MASSACHUSETTS INSTITUTE OF TECHNOLOGY
Department of Physics

Physics 8.01 **Fall 2013**

Schedule and Reading Assignments 8.01

Website: http://web.mit.edu/8.01t/www/

Reading Sources:
Classical Mechanics: MIT 8.01 Course Notes
http://web.mit.edu/8.01t/www/coursedocs/current/guide.htm

Week 1

Sept 4/5 W01D2 Introduction to TEAL, Concept of Force and Newton's Laws
Reading Assignment:
Chapter 1 The History and Limitations of Classical Mechanics
Chapter 2 Units, Dimensional Analysis, Problem Solving, and Estimation, Sections 2.1-2.2
Chapter 07 Newton's Laws of Motion, Sections 7.1-7.4

Sept 6 W01D3 Kinematics and Motion (Emphasis on Differentiation and Integration) Problem Solving Worked Examples
Reading Assignment:
Chapter 2 Units, Dimensional Analysis, Problem Solving, and Estimation, Section 2.5
Chapter 4 One Dimensional Kinematics, Sections 4.1-4.6

Week 2

Sept 9/10 W02D1 Vectors and Two Dimensional Motion
Reading Assignment:
Chapter 3 Vectors, Sections 3.1-3.2
Chapter 5 Two Dimensional Kinematics, Sections 5.1-5.2
Chapter 6 Circular Motion, Sections 6.1-6.3

Tuesday Sept 10 Problem Set 1 Due 9 pm

Sept 11/12 W02D02 Applications of Newton's Second Law
Reading Assignment:
Chapter 7 Newton's Laws of Motion, Sections 7.1-7.4
Chapter 8 Applications of Newton's Second Law, Sections 8.1-8.4.1

Sept 13 W02D3 Problem Solving 01: Applications of Newton's Laws
Reading Assignment:
Chapter 8 Applications of Newton's Second Law, Section 8.6: Example 8.6-8.9

Week 3

Sept 16/17 W03D1 Applications of Newton's Second Law: Continuous Systems and Differential Equations
Reading Assignment:
Chapter 8 Applications of Newton's Second Law, Sections 8.4: Examples 8.3-4. Section 8.4.2, Section 8.5

Tuesday Sept 17 Problem Set 2 Due 9 pm

Sept 18/19 W03D2 Review

Sept 19 Exam One Vectors, Kinematics, and Force 7:30-9:30 pm Rooms to be Announced

Sept 20 W03D3 No Class Student Holiday

Week 4

Sept 23/24 W04D1 Circular Motion Kinematics
Reading Assignment:
Chapter 6 Circular Motion, Sections 6.1-6.2

Sept 25/26 W04D2 Circular Motion Dynamics, Experiment 1: Circular Motion
Reading Assignment:
Chapter 9 Circular Motion Dynamics, Sections 9.1-9.2

Sept 27 W04D3 Problem Solving 02: Circular Motion
Reading Assignment:
Chapter 9 Circular Motion Dynamics, Section 9.3

Week 5

Sept 30/Oct1 W05D1 Momentum and Impulse, Center of Mass
Reading Assignment:
Chapter 10 Momentum, System of Particles, and Conservation of Momentum, Sections 10.1-10.9

Tuesday Oct 1 Problem Set 3 Due 9 pm

Oct 2/3 W05D2 Conservation of Momentum, Continuous Mass, Rocket Equation
Reading Assignment:
Chapter 11 Reference Frames, Sections 11.1-11.3
Chapter 12 Momentum and the Flow of Mass, Sections 12.1,12.3

Oct 4 W05D3 Problem Solving 03: Conservation of Momentum
Reading Assignment:
Chapter 10 Momentum, System of Particles, and Conservation of Momentum, Section 10.9
Chapter 12 Momentum and the Flow of Mass, Sections 12.2,12.3

Oct 4 Add Date

Week 6

Oct 7/8 W06D1 Work and Energy
Reading Assignment:
Chapter 13 The Concept of Energy and Conservation of Energy, Sections 13.1-13.8

Tuesday Oct 8 Problem Set 4 Due 9 pm

Oct 9/10 W06D2 Conservation of Energy
Reading Assignment:
Chapter 14 Potential Energy and Conservation of Energy, Sections 14.1-14.7

Oct 11 W06D3 Problem Solving 04: Work and Energy
Reading Assignment:
Chapter 13 The Concept of Energy and Conservation of Energy, Section 13.10 Examples 13.11-13.14

Week 7

Oct 14/15 Holiday No Class

Wednesday Oct 16 Problem Set 5 Due 9 pm

Oct 16/17 W07D2 Conservation of Energy, Experiment 2: Energy
Reading Assignment:
Chapter 14 Potential Energy and Conservation of Energy, Sections 14.5-14.7,14.9

Oct 19 W07D3 Problem Solving 05: Energy Transformations
Reading Assignment:
Chapter 14 Potential Energy and Conservation of Energy, Section 14.9

Week 8

Oct 21/22 W08D2 Energy and Collisions
Reading Assignment:
Chapter 15 Collision Theory, Sections 15.1-15.5

Tuesday Oct 22 Problem Set 6 Due 9 pm

Oct 23/24 W08D2 Exam 2 Review

Oct 24 Exam Two Circular Motion, Momentum, 7:30-9:30 pm Rooms to be Announced

Oct 25 W08D3 No Class

Week 9

Oct 28/29 W09D1 Two-Dimensional Rotational Kinematics
Reading Assignment:
Chapter 16 Two Dimensional Rotational Kinematics, Sections 16.1-16.4
Chapter 17 Two Dimensional Rotational Dynamics, Section 17.2

Oct 30/31 W09D2 Two Dimensional Rotational Dynamics
Reading Assignment:
Chapter 17 Two Dimensional Rotational Dynamics, Sections 17.1-17.5
Chapter 18 Static Equilibrium, Sections 18.1-18.3

Nov 1 W09D3 Problem Solving 06: Two Dimensional Rotational Dynamics
Reading Assignment:
Chapter 17 Two Dimensional Rotational Dynamics Chapter 17 Examples 10-12
Chapter 18 Static Equilibrium, Section 18.4

Week 10

Nov 4/5 W10D1 Angular Momentum
Reading Assignment
Chapter 19 Angular Momentum, Sections 19.1-19.6

Tuesday Nov 5 Problem Set 7 Due 9 pm

Nov 6/7 W10D2 Experiment 3: Rotational Dynamics; Experiment 4: Angular Momentum
Reading Assignment
Chapter 17 Two Dimensional Rotational Dynamics, Worked Example 17.11-17.12
Chapter 19 Angular Momentum, Sections 19.7-19.9, Worked Example 19.8

Nov 8 W10D3 Problem Solving 07: Conservation of Angular Momentum
Reading Assignment
Chapter 19 Angular Momentum, Worked Examples 19.1-19.8

Week 11

Nov 11 W11D1 Class Veterans Day Holiday

Nov 12 W11D1 Sections 5-7 W11D1 Rolling without Slipping, Translation and Rotation
Reading Assignment:
Chapter 20 Rigid Body: Translation and Rotational Motion Kinematics for Fixed Axis Rotation, Sections 20.1-20.5

Nov 12 Tuesday Problem Set 8 Due 9 pm

Nov 13 W11D2 Sections 1-4 Rolling without Slipping, Translation and Rotation
Reading Assignment:
Chapter 20 Rigid Body: Translation and Rotational Motion Kinematics for Fixed Axis Rotation, Sections 20.1-20.5
Chapter 21 Rigid Body Dynamics: Rotation and Translation about a Fixed Axis, Sections 21.1-21.5

Nov 14 W11D2 Sections 5-7 Translation and Rotation
Reading Assignment:
Chapter 21 Rigid Body Dynamics: Rotation and Translation about a Fixed Axis, Sections 21.1-21.5

Nov 15 W11D3 All Sections Problem Solving 08: Translation and Rotation
Reading Assignment:
Chapter 20 Rigid Body: Translation and Rotational Motion Kinematics for Fixed Axis Rotation, Sections Examples 20.1-20.5
Chapter 21 Rigid Body Dynamics: Rotation and Translation about a Fixed Axis, Section 21.6

Week 12

Nov 18/19 W12D1 Simple Harmonic Oscillator
Reading Assignment:
Chapter 23 Simple Harmonic Motion, Sections 23.1-23.4

Tuesday Nov 19 Problem Set 9 Due 9 pm

Nov 20/21 W12D2 (W13D2) Angular Harmonic Oscillator, Simple and Physical Pendulum
Reading Assignment:
Chapter 23 Simple Harmonic Motion, Section 23.7
Chapter 24 Physical Pendulum, Sections 24.1-24.2

Nov 22 W12D3 Problem Solving 9: Simple Harmonic Oscillator
Reading Assignment:
Chapter 23 Simple Harmonic Motion, Section 23.4, Example 23.6-7
Chapter 24 Physical Pendulum, Section 24.3

Week 13

Nov 25/26 W13D1 Test Three Review

Nov 26 Test Three: Energy and Fixed Axis Rotational Dynamics, Angular Momentum 7:30-9:30 pm Rooms to be Announced

Nov 27 W13D2 Drop Date No Class

Nov 28/29 Holiday No Class

Week 14

Dec 2/3 W14D1 Gyroscopes
Reading Assignment:
Chapter 22 Three Dimensional Rotations and Gyroscopes, Sections 22.1-22.3

Dec 3/4 W14D2 Synthesis Problems: Gyroscopes
Reading Assignment:
Chapter 22 Three Dimensional Rotations and Gyroscopes, Section 22.4

Thursday Dec 5 Problem Set 10 Due 9 pm

Dec 6 W14D3 Problem Solving 10: Three Dimensional Rotations and Angular Momentum
Reading Assignment:
Chapter 22 Three Dimensional Rotations and Gyroscopes, Section 22.4

Week 15

Dec 9/10 W15D1 Synthesis Problems: Newtonian Mechanics
Reading Assignment:
Chapter 25 Celestial Mechanics, Sections 25.1-25.3, 25.5-25.7

Dec 11 W15D2 Final Exam Review Last Day of Classes

Dec 12/13 No Class

Dec 16 Final Exam Johnson Track 9 am -12 noon