MASSACHVSETTS INSTITVTE OF TECHNOLOGY

Classical Mechanics 6.946, 8.351, 12.620

This is the assignments for the rest of the term. In addition to these weekly assignments, we would like you to attack one of the projects 5.32 or 5.33, and hand in your reports by Friday, 6 December 2002.

Week 10:

Read: 4.5
25: Poincare-Birkhoff theorem

Read: 4.6
26: Invariant Curves

Read: 5.1, 5.2
27: Canonical transformations,
point transforms, symplectic conditions

Week 11:

Due: 22 November 2002
Exercises: 5.1, 5.2, 5.3, 5.4, 5.5, 5.13, 5.16, 5.19

Read: 5.3, 5.4
28: Integral invariants, Extended Phase Space

Read: 5.6
29: Generating functions

Week 12:

Read: 5.7
30: Time Evolution is Canonical

Due: 6 December 2002
Exercises: 5.20, 5.22, 5.26, 5.27, 5.30, 6.1, 6.2, 6.4

Read: 5.8
31: Hamilton-Jacobi Equation

Week 13:

Read: 5.9, 5.10
32: Lie transforms and Lie series

Read: 6.1 up to 6.2.1
33: Perturbation theory with Lie series

Read: 6.2.1, 6.2.2, 6.3
34: Small Denominators and Secular Terms,

Pendulum to higher order and many degrees of freedom

Week 14:

Read: 6.4 up to 6.4.4
35: Nonlinear Resonances,
reading the Hamiltonian, resonance overlap

Read: 6.4.4, 6.4.5
36: Second-order Resonances,
stability of the vertical equilibrium

37: Adiabatic Invariance and Adiabatic Chaos

Week 15:

38: TBA

39: TBA

End of term!