

Developed by the ESCC Instructional Team
 Permission is freely given to copy, edit and distribute.

ROCHESTER INSTITUTE OF TECHNOLOGY
Kate Gleason College of Engineering
Department of Mechanical Engineering

Course: 0304-336 Statics (Class 4, Credit 4) Required

Course Description (08-09 Bulletin): This basic course treats the equilibrium of particles and rigid bodies under the action of forces. It integrates the mathematical subjects of calculus, vector algebra and simultaneous algebraic equations with the physical concepts of equilibrium in two and three dimensions. Topics include concepts of force and moment, trusses, frames, machines, friction, centroids and moments of inertia.

Prerequisite(s): 1016-252 Calculus II; 1017-311 University Physics I

Textbook(s) and/or Required Materials: *Vector Mechanics for Engineers – Statics*, by Beer, Johnston and Eisenberg, McGraw-Hill, 8th Edition.

Course Objectives / Relationship to Program Outcomes (1 = slightly, 2=moderately, 3=significantly):**

Course Learning Objectives	RIT Mechanical Engineering Program Outcomes								
	1	2	3	4	5	6	7	8	9
Level 1: Knowledge									
1.1 Express forces and position as vectors			3					2	
1.2 Determine vector sums			2	3					
1.3 Determine force resultants			2	3					
1.4 Be able to express vectors in generalized component form and in terms of Cartesian components			3	1					
1.5 Determine unit vectors in arbitrary directions as well as vector dot and cross products			2	3					
1.6 Determine centroids and first moments for plane bodies, lines and composites of either.			3	2				1	
1.6 Determine moments of inertia			3	2					
Level 2: Comprehension									
2.1 Draw and label free-body diagrams for particles in two and three dimensions			3					2	
2.2 Draw and label free-body diagrams for rigid bodies in two and three dimensions			3					2	
Level 3: Application									
3.1 Determine moments of forces about a point in two and three dimensions			3	2					
3.2 Recognize and determine couples			3					1	
3.3 Determine moments created by forces about a line or axis			3	2				1	
3.4 Determination of resultants and points of application for distributed loads			3	2				1	
3.5 Determine forces due to friction			3					1	
Level 4: Analysis									
4.1 Analyze and solve problems involving the equilibrium of particles in two and three dimensions			3	2					
4.2 Determination of equivalent force systems			3					2	
4.3 Analyze and solve problems involving the equilibrium of rigid bodies in two and three dimensions			3	3				3	
Level 5: Synthesis									
5.1 Analysis and solution of problems involving trusses	3		3	3				2	
5.2 Analysis and solution of problems involving frames	3		3	3				2	
5.3 Analysis and solution of problems involving machines	3		3	3					