

ENGR 221 – Dynamics

Spring 2024

Instructor: Mark Holdhusen, Ph.D. (he/him/his)

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Zoom: <https://wisconsin-edu.zoom.us/j/6053340979>

Office Hours

- Wausau (381-D): Tu 12:00-1:00
We 1:00-2:00
- Stevens Point (SCI B109): Th 11:00-12:00
- Marshfield (433): Fr 9:00-10:00

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:

- Tuesday – Virtual 9:00AM - 9:50AM
 - <https://wisconsin-edu.zoom.us/j/94675253697?pwd=dk0rZGVvV1ZkcEwrb2NqT3JrT2M0dz09>
- Wednesday 11:00AM - 11:50AM Wausau Room 284
 - <https://wisconsin-edu.zoom.us/j/96363888056?pwd=aThnUnh6Q1o1WjEzL2dURG5lUno1QT09>
- Thursday 8:00AM - 8:50AM Stevens Point Science Building (SCI) A201
 - <https://wisconsin-edu.zoom.us/j/92701701566?pwd=dUd5a01oanFPOEZoN0tK09WZHl1dz09>
- Friday 10:00AM - 10:50AM Marshfield Room 207
 - <https://wisconsin-edu.zoom.us/j/95867061242?pwd=RGF1Z3RNMIplbUpjK3MyL3JqWGRtQT09>

Grading:

- 5% - Introductory problems: After each weekly virtual lecture, problems will be completed before the first weekly discussion section. Late work will not be accepted.
- 10% - Discussion problems: During the weekly face-to-face discussions, problems will be solved with help from other students and the instructor. Credit will be given for simply doing these problems. Late submissions will get half credit up to a week past the due date. Submissions more than one week late will be given no credit.
- 10% - Homework problems: Assignments are due weekly. 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. Late submissions will get half credit up to a week past the due date. Submissions more than one week late will be given no credit.
- 10% - Online quizzes: 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. Due date extensions will not be given.
- 35% - Exams: 3 equally weighted 2-hour exams as shown on the schedule. These exams will be proctored outside of class. Each exam will consist of a few open-ended problems like those done for homework. One 8.5" x 11" sheet of notes, your 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. Partial credit will be given for getting the correct answer and partial credit will be given for the work done to achieve the answer. One sheet of notes, your textbook, and a calculator will be allowed on the final exam.
- 10% - Design Project: Design, build, and mathematically model a system. More details will follow.

Grading Scale

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

Course Schedule:

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