ROCHESTER COMMUNITY AND TECHNICAL COLLEGE — COMMON COURSE OUTLINE

Course discipline/number/title: ENGR 2211: Statics

A.   CATALOG DESCRIPTION
 1. Credits: 3
 2. Hours/Week: 3 Lecture
 3. Prerequisites (Course discipline/number): PHYS 1127, MATH 1127
 4. Other requirements: None
 5. MnTC Goals (if any): NA

B.   COURSE DESCRIPTION: This course is the study of rigid body dynamics in equilibrium. Topics include forces and moments in three dimensions, the equations needed to solve these systems, and the analysis of structures, trusses, frames, mechanisms, and statically determinate beams and cables. The nature and influence of friction on a static system is studied. Three-dimensional vector analysis and integral calculus are used. Students should either have already taken or be concurrently enrolled in Calculus II (MATH 1128).

C.   DATE LAST REVISED (Month, year): February, 2025

D.   OUTLINE OF MAJOR CONTENT AREAS:
 1. Vector Operations
   a) Vectors in two dimensions
   b) Vectors in three dimensions
 2. Forces
   a) Forces in a plane
   b) Forces in three dimensions
   c) Moments in three dimensions
   d) Equivalent systems of forces
 3. Static Equilibrium
   a) Equilibrium in Two Dimensions
   b) Equilibrium in Three Dimensions
   c) Method of Joints
   d) Method of Sections
   e) Trusses, Frames, and Machines
 4. Distributed Forces
   a) Centroids
   b) Centers of Gravity
   c) Moments of Inertia
 5. Friction

E.   LEARNING OUTCOMES (GENERAL): The student will be able to:
 1. Use methods to analyze a mechanical system in two and three dimensions.
 2. Construct free body diagrams.
 3. Use vector operations to analyze rigid systems.
 4. Use the methods of joints and sections to analyze systems in equilibrium.

F.   LEARNING OUTCOMES (MNTC): NA

G.   METHODS FOR EVALUATION OF STUDENT LEARNING: Methods may include but are not limited to:
 1. Objective exams
 2. Lab exams
 3. Research papers
 4. Quizzes
 5. Written homework
 6. Online homework
 7. Small group projects
 8. Oral presentations

G. METHODS FOR EVALUATION OF STUDENT LEARNING: Methods may include but are not limited to:
    9. Laboratory reports

H. RCTC CORE OUTCOME(S). This course contributes to meeting the following RCTC Core Outcome(s):
    Critical Thinking. Students will think systematically and explore information thoroughly before accepting or
    formulating a position or conclusion.

I. SPECIAL INFORMATION (if any):
    1. Scientific calculator or equivalent is required.