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[1] Updated 02/20/24.

1. Instructor

Shady Gomaa, PhD, (shady_gomaa@northwestern.edu), Tech A323,
https://northwestern.zoom.us/my/shadygomaa
Office hours by appointment.

2. Course Office Hours and Tutoring

2.1 Teaching Assistants (Graduate), CEE scholars (Undergraduate)

Graduate TAs and Undergraduate Tutors office hours (all in **AG40**, except that zoom only on Sundays)
(All TAs, and some undergraduate tutors, can help Matlab coding. Some undergraduate tutors may not.)
Mon:
10-11am: Ontiveros (undergraduate tutor, can help Matlab coding);
1-3pm: Berson (undergraduate tutor, may not help Matlab coding);
1-3pm: Erik Huang and Tong (TAs);
3-5pm: Li and Tong (TAs);
5-6pm: Granath (undergraduate tutor, can help Matlab coding);
Tue:
1-3pm: Erik Huang and Wei (TAs);
3-5pm: Li and Wei (TAs);
6-7pm: Ontiveros (undergraduate tutor, can help Matlab coding);
7-9pm: Johnson (undergraduate tutor, can help Matlab coding);
Wed:
1-3pm: Berson (undergraduate tutor, may not help Matlab coding);
1-3pm: Buettner, Chu and Dhargawe (TAs);
3-5pm: Buettner, Chu and Meem (TAs);
5-6pm: Granath (undergraduate tutor, can help Matlab coding);
Thu:
1-2pm: Bigdad and Khan (TAs);
1-3pm: Bigdad, Dhargawe and Khan (TAs);
3-5pm: Bigdad, Khan and Meem (TAs);
5-6pm: Dhargawe (TA);
6-8pm: Johnson (undergraduate tutor, can help Matlab coding);
Fri:
10:30am-12:30pm: Marchetta (undergraduate tutor, can help Matlab coding);
1-5pm: Guo (TA);
Sun:

10:30am-12:30: Marchetta (undergraduate tutor, can help Matlab coding), zoom only: https://northwestern.zoom.us/j/3458626063;
3:30-4:30pm: Granath (undergraduate tutor, can help Matlab coding), zoom only: https://northwestern.zoom.us/j/8423231467;
8-10pm: Ontiveros (undergraduate tutor, can help Matlab coding), zoom only: https://northwestern.zoom.us/j/7996940827.

Danyang Tong / danyang.tong@northwestern.edu
Th 2:00PM - 2:50PM -Recitation at 2122 Sheridan Rd Classroom 250.
Jiachen Guo / jiachen.guo@northwestern.edu
Th 2:00PM - 2:50PM -Recitation at Frances Searle Building 1441.

2.2 Quarter-Long Study Group Opportunity – Registration Required

If you would like to study with other students in this class, consider joining a Peer-Guided Study Group. Participants will meet weekly with about 5 to 8 other students and a peer facilitator, a student who has already taken and done well in the course. During sessions, students review concepts, work through practice problems, bring their questions, and work together to develop answers.
Students register for the full quarter on CAESAR and attendance is expected weekly. Study Group sessions are listed on CAESAR below course lecture and discussion sections (ex. CHEM 152-SG – CHEM 152-SG Peer-Guided Study Group: Quantitative Problem Solving in Chemistry). Feel free to contact Borislava at *pgsg@northwestern.edu* with any questions. Provided through Academic Support & Learning Advancement.

2.3 Small-Group Drop-in Peer Tutoring – No Appointment Needed

Students are welcome to stop by Drop-In Peer Tutoring to get support with a specific question or issue, or just talk through course materials with others. Covers this course and many introductory courses in Biology, Chemistry, Economics, Engineering, Math, Physics and Stats. Tutoring takes place Sundays through Thursdays. **Check specific times, courses and locations on the Drop-In Peer Tutoring website.** Feel free to contact Valerie at *valerie.wolf@northwestern.edu* with any questions. Provided through Academic Support & Learning Advancement.
Wondering how to become a peer leader with ASLA? Click on this link to find out more: https://www.northwestern.edu/academic-support-learning/peer-leadership/peer-leader-opportunities.html

3. Textbook

Bedford, A., & Fowler, W. *Engineering Mechanics: Statics* (5th ed.). Pearson. Older versions of the book are fine for studying the material. It is your responsibility to check other editions since section numbers may be different. We will post the homework statements.

4. Course Objectives

- Introduction to basic concepts in engineering mechanics: statics of particles and rigid bodies.
- Understand the process of engineering analysis in which fundamental concepts are employed through logical and systematic problem-solving approaches.
- Further understanding and application of mathematical tools: vectors, linear algebra, calculus, etc.
- Extend the programming skills introduced in Engineering Analysis 1 to make MATLAB an everyday tool for solving engineering design and analysis problems.
- Prerequisites: Engineering Analysis I (GEN ENG 205-1), Math 220-0 (or equivalent)

5. Course Organization

Class sessions for this course will occur in person.
If you are sick contact the instructor as soon as possible to arrange to complete coursework.
Students who experience a personal emergency should contact the instructor as soon as possible to arrange to complete coursework.

5.1 Lecture

Lectures will be @ **Annenberg G21**: 2.00 –2.50 PM (Chicago Central Time), Monday, Tuesday, Wednesday, and Friday.

5.2 Recitation

2.00 – 2.50 pm (Chicago Central Time) Thursdays. **Recitation at Frances Searle Building 1441 and 2122 Sheridan Rd Classroom 250.** Attendance is highly recommended.

6. Course Assessment

- Homework Assignments 10%
- Project 10%
- Midterm 1 Exam (just for our section) 15%
- Midterm 2 Exam (just for our section) 20%
- Final Exam (common to all EA2 sections) 45%

6.1 Homework

Take a professional attitude toward your homework: Prepare it as if you were submitting to an employer. You are encouraged to discuss homework with your classmates, but the **work you submit must be your own**.

Homework is assigned weekly on Canvas (guidelines and problem statement) and is **due on Canvas at 8 am on the next Friday** (unless noted otherwise). Please submit on a single pdf file: Last name_First name_EA2_HW$_i$.pdf (it is OK to take photos as long as they are scanned into one single document). Make sure the pdf has all the problems and that it is uploaded correctly. **Late homework will not be graded. Multiple files homework will not be graded.**

1- Print your first and last name, assignment number and page number.
2- Write neatly and clearly (engineering paper preferred but any paper including electronic version are ok), clearly separate each problem with a line if you are using the same page for two problems.
3- Include a brief statement of the problem (Given =…, Find= …)
4- Use a straight edge (a ruler or a triangle) to draw straight lines.
5- Draw a box around your final answer and provide units. It is your responsibility to indicate your solution method clearly.

I will post detailed solutions for each homework each week. It is cheating to copy from the solution manual. From the NU Academic Integrity Guide: **"Do your own work. The purpose of assignments is to develop your skills and measure your progress. Letting someone else do your work defeats the purpose of your education, and may lead to serious charges against you."**

6.2 Projects

These will consist of **two MATLAB projects**. See outline for dates. You are encouraged to discuss the project with your classmates, but the **work you submit must be your own**. If you work closely with someone by way of sharing ideas and discussing possible

approaches, make sure to state this clearly in your report, explaining the nature of the collaboration and elaborating on any potential similarities between your own work and another student's work. Instances of copying from another student or resource, in part or in whole, will be referred to McCormick's Associate Dean for Undergraduate Engineering in accordance with McCormick's policies on Academic Integrity.

6.3 Exams

Two Midterm Exams will occur during our class time (these are unique to our section). They will be closed books and notes. The Final Exam will be common to all EA2 sections on March 13, 12- 2PM. No make-up exams will be given.

From the NU Academic Integrity Guide: **"Protect Your Work. In examinations, do not allow your neighbors to see what you have written; you are the only one who should receive credit for what you know. 4. Avoid Suspicion. Do not put yourself in a position where you can be suspected of having copied another person's work, or of having used unauthorized notes in an examination. Even the appearance of dishonesty may undermine your instructor's confidence in your work."**

7. Special Accommodations

Northwestern University is committed to providing the most accessible learning environment as possible for students with disabilities. Should you anticipate or experience disability-related barriers in the academic setting, please contact AccessibleNU to move forward with the university's established accommodation process (accessiblenu@northwestern.edu; 847-467-5530). If you already have established accommodations with AccessibleNU, please let me know as soon as possible, preferably within the **first two weeks of the term**, so we can work together to implement your disability accommodations. Disability information, including academic accommodations, is confidential under the Family Educational Rights and Privacy Act.

8. Academic Integrity

Unauthorized student recording of classroom or other academic activities (including advising sessions or office hours) is prohibited. Unauthorized recording is unethical and may also be a violation of university policy and state law. Students requesting the use of assistive technology as an accommodation should contact **AccessibleNU**. Unauthorized use of classroom recordings – including distributing or posting them – is also prohibited. Under the University's **Copyright Policy**, faculty own the copyright to instructional materials – including those resources created specifically for the purposes

of instruction, such as syllabi, lectures, lecture notes, and presentations. Students cannot copy, reproduce, display, or distribute these materials. Students who engage in unauthorized recording, unauthorized use of a recording, or unauthorized distribution of instructional materials will be referred to the appropriate University office for follow-up.

"Uploading materials from this course to websites that sell such content to students is prohibited by Northwestern's academic integrity policies and may also put you at risk for violating copyright policies in Northwestern's Student Conduct Code."

Students in this course are required to comply with the policies found in the booklet, "Academic Integrity at Northwestern University: A Basic Guide". All papers submitted for credit in this course must be submitted electronically unless otherwise instructed by the professor. Your written work may be tested for plagiarized content. For details regarding academic integrity at Northwestern or to download the guide, visit:
https://www.northwestern.edu/provost/policies/academic-integrity/index.html

9. Support for Wellness and Mental Health

Northwestern University is committed to supporting the wellness of our students. Student Affairs has multiple resources to support student wellness and mental health. If you are feeling distressed or overwhelmed, please reach out for help. Students can access confidential resources through the Counseling and Psychological Services (CAPS), Religious and Spiritual Life (RSL) and the Center for Awareness, Response and Education (CARE). Additional information on all of the resources mentioned above can be found here:
https://www.northwestern.edu/counseling/
https://www.northwestern.edu/religious-life/
https://www.northwestern.edu/care/

10. Friendly Suggestions

Effort commitment

You should expect to spend two hours working on the course out of class for each hour of class time. **This is a total of 12 hours per week on average.** While class attendance is not compulsory, it is highly recommended you attend. Binging on a week's worth of material is not a productive use of your time. I stress important things in class which tend to be on homework and exams. There is no substitute for attending class.

Book and notes

Read the book and compare the material with your notes from class so you can see which topics have been stressed. If there is something you do not understand, make a note, and bring questions to class or to office hours.
I have placed several books on Course Reserve in the Mudd Library so you can check them out and study from different textbooks.

Solve many problems

More importantly, make sure you **understand** them. Learning Mechanics is like learning to play a musical instrument. At a minimum you should understand the homework problems, the examples presented in class and the examples solved in the textbook. If you need more problems, I would be happy to provide them to you.

Check Canvas regularly

Under **MODULES** I upload homework hints, relevant course information and materials as well as fun items such as conferences I go to or articles I read that are related to this class.

Take advantage office hours!

This is time we have set aside to meet with students. Our section has 2 TA's (PhD students). There are also undergraduate students (CEE Scholars) that can help. All office hours are posted both on the syllabus and on Canvas. **Every week the TA schedule will be published on Canvas.**

Course communication policy

Due to the volume of daily email I receive daily, please use Discussion in Canvas for all class-related communications. We will monitor it frequently and answer your questions. Before posting a question search for an answer in previous posts. If you have a personal matter, you can email me but please include EA2 in the subject. **Emails that do not include the course name will not be answered.**

11. Course Outline

The following schedule is subject to change. Changes will be announced in class or posted on Canvas. If you miss class, it is your responsibility to keep informed about changes.

Week 1		
Lecture 1	Wed, 1/3	Organization; Chapter 1: Introduction
Recitation 1	*Thu, 1/4*	*Review units and vectors*
Lecture 2	Fri, 1/5	Chapter 1: Introduction; Chapter 2: Vectors §2.1, §2.2, §2.3
Week 2		
Lecture 3	Mon, 1/8	Chapter 2: Vectors §2.4 (Dot product)
Lecture 4	Tue, 1/9	Chapter 2: §2.5 (Cross product)
Lecture 5	Wed, 1/10	Chapter 3: Forces §3.1 (Basics), §3.2 (2D force systems)
Recitation 2	Thu, 1/11	*Review dot product, cross product and 2D force systems*
Lecture 6	Fri, 1/12	Chapter 3: Forces §3.2 (2D force systems) (**Project 1 assigned**)
Week_3		
No class	**Monday 1/15**	**(MLK day)**
Lecture 7	Tue, 1/16	Matlab for EA2 “Mehsam is the lecturer_on Zoom”
Lecture 8	Wed, 1/17	Chapter 3: Forces §3.3 (3D force systems)
Recitation 3	*Thu, 1/18*	*Review 3D force systems*
Lecture 9	Fri, 1/19	Additional Matlab for EA2 “Mehsam is the lecturer_on Zoom”
Week 4		
Lecture 10	Mon 1/22	Chapter 3: Forces §3.3 (3D force systems)
Lecture 11	Tue, 1/23	Chapter 4: Moments §4.1 (Moment basics)
Lecture 12	Wed, 1/24	Chapter 4: Moments §4.2, §4.3 (Moment basics)
Recitation 4	*Thu, 1/25*	*Review 3D force systems*
Lecture 13	Tue, 1/26	Chapter 4: Moments §4.3, §4.4 (Couples) (**Project 2 assigned**)
Week 5		
Lecture 14	Mon, 1/29	Chapter 4: Moments §4.3, §4.4 (Couples)
Lecture 15	Tue,1/30	Chapter 4: Moments §4.5 (Equivalent systems)
Lecture 16	Wed, 1/31	Mock Exam 1
Recitation 5	*Thu, 2/1*	*Mock Exam 1 solution*
EXAM 1	Fri, 2/2	**Midterm Exam 1 in class**
Week 6		
Lecture 17	Mon, 2/5	Chapter 5: Objects in Equilibrium §5.1 (2D applications) **(Project 1 due)**
Lecture 18	Tue, 2/6	Chapter 5: Objects in Equilibrium §5.2 (2D applications)
Lecture 19	Wed, 2/7	Chapter 5: Objects in Equilibrium §5.3 (3D applications)

Recitation 6	*Thu, 2/8*	*Review 2D and Method of joints*
Lecture 20	Fri, 2/9	Chapter 5: Objects in Equilibrium §5.4 (2 force members) §6.1 (Trusses)

Week 7

Lecture 21	Mon, 2/12	Chapter 6: Structures in Equilibrium §6.2 (Method of joints)
Lecture 22	Tue, 2/13	Chapter 6: Structures in Equilibrium §6.2 (Method of joints) §6.3 (Method of sections)
Lecture 23	Wed, 2/14	Chapter 6: Structures in Equilibrium §6.3 (Method of sections)
Recitation 7	*Thu, 2/15*	*Review method of sections and frames*
Lecture 24	Fri, 2/16	Chapter 6: Structures in Equilibrium §6.5 (Frames and machines)

Week 8

Lecture 25	Mon, 2/19	Chapter 6: Structures in Equilibrium §6.5 (Frames and machines) (**Project 2 due**)
Lecture 26	Tue, 2/20	Chapter 6: Structures in Equilibrium §6.5 (Frames and machines)
Lecture 27	Wed, 2/21	Chapter 5: Mock Exam 2
Recitation 8	*Thu, 2/22*	*Mock Exam 2 solution*
Lecture 28	Fri, 2/23	Review for Midterm 2

Week 9

Lecture 29	Mon, 2/26	Review for Midterm 2
EXAM 2	Tue, 2/27	**Midterm Exam 2 in class**
Lecture 30	Wed, 2/28	Chapter 7: Centroids and Centers of Mass §7.1, 7.2 (Composite areas)
Recitation 9	*Thu, 2/29*	*Review centroids.*
Lecture 31	Fri, 3/1	Chapter 7: Centroids and Centers of Mass §7.3 (Distributed loads)

Week 10

Lecture 32	*Mon, 3/4*	Chapter 9: Friction
Lecture 33	Tue, 3/5	Chapter 9: Friction
Lecture 34	Wed, 3/6	Review for Final Exam
Recitation 10	*Thu, 3/7*	*Review friction.*
Lecture 35	Fri, 3/8	Review for Final Exam

Final Exam: Wednesday, March 13, 12-2 pm