ENGR 241, Analytic Mechanics - Dynamics  
5 credits (5 hours lecture)  
Spring 2015

Course Description:
Topics include vector representation of kinematics and kinematics of particles; Newton’s laws of motion; force-mass-acceleration, work-energy, and impulse-momentum methods; kinematics of systems of particles; kinematics and kinetics of rigid bodies.

This course is required for the Engineering Sciences major

Instructor: Dr. Yiannis Ampatzidis  
Office: Science III, Room 304  
Office Hours: TTh 12:30-14:00, W 13:00 – 15:00, or by appointment  
Phone: 654–2846  
E-mail: yampatzidis@csub.edu

Class Time: Tuesday and Thursday 10:00 – 12:05am (lecture)  
Classroom: SCI III 105

Prerequisite(s): ENGR 240, Analytic Mechanics - Statics

Supplemental Materials: MasteringEngineering

Course Outcomes: This course requires students to demonstrate the following:
- Express dynamic quantities as vectors in terms of cartesian components, polar coordinates, and normal-tangential coordinates.
- Compute mass moments of inertia for systems of particles and rigid bodies.
- Solve kinematic problems involving rectilinear and curvilinear motion of particles.
- Solve kinetic problems involving a system of particles using Newton’s Second Law.
- Apply the principles of work and energy, conservation of energy, impulse and momentum, and conservation of momentum to the solution of engineering problems involving particles and systems of particles.
- Solve kinematic problems involving the translation and rotation of a rigid body.
- Solve kinetic problems involving planar translation and rotation of rigid bodies.
- Apply the principles of work and energy, conservation of energy, impulse and momentum, and conservation of momentum to the solution of engineering problems involving rigid bodies in planar motion.

This Course Addresses the Following ENGR Program Outcomes:
- an ability to apply knowledge of mathematics, science, and engineering
- an ability to identify, formulate, and solve engineering problems
Tentative Schedule (Lecture):
Introduction, Motion of a point (Ch 12, 13) 2.5 weeks
Force, Mass and Acceleration (Ch 14) 2 weeks
Energy Methods (Ch 15) 1.5 weeks
Momentum Methods (Ch 16) 1.5 weeks
Planar Kinematics of Rigid Bodies (Ch 17) 1 week
Energy and Momentum in Rigid-Body Dynamics; Vibrations (Ch 19, 21) 1.5 weeks

Grades:
- In-Class Assign (experiment-based assignments) 15%
- Homework (MasteringEngineering) 40%
- Midterm 1 (May 7) 20%
- Final exam (June 11) 25%

Grading distribution:
I plan to follow the following distribution, but reserve the right to move the grade thresholds down (but not up).

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<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>≥ 90%</td>
<td>A- to A</td>
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<tr>
<td>80 to 89.9%</td>
<td>B- to B+</td>
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<tr>
<td>70 to 79.9%</td>
<td>C- to C+</td>
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<tr>
<td>60 to 69.9%</td>
<td>D- to D+</td>
</tr>
<tr>
<td>&lt; 60%</td>
<td>F</td>
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Policies:
- You are expected to attend every class, to be on-time, and to maintain a respectful and professional atmosphere in the classroom.
- Neither food nor beverages are allowed in the computer laboratory.
- Makeup exams will only be available for extraordinary, well-documented circumstances.
- Cell phones must be turned off when entering the classroom.

Academic Honesty
“There are certain forms of conduct that violate the university’s policy of academic integrity. Academic dishonesty (cheating) is a broad category of actions that involve fraud and deception to improve a grade or obtain course credit. Academic dishonesty (cheating) is not limited to examination situations alone, but arises whenever students attempt to gain an unearned academic advantage. Plagiarism is a specific form of academic dishonesty (cheating) which consists of the misuse of published or unpublished works of another by claiming them as one’s own. Plagiarism may consist of handing in someone else’s work as one’s own, copying or purchasing a pre-written composition and claiming it as one’s own, using paragraphs, sentences, phrases, words or ideas written by another without giving appropriate citation, or using data and/or statistics compiled by another without giving appropriate citation. Another example of academic dishonesty (cheating) is the submission of the same, or essentially the same paper or other assignment for credit in two different courses without receiving prior approval from the instructors of the affected courses.”
Source: 2011-2013 CSUB Catalog, pp.78-79.
Accommodations for Students with Disabilities
To request academic accommodations due to a disability, please contact the Office of Services for Students with Disabilities (SSD) as soon as possible. Their office is located in SA 140, and they may be reached at 661-654-3360 (voice), or 661-654-6288 (TDD). If you have an accommodations letter from the SSD Office documenting that you have a disability, please present the letter to me during my office hours as soon as possible so we can discuss the specific accommodations that you might need in this class.