

# RARITAN VALLEY COMMUNITY COLLEGE ACADEMIC COURSE OUTLINE

## ENGR 132 – Engineering Mechanics I - Statics

### I. Basic Course Information

- A. Course Number and Title: ENGR 132 – Engineering Mechanics I - Statics
- B. New or Modified Course: Modified Course
- C. Date of Proposal: Fall 2022
- D. Effective Term: Fall 2023**
- E. Sponsoring Department: Science and Engineering
- F. Semester Credit Hours: 3
- G. Weekly Contact Hours: 4                      Lecture: 4  
   Laboratory: 0  
   Out of class student work per week: 8 hours
- H. ☒ Prerequisites: PHYS 150 - Analytical Physics I  
   MATH 152 - Calculus II  
   ☐ Corequisite (s):  
   ☐ Prerequisite (s) and Corequisite (s):
- I. Additional Fees: None
- J. Name and E-Mail Address of Department Chair and Divisional Dean at time of approval: Dr. Marianne [marianne.baricevic@raritanval.edu](mailto:marianne.baricevic@raritanval.edu), Dr. Sarah Imbriglio, [sarah.imbriglio@raritanval.edu](mailto:sarah.imbriglio@raritanval.edu)

### II. Catalog Description

Prerequisites: PHYS 150 - Analytical Physics I  
   MATH 152 - Calculus II

The course is the first of a two-semester sequence in engineering mechanics. It covers the statics of particles and rigid bodies. Topics include vector description of forces and moments, two and three dimensional equilibrium of particles and rigid bodies, centroids and center of gravity, analysis of structures, friction, and moments of inertia.

### **III. Statement of Course Need**

- A. It is a standard course of an engineering program, and it is needed to ensure the credibility and transfer articulations of our engineering program.
- B. This course has no lab component.
- C. This course generally transfers as a requirement of engineering programs.

### **IV. Place of Course in College Curriculum**

- A. This course is a Free Elective.
- B. This course meets a program requirement for the Engineering Science AS degree.
- C. To see course transferability: a) for New Jersey schools, go to the NJ Transfer website, [www.njtransfer.org](http://www.njtransfer.org); b) for all other colleges and universities, go to the individual websites.

### **V. Outline of Course Content**

- A. Statics of Particles: Addition & resolution – rectangular components –Equilibrium of particle – Forces in space – Equilibrium in space.
- B. Rigid Bodies: Systems of forces – Vector product – Moment of force about a point – Mixed triple product - Moment of a force about an axis – Couples –Equivalent systems of forces.
- C. Equilibrium of Rigid Bodies: Equilibrium in two dimensions – Two and three force bodies – Equilibrium in three dimensions.
- D. Analysis of structure: Trusses by method of joints – Trusses by method of Section – Frames – Machines.
- E. Friction: Laws of friction and applications.
- F. Centroids and Centers of Gravity: Centroids of areas and lines – Centroids of volume.
- G. Moments of inertia: Moments of inertia of areas – Composite areas –Moments of inertia of masses.

### **VI. A. Course Learning Outcomes**

**At the completion of the course, students will be able to:**

1. Analyze text and interpret problem data. (GE-2)
2. Compose hypotheses and apply problem solving strategies. (GE-2, GE-3)
3. Assess the equilibrium of rigid bodies.
4. Solve a truss.
5. Evaluate friction.
6. Calculate the centroid of an area.

### **B. Assessment Instruments**

The following assessment methods may be used:

1. Quizzes
2. Exams
3. Homework

## **VII. Grade Determinants**

Factors that may enter into the determination of the final grade

- A. Quizzes
- B. Chapter Exams
- C. Homework
- D. Final Cumulative Exam

Primary formats, modes, and methods for teaching and learning that may be used in the course:

- A. lecture/discussion
- B. small-group work
- C. student collaboration
- D. independent study

## **VIII. Texts and Materials**

The following types of course materials will be used.

Suggested textbooks:

- “Vector Mechanics for Engineers – Statics”, F.P. Beer & E.R. Johnston,Jr., McGraw Hill, most recent edition
- 800 Solved Problems In Vector Mechanics for Engineers”, Vol. I: Statics, J.F. Shelley, 1<sup>st</sup> Edition, McGraw Hill, 1990.

Please Note: The course outline is intended only as a guide to course content and resources. Do not purchase textbooks based on this outline. The RVCC Bookstore is the sole resource for the most up-to-date information about textbooks.

## **IX. Resources**

No other type of resources are needed

## **X. Honors Option**

Not applicable.