

**MINNESOTA WEST COMMUNITY & TECHNICAL COLLEGE  
COURSE OUTLINE**

DEPT. **ENGR**

COURSE NO. **2215**

NUMBER OF CREDITS: **3**

COURSE TITLE **ENGINEERING MECHANICS-DYNAMICS**

CATALOG DESCRIPTION CATALOG DESCRIPTION: **This course includes vectorial kinematics and kinetics, absolute and relative motion, force-mass acceleration relations, potential and kinetic energy, work, power, impulse, momentum, conservation of energy and momentum. Applications to particles, particle systems, and rigid bodies will be studied.**

AUDIENCE **Engineering students**

FULFILLS MN TRANSFER CURRICULUM AREA(S) (*Leave blank if not applicable*)  
:

PREREQUISITES OR NECESSARY ENTRY SKILLS/KNOWLEDGE: **ENGR 2114**

LENGTH OF COURSE One semester

THIS COURSE IS USUALLY OFFERED:

Every other year ☐ fall ☐ spring ☒ summer ☐ undetermined ☐

Four goals are emphasized in course at Minnesota West Community & Technical College:

1) **ACADEMIC CONTENT:**

- (a) to acquire the ability to conduct analysis of dynamic motion problems.
- (b) to develop a systematic and orderly approach to the analysis of engineering problems.
- (c) to develop the ability to make free body diagrams.

2) **THINKING SKILLS:**

This course will help students to improve the effectiveness of their thinking skills through:

- (a) developing problem-solving strategies.
- (b) using many types of problems in engineering to model physical behavior and physics principles

- (c) focusing on the scientific method of observation, hypotheses formulation, logical and evaluative deduction.

### 3) COMMUNICATIONS SKILLS:

This course will help students improve their oral and written communication skills through:

- a. Writing concise solution papers to physical problems.
- b. Interpretation of results of problem solving to others.
- c. Group problem solving.
- d. Using short writes for expressing the meaning and interpretation of physical principles.
- e. Oral interpretation of related problems.

### 4) HUMAN DIVERSITY:

This course will help students recognize, understand and appreciate human diversity by:

- a. Working in small groups especially in the problem solving to experience ways diverse people solve problems and interpret data.
- b. Changing partners from time to time to enrich each person's point of view.

### TOPICS TO BE COVERED:

1. Kinematics of particles-Chapter 11—2 Weeks
2. Kinematics of particles-Newton's Second Law—Chapter 12—2 Weeks
3. Systems of particles—Chapter 13—3 Weeks
4. Kinematics of Rigid Bodies—Chapter 14—1 Week
5. Plane Motion of Rigid Bodies—Forces and Accelerations—Chapter 15-2 Weeks
6. Plane Motion of Rigid Bodies—Energy and Momentum Methods—Chapter 16-2 Weeks
7. Kinetics of Rigid Bodies---Chapter 17-2 weeks
8. \*Mechanical Vibrations—Optional

### LIST OF EXPECTED COURSE OUTCOMES:

The academic objectives of this course are:

- (a) to acquire the ability to conduct analysis of dynamic motion problems.
- (b) to develop a systematic and orderly approach to the analysis of engineering problems.
- (c) to develop the ability to make free body diagrams.

LEARNING/TEACHING TECHNIQUES used in the course are:

- |  |  |
|--|--|
| <input checked="" type="checkbox"/> Collaborative Learning | <input checked="" type="checkbox"/> Problem Solving      |
| <input type="checkbox"/> Student Presentations             | <input checked="" type="checkbox"/> Interactive Lectures |
| <input type="checkbox"/> Creative Projects                 | <input type="checkbox"/> Individual Coaching             |
| <input type="checkbox"/> Lecture                           | <input type="checkbox"/> Films/Videos/Slides             |
| <input type="checkbox"/> Demonstrations                    | <input type="checkbox"/> Other (describe below)          |
| <input type="checkbox"/> Lab                               |  |

ASSIGNMENTS AND ASSESSMENTS FOR THIS CLASS INCLUDE:

- |   |   |   |
|---|---|---|
| <input checked="" type="checkbox"/> Reading           | <input checked="" type="checkbox"/> Tests | <input type="checkbox"/> Individual Projects    |
| <input type="checkbox"/> Oral Presentations           | <input type="checkbox"/> Worksheets       | <input type="checkbox"/> Collaborative Projects |
| <input checked="" type="checkbox"/> Textbook Problems | <input type="checkbox"/> Papers           | <input type="checkbox"/> Portfolio              |
| <input checked="" type="checkbox"/> Group Problems    | <input type="checkbox"/> Term Paper       |   |
| <input type="checkbox"/> Other (describe below)       |   |   |

EXPECTED STUDENT LEARNING OUTCOMES:

The academic objectives of this course are:

- (a) to acquire the ability to conduct analysis of dynamic motion problems.
- (b) to develop a systematic and orderly approach to the analysis of engineering problems.
- (c) to develop the ability to make free body diagrams.

The information in this course outline is subject to revision

**Veteran Services:** Minnesota West is dedicated to assisting veterans and eligible family members in achieving their educational goals efficiently. Active duty and reserve/guard military members should advise their instructor of all regularly scheduled military appointments and duties that conflict with scheduled course requirements. Instructors will make every effort to work with the student to identify adjusted timelines. If you are a veteran, please contact the Minnesota West Veterans Service Office.

To receive reasonable accommodations for a documented disability, please contact the campus Student Services Advisor or campus Disability Coordinator as arrangements must be made in advance. In addition, students are encouraged to notify their instructor.

**This document is available in alternative formats to individuals with disabilities by contacting the Student Services Advisor or by calling 800-658-2330 or Minnesota Relay Service at 800-627-3529 or by using your preferred relay service.**

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