ME14: STATICS Summer 2010 - UC Santa Barbara	Instructor:Dominic J. Dal Belloemail:tecump@engineering.ucsb.eduVoicemail:922-6966 x3498 (message only)
M-Th:9:30-10:50 am – Phelps 1420	<u>Office Hours: EII 2323 (subject to change)</u>
F:9:30-10:50 am – Phelps 1420	M: 1:15-2:45 pm W: 2:45-4:15 pm or <i>by appointment</i>
4.0 Units - Enrollment Code#: 10900	<i>T.A.</i> : Mahdi Maleki Tehrani
http://www.ah-engr.com/me14	<i>email</i> : malekitehrani@engineering.ucsb.edu
All information subject to change. Revision: 6/21/10	Office Hours: EII 2243 (subject to change) Tu: 2:45-4:15 pm Th: 1:15-2:45 pm or by appointment

REQUIRED	Engineering Mechanics: STATICS, 6th ed., Meriam & Kraige, Wiley.Student Value Edition: ©2010, ISBN: 978-0-470-49977-1 – paperback, grayscale.Standard edition: ©2006, ISBN: 978-0-471-73932-6 – hardcover, color.	
TEXT	Note: Summer ME16: Dynamics: will use volume 2 of the same "set:" <i>Engineering Mechanics: DYNAMICS</i> , 6th ed., Meriam & Kraige, Wiley. Handouts to be distributed in class.	
SOFTWARE	Web browser (to access web site)	
PREREQUISITES	Math 3B and Physics 1 (integral calculus and mechanics)	
DATES	Course Begins:Monday, June 21, 2010Holiday:Independence Day observedLast Day/Final:Friday, July 30, 2010Monday, July 5, 2010	

Course Description (from UCSB Catalog):

Introduction to applied mechanics. Forces, moments, couples, and resultants; vector algebra; construction of free body diagrams; equilibrium in 2- and 3- dimensions; analysis of frames, machines, trusses and beams; distributed forces; friction.

Course Goals:

- To develop engineering problem-solving skills and techniques.
- To acquire a basic understanding of the principles of Vector Analysis and Equilibrium.
- To introduce students to Free Body Diagrams and their importance in solving engineering problems.
- To gain an appreciation for an orderly and logical analysis of engineering problems.

Course Objectives:

At the end of this course, students should be able to demonstrate the following:

- Generate appropriate Free Body Diagrams.
- Formulate and solve problems involving statically applied forces in 2- and 3- dimensions.
- Analyze trusses, frames and simple machines.
- Locate mathematically the centroid of areas.
- Calculate internal forces and bending moments in beam systems, including distributed loads.
- Calculate cable loads.
- Formulate and solve equilibrium problems involving frictional forces.

GRADE BREAKDOWN (subject to modification):	<u>GRADE SCALE</u> (subject to modification)
Homework	A \geq 90 % of possible points
Quizzes (best 3)10%	$B_{\dots\dots} \ge 80 \%$
Exams (2)40%	$C \geq 70 \%$
Final Examination	$D_{\dots\dots} \ge 60 \%$
Total100%	F < 60 %

Study and work on problems EVERY day: ~ 2+ problems/day, Monday through Sunday

Instructional Accommodation

If you are a student with a disability and would like to discuss special academic accommodations, please feel free to contact your instructor at your earliest convenience.

Please contact the instructor a week before any scheduled exam.

GENERAL GUIDELINES

1.1 EMAIL AND WEBSITE

- Each student should have an active email account for communication purposes. Check your email on a consistent basis.
- The course website: www.ah-engr.com/me14 should be accessed for announcements, due dates, solutions, links, etc.

1.2 STUDYING SUGGESTIONS/GUIDELINES

- Summer Session engineering and math courses can be challenging; six weeks goes by quickly.
- Study EVERY DAY. Put in at least 2 hrs per day per engineering course.
- DO not expect to just study (cram) the day before the exam and do well.
- Read/skim the sections of the text before they are covered in class
- Come prepared to learn and discuss.
- Working in groups is beneficial, acceptable and encouraged. The insights of others are very valuable. However, BEFORE collaborating with others, you should attempt each exercise/problem on your own. Only after you have made an honest effort should you discuss with other students or your instructor. See 2.6 Honor, Trust and Integrity.
- Work as many of the assigned problems, and as many additional problems as you can. The more you practice, the better you will understand the material. Discuss your solutions with other

• Some online engineering tools are available

- In class announcements trump online HW due dates; please attend class.
- through the website.

students, the TA or instructor, to gain further understanding.

- Please do your own work. Do not copy another's work or solutions. Doing your own work builds confidence in your problem solving skills and understanding. Simply copying is cheating, will not help you learn the material, and will not be tolerated.
- Do not fall behind. Get help from your instructor or other students. It is very difficult to catch-up, especially since the course material builds on itself and becomes more complicated as the term goes forward. Get ahead if you can.
- My two primary goals are to help you learn the material and to prepare you for the next level. For me to help you succeed, you must be an active participant in your education. Participate in class, do as much work as you can, and do not be afraid to ask for help.

1.3 ATTENDANCE

- ME14 is scheduled to meet 29 times, including one 1.5-hr final exam. Try to study 2+ hours outside of class for every lecture.
- Experience shows that students who do not attend class do not receive satisfactory grades. Attend class.
- Please be on time. Clarifying remarks are often made at the start of class. Show respect to your colleagues and your instructor.
- Missing class or being late to study for another course (or even to do ME14's homework!!!) is not very wise. If you find this to be common, perhaps you are over-committed or need to reschedule your time.

1.3 ATTENDANCE, *continued*

- If you miss a class, it is your responsibility to arrange for other students to turn in your work on time, have notes taken for you, get announcements, etc. Thus, one of the benefits of having a study group.
- You do not need to contact me if you are going to miss class. Any make-up work may be scheduled at the instructor's discretion. Quizzes cannot be made up.

1.4 COURSE CONDUCT

- Turn off and put away cell-phones and other electronic communication devices while in class. If you are expecting an important call, please put the phone on vibrate or silent mode.
- **Do not text/instant message during class.** This is really annoying/distracting to instructors.
- Do not read materials from other courses (or other literature), or do homework (even for this course), etc., during the class period.
- Class time is to be used for the appropriate coursework. Other activities (e.g., texting) are disruptive and disrespectful to the learning environment, to your fellow students and to the instructor. If you disrupt your colleagues or

- If you have a **dire emergency** (medical, family emergency, etc.) that requires you to **miss more than one class** or **an exam**, please leave a message for me at the email address (preferred) of phone number listed above. Please contact me **before** missing any exam.
- If you decide to drop the course, it is your responsibility to withdraw prior to the deadline published by UCSB's Summer Session.

instructor, you will be asked to leave the classroom.

- Please display professional attitude and behavior: reliability, respect for and cooperation with colleagues, willingness to work calmly and cordially under difficult conditions, determination to do first-rate work while meeting deadlines, respect for equipment and systems, and appropriate response to constructive criticism.
- Please respect your classmates, guest speakers, Teaching Assistant and instructor. Pay attention to what they have to say. In turn, you should be respected when you wish to speak.
- If you arrive late, or must leave early, please do so with as little distraction to the class as possible.

2 HOMEWORK, QUIZZES, EXAMS, etc.

2.1 CALCULATORS

- You may use any calculator for assignments, quizzes and exams.
- You **may not** use built-in or written programs to check calculations. The answer should fall out

2.2 QUIZZES

• There will be 3+ quizzes during the term, not necessarily announced. The top 3 quiz scores will be used to determine the quiz grade.

2.3 WRITTEN ASSIGNMENTS

 Written homework assignments will be taken from the book or handouts, and must conform to the Homework Format (Given/Req'd format) presented below. Homework not presented in an acceptable format will not be graded.

- from your step-by-step solution of the problem. You should be able to *demonstrate* your understanding of the solution process; i.e., **show your work.**
- No make-up quizzes will be given.
- **Problem experience is essential** in learning *Statics*. Students who do not do homework generally do not learn the subject, nor do well on exams. Do the homework.

2.3 WRITTEN ASSIGNMENTS, continued

- Homework that is simply copied (from other students or from other sources) will receive a zero. Homework (HW) that is allowed to be copied will receive a similar fate. Heavier penalties may be applied (see 2.6 Honor, Trust and Integrity.).
- Write legibly can't read it, can't grade it.
- Draw pictures/FBDs as appropriate.
- HW should be turned in **at the beginning** or **end** of the class period, or other designated time/location. Do not interrupt the class by turning in assignments during lecture.
- Not every problem will be graded in detail. However, you should honestly attempt all problems to ensure full credit for a HW assignment.

- *Late work* will not be accepted. Turn in what you have done; we are moving on to a new topic.
- Each graded problem is worth the same amount. Your HW score at the end of the course will be based on the total points you have earned on the problems that you turned in (on time), divided by 80% of the total points possible. Regardless, 100% will be the maximum possible score for HW.
- Brief solutions will be made available on the course web site or in class.
- Review HW problems by checking the solutions, comparing your work with others, going to office hours, etc.

2.4 EXAMS AND THE FINAL

- There will be 2 Exams and 1 Final. Each exam will consist of 3-4 problems that you must work to solution. The final will be cumulative.
- You are expected to take all exams and the final on the day that they are given. Make-up exams will be given at the discretion of the instructor. You must inform the instructor **before** the exam of your impending absence, unless it is an emergency which prevents you from getting to a phone/computer. The exam must be made up as soon as possible after the exam date.
- You will be allowed 1 side of an 8.5"×11" piece of paper for notes for each exam. Equations may be included, but **no worked out problems**.
 - You are to make your own sheet. However, the instructor reserves the right to provide a common note-sheet for the entire class.
 - The note sheet will be turned in with the exam.
 - Two sides may be used for the final.
 - The purpose of the note-sheet whether created by you or the by the instructor – is to help you study/review for the exam. <u>The best note</u> <u>sheet is one that you hardly need to look at</u> during the exam.

2.5 ERRORS IN SCORES

- If a mathematical error in adding your score was made, please submit your homework/exam with a <u>note attached</u> on top. Corrections will be made as soon as possible.
- If you feel a problem/question was graded incorrectly (e.g., marked wrong, when it was right), please submit your paper/exam with a note <u>attached</u> on top justifying why your answer was correct and should be re-graded. The instructor reserves the right to re-grade your entire paper/exam.

2.6 HONOR, TRUST AND INTEGRITY

- All work submitted by a student is expected to be his/her own work. While study groups are recommended and encouraged as a learning tool, your solution must be your own. If it is apparent that you have copied any material, or turned in work not your own, or you otherwise cheat, you will be subject to receiving an "F" in the course, and such activity reported to the administration.
- Remember, *cheating* is not only copying other's work, but also allowing others to copy your work.
- No electronic devices (except standard calculators) may be used during any quiz or exam.
- Do <u>your</u> best. Seek help <u>before</u> you find yourself tempted to simply copy another's work.

3 HOMEWORK FORMAT

- Effectively communicating your ideas, often using a required standard format, is important in your professional life. Failure to follow these guidelines for homework sets will result in a reduced score.
- Use engineering paper (the green paper with gridlines on the back) <u>or</u> blank (copy) paper only.
 - Do not use blue-lined notebook/filler paper.
- If you use blank copy paper, you do not need to draw the margin lines, etc.
- Use a pencil. Do not use a pen.
- Use a straight-edge (ruler) to draw pictures and graphs.
- Do not write on the back side of the paper. Only use the front. On engineering paper, the back is the side with the gridlines. The gridlines show through the paper so you can organize your work, draw graphs and pictures to scale, write on a horizontal line, and still have a clear workspace.
- Do not crowd graphs into a corner.
- Write your homework assuming the reader/grader does not have access to the question you are answering. Your homework should stand alone.
- Use the <u>Given/Req'd</u> format shown in *Figure 1*. The Given/Req'd are brief statements <u>in your own words</u> concerning what the problem is about. This will help you when you go back and study your homework for exams and ask yourself "What was I trying to solve here?" It will also help communicate to your instructor or grader (or anyone else) what you are doing.

For example, <u>do not</u> just write:

"Given: See picture."

Rather, write:

"<u>Given</u>: Simply supported beam under central point load."

The *Given* is the starting situation/what you know; the *Req'd* is what you are trying to find, e.g.: "<u>*Req'd*</u>: *Reactions*."

You may abbreviate "Given" and "Req'd" with "G" and "R". You may use "<u>Find</u>" in place of "Req'd".

- Write legibly. If I can't read it, I can't grade it.
- Explain your steps with brief statements

 ("Equilibrium:") <u>or</u> mathematical short-hand
 ("Σ<u>F</u> = 0 :") as you think through the problem.

 Demonstrate your understanding.

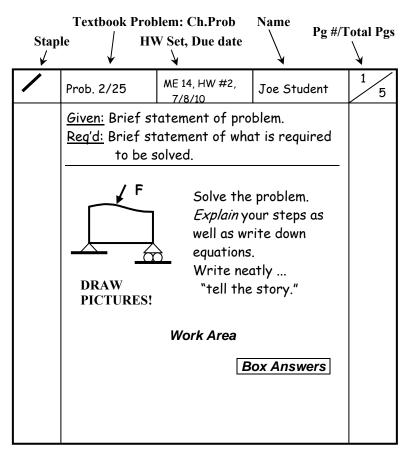


Figure 1. Format for homework with margins typical of Engineering Paper.

- Make your solution easy to follow (do not write in a "maze" or place steps of your solution in seemingly random places on the paper). Write the steps to your solution in a column down the page.
- Write clear justifications using **complete sentences** whenever such a response is appropriate.
- Do the algebra; substitute values at the end.
- <u>DRAW</u> at least one picture (e.g., a FBD) for EVERY problem.

-Do not make copies of the book picture and paste it on your homework sheet.

-Not drawing appropriate figures will result in loss of points in homeworks and exams.

- Give all answers to no less and no more than 3 significant figures (numbers that start with a "1" can have 4). Assume all textbook data are good to at least 3 significant figures.
- Write quantities less than 1.0 (one) with a zero in front of the decimal point; e.g.: one-fourth is "0.25" <u>not</u> ".25".

HOMEWORK FORMAT, continued

 Use appropriate S.I. prefixes to keep numbers between 0.1 and 1000, e.g. write 23,500 N as 23.5 kN. Or use engineering notation: 23.5×10³ N (scientific notation with the exponent divisible by 3 corresponding to the standard S.I. prefix magnitudes: G, M, k, m, μ, n, etc.).

<u>Avoid</u> writing numbers in scientific notation $(2.35 \times 10^4 \text{ N})$ or in calculator form (2.35E4 N).

- Make sure your units are correct. Include units they are part of the solution.
- Check your work; do the values and units make sense?
- Box your final answer.
- On the top of the first page of a HW set (*Figure 1*), write in each of the "third areas" of the engineering paper:
 - (1) the <u>Text Problem Number</u>,
 - (2) the Class, Homework Set Number and Due Date

(3) Your Name.

- In the upper right hand corner, start a running page <u>number count</u>: "1/ " (*Figure 1*).
- The textbook problems in Meriam and Kraige are numbered with a slash: Chapt/Prob; e.g., 2/25, 3/14.

- START A NEW PROBLEM ON A NEW PAGE. Place no more than one problem on a single page.
- If you continue a problem onto an additional page, indicate that at the bottom right of the first problem page so that it is clear that the solution does not just stop; e.g.: write "continued →"
- After the first page of a HW set, simply indicate the Problem Number and continue with the pagination, e.g. page "2/", "3/", etc. (*Figure 2*).
- When you are done with your homework, collate the pages, and write the total number of pages in the "denominator" of the page count on each page (e.g., "1/5" in *Figure 1* means "Page 1 of 5"), or at least on the <u>first</u> and <u>last</u> pages.
- Make sure your pages are in order.
- **Staple** your homework in the upper left-hand corner (*Figure 1*). **Buy yourself a small stapler**. Neither the instructor nor grader will be responsible for loose sheets.
- Do not fold the homework set.

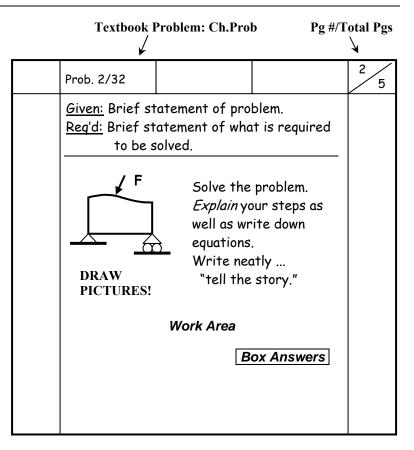


Figure 2. Format for Page 2 and beyond.