

## ENGR 2241 - STATICS

Fall 2019

Syllabus

*Instructor:* Bill Saari

*Office:* S 203

*Office Phone:* 763-433-1437

*E-mail:* william.saari@anokaramsey.edu

*Office Hours:* 11:00am - 12:50pm on Mondays; 11:00am - 11:50am on Tuesdays, Wednesdays, and Thursdays

*Course Website:* <http://www.ar.cc.mn.us/saari/engr2241>

### ***Course Description***

Topics include elementary vector algebra, force and moment vectors, free-body diagrams, application of the equations of static equilibrium to the analysis of simple engineering structures and machines, laws of friction, distributed loads, and properties of area.

### ***Major Areas of Course Content***

1. Newton's laws
2. Elementary vector algebra
3. Concurrent force systems
4. Equilibrium of a particle
5. General force systems of a rigid body
6. Distributed forces
7. Analysis of simple trusses, frames, and machines
8. Friction
9. Centroid
10. Moment of Inertia

### ***Learner Outcomes***

1. Comprehend and apply fundamental engineering concepts related to statics
2. Present clear and accurate solutions with respect to mathematics and units of measure

### ***Prerequisite***

Grade of C or better in PHYS 1327 or equivalent

### ***Textbook***

Engineering Mechanics: Statics and Dynamics 14<sup>th</sup> Edition by Hibbeler

Engineering Mechanics: Statics 4<sup>th</sup> Edition by Pytel and Kiusalaas

Statics and Mechanics of Materials 1<sup>st</sup> Edition by Gere and Goodno

### ***Grading***

Grades will be determined based on a weighted average of percentages.

Exams: 4 of 5 exams (the lowest exam score will be dropped) x 25% = 100%

A > 90%, B > 80%, C > 70%, D > 60%, F < 60%

**Exams**

Exams will be closed book, closed notes. Exam 5 will be during the final exam week, and will be cumulative and multiple choice. There will be no make-up exams under any circumstance. To account for an emergency on an exam date, your lowest exam score will be dropped.

***In-Class Exercises and Additional Problems***

There will be several in-class guided exercises that will be completed in groups. These exercises will be collected and count as extra credit. The extra credit will be applied to your next exam score. Extra credit will be assigned based on the accuracy of the solution, and your contributions to your group. An additional non-guided problem will be distributed during class on the day of the exercise. This should be completed individually, and may or may not be collected for extra credit at the next class period. All exercises and problems are distributed in class only. I will not e-mail them to you or post them on the course website.

***Homework***

Homework will be assigned on a regular basis. Homework will not count towards your grade, but it is critical that you do all of the homework problems. You can submit your homework to me if you would like feedback on your work.

***Academic Dishonesty***

You are encouraged to work with others in the class. However, I expect the work you submit to be your own efforts. Instances of academic dishonesty will be dealt with according to the regulations of Anoka-Ramsey Community College.

***Class Conduct***

You are expected to be courteous towards the instructor and your classmates. You are expected to be on time for lecture. Cell phones should be put away during lecture. You should not talk to your classmates while I am talking or while one of your classmates is asking a question. If you have a question about the course material, ask me and I will be more than happy to answer your question. The instructor reserves the right to take any necessary action for class disruptions in accordance with the Student Handbook.

## Tentative Course Schedule

H: Hibbeler

P&K: Pytel and Kiusalaas

G&G: Gere and Goodno

Week of	Topics	Book Sections
Aug 26	Vectors Vector Components in 2D and 3D	H: 2.1-2.3 ; P&K: 1.3; G&G: 1.3 H: 2.1-2.3, 2.5-2.7; P&K: 1.4; G&G: 1.3
Sep 2	Vector Components along a Line in 3D Resultant Force	H: 2.8-2.9; P&K: 1.4; G&G: 2.1 H: 2.4; P&K: 2.1-2.4; G&G: 2.1
Sep 9	Moments of Force in 2D and 3D Moments of Force about a Line in 3D	H: 4.1-4.4; P&K: 1.5, 2.5; G&G: 2.2 H: 4.5; P&K: 2.6; G&G: 2.2
Sep 16	Force Couples and Couple Moments <b>Exam 1: Thursday, September 18</b>	H: 4.6; P&K: 2.7; G&G: 2.2
Sep 23	Equivalent Systems Distributed Loads	H: 4.7-4.8; P&K: 2.8, 3.1-3.5; G&G: 2.2 H: 4.9; P&K: 3.6; G&G:
Sep 30	Equilibrium in 2D	H: 3.1-3.3, 5.1-5.6; P&K: 4.1-4.6; G&G: 3.2-3.3
Oct 7	Equilibrium in 3D	H: 3.4, 5.1-5.6; P&K: Ch 5; G&G: 3.2-3.3
Oct 14	Trusses <b>No Class: Thursday, October 17</b>	H: 6.1-6.4; P&K: 4.10-4.12; G&G: 4.2
Oct 21	Trusses <b>Exam 2: Thursday, October 24</b>	H: 6.1-6.4; P&K: 4.10-4.12; G&G: 4.2
Oct 28	Frames (Internal Connections)	H: 6.6; P&K: 4.7; G&G: 4.4
Nov 4	Friction	H: 8.1-8.2; P&K: Ch 7; G&G: 3.4
Nov 11	Centroid <b>Exam 3: Thursday, November 14</b>	H: 9.1-9.2; P&K: 8.1-8.2; G&G: 5.2-5.3
Nov 18	Centroid	H: 9.1-9.2; P&K: 8.1-8.2; G&G: 5.2-5.3
Nov 25	Moment of Inertia <b>No Class: Thursday, November 28</b>	H: 10.1-10.2, 10.4; P&K: 9.1-9.2; G&G: 5.6
Dec 2	Moment of Inertia <b>Exam 4: Thursday, December 5</b>	H: 10.1-10.2, 10.4; P&K: 9.1-9.2; G&G: 5.6
Dec 9	Review	
<b>Exam 5: Tuesday, December 17, 9:40 – 11:40 am</b>		