b>INSTRUCTOR:</b>	Dr. J.A. Laman, 231J Sackett Bldg., jlaman@psu.edu Course assistance electronically as discussed in the attached pages
<b>READING/VIDEOS/PENCASTS/CLASS PREP:</b>	Reading assignments and preparation are listed in the included <i>Lecture Preparation and Assignments</i> . Each student is expected to complete the <b>assigned reading</b> prior to <b>viewing videos</b> and <b>viewing pencasts</b> in order to best comprehend the material, complete homework and fundamental problems, and prepare for examinations.
<b>HOMEWORK PROBLEMS:</b>	Homework problems are assigned regularly throughout the course. See attached pages for required student homework solution upload to the CANVAS course website dropbox and <b>Quiz and Homework Schedule</b> .
<b>EXAMS</b>	Two proctored exams will be administered – Exam 1 and Exam 2. See the attached discussion of procedures for proctored exams. Each student must complete the submission of proctor information no less than two weeks prior to each examination (complete Canvas Quiz 1 and Quiz 2).
<b>GRADE WEIGHT:</b>	The course grade will be based on (detailed requirements next page): 5% - Adherence to Course Requirements 15% - Homework Submissions Complete <u>80% - Examinations (40% mid-term, 40% final)</u> 100% - Total

The following Pennsylvania State University policies on academic integrity apply to all aspects of this course:

- *Academic Administrative Policies and Procedures Manual, G-9: Academic Integrity*  
<http://www.psu.edu/oue/aappm/G-9-academic-integrity.html>
- *Undergraduate Advising Handbook, Academic Integrity*  
<http://handbook.psu.edu/content/academic-integrity>
- University Faculty Senate Policy 49-20 *Academic Integrity*  
[http://www.psu.edu/ufs/policies/separate\\_policy/49-20.htm](http://www.psu.edu/ufs/policies/separate_policy/49-20.htm)

## ACADEMIC INTEGRITY

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- University Faculty Senate Policy 49-20 *Academic Integrity*  
[http://www.psu.edu/ufs/policies/separate\\_policy/49-20.htm](http://www.psu.edu/ufs/policies/separate_policy/49-20.htm)

The Pennsylvania State University, College of Engineering, Academic Integrity Statement:

*The University defines academic integrity as the pursuit of scholarly activity in an open, honest and responsible manner. All students should act with personal integrity, respect other students' dignity, rights and property, and help create and maintain an environment in which all can succeed through the fruits of their efforts (refer to [Senate Policy 49-20](#)). Dishonesty of any kind will not be tolerated in this course. Dishonesty includes, but is not limited to, cheating, plagiarizing, fabricating information or citations, facilitating acts of academic dishonesty by others, having unauthorized possession of examinations, submitting work of another person or work previously used without informing the instructor, or tampering with the academic work of other students. Students who are found to be dishonest will receive academic sanctions and will be reported to the University's Office of Student Conduct for possible further disciplinary sanctions (refer to [Senate Policy G-9](#)).*

A note from the instructor:

In any case where submitted course work materials (homework or exams) are suspected of not meeting the highest standards of academic integrity, Penn State students involved will be reported to the Penn State College of Engineering Dean's Office and academic integrity violation reports placed in their College of Engineering files. Non-Penn State Students will be dropped from the course with a grade of "F". Students not familiar with what constitutes an academic integrity violation are strongly encourage to read the Pennsylvania State University policies. If a student finds themselves in a difficult situation, the best course of action is to speak with the instructor immediately.

## OFFICE FOR DISABILITY SERVICES

Penn State welcomes students with disabilities into the University's educational programs. Every Penn State campus has an office for students with disabilities. The Office for Disability Services (ODS) Web site provides contact information for every Penn State campus:

<http://equity.psu.edu/ods/dcl>. For further information, please visit the Office for Disability Services Web site: <http://equity.psu.edu/ods>.

In order to receive consideration for reasonable accommodations, you must contact the appropriate disability services office at the campus where you are officially enrolled, participate in an intake interview, and provide documentation: <http://equity.psu.edu/ods/doc-guidelines>. If the documentation supports your request for reasonable accommodations, your campus's disability services office will provide you with an accommodation letter. Please share this letter with your instructors and discuss the accommodations with them as early in your courses as possible. You must follow this process for every semester that you request accommodations.

## **ADHERENCE TO COURSE REQUIREMENTS**

Because this is a web-based course and there are no class meetings, it is extremely important that every student accept the responsibility of learning and adhering to course requirements. The administration of an online course involves detailed requirements for communication, submittal of work, execution of examinations, adherence to a schedule, completing all reading assignments, viewing all video lectures, and viewing all pencasts in addition to an intellectual commitment to learn the course material. It is each student's responsibility to read and understand all course requirements and follow them. Where a student has demonstrated a lack of ability to follow course instructions and requirements, the 5% weight will be adjusted by a loss of 5 to 20 points for each occurrence out of 100 possible.

## **COMPUTER FACILITIES**

Each student must have access to a computer facility capable of the following – this is essential for the course:

- Ready and continuous access to the Penn State University CANVAS course website,
- Download and upload of PDF files from and to CANVAS,
- Meet detailed scanning requirements for homework solutions (see below),
- Viewing and listening to videos, and
- Viewing dynamic PDF pencasts with embedded audio.

## **COURSE ASSISTANCE**

The instructor will communicate with students and respond to questions via email ([jlaman@psu.edu](mailto:jlaman@psu.edu)) on a regular basis. Every effort will be made to provide a response within 24 hours, however, certain periods of travel may extend the response time. Please use the following guidelines for seeking course assistance:

- Short questions – email text format is generally sufficient to formulate the question and response.
- Complex questions – attach an image, drawing, or figure to the email requesting assistance. Format must be PDF.

If it becomes necessary, it may be possible to consult with the instructor via phone or video/voice by appointment.

## **READING/VIDEO LECTURES/PENCASTS AND CLASS PREPARATION**

To facilitate preparation and understanding, a detailed reading assignment list is provided. Students are strongly encouraged to complete all reading relating to a particular topic before advancing to video lectures and pencasts on that topic. Video lectures and pencasts are designed to enhance the reading materials, not as a substitute or alternative for reading materials.

## **GRADED PROBLEMS**

Homework problems are assigned on a regular basis and are to be submitted electronically to Canvas. Late homework is not accepted under any circumstance. Homework problems will be evaluated on a 6 point scale:

- 5 pts = Professional work with complete, or nearly complete, accuracy,
- 4 pts = Professional work with a strong effort and high accuracy,
- 3 pts = Mostly professional work with good effort and accuracy,
- 2 pts = Marginal professional work with marginal effort with errors,
- 1 pt = Unprofessional work with poor effort with numerous errors,
- 0 pts = no submittal or submittal rejected due to lack of professional quality.

## **Due dates and times are Penn State University time, Eastern Time Zone.**

Homework problems are intended to be challenging and require the application and extension of recent presented materials and concepts. It is expected that all student submitted problem solutions will represent an individual student effort (see the Pennsylvania State University academic integrity policies for guidance); however, study groups are acceptable and encouraged. Textbook solutions are obtainable – copying these published solutions and submitting is an academic integrity violation. The published solutions contain errors, so beware!

All submitted work must be on engineering paper, in pencil, and double spaced. All submitted work must follow the guide submission provided on the attached pages. Particular attention must be paid to:

- First page header exactly as shown
- Problem statement repeated, but can be abbreviated. Complex structures do not need to be redrawn.
- All drawings must be to scale and completed with a straight edge.
- Calculations must flow vertically on the page as illustrated. Never partition the page with a vertical line and draw arrows to additional work.
- Every number that has units must have those units provided, every time, not just at the end of a calculation.
- Report all results, intermediate and final, with 3 significant figures.
- Double underline answers.

Acceptable engineering paper (submissions on other paper will be rejected):

- Standard College of Engineering, pale green, one sided engineering paper available at all university bookstores in the USA
- Standard, 4x4 or 5x5 white graph paper with pale blue graph lines available from office supply and department stores

All submitted work must be scanned to a PDF meeting the following:

- PDF format, one file only,
- gray scale only (color and black & white will be rejected and not graded),
- on a flat, platen scanner (cell phone photos will be rejected and not graded),
- in a single file **with file size not to exceed 2MB**
  - adjust the scan resolution as required to achieve 2MB
  - gray scale and 100 to 200 dpi is sufficient
  - files larger than 2MB will be rejected and not graded (overloads the Canvas site)
- Name the file exactly as follows (any other file naming scheme will be rejected):  
**LASTNAME\_340\_HW#.PDF** or for example: **SMITH\_340\_HW1.PDF**

Upload the single PDF file to CANVAS in the corresponding drop box by the deadline provided. Late homework will not be accepted under any circumstance – the drop box will close at the published time – do NOT wait until the last minute to submit files. Many things can go wrong and if sufficient time is not allowed to correct the situation, the drop box will close and the submission will not be accepted. Each student is responsible for ensuring that the file has been correctly submitted and meets all requirements.

See the CE340 **Quiz and Homework Schedule** for assigned problems and due dates.

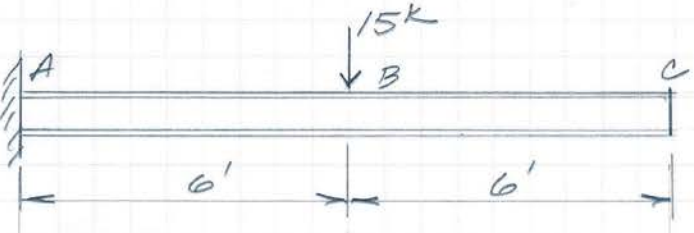
HEADERS

HOMWORK WEEK 6: PROB 8-10, 12, 14 pg 11  
CE340, SU 2016 SUSAN SMITH 6/12/16

PROBLEM STATE

PROBLEM 8-10 DETERMINE THE SLOPE AT B AND THE MAX. DISPLACEMENT OF THE BEAM.  
USE MOMENT-AREA.  $E = 29,000 \text{ KSI}$ ,  $I = 500 \text{ in}^4$ .

ENGINEERING DRAWING

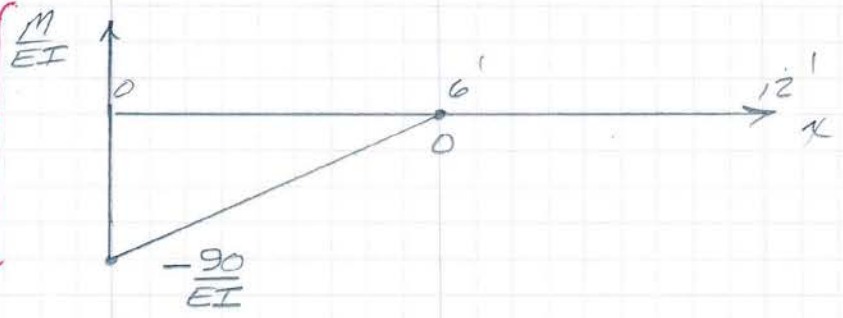


- TO SCALE
- DIMENSIONED
- USE STRAIGHT EDGE

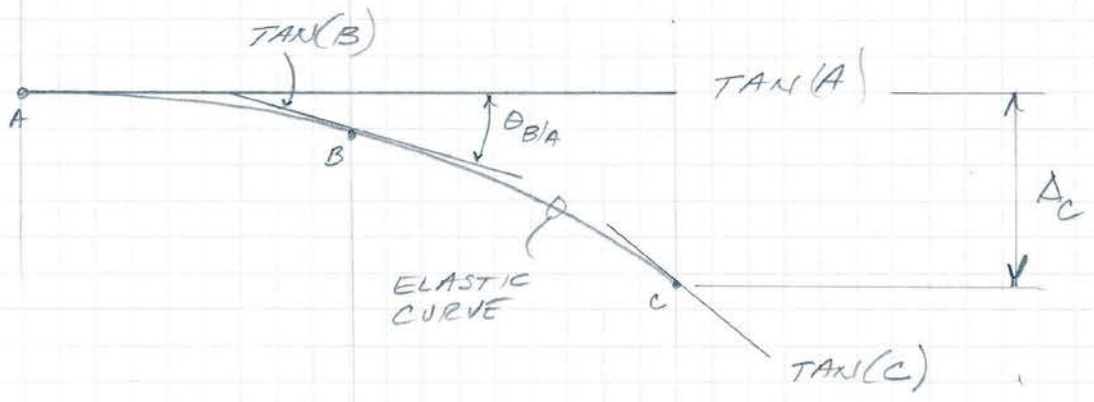
SOLUTION:

USING THE  $M/EI$  DIAGRAM & ELASTIC CURVES.

DRAWING



- TO SCALE
- USE STRAIGHT EDGE



$$\theta_B = |\theta_{B/A}| = \frac{1}{2} \left( \frac{90 \text{ FT-KIPS}}{EI} \right) 6 \text{ FT} = \frac{270 \text{ FT}^2\text{-K}}{EI}$$

$$= \frac{270 \text{ FT}^2\text{-K}}{(29000 \text{ KSI})(500 \text{ IN}^4)} \times \frac{12 \text{ IN}}{\text{FT}} \times \frac{12 \text{ IN}}{\text{FT}} = \frac{0.00268 \text{ RAD}}{\text{E.I.}}$$

UNITS REQUIRED  $\frac{2}{2}$   
 UNDERLINE = 3 SIG. FIGURES

$$\Delta_{\text{MAX}} = \Delta_C = |t_{B/A}| = \left[ \frac{1}{2} \left( \frac{90 \text{ FT-K}}{EI} \right) 6 \text{ FT} \right] \left[ 6 \text{ FT} + \frac{2}{3} (6 \text{ FT}) \right]$$

$$= \frac{2700 \text{ FT}^3\text{-K}}{EI}$$

$$= \frac{2700 \text{ FT}^3\text{-K}}{(29000 \text{ KSI})(500 \text{ IN}^4)} \times \frac{12 \text{ IN}}{\text{FT}} \times \frac{12 \text{ IN}}{\text{FT}} \times \frac{12 \text{ IN}}{\text{FT}} = \frac{0.322 \text{ IN}}{\text{E.I.}}$$

UNITS REQUIRED  
 UNDERLINE ANSWER = 3 SIGNIFANT FIGURES

### NOTES:

- ON ENGINEERING OR GRAPH PAPER
- IN PENCIL
- DOUBLE SPACED
- PROFESSIONAL PRESENTATION/ORGANIZATION
- SCAN AS PDF, 1 MB MAX
- GRAYSCALE SCAN (200 dpi)
- SMITH\_340\_HW6.PDF
- PROPER FILE NAME
- ALL PROBLEMS IN ONE FILE PER WEEK ASSIGNMENT.

## PROCTORED EXAMS

All students must sit for the mid-semester and final examinations during the time specified in the course schedule. No alternate examination times will be accommodated. Registering for this course constitutes a contract to meet all requirements as specified herein – this course is your first priority. In the event of an extreme and unforeseeable circumstance, a request for consideration of an exception must include official documentation of the circumstances that prohibit the student from sitting for the examination. After timely receipt of the documentation, the instructor will make the final determine if an alternate examination time will be granted or not.

Each student is required to secure a proctor meeting the requirements for this course and submit proctor information via the course website for Penn State College of Engineering approval **no less than 2 weeks prior to each examination**. Students who do not submit proctor information for approval two weeks or more in advance of the examination will receive a ZERO grade for that examination – no exceptions will be granted to this requirement.

1. Each student must request their proposed proctor by completing the **Proctor Information Form** and return that form to the student. Allow the proctor sufficient time in advance of the two-week deadline.
2. Proposed proctor information must then be submitted via Penn State Canvas CE340 course website:
  - a. Under “Quiz” take Quiz 1 to enter information regarding the proposed proctor for the mid-term examination. The Penn State College of Engineering will receive the proposed proctor information via Quiz 1 and alert the student of approval through the posted quiz grade.
  - b. Under “Quiz” take Quiz 2 to enter information regarding the proposed proctor for the mid-term examination. The Penn State College of Engineering will receive the proposed proctor information via Quiz 2 and alert the student of approval through the posted quiz grade.

## **Examination Instructions – Proctor and Student**

1. Proctored examinations must be completed within one, 3:00:00 hour time period – no additional time is to be provided by the proctor or requested by the student.
2. This 3:00:00 time period does not include time for the proctor to download the examination, print the examination, scan the student solution, or upload the PDF solution.
3. The 3:00:00 hour time period must be mutually agreed upon between the student and the proctor and be within the allotted examination days.
4. Any item or reference not explicitly permitted by these instructions is to be considered prohibited from the examination room.
5. The Hibbeler *Structural Analysis* printed text is permitted in the examination room. Electronic copies of the textbook are not permitted due to requiring a computer (see item #8).
6. Note materials that were accumulated as a direct result of this CE340 course are permitted in the examination room.
7. Scientific, non-programmable calculators are permitted in the examination room. Computers or other programmable calculators/devices are strictly prohibited.
8. Cell phones, iPads, tablet PCs or any other communication device or internet access capable devices of any type are not permitted in the examination room.
9. Backpacks of any type are not permitted in the examination room.
10. Examination solutions must be prepared on standard engineering paper, in pencil, double spaced – follow homework guidelines provided here.
11. Each examination requires the submission of a **study summary** (5% extra credit for the examination grade if complete, organized, thorough, and covering all examination topics – otherwise zero credit). This study summary is limited to two sides of one piece of 8½" x 11" engineering paper. The summary must stand alone – list equations, solution steps, drawings, and other information explicitly and not refer to other documents.
12. The completed examination is to be immediately submitted in person by the student to the proctor at the conclusion of the 3:00:00 time period. The proctor must:
  - a. Scan and make a gray scale (not color!), 200 dpi (no more, no less) single PDF document of the examination honor code, student solution, and study summary;
  - b. Name the file exactly as follows (any other file naming scheme will be rejected): **LASTNAME\_340\_EX#.PDF** or for example: **SMITH\_340\_EX1.PDF**
  - c. Upload the properly named, single PDF document to the Penn State Canvas course website; and
  - d. Secure the original examination until successful upload of the PDF examination.

**Examinations failing to meet these requirements, explicitly, will be rejected and not graded.**

## **Examination Instructions – Student**

1. The student solution must:
  - a. Be professional, organized, neat, and legible,
  - b. Be double spaced,
  - c. Be in pencil on engineering paper, and
  - d. Follow the provided sample calculation as a guide (see above).
  - e. A portion of the grade is based on following these requirements.
2. Present no more than 3 significant figures for calculation results.
3. All units must be provided for every number that has units.
4. Show all calculations, inserting number values in equations, and identify each step for credit. General equations followed by a numerical result will receive no credit.
5. Clearly state and justify all approximations.
6. Write your initials and page number in the upper right corner of each solution page.



## **COURSE GRADING POLICY**

Graded assignments and examinations may vary in difficulty, therefore, it may be necessary to adjust final course percentages for each student to account for this variability. A suitable adjusted class mean percentage will be determined by the instructor, however the curved average is commonly set to 81.50%. The adjusted course mean will correspond to the standard university grading scale ranges as shown below:

93.00 to 100	A	
90.00 to 92.99	A-	
87.00 to 89.99	B+	
83.00 to 86.99	B	
80.00 to 82.99	B-	(adjusted course average = 81.50%)
77.00 to 79.99	C+	
70.00 to 76.99	C	
60.00 to 69.99	D	
0.00 to 59.99	F	

Adjustment will occur once at the end of the semester for the final grade. Individual assignment grades will not be adjusted during the semester.