ENGR 2326 - Dynamics  
Department of Engineering  
Spring 2019

A. COURSE INFORMATION

Course number/section: ENGR-2326.002  
Class meeting time: MWF 11:00 a.m. – 11:50 a.m.  
Class location: EN 111  
Course Website: Blackboard

B. INSTRUCTOR INFORMATION

Instructor: Dr. Hua Zhang  
Office location: EN 312  
Office hours: WMF 9:00 a.m. – 10:50 a.m.  
Telephone: (361) 825-2467  
e-mail: hua.zhang@tamucc.edu  
Appointments: By email

C. COURSE DESCRIPTION

Catalog Course Description  
Theory of engineering mechanics involving the motion of particles and rigid bodies; Newton’s Laws; work and energy relationships; principles of impulse and momentum; applications of kinetics and kinematics to the solutions of engineering problems.

D. PREREQUISITES AND COREQUISITES

Prerequisites  
MATH 2414 – Calculus II; ENGR 2325 – Statics

E. REQUIRED TEXTBOOK(S), READINGS AND SUPPLIES

Required Textbook(s)  

Select one from the following formats of the textbook:

1. Modified Mastering Engineering with Pearson eText - Standalone Access Card  

2. Modified Mastering Engineering SVE package with loose-leaf hardcopy  

3. Modified Mastering Engineering without Pearson eText - Instant Access. You may select this option if you already have a hardcopy of the textbook.
Supplies  
Calculator, engineering paper, ruler.

F. STUDENT LEARNING OUTCOMES AND ASSESSMENT  
Assessment is a process used by instructors to help improve learning. Assessment is essential for effective learning because it provides feedback to both students and instructors. A critical step in this process is making clear the course’s student learning outcomes that describe what students are expected to learn to be successful in the course. The student learning outcomes for this course are listed below. By collecting data and sharing it with students on how well they are accomplishing these learning outcomes students can more efficiently and effectively focus their learning efforts. This information can also help instructors identify challenging areas for students and adjust their teaching approach to facilitate learning.

By the end of this course, students should be able to:

- Understand the kinematics of particles and be able to analyze the rectilinear and curvilinear motion of particles using different coordinate systems.
- Understand Newton’s Second Law of Motion and be able to analyze the accelerated motion of a particle using the equation of motion in different coordinate systems.
- Understand the principle of work and energy, the conservation of energy, the principle of impulse and momentum and the conservation of momentum; be able to apply them to solve kinetic problems of particles.
- Be able to investigate the various types of rigid-body planar motion using absolute motion analysis, relative motion analysis and the instantaneous center of zero velocity.
- Understand the methods used to determine the mass moment of inertia of a body and be able to investigate the planar motion of symmetric rigid bodies using kinetic equations.
- Understand the principle of work and energy, the conservation of energy, the principle of impulse and momentum and the conservation of momentum; be able to apply them to solve rigid-body planar kinetic problems.

G. INSTRUCTIONAL METHODS AND ACTIVITIES  
Lectures, homework, quizzes, exams

H. MAJOR COURSE REQUIREMENTS AND GRADING

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>% of FINAL GRADE</th>
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<tbody>
<tr>
<td>Final Exam</td>
<td>30</td>
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<tr>
<td>Midterm Exam</td>
<td>30</td>
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<tr>
<td>Homework</td>
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<td>Quiz</td>
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<td>Attendance &amp; Course Folder</td>
<td>5</td>
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# COURSE CONTENT/SCHEDULE

<table>
<thead>
<tr>
<th>Week</th>
<th>Week of</th>
<th>Topic</th>
<th>Chapter</th>
<th>Exam</th>
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<tbody>
<tr>
<td>1</td>
<td>January 14</td>
<td>Kinematics of a Particle</td>
<td>12.1 – 12.5</td>
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<tr>
<td>2</td>
<td>January 21</td>
<td>Kinematics of a Particle</td>
<td>12.6 – 12.9</td>
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<tr>
<td>3</td>
<td>January 28</td>
<td>Kinetics of a Particle: Force and Acceleration</td>
<td>13.1 – 13.4</td>
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<tr>
<td>4</td>
<td>February 4</td>
<td>Kinetics of a Particle: Force and Acceleration</td>
<td>13.5 – 13.6</td>
<td>Midterm 1</td>
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<tr>
<td>5</td>
<td>February 11</td>
<td>Kinetics of a Particle: Work and Energy</td>
<td>14.1 – 14.3</td>
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<tr>
<td>6</td>
<td>February 18</td>
<td>Kinetics of a Particle: Work and Energy</td>
<td>14.4 – 14.6</td>
<td></td>
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<tr>
<td>7</td>
<td>February 25</td>
<td>Kinetics of a Particle: Impulse and Momentum</td>
<td>15.1 – 15.4</td>
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<tr>
<td>8</td>
<td>March 4</td>
<td>Kinetics of a Particle: Impulse and Momentum</td>
<td>15.5 – 15.7</td>
<td>Midterm 2</td>
</tr>
<tr>
<td>9</td>
<td>March 11</td>
<td></td>
<td></td>
<td>Spring Break</td>
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<tr>
<td>10</td>
<td>March 18</td>
<td>Planar Kinematics of a Rigid Body</td>
<td>16.1 – 16.4</td>
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<tr>
<td>12</td>
<td>April 1</td>
<td>Planar Kinetics of a Rigid Body: Force and Acceleration</td>
<td>17.1 – 17.4</td>
<td></td>
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<tr>
<td>13</td>
<td>April 8</td>
<td>Planar Kinetics of a Rigid Body: Force and Acceleration</td>
<td>17.5</td>
<td>Midterm 3</td>
</tr>
<tr>
<td>14</td>
<td>April 15</td>
<td>Planar Kinetics of a Rigid Body: Work and Energy</td>
<td>18.1 – 18.5</td>
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<tr>
<td>15</td>
<td>April 22</td>
<td>Planar Kinetics of a Rigid Body: Impulse and Momentum</td>
<td>19.1 – 19.3</td>
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<tr>
<td>16</td>
<td>April 29</td>
<td>Review</td>
<td>12-19</td>
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**Final Exam: May 6th, Monday, 11:00 a.m. – 1:30 p.m.**

**Important Dates:**
- January 14: Classes begin
- March 11-15: Spring Break
- April 5: Last day to drop a class
- May 2: Reading Day

Note: Changes in this course schedule may be necessary and will be announced to the class by the Instructor. The assignments and exams shown are directly related to the Student Learning Outcomes described in Section F.
J. COURSE POLICIES

Exam
Instructions of midterm and final exams will be provided in the class one week before the exam dates. No make-up exam is allowed.

Quiz
Quizzes will be given during regular class time. No make-up quiz is allowed.

Homework
Homework may include both online assignments and hardcopy assignments. For online assignments, you should submit the answers through Mastering Engineering and keep all of your scratch papers. For hardcopy assignments, you should use engineering papers, work the problems in an orderly fashion, and box the final results. The due date and time of homework will be announced in the class or online. Late submission is not acceptable. You will receive a zero on the assignment turned in after the due date unless a permission is secured from the Instructor prior to the due date.

Attendance/Tardiness
You must attend all lectures. You are responsible for any materials covered or handed out or announcements made in your absence. Records of your attendance will be maintained. Tardiness without prior consent of the Instructor is not accepted and will be penalized. Being tardy consistently can be basis to be removed from classroom or not be permitted to enter classroom. For more than two absences, a deduction from your final grade will apply.

Course Folder
Course folder should contain homework assignments (or scratch papers for online assignments in Mastering Engineering), quizzes, and midterm exams. Materials should be organized based on the time of completion.

Cell Phone Use
Cell phones and beepers must be turned off or set on silent/vibrate mode during lectures, quizzes and exams. During midterm and final exams, cell phones and beepers must be put in your backpack or in the front of the classroom.

Food in Class
Food is prohibited in classroom.

K. COLLEGE AND UNIVERSITY POLICIES

• Academic Integrity (University)
  University students are expected to conduct themselves in accordance with the highest standards of academic honesty. Academic misconduct for which a student is subject to penalty includes all forms of cheating, such as illicit possession of examinations or examination materials, falsification, forgery, complicity or plagiarism. (Plagiarism is
the presentation of the work of another as one’s own work.) In this class, academic misconduct or complicity in an act of academic misconduct on an assignment or test will result in a failing grade.

- **Classroom/Professional Behavior**  
  Texas A&M University-Corpus Christi, as an academic community, requires that each individual respect the needs of others to study and learn in a peaceful atmosphere. Under Article III of the Student Code of Conduct, classroom behavior that interferes with either (a) the instructor’s ability to conduct the class or (b) the ability of other students to profit from the instructional program may be considered a breach of the peace and is subject to disciplinary sanction outlined in article VII of the Student Code of Conduct. Students engaging in unacceptable behavior may be instructed to leave the classroom. This prohibition applies to all instructional forums, including classrooms, electronic classrooms, labs, discussion groups, field trips, etc.

- **Statement of Civility**  
  Texas A&M University-Corpus Christi has a diverse student population that represents the population of the state. Our goal is to provide you with a high quality educational experience that is free from repression. You are responsible for following the rules of the University, city, state and federal government. We expect that you will behave in a manner that is dignified, respectful and courteous to all people, regardless of sex, ethnic/racial origin, religious background, sexual orientation or disability. Behaviors that infringe on the rights of another individual will not be tolerated.

- **Deadline for Dropping a Course with a Grade of W (University)**  
  I hope that you never find it necessary to drop this or any other class. However, events can sometimes occur that make dropping a course necessary or wise. *Please consult with your academic advisor, the Financial Aid Office, and me, before you decide to drop this course.* Should dropping the course be the best course of action, you must initiate the process to drop the course by going to the Student Services Center and filling out a course drop form. Just stopping attendance and participation WILL NOT automatically result in your being dropped from the class. Please consult the Academic Calendar ([http://www.tamucc.edu/academics/calendar/](http://www.tamucc.edu/academics/calendar/)) for the last day to drop a course.

- **Grade Appeals (College of Science and Engineering)**  
  As stated in University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures, a student who believes that he or she has not been held to appropriate academic standards as outlined in the class syllabus, equitable evaluation procedures, or appropriate grading, may appeal the final grade given in the course. The burden of proof is upon the student to demonstrate the appropriateness of the appeal. A student with a complaint about a grade is encouraged to first discuss the matter with the instructor. For complete details, including the responsibilities of the parties involved in the process and the number of days allowed for completing the steps in the process, see University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures. These documents are accessible
through the University Rules website at http://www.tamucc.edu/provost/university_rules/index.html, and the College of Science and Engineering Grade Appeals webpage at http://sci.tamucc.edu/students/GradeAppeal.html. For assistance and/or guidance in the grade appeal process, students may contact the chair or director of the appropriate department or school, the Office of the College of Science and Engineering Dean, or the Office of the Provost.

- **Disability Services**
The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please call (361) 825-5816 or visit Disability Services in Corpus Christi Hall 116.

If you are a returning veteran and are experiencing cognitive and/or physical access issues in the classroom or on campus, please contact the Disability Services office for assistance at (361) 825-5816.

http://disabilityservices.tamucc.edu/

- **Statement of Academic Continuity**
In the event of an unforeseen adverse event, such as a major hurricane and classes could not be held on the campus of Texas A&M University–Corpus Christi; this course would continue through the use of Blackboard and/or email. In addition, the syllabus and class activities may be modified to allow continuation of the course. Ideally, University facilities (i.e., emails, web sites, and Blackboard) will be operational within two days of the closing of the physical campus. However, students need to make certain that the course instructor has a primary and a secondary means of contacting each student.

L. **OTHER INFORMATION**

- **Academic Advising**
The College of Science & Engineering requires that students meet with an Academic Advisor as soon as they are ready to declare a major. The Academic Advisor will set up a degree plan, which must be signed by the student, a faculty mentor, and the department chair. Meetings are by appointment only; advisors do not take walk-ins. Please call or stop by the Advising Center to check availability and schedule an appointment. The College’s Academic Advising Center is located in Center for Instruction 350 or can be reached at (361) 825-3928.
GENERAL DISCLAIMER

I reserve the right to modify the information, schedule, assignments, deadlines, and course policies in this syllabus if and when necessary. I will announce such changes in a timely manner during regularly scheduled lecture periods.