Physics 411: Analytical Mechanics

Fundamental principles of Newtonian mechanics, conservation laws, small oscillations, planetary motion, systems of particles. Prereq: Math 282. Only nonmajors may earn graduate credit.

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Course: Physics 411: Analytical Mechanics
Course CRN: 26061
Class: 09:00-09:50, MWF
Room: 318 Willamette Hall
Problem Sessions: 14:00-16:00, 472 Willamette Hall

Grading:

Homework: 20 %
Test 1: 20 %
Test 2: 20 %
Final: 40 %

Tests:
<table>
<thead>
<tr>
<th>Week</th>
<th>Material</th>
<th>Homework</th>
<th>Due</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Chapters 2 and 4: Newtonian mechanics; Newton's Laws of Motion, inertia and inertial frames, equations of motion</td>
<td>4.2, 4.3, 4.4, 4.5, 4.7, 4.8, 4.14, 4.19</td>
<td>01/16/2009</td>
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<td>2</td>
<td>Chapters 2 and 4: Work and Conservative vs Nonconservative forces, kinetic and potential energy, the energy equation, separable forces, constraints; solution of single body problems for different kinds of forces.</td>
<td>4.21, 4.22, 4.23, 5.3, 5.4, 5.5</td>
<td>01/23/2009</td>
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<td>3</td>
<td>Chapters 2 and 4: solution of single body problems for the different kinds of forces; Chapter 5: Noninertial reference frames, frame translations and rotations, inertial velocity, fictitious forces—transverse acceleration, Coriolis acceleration, centrifugal acceleration—motion in noninertial frames, motion near the surface of the Earth (the Foucault pendulum, projectile motion, cyclonic motion).</td>
<td>5.6, 5.7, 5.8, 5.10, 5.11, 5.12</td>
<td>01/30/2009</td>
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<td>4</td>
<td>Chapter 5: Noninertial reference frames, motion near the surface of the Earth, Plumb Bob, the Foucault pendulum, projectile motion, cyclonic motion. Chapter 6: Gravitation and Central Forces.</td>
<td>5.16, 5.17, 6.2, 6.4, 6.5, 6.11, 6.14</td>
<td>02/09/2009</td>
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