ESC210 Statics
Section 2
Class: TuTh 10:00-11:15, Donovan Hall G131

Instructor	Dr. Firas A. Khasawneh
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Office hours	Tuesdays & Thursdays: 11:15-12:15; Wednesdays: 9:30-10:30; or by appointment

Textbooks:

- FP Beer et al, Vector Mechanics for Engineers: Statics and Dynamics, 10th ed., (McGraw Hill, 2013).

Any supplemental course material will be posted on Blackboard.

Communication: Check Blackboard frequently, i.e., daily. In the event I must communicate urgently to the class then I will send and email in addition to posting an announcement.

Grading Scheme:

HW & quizzes:	20	Exams (3 total, 20 each):	60
		Final Exam:	30
		Total:	**110**

Exams: Three exams, worth 20 points each, will be administered during the regular semester. **The three exams are scheduled on 10/1, 11/5, and 12/3**. The final exam is comprehensive and is worth 30 points.

Homework: Homework is extremely important for your success in this class. That being said, although I will be assigning homework, I will not be grading all of the homework assignments or all the different parts of an assignment. Sometimes I may give a pop quiz based on a homework problem in lieu of collecting the homework. I will post the solutions to the homework at the same time the homework is assigned. These solutions are intended to help you if you get stuck while coming up with your own solution. Please use these solutions only as a guide; however, be very careful not to copy the solution manual as this will be considered plagiarism and is in violation of the university policies. You are expected to have completed the previous lecture's homework before attending the subsequent class. If you do the homework, you will find the quizzes particularly easy. Homework will be due a the beginning of the lecture. No late homework will be accepted.

Quizzes: Short pop quizzes will be given. The quiz will cover concepts you learned from doing the homework and/or the class examples. If you have done the homework and re-worked class examples, the quizzes should be easy for you. 25%–50% of any quiz grade will be awarded solely for attempting to solve it. You must attend the class in its entirety to receive any credit for the quiz. There will be no make-up quizzes.

Policy on missing quizzes/homework: You have two free passes: you can choose to use them to drop the grade for a quiz or a homework that you missed, or to drop your two lowest HW/quiz grades at the end of the semester.

Class attendance: Attendance at lectures is mandatory.

Other behavior expectations: Students are expected to take a sincere interest in learning the classroom material and to abide by the university policies. Keeping with this expectation, students should: 1) not create distractions (i.e. turn cell phones off and put laptops away), 2) show up to class on time, and 3) be courteous to other students and the instructor. During class time, cell phones should be put out of sight so that you are not tempted to text or check your email. Violations of the university policies will be dealt with appropriately and may involve the Academic Conduct Board.

Course Help: Good study habits are absolutely essential to your success in this course. If you feel you are having difficulty keeping up with work, please talk to me as soon as possible so we can figure out a plan to get you and your study habits back on track. I will make every effort to assist you but please restrict your in-person inquiries to our office hours and immediately after class.

Regrade requests: Errors, oversights, and misinterpretations may occur. If there is an error in your grade (e.g., the total number of points incorrectly added) or you feel that the grade you received is not commensurate for your solution then you may submit a regrade request. For quizzes and homework assignments, you

must return the assignment with an attached written request detailing why you think your grade should be reconsidered. This regrade request should occur within 7 days after the graded assignment in question has been returned to the class. For exams, no regrade requests will be accepted until exactly one week after the graded exam has been returned. To submit a regrade request, you must: 1) review the posted exam solution, and 2) attach a written request explaining why I should reconsider your grade. You must hand me your exam with the attached request either before or after the class one week after the exams are returned. Note that by submitting a regrade request you understand that your whole work can be re-evaluated and not only the problems you requested.

Course description: This course has several objectives. The first is to help you develop curiosity and persistence to understand and describe the mechanics of your environment. The second objective is to provide you with the opportunity to discover how to learn engineering material. That is, how to take technical notes, how to present your work, and how to approach tests. The third objective is to help you learn how to analyze solid objects with a collection of loads acting on them. In so doing, you will practice the use of some very important and powerful principles, such as equivalent force systems, equilibrium, and the mathematical tools used to describe them.

Course objectives: By the end of this course, the students are expected to:

- Develop curiosity and persistence to understand and describe how forces interact with their environment (ABET g)
- Discover how to learn engineering material. That is how to take technical notes, prepare homeworks and approach tests (ABET g)
- Approach engineering problems in a systematic and logical manner, including the ability to draw complete free-body diagrams (ABET a, e)
- Utilize basic principles such as using principles such as equivalent system of forces and static equilibrium to calculate support reactions and internal forces in trusses, frames and machines (ABET a, e)

Course subject outline: By the end of this course, the students are expected to:

1. Calculate the resultant force for a system of concurrent and non-concurrent forces
2. Apply the principle of transmissibility to slide a force along its line of action
3. Calculate the moment of a force about an arbitrary axis
4. Differentiate between the moment of a force and a couple moment
5. Explain when two systems of forces are equivalent
6. Reduce a system of forces to an equivalent system of one force and one moment at an arbitrary point
7. Apply static equilibrium principles to rigid bodies
8. Calculate support reactions of a rigid body using equilibrium equations
9. Find centroids and centers of gravity for common as well as arbitrary shapes
10. Replace distributed loadings on beams with an equivalent point force
11. Perform truss analysis using the method of joints and the method of sections
12. Analyze frames and machines using equilibrium equations
13. Solve problems involving dry friction
14. Obtain internal forces in members

Academic Integrity
Under no circumstances may you submit another person's work for credit. For the products of a team work (e.g. a design project), all team members should submit their work together. SUNY Poly's current Code of Academic Conduct regarding plagiarism and other inappropriate academic activities are in the Student Handbook (Page 49-53, available at http://www.sunyit.edu/pdf/student_handbook.pdf).

Social Justice Statement
SUNY Poly is committed to social justice. I concur with the commitment and expect to maintain a positive learning environment based upon open communication, mutual respect, and nondiscrimination. SUNY Poly does not discriminate on the basis of race, sex, age, disability, veteran status, religion, sex orientation, color, or national origin. Any suggestions on how to further such a positive and open environment in this class will be appreciated and given serious consideration. If you are in need of accommodations due to a documented disability, please see me as soon as possible. I will need a copy of your current accommodations plan. If you do not have a current plan, please contact Suzanne Sprague (suzanne.spraguesunyit.edu) in the Disability Services Office located in the Career Services Suite, B101, Kunsela Hall, 315-792-7170, to develop an accommodations plan. This plan must be updated each semester.

Accommodations for Students with Disabilities: In compliance with the Americans with Disabilities Act of 1990 and with Section 504 of the Rehabilitation Act, SUNY Polytechnic Institute is committed to ensuring educational access and accommodations for all its registered students seeking access to meet course requirements and fully participate in programs or activities. SUNY Poly students with documented disabilities and medical conditions are encouraged to request these services by registering with the Disability Services Office and discussing their need for accommodations. For information or an appointment contact Suzanne Sprague, Disability Services Coordinator, at the Disability Services Office, located in room B101 Kunsela Hall or by phone (315) 792-7170; or email Suzanne.sprague@sunyit.edu.

	Date	Topics	Sections
		Statics	
1	9/1	Introduction, Class overview	Chapter 1
		Vector algebra review	2.1-2.8, 2.12-2.14
	9/3	Vector algebra review	2.9-2.11, 2.15, 3.2, 3.4-3.6, 3.9
2	9/8	Equivalent forces, moment of a force about a point	3.1, 3.3, 3.6, 3.7
		Mixed triple product, moment of a force about a given axis	3.8, 3.10, 3.11
	9/10	Couple moments	3.12-3.15
		Reduction of a system of forces, Equivalent systems of forces	3.16-3.18
3	9/15	Further reduction of a system of forces	3.19-3.20
		Center of gravity, centroid, composite areas	5.1-5.5
	9/17	Finding centroids by integration	5.6
		Distributed loads on beams	5.8
		Introduction to Static Equilibrium and FBD	4.1-4.2
4	9/22	Constructing FBDs	4.2
		Support reactions, and constraints	4.3-4.4
	9/24	Equilibrium of two-force, and three-force bodies	4.6, 4.7
5	9/29	Equilibrium of a rigid body in three dimensions	4.8, 4.9
	10/1	**First exam**	
6	10/6	Equilibrium of a rigid body in three dimensions	
	10/8	Introduction to dry friction	8.1, 8.2
7	10/13	**No class—Midsemester break (Oct 10-13)**	
	10/15	Dry friction	8.3-8.4
8	10/20	Dry Friction examples	8.1-8.4
		Introduction to trusses, simple trusses	6.1-6.3
	10/22	Method of joints	6.4
9	10/27	Zero force members	6.5
	10/29	Method of sections	6.7
10	11/3	Truss problems	6.1-6.7
	11/5	**Second exam**	
11	11/10	Analysis of frames	6.9-6.11
		Analysis of machines	6.12
	11/12	Analysis of frames and machines	6.9-6.12
12	11/17	Internal forces in members	7.1, 7.2
	11/19	Internal forces in members	
13	11/24	Moment of inertia of an area	9.1, 9.3
	11/26	**No class—Thanksgiving holiday (Nov 25-29)**	
14	12/1	Polar moment of inertia, radius of gyration	9.4, 9.5
	12/3	**Third exam**	
15	12/8	Parallel axis theorem, moments of inertia of composite bodies	9.6, 9.7
	12/10	Review and wrap up (LDOC Dec 12)	