

FORT LEWIS COLLEGE
Department of Physics and Engineering

Course: ENGR 217 – Statics

Term: Fall 2015

Sect 1, 10:10-11:05, MWF, Trailer 101

Sect 2, 11:15-12:10, MWF, Trailer 101

Instructor: Dr. Laurie Williams

Office Hours: 632 BH - MW 9:05-10:00 am; TR 1:25-2:20 pm; MF 2:30-3:25 pm

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Textbook(s):

Engineering Mechanics: Statics, MasteringEngineering, 13th Edition, R.C. Hibbeler, Pearson Publishing

NOTE: This is the last academic year for edition 13 (this applies to both Statics and Dynamics)

COURSE INFORMATION

Catalog description:

Vectors, forces and moments. Static equilibrium of particles and rigid bodies. Trusses, frames and machines. Internal forces, shear and bending moment diagrams. Centroids, moment of inertia, friction and virtual work. Includes engineering design applications.

Course Objective:

Introduce students to concepts and applications used in engineering mechanics. Students will learn to use the methods of engineering problem formulation (including identifying pertinent information and constraints), draw a free body diagram, apply the equilibrium equations and assess the reasonableness of their answer.

Prerequisites: Math 221 – Calculus I

Required Course: 3 credit hours (lecture)

COURSE OUTCOMES (WITH CORRESPONDING ABET OUTCOMES):

1. Obtain and demonstrate a thorough understanding of the fundamental concepts of vector mechanics of bodies at rest (vectors, forces, couples, moments, Newton's laws, free body and equilibrium analysis (a, e).
2. Determine reactions at the supports of bodies in static equilibrium (a, e).
3. Demonstrate the ability to determine internal forces acting in structural members – normal and shear forces and the bending and twisting moments of a sectioned body; shear force and bending moment diagrams for transversely loaded beams (a, e).
4. Demonstrate the ability to determine geometric and inertial properties of solid bodies – determine the centroid or arcs, areas, and solids, and the area moments of inertia of areas, including use of the parallel axis theorem; determine the mass moment of inertias of common solid objects (a, c).
5. This course will also stress the impact of engineering on local and global societies. (h, i).
6. Research and write a short report on a topic provided by the professor. This will be a team project. (c).

ABET is the national organization that accredits engineering programs and their criterion-3 lists 11 learning outcomes titled a-k. This course addresses the following subset of these outcomes.

- (a) Ability to apply knowledge of mathematics, science and engineering.
- (c) Ability to design a system, component, or process to meet needs with realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
- (e) Ability to identify, formulate and solve engineering problems.
- (h) A broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
- (i) Recognition of the need for, and an ability to engage in life-long learning.

TOPICS

- Vectors
- Forces and moments
- Free-body diagrams
- Equilibrium 2D and 3D
- Trusses
- Frames and machines
- Friction
- Centroids and center of mass
- Beams (distributed loads, shear, bending, shear and moment relationships)
- Area moments of inertia

HOMEWORK

- 1) Daily homework assignments are listed on the MasteringEngineering online homework website. The Course Title is: Engr217F15.
- 2) Homework problems are submitted via the MasteringEngineering website. Assignments are due at 12:00 AM (midnight) on the class day following the assigned date. e.g. (assigned on Monday, due on Wednesday, etc). See MasteringEngineering for the due date for each assignment.
- 3) *Engineering format* is an accepted standard for completing computational problems in the engineering profession. MasteringEngineering does not require that you show work to document your solutions and thus you are not required to prepare formal problem write-ups using engineering format. **However, you are required to use this format on all problems turned in on engineering paper.** Problems circled (○) on the schedule are to be completed in Mastering **AND** by on engineering paper using the prescribed format. Engineering format is expected on all exams. Carefully study the examples provided by the instructor and practice using this format on homework assignments.

ATTENDANCE

Class attendance is required. Students are responsible for any missed material and announcements. Missed work completed during class, including unannounced quizzes, cannot be made up unless prior arrangements have been made.

EXAMS and GRADING – the graded events are listed below with the relative weights.

Graded Event	Points
Exams 4 at 110	440
Random Quizzes/Formatted HW	50
Homework	120
Project	40

Grades will be no worse than:

- >90% - A
- >80% - B
- >75% - C
- >60% - D
- <60% - F

Failure to earn a minimum average exam score of 60 percent will result in an automatic failure in this course – regardless of any other percentages noted above.

CLASS POLICIES

- 1) Fort Lewis College email and the Canvas course management system will be used in this class. You are responsible for all course communications sent to your college email or posted on Canvas. “I did not check my email,” is not an excuse for missing an assignment change or other announcements.
- 2) Entering the classroom after class has begun is distracting and rude. Habitual tardiness will not be tolerated.
- 3) Under **NO CIRCUMSTANCES** are cell phones allowed in class – this MEANS do not forget your calculator – I will not allow you to use a cell phone in lieu of!

TESTS:

Testing is an individual effort. Any act of dishonesty on a test or an assignment will result in an automatic "F" for that assignment. There are four exams in this class. All exams are closed book and you will not be allowed to use any electronic devices during exams. Finally, anyone caught using a cell phone during the exam will receive an automatic "0" for the exam.

SPECIAL NEEDS:

"Students with disabilities who require reasonable accommodations to fully participate in course activities or meet course requirements must contact the Disability Services Office by contacting, Dian Jenkins, the Director of Disability Services, 280 Noble Hall, 970-247-7383, and/or jenkins_d@fortlewis.edu, for an appointment as soon as possible."

DEPARTMENT POLICIES: For policies on grading, syllabus changes, disputes with instructor, academic dishonesty, and other important issues see: Syllabus Policies (link on Canvas).

ENGINEERING 217, STATICS
Tentative Class Schedule, Fall 2015

Week	Period	Date	Subject - reading assignment	Homework Problems
1	1M	8/31	Read: Ch. 1 General Principles, Introduction to MasteringEngineering	Introduction to MasteringEngineering, HW1: Ch.1: 12, 16, 20
	2W	9/2	Read: Sections 2/1-2/3	HW2: Ch.2: 1, 6, 9, 17
	3F	9/4	Read: Sections 2/4-2/6	HW3: Ch.2: 32, 39, 70, 79
2	4M	9/7	Read: Sections 2/7-2/8	HW4: Ch.2: 89, 91, 96, 102
	5W	9/9	Read: Section 2/9	HW5: Ch.2: 113, 117, 120
	6F	9/11	Chapter 2 Review	HW6: Ch.2: 140, 145, 149
3	7M	9/14	Exam #1	
	8W	9/16	Read: Sections 4/1- 4/4	HW7: Ch.4: 4, 8, 15, 22
	9F	9/18	Read: Section 4/5	HW8: Ch.4: 49, 53, 62
4	10M	9/21	Read: Section 4/6	HW9: Ch.4: 68, 71, 78, 85
	11W	9/23	Read: Section 4/7	HW10: Ch.4: 98, 104, 109
	12F	9/25	Read: Section 4/8	HW11: Ch.4: 115, 120, 129
5	13M	9/28	Read: Section 4/9	HW12: Ch.4: 140, 144, 151, 158
	14W	9/30	Read: Sections 3/1-3/3	HW13: Ch.3: 1, 6, 13, 23
	15F	10/2	Read: Section 3/4	HW14: Ch.3: 43, 51, 56
6	16M	10/5	Review	HW15: Ch.3: 71, 75, 76
	17W	10/7	Review	HW16: Ch.4: 160, 163, 167
	18F	10/9	Exam #2	
7	19M	10/12	Read: Sections 5/1-5/2	HW17: Ch.5: 4, 5, 6
	20W	10/14	Read: Sections 5/3-5/4	HW18: Ch.5: 11, 14, 18
	21F	10/16	Read: Sections 5/3-5/4	HW19: Ch.5: 23, 37, 43, 48

Week	Period	Date	Subject - reading assignment	Homework Problems
8	22M	10/19	Read: Sections 5/5-5/7	HW20: Ch.5: 63, 68, 81
	23W	10/21	Handout Design Project	
	24F	10/23	Read: Sections 6/1-6/3	HW21: Ch.6: 1, 3, 8, 19
9	25M	10/26	Read: Section 6/4	HW22: Ch.6: 28, 33, 37, 44
	26W	10/28	Read: Section 6/6	HW23: Ch.6: 62, 64, 68, 80
	27F	10/30	Review	HW24: Ch.6: 119, 120, 100 (practice probs)
10	29M	11/2	Exam #3	
	30W	11/4	Read: Section 7/1	HW25: Ch.7: 1, 6, 8, 18
	31F	11/6	Read: Section 7/2	HW26: Ch.7: 46, 52, 55, 59 Design Project Due
11	32M	11/9	Read: Section 7/3	HW27: Ch.7: 70, 80, 83, 89
	33W	11/11	Review	HW28: Ch.7: 126, 133, 137
	34F	11/13	Read: Sections 8/1-8/2	HW29: Ch.8: 1, 5, 11, 25
12	35M	11/16	Read: Section 9/1	HW30: Ch.9: 2, 6, 9, 21
	36W	11/18	Read: Section 9/2	HW31: Ch.9: 54, 60, 63
	37F	11/20	Read: Section 9/3	HW32: Ch.9: 91, 102, 106
Thanksgiving Break, 11/23-11/27				
13	38M	11/30	Read: Sections 10/1-10/3	HW33: Ch.10: 1, 2, 10
	39W	12/2	Read: Sections 10/1-10/3	HW34: Ch.10: 17, 18, 22
	40F	12/4	Read: Section 10/4	HW35: Ch.10: 30, 35, 40, 41
14	41M	12/7	Read: Sections 10/5-10/7	HW36: Ch.10: 56, 58, 64
	42W	12/9	Catch-up & Review.	??
	43F	12/11	Catch-up & Review.	??
Final Exam				
WEDNESDAY, 12/15/2015, 9:45am-11:45am (Section 1, 10:10-11:05 MWF)				
THURSDAY, 12/16/2015, 7:30am-9:45am (Section 2, 11:15-12:10 MWF)				