
1: Instructor
   Dale B. McDonald, Ph.D.
   - Phone: 325-486-5509
   - Email: dale.mcdonald@angelo.edu
   - Office: West Annex-108
   - Hours: See Engineering Homepage

2: Required materials

3: Prerequisites
   - ENGR 2301

4: Course Description
   Basic theory of engineering mechanics, using calculus, involving the motion of particles, rigid bodies, and systems of particles; Newton’s Laws; work and energy relationships; principles of impulse and momentum; application of kinetics and kinematics to the solution of engineering problems.

5: Student Learning Outcomes
   When you complete this class you should be able to:
   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.
   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. Recognize current social, economic, and environmental issues where statics principles are important for the development of engineering solutions.

Course outcome mapping
   The mapping of the course outcomes to the ABET Criterion 3 student outcomes is shown in Table 1.

Table 1: Course Outcome Mapping

Student Outcomes from ABET Criterion 3
6: Course structure and communication

This course will contain a significant amount of lecture. However, I very much encourage questions and discussion during class. In addition, there will be occasions (some for credit, some not) where you will work in small groups or teams to address a particular aspect of the course material as an “in-class” team activity. You are expected to stay current in lecture and readings in the text.

6.1: Calculator policy

The use of a calculator is allowed in general, at the discretion of the instructor. Computers, tablets, smart phones, I-pads and similar electronics are not allowed on tests in general (instructor discretion). Calculators with graphing capabilities will be allowed in the course. Recommended calculators with these capabilities include the HP48, HP49, HP50, TI86, and TI89. However, only calculators currently allowed in the Fundamentals of Engineering (FE) and Professional Engineering (PE) exams will be allowed in exams and quizzes. Please refer to the National Council of Examiners for Engineering and Surveying (NCEES) calculator policy for the list of acceptable calculators (http://ncees.org/exams/calculator-policy/).

6.2: Professionalism

One of the goals of this course is to teach students about professionalism, including the standards and expected behavior of your chosen profession. With this in mind, students are expected to demonstrate a behavior consistent with the conduct of an individual practicing in the engineering profession. Students are expected to: (1) come prepared for class; (2) respect faculty and peers; (3) demonstrate responsibility and accountability for your own actions; (4) sensitivity and appreciation for diverse cultures, backgrounds, and life experiences; (5) offer and accepts 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.

7: Graded Material

7.1: Homework

Homework will be due as specified by the instructor. Your lowest submittal grade will be dropped.

7.2: Grades: Weighting and Letter Grades

The following weighting system will be used in determining final grade for the course. Homework will account for 15% of the course grade. Exam One will account for 25% of the course grade. Exam Two will account for 25% of the course grade. The final Exam will account for 35% of the course grade. The instructor will determine letter grades for the course using his professional judgment.

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
8: Classroom and University Policies and Student Support

8.1: General Policies Related to This Course

All students are required to follow the policies and procedures presented in these documents:

- Angelo State University Student Handbook
- Angelo State University Catalog

8.2: Student Conduct

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.

The College of Science and Engineering adheres to the Statement of Academic Integrity.

Plagiarism

Plagiarism is a serious topic covered in ASU’s Academic Integrity policy 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. Resources to help you understand this policy better are available at the ASU Writing Center.

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.

8.3: 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.

8.4: Student Disability Services

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.

The Office of Student Affairs is the designated campus department charged with the responsibility of reviewing and authorizing requests for reasonable accommodations based on a disability, and it is the student’s responsibility to initiate such a request by contacting:

Dallas Swafford, Director of Student Disability Services
8.5: Title IX

Angelo State University is committed to the safety and security of all students. If you or someone you know experience sexual harassment, sexual assault, domestic or dating violence, stalking, or discrimination, you may contact ASU’s Title IX Coordinator:

Michelle Boone, Director of Title IX Compliance
325-486-6357
michelle.boone@angelo.edu

Mayer Administration Building, Room 204

8.6: Student Absence for Observance of Religious Holy Day

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 for more information.

9: Instructor Prerogative

This class does not operate under democratic principles. Your instructor may change policies, procedures, of this course when he deems it necessary. You will be notified of any such changes.
9 Course Outline

The course outline is presented in Table 1. Detailed reading and homework assignments along with updates to this schedule will be provided during the lecture sessions. Assignments are due the Wednesday following the stated week in Table 1 unless the instructor announces otherwise. As the semester progresses, fill in the “Assignment” column with the HW announced by the instructor during class and/or online. Please note that the first 1-3 minutes of each class session may be used to discuss broader topics of importance to engineers, scientists, and mathematicians. If a classroom discussion presents, this time may be extended.

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topic</th>
<th>Assignment</th>
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<tbody>
<tr>
<td>1</td>
<td>Jan. 15-19</td>
<td>General Principles</td>
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<td>2</td>
<td>Jan. 22-26</td>
<td>Particle Kinematics</td>
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<td>Jan. 29-Feb. 2</td>
<td>Particle Kinematics</td>
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<td>3</td>
<td>Feb. 5-9</td>
<td>Particle Kinetics (Force/Acceleration)</td>
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<td>4</td>
<td>Feb. 12-16</td>
<td>Particle Kinetics (Force/Acceleration)</td>
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<td>5</td>
<td>Feb. 19-23</td>
<td>Particle Kinetics (Work/Energy)</td>
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<td>6</td>
<td>Feb. 26-Mar. 2</td>
<td>Particle Kinetics (Work/Energy)</td>
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<td>7</td>
<td>Mar. 5-9</td>
<td>Particle Kinetics (Impulse/Momentum)</td>
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<td>8</td>
<td>Mar. 12-16</td>
<td>Planar Kinematics of a Rigid Body</td>
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<td>9</td>
<td>Mar. 19-23</td>
<td>Planar Kinematics of a Rigid Body</td>
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<td>10</td>
<td>Mar. 26-30</td>
<td>Kinetics of a Rigid Body (Force and Acceleration)</td>
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<td>11</td>
<td>Apr. 2-6</td>
<td>Kinetics of a Rigid Body (Force and Acceleration)</td>
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<td>12</td>
<td>Apr. 9-13</td>
<td>Kinetics of a Rigid Body (Impulse and Momentum)</td>
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<td>13</td>
<td>Apr. 16-20</td>
<td>Kinetics of a Rigid Body (Impulse and Momentum)</td>
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<td>14</td>
<td>Apr. 23-27</td>
<td>Kinetics of a Rigid Body (Work and Energy)</td>
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<td>15</td>
<td>Apr. 30-May 4</td>
<td>3-D Kinetics of a Rigid Body</td>
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<td>16</td>
<td>May 7-11</td>
<td>Final Exams</td>
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