Statics

Course Syllabus and Outline – Fall 2011 – Course no: ENGR- 01271

http://users.rowan.edu/~mehta/Statics/statics.htm

Instructor: Dr. Y. Mehta, RM 329 Rowan Hall, 856-256-5327, mehta@rowan.edu

Required Text: Engineering Mechanics - Statics, 5th Edition, Bedford and Fowler, Prentice Hall Publishers.

Class Times: T, R, and F 10.50 pm to 12.05 pm

Office Hours: Monday 11 am to noon or by appointment

Grading

Midterm Exam	30 %
Final Exam	30 %
Homework	10 %
Quizzes	30 %

Accommodation: Your academic success is important. If you have a documented disability that may have an impact upon your work in this class, please contact me. Students must provide documentation of their disability to the Academic Success Center in order to receive official University services and accommodations. The Academic Success Center can be reached at 856-256-4234. The Center is located on the 3rd floor of Savitz Hall. The staff is available to answer questions regarding accommodations or assist you in your pursuit of accommodations. We look forward to working with you to meet your learning goals

Academic Integrity: The University policy on academic integrity can be found at

http://www.rowan.edu/studentaffairs/deanstu/policies/academic_honesty/

Objectives

The objectives of the course are as follows:

1. Define Newton's gravitational force
2. Explain significance of Newton's gravitational force
3. Calculate / define acceleration due to gravity
4. Define a scalar, vector, vector addition, associative and commutative laws
5. Explain product of scalar and vector, vector subtraction, and define a unit vector
6. Explain vector component in 2D, and describe position vector
7. Define line of action, external and internal forces, body and surface forces
8. Define gravitational forces and contact forces
9. Explain spring behavior
10. Define equilibrium
11. What is free body diagram, and explain the process of drawing FBD
12. Define the magnitude of moment, and explain sign and direction of moment
13. Define a two force and a three force members
14. Explain method of sections and explain process of analyzing frames
15. Explain moment-vector, and define magnitude of moment-vector and explain moment of a force about a line.
16. Define a couple and explain how couple is determined.
17. Define conditions of equilibrium
18. Define and explain different types of support
19. Define redundant supports and indeterminate structures
20. Determine reactions and forces by method of joints
21. Define a truss and draw FBD of a member
22. Determine area, and centroids of composite areas
23. Analyze structures under distributed loads

A student will derive more benefit from this course in terms of comprehension, insight, experience and stimulation if he/she puts effort in the class. The students should attend all classes. The homework should be submitted on time using guidelines provided.

OUTLINE

Month	Week	Date	Day	Class Topic	Reading
September	1	6	T	Introduction Units/Newtonian Gravitation/	Chapter 1
		8	R	Vectors and vector operations Scalars and Vectors/2D & 3D Components/Dot and Cross products	Chapter 2
		9	F		
	2	13	T	Forces Equilibrium and FBD – Ropes/Cables/Springs 2D and 3D force	Chapter 3
		15	R		
		16	F	System of Forces and Moments 2D Moment/Moment vector/Moment of a force about a line/Couples	Chapter 4
	3	20	T		
		22	R		
		23	F	**Midterm Exam**	
	4	27	T	Rigid Body Equilibrium 2D applications/Type of supports (Redundant versus Improper supports)	Chapter 5
		29	R		
		30	F		
October	5	4	T	Analysis of structures - Trusses - Method of Joints/Method of Sections	Chapter 6
		6	R		
		7	F		
	6	11	T	**Frames and machines**	
		13	R		
		14	F	Centroids /Distributed Loads	Chapter 7
	7	18	T		
		20	R	**Final Exam**	