

**MASSACHUSETTS INSTITUTE OF TECHNOLOGY**  
**Department of Physics**

**Physics 8.02**

**Spring 2012**

**Class Schedule and Reading Assignments**

**Text: Liao, Dourmashkin, Belcher; Introduction to E & M MIT 8.02 Course Notes.**

**Week One Introduction to Teal,  
Coulomb's Law and Electric Fields**

W01D1 T Feb 7	Special Class
W01D2 W/R Feb 8	Introduction to Teal, Fields, Coulomb's Law, Electric Fields, Discrete Charge Distributions
W01D3 F Feb 10 Reading	PS01: Coulomb's Law Course Notes: Chapter 1.1-1.7, 2.1-2.7

**Week Two: Gauss's Law**

**Problem Set 1 Due Tuesday Feb 14 at 9 pm**

W02D1 M/T Feb 13/14 Reading	Electric Dipoles and Continuous Charge Distributions Course Notes: Sections 2.7-2.10, 2.12, 2.13.4-2.13.6
W02D2 W/R Feb 15/16 Reading	Gauss's Law Electric Fields Course Notes: Sections 4.1-4.2, 4.7
W02D3 F Feb 17 Reading	PS02: Gauss's Law Course Notes: Sections 4.1-4.2, 4.7

**Week Three:  
Electric Potential**

**Problem Set 2 Due Tuesday Feb 21 at 9 pm**

W03D1 T Feb 21	Special Class
W03D2 W/R Feb 22/23 Reading	Electric Potential, Discrete and Continuous Charges; Configuration Energy Course Notes: Sections 3.1-3.4
W03D3 F Feb 24 Reading	PS03: Electric Potential Course Notes: Sections 3.5, 3.7-3.8, 4.8.4

**Week Four: Equipotentials and Energy; Exam 1**

W04D01 M/T Feb 27/28

Reading

Potential and Gauss's Law; Equipotential Lines and Electric Fields

Course Notes: Sections 3.4, 4.3

W04D2 W/R Feb 29/Mar 1

Exam 1 Review

**Exam 1 Thursday Mar 1**

**7:30 pm –9:30 pm**

W04D3 F Mar 2

No Class

**Week Five Capacitors and Capacitance, Dielectrics**

**Problem Set 4 Due Tuesday Mar 6 at 9 pm**

W05D1 M/T Mar 5/6

Reading

Conductors and Insulators; Capacitance & Capacitors; Energy Stored in Capacitors;

Course Notes: Sections 4.3-4.4, 5.1-5.4, 5.9-5.10

W05D2 W/R Mar 7/8

Dielectrics; Conductors as Shields: Expt.1: Faraday Ice Pail.

Reading

Course Notes: Sections 4.3-4.4, 5.5, 5.9-5.10

W05D3 F Mar 9

**Add Date Mar 9 PS04: Friday Problem Solving: Capacitance and Dielectrics**

Reading

Course Notes: Sections 4.3-4.4, 5.5, 5.9-5.10

**Week Six Current, Magnetic Fields and Forces**

**Problem Set 5 Due Tuesday Mar 13 at 9 pm**

W06D1 M/T Mar 12/13

Reading

Current, Current Density, and Resistance and Ohm's Law, Magnetic Fields and Forces

Course Notes: Sections 6.1-6.5, 8.1-8.3, 8.5-6, 8.11.5-.5

W06D2 W/R Mar 14/15

Magnetic Force on Current Carrying Wire, Sources of Magnetic Fields: Biot-Savart Law

Reading

Course Notes: Sections 8.3, 8.11.2-.3, 9.1-9.2, 9.10.1, 9.11.1-.4

W06D3 F Mar 16  
Reading

PS05: Calculating Magnetic Fields and Magnetic Force  
Course Notes: Sections 8.8-8.9

**Week Seven Magnetic Fields  
and Exam 2**

**Problem Set 6 Due Tuesday Mar 20 at 9 pm**

W07D1 M/T Mar 19/20  
Reading

Magnetic Dipoles, Torque and Force on a Dipole,  
Experiment 2: Magnetic Dipole in a Helmholtz Coil  
Course Notes: Sections 8.4,8.11.6, 9.5 9.9

W07D2 W/R Mar 21/22

Test 2 Review

**Exam 2 Thursday Mar 22**

**7:30 pm –9:30 pm**

W7D3 F Mar 23

No Class

**Week Eight Spring Break**

**Week Nine Faraday's Law**

W09D1 M/T Apr 2/3  
Reading

Creating Fields: Ampere's Law  
Course Notes: Sections 9.3-9.4, 9.6

W09D2 W/R Apr 4/5  
Reading

Faraday's Law; Expt.3: Faraday's Law,  
Course Notes: Sections 10.1-10.6; Expt.3: Faraday's  
Law

W09D3 W F Apr 6  
Reading

PS06: Ampere's Law and Faraday's Law Problem  
Solving Faraday's Law;  
Course Notes: Sections 9.10.2, 9.11.4-7; 10.8-9

**Week Ten Magnetic Induction  
and Energy; DC Circuits**

**Problem Set 7 Due Tuesday April 10 at 9 pm**

W10D1 M/T Apr 9/10  
Reading

Inductance & Magnetic Energy,  
Course Notes: Sections 11.1-4

W10D2 W/R Apr 11/12  
Reading

DC Circuits & Kirchhoff's Loop Rules;  
Course Notes: Sections 7.1-7.4

W10D3 F Apr 13

PS07: PhET: Building a Circuit 7.1-7.4,7.8-7.9

**Week Eleven Exam 3****Problem Set 8 Due Tuesday April 17 at 9 pm**

W11D1 M/T Apr 16/17

**Patriot's Day Holiday**

W11D2 W/R Apr 18/19

Exam 3 Review

**Exam 3 Thursday April 19 7:30 pm –9:30 pm**

W11D3 F Apr 20

No Class

**Week Twelve Undriven RLC Circuits**W12D1 M/T Apr 23/24  
ReadingRC and LR Circuits;  
Course Notes: Sections 7.5-7.6, 11.1-11.4,W12D2 W/R Apr 25/26  
ReadingUndriven RLC Circuits; Expt. 4: Undriven RLC Circuits  
Course Notes: Sections 11.4-11.8**Drop Date Thurs Apr 21**W12D3 F Apr 27  
ReadingPS09: Undriven RLC Circuits  
Course Notes: Sections 11.10-11.11**Week Thirteen EM Waves****Problem Set 9 Due Tuesday May 1 at 9 pm**W13D1 M/T Apr 30/May1  
ReadingMaxwell's Equations and Displacement Current; One  
Dimensional Wave Equation  
Course Notes: Sections 13.1-13.7W13D2 W/R May 2/3  
ReadingMaxwell's Equations and One Dimensional Wave  
Equation  
Course Notes: Sections 13.1-13.7W13D3 F May 4  
ReadingPS10: Maxwell's Equations; Displacement Current; EM  
Waves  
Course Notes: Sections 13.11, 13.12.1-13.12.2

**Week Fourteen Interference  
and Diffraction**

**Problem Set 10 Due Tuesday May 8 at 9 pm**

W14D1 M/T May 7/8  
Reading

Polarization Expt 5 MW; Interference  
Course Notes: Sections 13.8, 14.1-14.3

W14D2 W/R May 9/10  
Reading

Diffraction; Expt. 6: Interference and Diffraction  
Course Notes: Sections 14.4-14.9

W14D3 F May 11  
Reading

PS11 Interference and Diffraction  
Course Notes: Section 14.4-14.11

**Week Fifteen Poynting Vector and Energy Flow; Final Review**

W15D1 M/T May 14/15  
Reading

Poynting Vector and Energy Flow  
Course Notes: Sections. 13.6, 13.12.3-13.12.4

W15D2 W/R May 16/17

Final Review

**Final Exam Monday Morning May 21 from 9 am-12 noon  
Johnson Athletic Center Track 2<sup>nd</sup> floor**