SAN JOSÉ STATE UNIVERSITY
Department of Mechanical Engineering

ME 101 Dynamics
Fall 2016

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 (42090)  MW 18:00 – 19:15  Room CL 234:  Prof. A. Rahimi, Office: E348
Section 2 (44357)  TTH 15:00 – 16:15  Room ENG 341:  Prof. R. Agarwal, Office: E310 D
Section 3 (44358)  TTH 09:00 – 10:15  Room ENG 329:  Prof. A. Tabrizi, Office E 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. A Rahimi, E 348, email: arz_rahimi@yahoo.com
Prof. A Tabrizi, E348, email: abdie.tabrizi@evc.edu

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

COURSE DESCRIPTION: Vector Mechanics. Motion of particles and rigid bodies. Force, energy, and momentum principles.


Grading Metrics:  
Homework 10%
Midterm 40%
Quizzes 10%
Final Exam 40%

"You must turn in an unofficial transcript with the prerequisites highlighted by the second class period, or you will be dropped from the class."

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+,70-74.9, 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.
5. In the context of B.S. Mechanical Engineering program assessment, this course is intended to help students achieve ABET Student Outcome 3a:
"an ability to apply knowledge of mathematics, science, and engineering." For more information on ABET Student Outcomes, please see http://www.abet.org/eac-criteria-2016-2017/.

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 principle of energy and momentum principles 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

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/ Presidential Directive 97-03 requires that students with disabilities requesting accommodation must register with the AEC at: 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. Success in this course is based on the expectation that students will spend, for each unit of credit, a minimum of forty-five hours over the length of the course (normally 3 hours per unit per week with 1 of the hours used for lecture) for instruction or preparation/studying or course related activities including but not limited to internships, labs, clinical practice. Other course structures will have equivalent workload expectations as described in the syllabus.

4. There are three ME 180 Workshops scheduled to provide extra help in this course. By attending the workshop regularly, you can earn bonus points, which can add up to 5% to your term average in ME 101 course. The attendance is mandatory for those who have failed this course once before. The workshops are open to all sections. You are strongly encouraged to attend any one or more scheduled workshops that fit into your schedule. To earn any bonus points, you are required to attend at least 10 workshop sessions (coming in late or leaving early doesn’t count towards the 10-session requirement).

5. 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.

6. Schedule is subject to change with fair notice via announcement in class or via course website.
**ME 101 Dynamics**  

**Course Schedule Fall 2016**  

*(The weekly schedule is tentative and subject to change)*

Homework will be assigned through the Wiley Plus website. Access code must be purchased to use the website. The course ID will be given in class.

<table>
<thead>
<tr>
<th>Week No.</th>
<th>Subject</th>
<th>Reading Assignment</th>
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<tbody>
<tr>
<td>Week 1</td>
<td>Enrollment and Course organization, Introduction to dynamics</td>
<td>Chapter 1</td>
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<tr>
<td>August 22</td>
<td>Kinematics (motion) of a particle - Straight line</td>
<td>Chapter 2.1 – 2.2</td>
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<tr>
<td>Week 2</td>
<td>Chapter 2: Kinematics of a particle. Curvilinear motion Rotational (angular) motion - normal &amp; tangential components.</td>
<td>Chapter 2.3 – 2.5</td>
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<td>August 29</td>
<td>Chapter 3: Polar and cylindrical coordinates.</td>
<td>Chapter 2.6 – 2.9</td>
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<tr>
<td>September 5</td>
<td>Chapter 3: Work &amp; Energy – work done by a force. Principle of work and energy, Potential energy, Conservative forces, conservation of energy.</td>
<td>Chapter 3.6 &amp; 3.7</td>
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<tr>
<td>Week 4</td>
<td><strong>Review &amp; Midterm # 1</strong></td>
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<tr>
<td>September 12</td>
<td>Chapter 3: Principle of linear impulse and momentum, Conservation of linear momentum, Impact.</td>
<td>Chapter 3.8 – 3.10</td>
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<tr>
<td>Quiz # 1 (Tuesday)</td>
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<td>Week 5</td>
<td>Chapter 3: Impact</td>
<td>Chapter 3.12</td>
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<tr>
<td>September 19</td>
<td>Chapter4: Kinetics of System of Particles.</td>
<td>Chapter 4.1 – 4.15</td>
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<td>Week 6</td>
<td>Chapter 5: Kinematics of Rigid Bodies. Absolute, and relative velocity and acceleration</td>
<td>Chapter 5.1 – 5.3</td>
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<td>Week 7</td>
<td>Chapter 5: Kinetics of a rigid body; work &amp; energy, kinetic and conservation of energy, power.</td>
<td>Chapter 5.4 – 5.5</td>
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<td>September 26</td>
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<td>Week 8</td>
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<td>October 3</td>
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<td>Week 9</td>
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<td>October 10</td>
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<td>Quiz # 2 (Tuesday)</td>
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<td>Week 11</td>
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<td>October 17</td>
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Week 12
October 24
Chapter 5: Kinetics of a rigid body; Impulse and Momentum.

Week 13
October 31
Exam Review
Midterm Exam 2

Week 14
November 7
Chapter 6: Planar Kinetics of Rigid bodies: Newton’s Second Law.

Week 15
November 14
Quiz # 3 (Thursday)
Chapter 6: Planar Kinetics of a Rigid bodies:
General Plane Motion

Week 16
November 21
November 23-25
Chapter 6: Planar Kinetics of a Rigid bodies:
Work & Energy
NO CLASS

Week 15
November 28
Chapter 6: Impulse & momentum

Week 16
December 5
Wrap-up & Review

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<tr>
<th>December 12</th>
<th>Last Day of Instruction</th>
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<tr>
<td>December 14-16 &amp; 19-20</td>
<td>Final Examinations</td>
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<td>December 21</td>
<td>ME 101 Final Exam Scheduled on the make-Up day</td>
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<td>(Common Final Exam: 9:45 – 12:00)</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: December 21, 2016. Final Exam room will be the same as the current classroom for respective sections.

NOTE 3: Extra Help: There are three workshops scheduled to help you learn the fundamental concepts of dynamics. You can attend any one of the three workshops. If you attend the workshop regularly and complete the simple quizzes/assignment, you can enhance your overall grade as mention earlier.