MOHAWK VALLEY COMMUNITY COLLEGE UTICA AND ROME, NEW YORK

COURSE OUTLINE

STATICS: MECHANICAL MT 126

Catalog Description

MT 126 – Statics: Mechanical C 2, P 2, CR 3

This course is a study of force systems and their actions on bodies at rest. Topics include force systems, equilibrium of force systems, distributed forces, friction, moments of inertia, centroids, and bending and shear diagrams. The Laboratory component emphasizes computer analysis. Prerequisite: MA121 Fundamentals of College Mathematics or a higher level mathematics course which includes trigonometry.

Student Learning Outcomes

*Upon successful completion of the course, the student will be able to:*

1. …set up, begin, execute, and solve non-calculus concurrent force system problems including friction. (1) (4)
2. … set up, begin, execute, and solve non-calculus nonconcurrent force system problems including trusses and frames. (1)
3. …apply trigonometric and algebraic techniques in solving area properties and systems of equations. (1)
4. …program and use spreadsheets to solve statics problems. (1) (3)
5. …calculate cross-sectional properties and centers of gravity. (1) (3)
6. …calculate and execute non-calculus shear force and bending moment diagrams. (1) () – References ETAC of ABET Student Outcomes

Major Course Topics

Introduction

Statics terms, background, math review, unit analysis, vectors, force, torque

Concurrent force systems

Collinear, concurrent force systems, free-body diagrams Resultants: graphical, triangle, component methods Equilibrium of forces

Nonconcurrent force systems

Moments, couples, nonconcurrent force system FBD’s

Equilibrium of moments, Beams AMOI spreadsheet lab

Shear Force and Bending Moment Diagrams

Simple mechanical systems Frames

Trusses, methods of sections and joints

Static friction, concurrent frictional force systems, rolling, wedges Nonconcurrent frictional force systems, belts

Shape and volume analysis

Center of gravity, centroids Area moment of inertia Standard shapes