

1. Course Number and Name

- a. **ENGR 2302:** Engineering Mechanics-Dynamics, Fall 2021
- b. Lecture: Section 010, MWF 9:00 – 9:50 am
Lab: Section 01Z, Tuesday 9:30 – 10:20 am

2. Credits and Contact Hours

- a. **Credits:** 3
- b. **Contact Hours:** 3 hours/week (Classroom) 1 hour/week (Lab)

3. Instructor Information

- a. **Course Coordinator:** Dr. Azize Akcayoglu
- b. **Instructor:** Dr. Azize Akcayoglu, 325-486-5540, azize.akcayoglu@angelo.edu
Office: VIN 270. For office hours see [faculty homepage](#).

4. Course Materials

- a. **Required Textbook:**
 - Hibbeler, R. C. (2016), Engineering Mechanics, Dynamics, (14th Ed.). Upper Saddle River, NJ: Pearson Prentice Hall.
- b. **Other Supplemental Materials:** Will be posted on Blackboard Learning Management System
- c. **Allowable calculators:** Only scientific calculators are allowed (No programmable/graphing calculators).

5. Technology Requirement

To successfully complete this course, you need to use Blackboard to download course materials and may use Blackboard Collaborate (this require a webcam) for online appointment.

6. Specific Course Information

- a. **Catalog Description:** The course emphasizes the proper utilization of vector algebra and free-body diagrams to solve problems in the second course of the engineering mechanic's sequence. The primary purpose of this course if to give students an application of basic principles of dynamics related to different fields of engineering. The course covers four major areas of study: (1) kinematics and kinetics of particles and rigid bodies in 2D and 3D motion, rotations, translations, and oscillations; (2) principles of impulse and momentum; (3) principles and application of friction; and (4) principles of force and acceleration.
- b. **Prerequisites and Corequisites:** Prerequisites: ENGR 2301 – Engineering Mechanics - Statics
- c. **Required or Elective Course:** Required

7. Specific Goals for the Course

- a. Course Learning Outcomes:
 1. Express dynamic quantities as vectors in terms of Cartesian components, polar coordinates, and normal-tangential coordinates.
 2. Define vector relationships between positions, velocities, and accelerations of rigid bodies and systems of particles in rectilinear and curvilinear motion.

3. Solve kinematic problems involving rectilinear and curvilinear motion of particles using Newton's Second Law.
4. Apply the principles of work and energy, and impulse and momentum, to solve engineering problems involving particles and systems of particles.
5. Solve kinematic and kinetic problems involving the translation, rotation, and oscillation of a rigid body and systems of particles.
6. Compute mass moments of inertia for systems of particles and rigid bodies.

b. Course Learning Outcome Mapping to ABET Criterion 3 Student Outcomes:

Table 1: Course Learning Outcomes mapped to ABET Student Outcomes

ABET Student Outcomes	1	2	3	4	5	6
1. Solve Problems	X	X	X	X	X	X
2. Design						
3. Communication						
4. Ethics & Professionalism						
5. Teamwork	X	X	X	X	X	X
6. Experimentation						
7. Acquire New Knowledge						

8. Topics Covered

1. Kinematics of a Particles: Rectilinear and Curvilinear motion, Projectile motion
2. Kinetics of a Particles: Force and Acceleration; Work and Energy; Impulse and Momentum
3. Planar Kinematics of a Rigid Body
4. Planar Kinetics of a Rigid Body: Force and Acceleration
5. Planar Kinetics of a Rigid Body: Work and Energy

9. Course Delivery and Communication

9.1 Delivery Method

This is a face-to-face course with learning resources and supplemental materials posted in [Blackboard](#). Accommodations will be made for students who are in quarantine or isolation and are unable to attend.

9.2 Communications

You may communicate with me via Blackboard /Email.

I will respond to email within 24 hours during working hours Monday through Friday. Weekend messages may not be returned until Monday.

Written communication via email: All private communication will be done exclusively through your ASU email address. Check frequently for announcements and policy changes. In your emails to faculty, include the course name and section number in your subject line.

Office hours or advising may be arranged with the assistance of Collaborate, Zoom, or another web meeting platform

10. Professionalism

Professional engineering standards apply in this class. You are expected to demonstrate a behavior consistent with the conduct of an individual practicing in the engineering profession. You are expected to: (1) come prepared for class; (2) respect faculty and peers; (3) demonstrate responsibility and accountability for your own actions; (4) demonstrate sensitivity and appreciation for diverse cultures, backgrounds, and life experiences; (5) offer and accept constructive criticism in a productive manner; (6) demonstrate an attitude that fosters professional behavior among peers and faculty; (7) be punctual to class meetings; (8) maintain a good work ethic and integrity; and (9) recognize the classroom as a professional workplace.

11. Graded Material

11.1 *Class Attendance, Participation, Timeliness, and Teamwork*

You are expected to meet every class meeting on time and prepared. Attendance will be taken. Should you find it necessary to miss a class for any reason, you are expected to notify your instructor as early as the absence is known—preferably before the absence.

Your online assignments will be due at the time specified on Blackboard. Assignments submitted in hard copy are due at the beginning of class on the due date. Your instructor may assess penalties for late work.

Nearly all worthwhile accomplishments from raising a family to launching the space shuttle are the work of teams. Civil engineering is no exception. All significant civil engineering projects are completed by teams. You will be assigned to a team for most labs. The purpose of the teams are to give you practice working together and to provide a support group for you within the class. Outside of class, please collaborate and work with anyone you wish.

11.2 *Homework*

Problem sets will be due weekly and will be based on the previous week's lecture and lab topics. Check Blackboard for specific due dates. Your lowest submittal grade will be dropped.

11.2.1 *Quizzes*

There may be in-class quizzes. The quizzes will be unannounced and unscheduled. The quizzes are intended to determine whether or not you have completed the pre-class work and are prepared for class.

11.3 *Exams*

This course will have two exams and one final exam.

Exams will be closed books or notes, but a formula sheet will be provided. Details will be discussed closer to the exam time.

Make-up exams will only be given for extenuating circumstances, unless prior arrangements with the instructor are agreed upon. Proof, such as a doctor's note or other official document, may be required for unexcused absences during an exam.

11.4 *Grades: Weighting and Letter Grades*

Table 2 presents the grade weighting

Table 2: Grade Weighting

Item	Percent
Quizzes	10%
Homework	10%
Exam 01	25%
Exam 02	25%
Final Exam	30%
Total	100%

The instructor will determine letter grades for the course using his professional judgment, and the following standards as described in the [University Catalog](#):

A = excellent work, B = good work, C = average work, D = poor work, F = failing work

Table 3: Grading Scale

Letter Grade	Number Grade
A	≥ 90
B	[80 – 90)
C	[70 – 80)
D	[60 – 70)
F	< 60

11.5 Incomplete Grade Policy

It is policy that incomplete grades be reserved for student illness or personal misfortune. Please contact faculty if you have serious illness or a personal misfortune that would keep you from completing course work. Documentation may be required. See ASU Operating Policy 10.11 Grading Procedures for more information

12. Classroom and University Policies and Student Support

12.1 General Policies

All students are required to follow the policies and procedures presented in the [Angelo State University Student Handbook](#)¹ and [Angelo State University Catalog](#)².

12.2 Accommodations for Students with Disabilities

ASU is committed to the principle that no qualified individual with a disability shall, on the basis of disability, be excluded from participation in or be denied the benefits of the services, programs or activities of the university, or be subjected to discrimination by the university, as provided by the Americans with Disabilities Act of 1990 (ADA), the Americans with Disabilities Act Amendments of 2008 (ADAAA) and subsequent legislation.

Student Disability Services is located in the Office of Student Affairs and is the designated campus department charged with the responsibility of reviewing and authorizing requests for reasonable accommodations based on a disability. It is the student's responsibility to initiate such a request by contacting an employee of the Office of Student Affairs, in the Houston Harte University Center, Room

112, or contacting the department via email at ADA@angelo.edu. For more information about the application process and requirements, visit the [Student Disability Services website](#)³. The employee charged with the responsibility of reviewing and authorizing accommodation requests is:

Dallas Swafford
Director of Student Disability Services
Office of Student Affairs
325-942-2047
dallas.swafford@angelo.edu
Houston Harte University Center, Room 112

12.2 Title IX at Angelo State University

Angelo State University is committed to providing and strengthening an educational, working, and living environment where students, faculty, staff, and visitors are free from sex discrimination of any kind. In accordance with Title VII, Title IX, the Violence Against Women Act (VAWA), the Campus Sexual Violence Elimination Act (SaVE), and other federal and state laws, the University prohibits discrimination based on sex, which includes pregnancy, and other types of Sexual Misconduct. Sexual Misconduct is a broad term encompassing all forms of gender-based harassment or discrimination and unwelcome behavior of a sexual nature. The term includes sexual harassment, nonconsensual sexual contact, nonconsensual sexual intercourse, sexual assault, sexual exploitation, stalking, public indecency, interpersonal violence (domestic violence or dating violence), sexual violence, and any other misconduct based on sex.

You are encouraged to report any incidents involving sexual misconduct to the Office of Title IX Compliance and the Director of Title IX Compliance/Title IX Coordinator, Michelle Miller, J.D. You may submit reports in the following manner:

Online: [Incident Reporting Form](#)⁴
Face to Face: Mayer Administration Building, Room 210
Phone: 325-942-2022
Email: michelle.miller@angelo.edu

Note, as a faculty member at Angelo State, I am a mandatory reporter and must report incidents involving sexual misconduct to the Title IX Coordinator. Should you wish to speak to someone in confidence about an issue, you may contact the University Counseling Center (325-942-2371), the 24-Hour Crisis Helpline (325-486-6345), or the University Health Clinic (325-942-2171).

For more information about resources related to sexual misconduct, Title IX, or Angelo State's policy please visit the [Title IX website](#).⁵

12.3 Student Absence for Observance of Religious Holy Days

A student who intends to observe a religious holy day should make that intention known in writing to the instructor prior to the absence. See ASU Operating Policy 10.19 Student Absence for [Observance of Religious Holy Day](#)⁶ for more information.

12.4 Information About COVID-19

Please refer to ASU's [COVID-19 \(Coronavirus\) Updates](#)⁷ web page for current information about campus guidelines and safety standards as they relate to the COVID-19 pandemic.

12.5 Student Conduct Policies

12.5.1 Academic Integrity

Students are expected to maintain complete honesty and integrity in all work. Any student found guilty of any form of dishonesty in academic work is subject of disciplinary action and possible expulsion from ASU.

12.5.2 Plagiarism

Plagiarism is a serious topic covered in ASU's [Academic Integrity policy](#)⁸ in the Student Handbook. Plagiarism is the action or practice of taking someone else's work, idea, etc., and passing it off as one's own. Plagiarism is literary theft.

In your discussions and/or your papers, it is unacceptable to copy word-for-word without quotation marks and the source of the quotation. It is expected that you will summarize or paraphrase ideas giving appropriate credit to the source both in the body of your paper and the reference list.

Papers are subject to be evaluated for originality via Turnitin or SafeAssign. Resources to help you understand this policy better are available at the [ASU Writing Center](#)⁹.

12.5.3 Copyright Policy

Students officially enrolled in this course should make only one printed copy of the given articles and/or chapters. You are expressly prohibited from distributing or reproducing any portion of course readings in printed or electronic form without written permission from the copyright holders or publishers.

13. Course Outline

The course outline is presented in Table 4. Detailed reading and homework assignments along with updates to this schedule will be provided via BB. The following schedule may be modified as the semester progresses.

14. End Notes

angelo.blackboard.com

¹<http://www.angelo.edu/student-handbook/>

¹<http://www.angelo.edu/catalogs/>

¹<http://www.angelo.edu/services/disability-services/>

¹<https://www.angelo.edu/incident-form>

¹<https://www.angelo.edu/title-ix>

¹<http://www.angelo.edu/content/files/14206-op-1019-student-absence-for-observance-of>

¹<https://www.angelo.edu/covid-19/>

¹<http://www.angelo.edu/student-handbook/community-policies/academic-integrity.php>

¹http://www.angelo.edu/dept/writing_center/academic_honesty.php

¹⁰<https://www.angelo.edu/content/files/14197-op-1011-grading-procedures>

Table 4: Course Lecture Schedules

week #	Topic	Textbook Reading
1-Aug 23	Syllabus and Introduction (Chapter 12) Kinematics of Particles Rectilinear Kinematics	12.1-12.3
2-Aug 30	(Chapter 12) Kinematics of Particles Curvilinear Motion, Motion of a Projectile	12.4-12.6
3- Sep 6	(Chapter 12) Kinematics of Particles Curvilinear Motion, Absolute Motion	12.7-12.9
4-Sep 13	(Chapter 12) Kinematics of Particles Relative Motion	12.10
5-Sep 20	(Chapter 13) Kinetics of Particles The equation of Motion- Rectangular Coordinates	13.1-13.4
6-Sep 27	(Chapter 13) Kinetics of Particles The equation of Motion- Normal, Tangential, Cylindrical Coordinates	13.5-13.6
7-Oct 4	Review, Exam 1 Ch. 12-13 (Chapter 14) Kinetics of Particles- Work and Energy	14.1-14.3
8-Oct 11	(Chapter 14) Kinetics of Particles Power, Efficiency, Conservation of Energy	14.4-14.6
9-Oct 18	(Chapter 15) Kinetics of Particles Impulse, Linear Momentum, Impact	15.1-15.3 15.4
10-Oct 25	(Chapter 15) Kinetics of Particles Angular Momentum Moment, Force, Angular Momentum Angular Impulse and Momentum	15.5 15.6 15.7
11-Nov 1	(Chapter 16) Planar Kinematics of a Rigid Body Planar Kinematics- Absolute Motion	16.1-16.4
12-Nov 8	(Chapter 16) Planar Kinematics of a Rigid Body Relative Motion, Center of Zero Velocity	16.5-16.7
13-Nov 15	Review, Exam 2 Ch 14-16 (Chapter 17) Planar Kinetics of a Rigid Body Planar Kinetics, Mass Moment of Inertia, Translation	17.1-17.3
14-Nov 22	(Chapter 17) Planar Kinetics of a Rigid Body Rotation about a fixed axis, General Plane Motion	17.4-17.5
15-Nov 29	(Chapter 18) Planar Kinetics of a Rigid Body Work and Energy Review	18
16- Dec6	Final Exam Monday, Dec. 6- Dec. 10 (to be announced)	Ch 12-18