

ENGR 221 – Dynamics

Spring 2022

Instructor: Mark Holdhusen, Ph.D.
E-mail: mholdhus@uwsp.edu
Phone: (715) 212-5364 (text)
Zoom: uwsp.zoom.us/j/8176801330

Office Hours

- Wausau (381-D): MTW 11:00-12:00
- Marshfield (622): R 12:00-1:00
- Stevens Point (B118): F 11:00-12:00

Description:

Kinematics, force-mass-acceleration relations, work and energy, impulse and momentum and moments of inertia of mass. This course will serve the requirements of the several engineering curricula.

Text:

Hibbeler – Engineering Mechanics: Dynamics, **ANY EDITION**

Website:

<https://canvas.uwsp.edu>

- This class is a hybrid format so much of the course is online at the above website.

Meeting Times:

- Wednesday - Wausau - Room 284 - 9:00AM - 9:50AM
- Thursday - Marshfield - Room 201 - 2:00PM - 2:50PM
- Friday - Stevens Point - Science Building A112 - 9:00AM - 9:50AM
- All meetings also in Zoom, check Canvas for link

Grading:

- 10% - In-class problems: Each weekly discussion meeting will be devoted to an in-class assignment consisting of problems based on topics presented online. It can be worked on in groups. Full credit will be given for simply completing the problems.
- 10% - Homework: Assignments, due after each week. Group work is encouraged on homework; however, each student must submit their own assignment. The answers will be given with the assignment. These answers should be used as a guide as to whether you've done the problem correctly. The homework will be graded for completeness only.
- 10% - Online quizzes: Quasi-weekly online quizzes via Canvas corresponding to each homework assignment. Each quiz will consist of a handful of questions from a larger bank of questions. You will be allowed 2 attempts for each quiz and the best score will be recorded.
- 40% - Exams: 2 exams as shown on the schedule. Each exam will consist of a few open-ended problems similar to those done for homework. One 8.5" x 11" sheet of notes, textbook, and calculator is allowed. You must use your own note sheet. Partial credit will be given.
- 20% - Final Exam: The final exam will consist of 10 multiple choice questions taken from the Fundamentals of Engineering certification exam. One sheet of notes, textbook, and a calculator will be allowed on the final exam. Partial credit will be given.
- 10% - Design Project: Design, build, and mathematically model a system. More details will follow.

Grading Scale

- | | | |
|-----------------|-----------------|-----------------|
| • 93 – 100% = A | • 80 – 82% = B- | • 67 – 69% = D+ |
| • 90 – 92% = A- | • 77 – 79% = C+ | • 63 – 66% = D |
| • 87 – 89% = B+ | • 73 – 76% = C | • 60 – 62% = D- |
| • 83 – 86% = B | • 70 – 72% = C- | • < 59% = F |

Course Schedule:

| Date | Topic | Assignments | Date | Topic | Assignments | |
|--------|---|---|--------|----------------------------------|-------------------|--|
| 24-Jan | Rectilinear Kinematics | Class Problems 1 Homework 1 Online Quiz 1 | 28-Mar | Acceleration Analysis | Homework 7 | |
| 25-Jan | | | 29-Mar | | Online Quiz 7 | |
| 26-Jan | | | 30-Mar | | | |
| 27-Jan | | | 31-Mar | | | |
| 28-Jan | | | 1-Apr | | Class Problems 8 | |
| 31-Jan | Rectangular & Normal/Tangential Coordinates | Class Problems 2 Homework 2 Online Quiz 2 | 4-Apr | Newton's 2nd Law on Rigid Bodies | Homework 8 | |
| 1-Feb | | | 5-Apr | | | |
| 2-Feb | | | 6-Apr | | | |
| 3-Feb | | | 7-Apr | | | |
| 4-Feb | | | 8-Apr | | Class Problems 9 | |
| 7-Feb | Cylindrical Coordinates & Relative Motion | Class Problems 3 Homework 3 Online Quiz 3 | 11-Apr | Work/Energy on Rigid Bodies | Homework 9 | |
| 8-Feb | | | 12-Apr | | Online Quiz 9 | |
| 9-Feb | | | 13-Apr | | | |
| 10-Feb | | | 14-Apr | | | |
| 11-Feb | | | 15-Apr | | Class Problems 10 | |
| 14-Feb | Newton's 2nd Law | Class Problems 4 Homework 4 Online Quiz 4 | 18-Apr | Impulse/Momentum on Rigid Bodies | Homework 10 | |
| 15-Feb | | | 19-Apr | | Online Quiz 10 | |
| 16-Feb | | | 20-Apr | | | |
| 17-Feb | | | 21-Apr | | | |
| 18-Feb | | | 22-Apr | | Class Problems 11 | |
| 21-Feb | Work/Energy | Class Problems 5 Homework 5 Online Quiz 5 | 25-Apr | Review 2 | Homework 11 | |
| 22-Feb | | | 26-Apr | | Online Quiz 11 | |
| 23-Feb | | | 27-Apr | | | |
| 24-Feb | | | 28-Apr | | | |
| 25-Feb | | | 29-Apr | | | |
| 28-Feb | Impulse/Momentum | Class Problems 6 Homework 6 Online Quiz 6 | 2-May | Project | Exam 2 | |
| 1-Mar | | | 3-May | | | |
| 2-Mar | | | 4-May | | | |
| 3-Mar | | | 5-May | | | |
| 4-Mar | | | 6-May | | | |
| 7-Mar | Review 1 | Exam 1 | 9-May | Final Review | | |
| 8-Mar | | | 10-May | | | |
| 9-Mar | | | 11-May | | | |
| 10-Mar | | | 12-May | | | |
| 11-Mar | | | 13-May | | | |
| 14-Mar | Fixed axis rotation & velocity analysis | Class Problems 7 | 16-May | Final Exam | | |
| 15-Mar | | | 17-May | | | |
| 16-Mar | | | 18-May | | | |
| 17-Mar | | | 19-May | | | |
| 18-Mar | | | | | | |
| 21-Mar | Spring Break | | | | | |
| 22-Mar | | | | | | |
| 23-Mar | | | | | | |
| 24-Mar | | | | | | |
| 25-Mar | | | | | | |