Spring Semester, 1395 (2016)

IN THE NAME ONE WHO TAUGHT THE MIND TO THINK

School of Science & Engineering
Sharif University of Technology-International Campus-Kish Island

COURSE TITLE:  Advanced Engineering Dynamics

DAYS & TIME:  Thursdays & Fridays
OFFICE HOURS:  Fridays before Class: Tel: 6616-5541

INSTRUCTUR:  Ali Meghdari, Ph.D., Professor, Email: meghdari@sharif.edu
http://sina.sharif.edu/~cedra/ecourse.php

TEXT BOOK:  Advanced Engineering Dynamics, By: Jerry H. Ginsberg,
2008, and Lecture Notes.

REFERENCES:  Engineering Mechanics: Dynamics, By: J.L. Meriam & L.G.
Advanced Dynamics; Modeling & Analysis, By: A.F. D’Souza

TOPICS:
1. A Quick Review of Cartesian Tensors
2. Introduction, and Review of Undergraduate Dynamics
3. Kinematics: Coordinate Transformations, Curvilinear Coordinates, Generalized
   Coordinates, Euler’s Angles, Moving Reference Frame, General 3-D Motion.
4. Particle Dynamics
5. Inertia Tensors
6. Rigid Body Dynamics: Eulerian Equations of Motion

Mid-Term Exam:  (2nd week of Ordibehesht, 1395)

7. Kinetic Principles in Non-Newtonian Reference Frame
8. Energy Principles: Leibniz Equations of Motion
9. Lagrange’s Equations of Motion: (Constraints, Generalized Forces, Holonomic
   and Non-Holonomic Systems, etc.)
10. Hamilton’s Principle
11. Introduction to Gyromechanics (if time permits)
12. Introduction to Kane’s Equations of Motion (if time permits)

Final Examination:  (Finals Week)

GRADING:

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<tr>
<th>Component</th>
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<tr>
<td>Homework</td>
<td>(10 % of the Final Grade)*</td>
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<tr>
<td>Quiz</td>
<td>(20% of the Final Grade)</td>
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<tr>
<td>Mid-Term Exam</td>
<td>(30% of the Final Grade)</td>
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<tr>
<td>Final Exam</td>
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*  Homework will be assigned every other session, and solutions will be posted online. Short
quizzes will be given almost every week during the semester.