MEC 260
ENGINEERING STATICS
Fall 2018

Lectures: Prof. Robert Kukta
Office Hours: Mon 1:00pm-2:30pm and Fri 1:00pm-2:30pm (231 Eng)

Teaching Assts: Troy Singletary: Office Hours: TBD (4 hrs per week)
Email: Troy.Singletary@stonybrook.edu
Torin Rockwell: Office Hours: TBD (4 hrs per week)
Email: Torin.Rockwell@stonybrook.edu

Lectures: MWF 12:00-12:53pm (Earth & Space 001)
Recitation-01: W 10:00-10:53am (Harriman Hall 108) (TA: Troy)
Recitation-02: M 7:00-7:53pm (Harriman Hall 116) (TA: Torin)
Recitation-03: Tu 8:30-9:23am (Psychology A 137) (TA: Troy)
Recitation-04: W 7:00-7:53pm (Melville Lbr E4330) (TA: Torin)

Catalog Data: A review of vector algebra. Concept of force. Equilibrium of particles. Moments about points and lines, couples and equivalent force systems. Equilibrium of rigid bodies. Analysis of simple structures such as trusses, frames, and beams. Centroids, centers of gravity, and moments of inertia. Dry friction with applications to wedges, screws, and belts. Method of virtual work, potential energy, and stability. Prerequisites: PHY 131/133 or 141 or 125, Co-requisite: MAT 203 or AMS 261

Textbook: *Vector Mechanics for Engineers: Statics* 12th Edition, by Beer, Johnston, Mazurek, Cornwell, and Eisenberg, McGraw-Hill Higher Education, ISBN: 9781260689495 (Online version with Connect is required and available in the bookstore or directly from McGraw-Hill. A print-upgrade option is available via Connect).

Clickers: Answers for in class questions/quizzes will be recorded from your Turning Technologies ResponseCard, which is required for the course. You must register your ResponseCard on Blackboard by selecting the Tools then Turning Technologies Registration. Clickers are available at the bookstore (ISBN: 9780998819112)

Course Objective: Provide the necessary background for further study of MEC 262 Dynamics, MEC 363 Mechanics of Solids, and MEC 364 Fluid Mechanics.

Grading: In-Class Quizzes (5% + bonus), Homework (15%, your 10 best HW's, weighted equally), two Midterm Exams (2×25%), Final Exam (30%). Note: A grade of 'C' or higher is required to take MEC 262 and MEC 363.

Grading Scale:

92	≤	A	≤	100			
88	≤	A-	<	92			
85	≤	B+	<	88			
81	≤	B	<	85			
78	≤	B-	<	81			

74	≤	C+	<	78
70	≤	C	<	74
67	≤	C-	<	70
64	≤	D+	<	67
60	≤	D	<	64

Exams: All exams will be closed book and closed notes. You must coordinate and receive permission for a planned exam absence one-week prior to the exam date. An unexcused exam absence will be scored as a zero, unless a valid excuse with appropriate documentation is presented to Professor Kukta within three days following the exam. Sleeping late is not a valid excuse. If you are sick, see your doctor and get a note. You must bring your Stony Brook ID, two or more pencils, and an approved scientific calculator to each exam.

Allowed Calculators: Following the Mechanical Engineering Department's mandatory calculator policy, **only** the following calculators will be allowed to be used on the midterm and final exams. There will be no exceptions. This list of calculators is identical to that allowed for the *National Council for Examiners for Engineering and Surveying* (NCEES) Fundamentals of Engineering (FE) exam that many of you will take in your senior year, as well as the Professional Engineering (PE) exam that you may take several years from now. The sooner you become comfortable on one of these calculators, the better. If you have any questions on this policy please feel free to contact me. The NCEES policy on calculators can be found here: http://ncees.org/exams/calculator-policy

Casio: All **fx-115** models. Any Casio calculator must contain **fx-115** in its model name.

HP: The **HP 33s** and **HP 35s** models, but no others.

TI: All **TI-30X** and **TI-36X** models. Any Texas Instruments calculator must contain either **TI-30X** or **TI-36X** in its model name.

Homework Assignments:
- Homework is to be completed in McGraw-Hill Connect, which is accessible through Blackboard under Assignments.
- You need a subscription to Connect, which is available through the bookstore.
- On each problem, you have 10 opportunities to check your work to see if you have the correct answer. If exhaust your 10 opportunities, you will need to submit your assignment without assurance that all of your answer are correct. However, until the due date, you may rework the assignment with additional attempt. You highest score will be recorded on Black Board. The number of attempts you have is unlimited until the due date. Do not settle for less than 100%.
- Homeworks will be automatically be submitted before class on the due date
- Solutions can be accessed through Connect 1 hour after the homework is due.
- Please connect McGraw-Hill you have problems with Connect.

Topics:
- Chapter 2: Statics of Particles (5 lectures) -vectors, resultant forces, equilibrium, Newton's Law, 2d and 3d problems
- Chapter 3: Rigid Bodies: Equivalent Systems of Forces (7 lectures) - vector products, moments, couples, equivalent force/moment systems
- Chapter 4: Equilibrium of Rigid Bodies (5 lectures) - free body diagrams, 2d and 3d problems
- Chapter 5: Distributed Forces: Centroids and Centers of Gravity (3 lectures) - center of gravity, centroids, first moments of areas and lines
- Chapter 6: Analysis of Structures (6 lectures) - trusses, methods of joints and sections, frames and machines
- Chapter 7: Forces in Beams and Cables (3 lectures) - internal forces, shear and bending moments
- Chapter 8: Friction (3 lectures) - dry friction, coefficient of friction, wedges and screws
- Chapter 9: Distributed Forces: Moments of Inertia (4 lectures) - second moments of areas, parallel axis theorem
- Chapter 10: Method of Virtual Work (1 lecture) - virtual work, equilibrium, potential energy, stability
- Exams and Review (6 lectures)

Course Learning Objectives:
- Represent force and moment as vectors in a Cartesian coordinate system.
- Algebraically analyze the effect of systems of forces on rigid bodies.
- Draw free body diagrams of rigid bodies and systems.
- Apply vector-based systematic procedures for determining forces in statically determinate systems.
- Calculate centroids, second moments of area, and moments of inertia.

Schedule:

Date	Day	Topic	Homework Due
8/27	M	Syllabus, 2.1	
8/29	W	2.2	
8/31	F	2.3	
9/3	M	No Class	
9/5	W	2.4-2.5	HW 1
9/7	F	Ch 2: Examples	
9/10	M	3.1A-3.1D	
9/12	W	3.1E-3.1F	HW 2
9/14	F	3.2	
9/17	M	3.3	
9/19	W	3.4	HW 3
9/21	F	Ch 3: Examples	
9/24	M	Catch-up, Examples	
9/26	W	4.1	HW 4
9/28	F	4.2	
10/1	M	4.3	
10/3	W	Ch 4: Examples	HW 5
10/5	F	Catch-up	
10/8	M	No Class	
10/10	W	Catch-up, Review for Exam	HW 6
10/12	F	Exam I (Chapters 2, 3 & 4)	*
10/15	M	5.1	
10/17	W	5.2, 5.3A	
10/19	F	5.4	
10/22	M	6.1	HW 7
10/24	W	6.2	
10/26	F	Ch 6 Examples	
10/29	M	Catch-up	HW 8
10/31	W	6.3-6.4	
11/2	F	Ch 6 Examples	
11/5	M	7.1-7.2B	HW 9
11/7	W	Ch 7 Examples	
11/9	F	Catch-up	
11/12	M	8.1	HW 10
11/14	W	8.2	
11/16	F	Ch 8 Examples	
11/19	M	9.1	HW 11
11/21	W	No Class	
11/23	F	No Class	
11/26	M	Catch-up, Review for Exam II	
11/28	W	*Exam II* (Chapters 5, 6, 7 & 8)	*
11/30	F	9.2	
12/3	M	9.5	
12/5	W	Ch 9: Examples	HW 12
12/7	F	10.1	
12/10	M	Catch-up, Review for Final Exam	HW 13
12/18	Tu	*Final Exam*, 5:30-8:00pm	*

Academic Integrity Statement: Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Faculty is required to report any suspected instances of academic dishonesty to the Academic Judiciary. Faculty in the Health Sciences Center (School of Health Technology & Management, Nursing, Social Welfare, Dental Medicine) and School of Medicine are required to follow their school-specific procedures. For more comprehensive information on academic integrity, including categories of academic dishonesty please refer to the academic judiciary website at http://www.stonybrook.edu/commcms/academic_integrity/index.html

Student Accessibility Support Center Statement: If you have a physical, psychological, medical or learning disability that may impact your course work, please contact Student Accessibility Support Center, ECC (Educational Communications Center) Building, Room 128, (631)632-6748. They will determine with you what accommodations, if any, are necessary and appropriate. All information and documentation is confidential.

Critical Incident Management: Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of University Community Standards any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students' ability to learn. Faculty in the HSC Schools and the School of Medicine are required to follow their school-specific procedures. Further information about most academic matters can be found in the Undergraduate Bulletin, the Undergraduate Class Schedule, and the Faculty-Employee Handbook.