ENGINEERING MECHANICS: DYNAMICS

LECTURES
Monday and Wednesday, 3:00 p.m. - 4:20 p.m., Towne 315

RECITATION
Friday, 1:00 p.m. - 2:00 p.m., Towne 313

INSTRUCTORS
Michael Carchidi
jfiene@seas.upenn.edu
208 Towne 346 Towne
898-8342 573-6581

Jonathan Fiene

TEACHING ASSISTANT
Subhrabajit Bhattacharya
subhrabh@seas.upenn.edu
403 Levine Hall (GRASP Lab)
(267) 252-6638

OFFICE HOURS

<table>
<thead>
<tr>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
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<tr>
<td>Dr. Carchidi</td>
<td>10 - 3</td>
<td>10 - 3</td>
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<tr>
<td>Dr. Fiene</td>
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<td>Subhrabajit</td>
<td>1 - 2:30</td>
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EMAIL LIST
Please send all course-related questions to meam211staff@lists.seas.upenn.edu

COURSE OBJECTIVES
MEAM211 introduces the basic concepts in kinematics and dynamics necessary to understand, analyze, and design mechanisms and machines. The topics covered include:
• Particle dynamics using energy and momentum methods
• Dynamics of systems of particles
• Impact
• Systems of variable mass
• Planar kinematics and dynamics of rigid bodies
• Three-dimensional kinematics and dynamics of rigid bodies
• Computer-aided dynamic simulation and animation

GRADING
20% Homework
15% Projects
40% Exams 1 & 2
20% Final Exam
5% Class Participation

HOMEWORK POLICY
Homework assignments will be due by 3:00 p.m. on Fridays (unless otherwise stated), and should be placed in the mailbox for the teaching assistant, Subhrabajit Bhattacharya, in 279 Towne.

Late assignments will not be accepted.

As an incentive for early completion, 5% will be added to any homework assignment submitted by 3:00 p.m. two days prior to the due date.
<table>
<thead>
<tr>
<th>Wk.</th>
<th>Date</th>
<th>Topic</th>
<th>Topic</th>
<th>Reading</th>
<th>Projects</th>
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<tbody>
<tr>
<td>1</td>
<td>16 Jan W</td>
<td>Kinematics of Particles (Ch. 2)</td>
<td>introduction, straight-line motion</td>
<td>1.1-1.5, 2.1</td>
<td>Simulating the Trajectory of Sports Balls</td>
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<td>2</td>
<td>23 Jan W</td>
<td>Kinematics of Particles (Ch. 2)</td>
<td>cartesian motion, numerical methods</td>
<td>2.2, App. A</td>
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<td>3</td>
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<td>Kinematics of Particles (Ch. 2)</td>
<td>polar, cylindrical, and path</td>
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<td>30 Jan W</td>
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<td>coordinates</td>
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<td>Kinematics of Particles (Ch. 2)</td>
<td>trajectory of sports balls, num.</td>
<td>App. A</td>
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<td>6 Feb W</td>
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<td>5</td>
<td>11 Feb M</td>
<td>Kinetics of Particles (Ch. 3)</td>
<td>cartesian and polar dynamics</td>
<td>3.1-3.2</td>
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<td>polar and path dynamics</td>
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<td>linear and angular momentum, impulse</td>
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<td>3.7-3.8</td>
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<td>29 Nov W</td>
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<td>8</td>
<td>3 Mar M</td>
<td>Multiparticle Systems (Ch. 5)</td>
<td>work, kinetic energy</td>
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<td>5 Mar W</td>
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<td>potential energy, conservation,</td>
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<td>10 Mar M</td>
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<td>10</td>
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<td>Rigid-body Kinematics (Ch. 6)</td>
<td>work and energy</td>
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<td>19 Mar W</td>
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<td>relative velocities</td>
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<td>rotating frames, acceleration</td>
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<td>curvilinear motion</td>
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<td>momentum of planar bodies</td>
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<td>work/energy of planar bodies</td>
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<td>kinematics, moments of inertia</td>
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<td>17</td>
<td>8 May R</td>
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