

ME 212: Dynamics

This is a cooperative course taught jointly by WSU and the University of Idaho.

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| <i>Course description:</i> | Kinematics and kinetics of particles and rigid bodies; introduction to mechanical vibration. |
| <i>Number of credits:</i> | 3 |
| <i>Course Coordinator:</i> | L.V. Smith |
| <i>Prerequisites by course:</i> | Math 172 with a grade of C or better; CE 211 with a grade of C or better |
| <i>Prerequisites by topic:</i> | <ol style="list-style-type: none">1. Differentiation2. Integration3. Newton's second law4. Basic vector analyses |
| <i>Postrequisites:</i> | ME 303 Fluid Mechanics and ME 348 Dynamics Systems |
| <i>Textbooks/other required materials:</i> | <ol style="list-style-type: none">1. R.C. Hibbeler. <i>Engineering Mechanics: Dynamics</i>, 14/e. |
| <i>Course objectives:</i> | <ol style="list-style-type: none">1. Develop basic concept of Newton's law, dimensions, and units.2. Determine the kinematics of particles in various coordinate systems.3. Application of Newton's law, work-energy relation and impulse-momentum principle to determine the kinetics of particles.4. Determine the plane translation and rotation of rigid bodies in various coordinates.5. Description of the kinetics of rigid bodies in plane motion via Newton's second law, energy relations, and the impulse-momentum principle. |
| <i>Topics covered:</i> | <ol style="list-style-type: none">1. Rectilinear motion.2. Curvilinear motion in rectangular coordinates.3. Coordinates: path and cylindrical.4. Kinetics.5. Newton's second law.6. Angular momentum.7. Work-energy methods.8. Impulse and momentum.9. Impact.10. Systems of particles.11. Plane motion: kinematics, kinetics, energy methods, and impulse-momentum. |
| <i>Expected student outcomes:</i> | <ol style="list-style-type: none">1. Describe the kinematic and kinetic behavior of a single particle by applying the Newton's law, energy conservation and impulse-momentum relations.2. Describe the kinematic and kinetic behavior of systems of particles by applying the Newton's law, energy conservation and impulse-momentum relations.3. Analyze the plane motion and kinetics of rigid bodies using the Newton's law and moment equation, work-energy equation and impulse-momentum relations. |
| <i>Class schedule:</i> | Three 50-minute lecture sessions per week, for one semester. |
| <i>Laboratory schedule:</i> | None |

Contribution to meeting the professional component:

Engineering Topics

Relationship of course to program objectives:

Meets:

1. School of MME ME educational objectives: 1, 2
2. School of MME ME program outcomes: (a)
3. ABET EC2000, Criterion 3 program outcomes: (a)

Prepared by: L.V. Smith

Date: August 17, 2016

POLICIES

A. Reasonable Accommodation (the nature of the particular course determines which one applies):

- Pullman Campus. Reasonable accommodations are available for students with a documented disability. If you have a disability and need accommodations to fully participate in this class, please either visit or call the Access Center (Washington Building 217; 509-335-3417) to schedule an appointment with an Access Advisor. All accommodations MUST be approved through the Access Center.
- WSU Online Course. Reasonable accommodations are available in online classes for students with a documented disability. All accommodations must be approved through your WSU Disability Services office. If you have a disability and need accommodations, we recommend you begin the process as soon as possible. For more information contact a Disability Specialist on your home campus: Pullman or WSU Online (<http://accesscenter.wsu.edu>), Spokane (<http://spokane.wsu.edu/students/current/studentaffairs/disability/>), Tri-Cities (<http://www.tricity.wsu.edu/disability>), Vancouver (<http://studentaffairs.vancouver.wsu.edu/student-resource-center/disability-services>).

B. Academic Integrity

WSU expects all students to behave in a manner consistent with its high standards of scholarship and conduct. Students are expected to uphold these standards both on and off campus and acknowledge the university's authority to take disciplinary action. The Standards of Conduct for Students can be found at <http://conduct.wsu.edu>.

C. WSU Safety

WSU is committed to maintaining a safe environment for its faculty, staff, and students. Safety is the responsibility of every member of the campus community and individuals should know the appropriate actions to take when an emergency arises. In support of our commitment to the safety of the campus community the University has developed a Campus Safety Plan, <http://safetyplan.wsu.edu>. It is highly recommended that you visit this web site as well as the University emergency management web site at <http://oem.wsu.edu/> to become familiar with the information provided.