ME 101 Dynamics
Spring 2015

Prerequisites: CE 95 or CE 99 and Math 32 (with a grade of C- or better in each)

Credit Units: 3 units

Instructors and Meeting Rooms:
Section 1 (20377)  TTH 15:00 – 16:15   Room ENG 331: Prof. R. Agarwal, Office: E310D
Section 2 (26340)  TTH 18:00 – 19:15  Room CL117: Prof. Syed Zaidi, Office: E348
Section 3 (-----)   TTH 9:00 – 10:15  Room 340: Prof. Abdie Tabrizi, Office 348

Course Coordinator: Prof. R. Agarwal, E 310D, email: raghu.agarwal@sjsu.edu

Instructors Contact Information
Prof. R. Agarwal, E 310D, email: raghu.agarwal@sjsu.edu
Prof. Syed Zaidi, E 348, email: sohailhzaidi@gmail.com
Prof. Abdie Tabrizi, E348, email: abdie.tabrizi@evc.edu

Office hours: Check with your instructor and enter the Office Hours here: _______________

COURSE DESCRIPTION: Vector Mechanics. Two and three dimensional motion of particles and rigid bodies. Force, energy and momentum principles.


Grading Metrics: Homework 10%
                Midterm and Quizzes 45%
                Final Exam 45%

Grading Scale
95.0-100 A+, 90.0-94.9 A, 87.0-89.8 A-, 85-86.9 B+, 80-84.9 B, 77-79.9 B-, 75-76.9 C+, 70-4.9, 67-69.9 C-, 65-66.9 D+, 60-64.9 D, 57-59.9 D-, Below 57 F

Course Goals
1. To learn fundamental concepts and principles of particle and rigid body motion
2. To learn fundamental concepts and principles of particle and rigid body kinetics
3. Application of Newton’s second law to solve problems in particle and rigid body dynamics
4. Application of energy and momentum methods to solve problems in particle and rigid body dynamics.

Student Learning Objectives
Upon successful completion of this course, the student should be able to:
1. Distinguish kinematics and kinetics in dynamics of solids
2. Develop analytical models for a given dynamic situation using particle and rigid body dynamics theories.
3. Characterize a motion to be rectilinear, curvilinear, planar rigid body dynamics.
4. Describe the motion of a particle in terms of kinematics for general curvilinear motion as well as in moving reference frames.
5. Apply Newton’s Second Law in solving particle and rigid body dynamics problems.
6. Apply the principle of energy and momentum in solving problems involving particles and 2-D rigid bodies in motion and subject to impact.
7. Apply vector mechanics, differential equations and integral calculus as needed in modeling and solving dynamics of engineering systems.

**Academic Integrity**

Students in this course are expected to maintain high ethical standards in all matters pertaining to the course, including, but not limited to, examinations, homework, and course assignments. Cheating and plagiarism are violations of the SJSU Policy on Academic Dishonesty (S98-1) and will not be tolerated in the class. Students are expected to have read the Policy, which is available at: [http://www.sjsu.edu/senate/docs/S07-2.pdf](http://www.sjsu.edu/senate/docs/S07-2.pdf)

**Campus Policy on Disability**

If you need course adaptation or accommodation because of a disability, or if you need to make special arrangements in case of building evacuation, please make an appointment with the Accessibility Education Center (AEC) or visit their web site at: [http://www.sjsu.edu/aec/](http://www.sjsu.edu/aec/)

Presidential Directive 97-03 requires that students with disabilities requesting accommodation must register with the AEC at: [http://www.sjsu.edu/aec/](http://www.sjsu.edu/aec/)

**Other Useful Information**

1. The passing grade in this course, for students majoring in Mechanical Engineering, is a C-. Those receiving a grade lower than C- will be placed on probation and will be allowed another attempt to pass the course with a grade of C- or better. Failure to pass this course in two successive attempts will result in disqualification from the ME program.

2. You are encouraged to visit your instructor during his/her Office Hours to discuss any problems or to get extra help in the course.

3. The department will offer special tutorial sessions throughout the semester. These sessions will be open to all sections. You are strongly encouraged to attend these sessions for extra help in the course.

4. College of Engineering Student Success Center is a good source for getting advice on learning and career opportunities. You can get more information on their web site at: [http://engineering.sjsu.edu/students/success-center](http://engineering.sjsu.edu/students/success-center).

5. **Schedule** is subject to change with fair notice via announcement in class or via course website.
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<thead>
<tr>
<th>Wk. No.</th>
<th>Subject</th>
<th>Reading Assignment</th>
<th>Homework</th>
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<tbody>
<tr>
<td>Week 1 Thursday, January 22</td>
<td>Enrollment and Course organization, Introduction to dynamics Kinematics (motion) of a particle - Straight line</td>
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<tr>
<td>Week 2 1/27/15</td>
<td>Kinematics of a particle - Curvilinear motion Rotational (angular) motion - normal &amp; tangential components, examples</td>
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<td>Week 3 2/3/15</td>
<td>Polar and cylindrical coordinates, examples Kinetics of a particle, Newton’s 2nd Law</td>
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<td>Week 4 2/10/15</td>
<td>Equation of motion – rectangular coordinates Equation of motion – normal &amp; tangential coordinates Equation of motion – Polar coordinates, examples</td>
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<td>Week 5 2/17/15</td>
<td>Work &amp; Energy – work done by a force Principle of work and energy, Potential energy, Conservative forces, conservation of energy</td>
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<td>Week 6 2/24/15</td>
<td>Principle of linear impulse and momentum, Conservation of linear momentum, Impacts Systems of particles; Newton’s law, motion</td>
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<td>Week 7 3/3/15</td>
<td>Exam Review Midterm Exam 1: October 16</td>
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<td>Week 8 3/10/15</td>
<td>Linear and angular momentum, conservation of momentum Impact Example problems</td>
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<td>Week 9 3/17/15</td>
<td>Absolute, and relative velocity and acceleration Coriolis acceleration, examples Planar kinetics of a rigid body</td>
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<td>Cesar Chavez Day 3/31/15</td>
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<td>Week 10 4/2/15</td>
<td>Planar kinetics of a rigid body; work &amp; energy, kinetic and conservation of energy, power</td>
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<td>Week 11 4/7/15</td>
<td>Principle of impulse &amp; momentum Principle of impulse and momentum</td>
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NOTE 1: In addition to the midterms and final exam, there would be several weekly quizzes

NOTE 2: The final exam is common to all sections and will be given on the Final Exam Make-up day: May 22, 2015. Final Exam room will be the same as the current classroom for respective sections.

NOTE 3:  
**Extra Help:** Student assistants would be available to provide extra help to you. You can attend the regularly scheduled help sessions or make appointment with the helpers.

NOTE 4: For ME majors, the passing grade in this course is a C-