

Portland State University

Department of Physics

Fall 2008

Physics 424: Classical Mechanics

(CRN 13022)

Instructor: Aslam Khalil, Professor

Time and Place: MWF 11:30-12:35 SEH, Rm 107

Office Hours: MW 4:00-5:00; 5:00-6:00 (if needed) SB2 Rm 410

Contact Information: Call anytime: (503) 725-8396 or FAX: (503) 725-8550

e-mail: aslank@pdx.edu (Preferred means of contact)

SCHEDULE

| Day | Date | CH | Wk | Lect |
|-----|------|----|----|------|
|-----|------|----|----|------|

September

| | | | | | |
|---|----|---|---|---|----------------------------------|
| M | 29 | 1 | 1 | 1 | Scope, Context. Basic Principles |
|---|----|---|---|---|----------------------------------|

October

| | | | | | |
|---|----|---|---|----|--|
| W | 1 | | | 2 | Newton's Laws |
| F | 3 | 2 | | 3 | Projectile Motion |
| M | 6 | | 2 | 4 | Air Resistance |
| W | 8 | 3 | | 5 | Conservation on Momentum |
| F | 10 | | | 6 | Rocket Science |
| M | 13 | | 3 | * | <<Problem Set 1 Ch 1-3>> |
| W | 15 | 4 | | 7 | Conservation of Energy and the 1-D Problem |
| F | 17 | | | 8 | Central Forces |
| M | 20 | | 4 | 9 | Oscillations: Simple Harmonic Motion |
| W | 22 | 5 | | 10 | Anharmonic and Anisotropic Oscillators |
| F | 24 | | | 11 | Damped Oscillations |
| M | 27 | | 5 | 12 | Resonance |
| W | 29 | | | * | <<Problem Set 2 Due Ch 4,5>> |
| F | 31 | | | * | <<Mid-term Exam>> |

November

| | | | | | |
|---|----|----|---|----|---------------------------------------|
| M | 3 | 6 | 6 | 13 | Calculus of Variations |
| W | 5 | | | 14 | First Integrals and Applications |
| F | 7 | 7 | | 15 | Lagrange Formulation |
| M | 10 | | 7 | 16 | First Integrals and Conservation Laws |
| W | 12 | | | 17 | Applications of Lagrange Formulation |
| F | 14 | 8 | | 18 | Motion of Two Interacting Bodies |
| M | 17 | | 8 | 19 | <<Problem Set 3; Ch 6,7>> |
| W | 19 | 9 | | 20 | Kepler Orbits |
| F | 21 | | | 21 | Mechanics in Non-Inertial Frames |
| M | 24 | | 9 | 22 | Tides and Applications |
| W | 26 | 10 | | 23 | Rotational Motion of Rigid Bodies |

December

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|----|----|--|----|----|--|
| M | 1 | | 10 | 24 | Rigid Bodies |
| W | 3 | | | 25 | Rigid Bodies |
| F | 5 | | | * | <<Problem Set 4 Due>>Problem Solutions (Ch 8-10) |
| Th | 11 | | 11 | * | <<Final Exam>> 12:30 - 14:20 |

See Notes on the Back

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Grading:

| | |
|---------|---|
| 85-100% | A |
| 75-84% | B |
| 65-74% | C |
| 50-64% | D |
| < 50% | F |

Distribution

| | |
|---------------------|-------------|
| Exams | 50% |
| Problem Sets | 45% |
| Class participation | 5% |
| TOTAL | 100% |

* Lower Limit of grade range is a -, upper limit is a +. Eg. 75=B-, 84=B+

Notes:

John R. Taylor, Classical Mechanics (University Science Books, 2005)

Text

* Exams will be in class and closed book. You are allowed on 8.5" x 11" sheet of paper with your notes (both sides).

Work

* No late work will be accepted. Exceptions for dire circumstances only.

* This schedule is subject to change

* 2 points lost from "class participation" per class missed.