

University of Illinois at Urbana-Champaign
Department of Mechanical Science and Engineering

TAM 210 - Introduction to Statics

TAM 211 - Statics

Course description

TAM 210 (2 hours): Forces, moments, couples; resultants of force systems; equilibrium analysis and free-body diagrams; analysis of forces acting on members of trusses, frames, etc.; shear-force and bending-moment distributions; Coulomb friction; centroids and center of mass; applications of statics in design.

TAM 211 (3 hours): Forces, moments, couples; resultants of force systems; equilibrium analysis and free-body diagrams; analysis of forces acting on members of trusses, frames, etc.; shear-force and bending-moment distributions; Coulomb friction; centroids and center of mass; moment of inertia, polar moment of inertia, and product of inertia; virtual work; hydrostatic pressure; applications of statics in design.

Prerequisites

PHYS 211; credit or concurrent registration in MATH 241.

Instructors

Dr. Mariana Silva
Email: mfsilva@illinois.edu
Office: MEB 154
Lectures: MWF, 12PM (AL1), GH 112
Office hours: Thursdays, 1-2pm, MEB 154 (or by appointment)

Teaching assistants

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Discussion sessions

AD1, M 4:00-4:50PM, 252 MEB,
AD2, T 11:00-11:50AM, 252 MEB,
AD3, T 12:00-12:50PM, 153 MEB,
AD4, T 5:00-5:50PM, 335 MEB,
AD5, W 12:00-12:50PM, 252 MEB,
AD6, R 10:00-10:50AM, 252 MEB,
AD7, R 12:00-12:50PM, 252 MEB,
AD8, W 3:00-3:50PM, 252 MEB,
AD9, T 10:00-10:50AM, 243 MEB,

Special accommodations

To obtain disability-related academic adjustments and/or auxiliary aids, students with disabilities must contact their lecturer and the Disability Resources and Educational Services (DRES) as soon as possible.

To contact DRES you may visit 1207 S. Oak St., Champaign, call 333-4603 (V/TDD), or e-mail a message to disability@uiuc.edu.

Compass 2g

Your grades, class notes and general announcements will be posted on Compass 2g (<https://compass2g.illinois.edu>).

i>clicker

Quizzes will be administered in lectures via the i>clicker system. The i>clicker remote may be purchased at any of the book stores and must be registered on Compass 2g, under the tab “Register i>clicker”. **You need to register your i>clicker by September 5th, when the i>clicker roster will be synced for the last time.**

Supporting material

We will provide lecture notes. They will be available for downloading on Compass 2g.

The custom version of “*Statics*” by Hibbeler R.C., Pearson (ISBN: 9781256648680) can be used as supplemental material and is available at Uoff Bookstore. The package available at the bookstore includes the *MasteringEngineering* access code, which is required to complete your homework assignments (see section “Required online tool”) and eText.

REQUIRED online tool - MasteringEngineering

Your online homework assignments will be available from the website www.masteringengineering.com. You should consider one of the following options to obtain access to MasteringEngineering:

1. Purchase custom textbook from the bookstore: MasteringEngineering + **eText** + printed custom version of the textbook
2. Purchase MasteringEngineering + **eText** (\$110.00)
3. Purchase MasteringEngineering only (\$55.00) - in this case, you may choose to use your lecture notes for text reference, borrow a book from a friend or library, or buy any other used textbook

Please follow the steps below to start using MasteringEngineering:

- Go to the website http://www.pearsoncustom.com/il/ui_eng_mech_statics
- Select one of the three options under the “Sign in” box on the top left of the page.
 - “Register Here” - if you purchased the printed version of the textbook from the bookstore (option 1 above)
 - “Purchase Access with eText” (option 2 above)
 - “Purchase Access without eText” (option 3 above)
- You will need to create a Login Name and Password.
- After you login for the first time, you will receive a Welcome Message. You will be asked to enter the Course ID: TAM210SP15
- You will also be asked to enter your UIUC NetID (which is the first part of your email address - NetID@illinois.edu). Make sure you type this information correctly, since it will be used to upload your grades into Compass 2g.

Study Hall

- A Study Hall in 429 Grainger Library is provided to answer questions you may have.
- Study Hall is intended to supplement the lectures and discussion sections.
- Do not ask the staff to work the homework problems before they are due. It is OK to ask them specific questions on the details of your attempted solutions or to work out problems that are similar to the homework problems.
- The Study Hall will begin on Friday, Jan 23rd. It will be staffed by the TAs during the time slots indicated in Table 1.

Table 1: Office hours at 429 Grainger Library

Time	Monday	Tuesday	Wednesday	Thursday	Friday
3 - 4pm					Bruno
4 - 5pm	Amir		Chris + TC	Chris + Ali	Matt + Bruno
5 - 6pm	Amir	TC	Chris + TC	Chris + Bruno	Cory + Matt
6 - 7pm	Amir	TC		Bruno	

Online Forum

This class uses Piazza <https://piazza.com/illinois/spring2015/tam210tam211/home> for ALL online questions and feedback. You will receive an invitation to join this forum. Official class announcements will be sent via Piazza, so you must register with an email address that you regularly check. You can also use the Search for Teammates feature on Piazza to help find a study group. The use of Piazza should not replace the Study Hall time, since some questions cannot be fully addressed via an online forum.

1. Students are encouraged to post public messages on Piazza (“Post to Entire Class”). However, you can use the private feature by posting a message visible only to the Instructors. In this last case, you must type “Instructors”, instead of sending a message to a specific TA or instructor.
2. Questions about missing or incorrect grades on compass 2g must be addressed **within two weeks after the grade was released**. Make sure you routinely check your grades on compass 2g, otherwise, we are not going to modify your grade. When posting your concern on Piazza, you should direct the message to the TA that grades your assignment by selecting the folder with his name on it (you should still post the message to “Instructors”).
3. Questions to the instructor regarding class logistics should be posted in the folder “Logistics”.
4. Questions regarding online HW and written assignments must be posted in the folder “Homework”
5. Questions regarding discussion sections must be posted in the folder “Discussion”

Online homework

1. You will find your online homework assignments on MasteringEngineering.
2. Online homework assignments will be due on **Mondays, Wednesdays and Fridays at 11:59 pm**. Late submissions will be penalized by 20% over each day late. Make sure to check the deadlines on MasteringEngineering.
3. Some of the problems will have a Hint. You can get bonus points if you choose not to open the Hint.
4. You can rework completed items after the due date. This work will not be saved and will not affect your grades.

5. Your HW score will also be uploaded on the Compass 2g grade book. Please make sure to check your grade book regularly for inconsistencies.
6. To encourage you to work through the problems and to obtain the correct solution you may revise and resubmit your solutions numerous times until the due date.
7. The online homework problems give explicit values and units to the relevant lengths, material properties, forces, et cetera, and therefore you should give your final answer with an explicit numerical value. Nevertheless, when solving a homework problem you should (to the utmost extent possible) assign symbols to all the relevant lengths, forces, material properties, et cetera, and then solve the problem symbolically. As a last step, you should substitute the value and units of each of the symbols in the symbolic formula. You are encouraged to solve all problems symbolically.
8. This symbolic form of working out the problems will be used by me in the lectures and by yourselves in the written assignments and exams.
9. You are encouraged to print out each homework problem and derive your symbolic solution on this print out. Store these solutions for your future reference.
10. You should come to office hours with the symbolic solution for your online assignment. We will be able to check your work better if you have that in hand.
11. Solutions will not be posted.
12. Your first three assignments are due on January 23rd:
 - (a) MasteringEngineering Introduction: this assignment is optional; its purpose is to help you getting familiar with the online homework system. You can earn up to 0.2% of extra points to be added to your final grade.
 - (b) Syllabus Quiz: This assignment is also optional and consists of multiple choice questions regarding this syllabus. You can earn up to 0.52% of extra points to be added to your final grade. **FOR THIS ASSIGNMENT, YOU WILL HAVE ONLY ONE ATTEMPT FOR EACH MULTIPLE CHOICE ITEM.**
 - (c) HW #1: This is your first required online HW and is related to the material covered in the first week of classes.

Discussion Group Activities

1. Most discussion sessions will consist of a group worksheet exercise, which is a high-energy and efficient 50-minute learning experience.
2. One of the main goals of your discussion section activity is to gain experience in team-work. This skill is critical in all engineering disciplines, from large scale industrial projects to academic research. To work productively in teams is a skill that must be learned just like math or physics, and regular practice is essential. Often you will have to work with people who you do not especially like, or who you find it difficult to work with. It is important to learn how to manage these situations so that the important work is still accomplished.
We also hope that these discussion worksheets will help you to meet your classmates, and we encourage you to get together outside of lectures and discussions to work collaboratively on
3. You **MUST** attend the discussion session in which you are registered. You won't get any grade for the worksheet if you attend the wrong discussion.
4. **You must be on time!** Arriving late is very disruptive for this type of group activity. Your TA will not let you join the activity in case you are late and therefore you won't receive any grade for the missed worksheet.
5. Discussion sessions will begin on Tuesday, January 20th.
6. If you attend the Monday discussion section (AD1), you should go to any other discussion section during the first week of classes.

Written Assignment

1. To teach you how to prepare your analyses in a logical manner, you will be asked to submit an INDIVIDUAL assignment on a weekly basis.
2. Scan your assignment and save it in pdf format. Files in any other format will not be graded.
3. While scanning make sure you scan all the pages of your written assignment in ONE pdf file. We will only grade a single pdf file.
4. Your scanned work must be in portrait format.
5. IN SUMMARY, WE WILL ONLY GRADE REPORTS UPLOADED AS A PDF FILE, SINGLE DOCUMENT, PORTRAIT FORMAT! NO EXCEPTIONS!! Submitted assignments that do not comply with these guidelines will receive a ZERO score.
6. You will upload your written assignment on compass 2g. These assignment are due on Fridays at 11:59pm.
7. You will have two attempts to upload your written assignment and we will grade only your last attempt.
8. You can find more information on how to upload these assignments on compass 2g.
9. Your name and discussion session number must be printed legibly on the top of the first page.
10. When preparing your written assignment, you MUST assign symbols (to the utmost extent possible) to all the relevant lengths, forces, material properties, et cetera, and then solve the problem symbolically. If given, you should assign numerical values to your final result. Depending on the difficulty of the problem, you may assign numbers at intermediate steps.
11. These assignments are designed to practice the communication of engineering concepts in writing. They will be graded based on content and presentation.
12. In the first week of discussion, we will give you some tips on how to present a written document in engineering format.
13. Late written assignment will not be accepted (you will not be able to upload it on compass 2g). No exceptions. PLEASE DO NOT SEND YOUR LATE WRITTEN ASSIGNMENT BY EMAIL.
14. Your lowest written assignment score will be dropped. *This drop should be reserved for unexpected occurrences such as sickness or a family emergency.*

Lectures

1. Prompt and regular attendance at lectures is required.
2. The lectures will be delivered on a Tablet-PC.
3. Lecture notes are uploaded on Compass 2g. You will have access to pre-lecture notes in advance. These notes have blank spaces for you to take notes. We encourage you to print and bring these to class. You will also have access to post-lecture notes, with the instructor's annotations from the lecture.
4. Quizzes (2%)
 - (a) Expect an i>clicker quiz in every lecture: 1% for attendance + 1% for correct answer
 - (b) Your three lowest scores will be dropped. *These drops should be reserved for unexpected occurrences such as sickness or a family emergency.*

Exams

1. Bring your student ID to the exam, and arrive with sufficient time to sign in.
2. A formula sheet will be provided at the exam.
3. The midterm exams are scheduled in the evening. According to the student code, students are to be excused from one or more regular class periods for an amount of time equivalent to that required for the evening examination. Instead of canceling classes, there will be two review classes during lecture time prior to each of the exams. These lectures are optional and therefore there will be no i>clicker questions on these days. Attendance is not required, but you may find it beneficial to attend.
4. Conflict exams will be scheduled for students with legitimate (documented) scheduled conflicts. These are usually on the same day but earlier than the regular exam. You should contact your instructor to schedule a conflict exam no later than one week prior to the exam date.

Midterms

- (a) 2 hours exam, “closed book” and “closed notes”.
- (b) A formula sheet will be provided at the exam.
- (c) Midterm 1: Tuesday, February 24th, 7:00PM-9PM, Location: TBA
- (d) Midterm 2 (TAM 211 only): Tuesday, April 14th, 7:00PM-9PM, Location: TBA

Final exam

- (a) 3 hours exam, “closed book” and “closed notes”.
- (b) A formula sheet will be provided at the exam.
- (c) Make-up exams will only be allowed with a major documented excuse.
- (d) Final Exam (TAM 210): Tuesday, April 14th, 7:00PM-10PM, Location: TBA
- (e) Final Exam (TAM 211): Monday, May 11th, 8:00-11:00 AM, location TBA

Final grades

Table 2: Grading Distribution

	TAM 210	TAM 211
Online Homework	10%	10%
Discussion Worksheet	8%	8%
Written Assignment	10%	10%
Lecture Quizzes	2%	2%
Midterm 1	30%	20%
Midterm 2	--	20%
Final Exam	40%	30%

You total score corresponds to final letter grades as described in Table 3

Grading generalities

1. Questions about your grades must be made within the week after the quiz, exam or HW is returned. Discuss the issue with the TA who graded the problem in question.
2. Questions about missing quiz/exam/HW grades must be addressed to the Super-TA Joel Krehbiel (jkrehbi2@illinois.edu) within the week after the quiz/exam/HW was returned to your class-mates. Make sure to routinely check your grades on compass.

Table 3: Final letter grade

97 - 100	A+	93 - 97	A	89 - 93	A-
86 - 89	B+	82 - 86	B	79 - 82	B-
76 - 79	C+	72 - 76	C	69 - 72	C-
65 - 69	D+	60 - 65	D	55 - 60	D-
		0 - 55	F		

Absences and excused grades

- Excuses from homework, quizzes and exams will be given only in one of the following circumstances:
 - illness;
 - personal crisis (e.g. automobile accident, required court appearance, death of a close relative, weather conditions which make it impossible to get to the university); and
 - required attendance at an official UIUC activity (e.g. varsity athletics, band concert).
- In all cases you must complete the “TAM Excused Absence Request Form” (<https://illinois.edu/fb/sec/411728>) and upload a scan of the official written documentation explaining your absence.
- In cases (a) or (b) an official excuse letter from the Dean on Duty (<http://www.odos.uiuc.edu/deanonduty/>) must be submitted via the online form within 2 weeks of the due date of the missed assessment, but no later than reading day. In cases of extended or unusual illness, late submission of excuse documentation will be considered.
- In case (c) an official letter from the designated university official must be submitted via the online form at least one week prior to the due date of the missed assessment.
- The dropped homework and quiz grades are intended for excused absences. If additional homework and quizzes are excused, then each such approved excuse will increase the number of grades that will be dropped.
- An excused absence from a midterm exam will receive the score EX. At the end of the semester, midterm-exam EX scores will be replaced by a weighted average of your non-EX exam scores (midterm-exams and the final exam).
- When possible, you will be required to attend another discussion section rather than miss your scheduled discussion section for one of the aforementioned circumstances. In this situation please contact the Super-TA Joel Krehbiel (jkrehbi2@illinois.edu), so you don't get penalized on your HW assignment.

Effective use of email

Email is most useful when you need to report a problem or request an appointment. But it is hard to discuss concepts, equations, plots or diagrams by email. If you have difficulties solving your homework or understanding a theoretical point, talk to one of us in person during office hours or post messages on Piazza.

Academic integrity

Infractions will not be tolerated. See the University's Student Code, Article 1, Part 4.