

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
Department of Physics

Physics 8.02

Spring 2013

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 5	Faraday's Law Exploration
W01D2 W/R Feb 6	Introduction to Teal, Fields, Coulomb's Law, Electric Fields, Discrete Charge Distributions
W01D3 F Feb 8 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 12 at 9 pm

W02D1 M/T Feb 11/12 Reading	Electric Dipoles and Continuous Charge Distributions Course Notes: Sections 2.9-2.13, 2.14.5-2.14.6
W02D2 W/R Feb 13/14 Reading	Gauss's Law Course Notes: Sections 3.1-3.2, 3.6, 3.7, 3.10
W02D3 F Feb 15 Reading	PS02: Gauss's Law Course Notes: Sections 3.6, 3.7, 3.10

**Week Three:
Electric Potential**

Problem Set 2 Due Tuesday Feb 19 at 9 pm

W03D1 T Feb 19	Monday Schedule: Faraday Law Exploration
W03D2 W/R Feb 20/21 Reading	Electric Potential, Discrete and Continuous Charges; Configuration Energy Course Notes: Sections Sections 4.1-4.3
W03D3 F Feb 22 Reading	PS03: Electric Potential Course Notes: Sections Sections 4.7-4.10

Week Four: Equipotentials and Energy; Exam 1

W04D01 M/T Feb 26/27

Reading

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

Course Notes: Sections 3.3-3.4, 4.4-4.6, 4.10.5

W04D2 W/R Feb 27/28

Exam 1 Review

Exam 1 Thursday Feb 28

7:30 pm –9:30 pm

W04D3 F Mar 1

No Class

Week Five Capacitors and Capacitance, Dielectrics

Problem Set 4 Due Tuesday Mar 5 at 9 pm

W05D1 M/T

Reading

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

Course Notes: Sections 3.3, 4.5, 5.1-5.4

W05D2 W/R

Reading

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

Course Notes: Sections 5.4, 5.6, 5.8-5.9

W05D3 F Mar 9

Reading

PS04 Friday Problem Solving: Capacitance, Stored Energy, Capacitors in Parallel and Series, Dielectrics

Course Notes: Sections 5.6, 5.8-5.9

Week Six Current, Magnetic Fields and Forces

Problem Set 5 Due Tuesday Mar 12 at 9 pm

W06D1 M/T

Reading

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

Course Notes: Sections 6.1-6.3, 8.1-8.3, 8.5

W06D2 W/R

Reading

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

Course Notes: Sections 8.3, 9.1-9.2

W06D3 F
Reading

PS05: Calculating Magnetic Fields and Magnetic Force
Course Notes: Sections 8.9, 8.10, 9.10.1, 9.11.1-3,
9.11.7-8

**Week Seven Magnetic Fields
and Exam 2**

Problem Set 6 Due Tuesday Mar 19 at 9 pm

W07D1 M/T Mar
Reading

Magnetic Dipoles, Torque and Force on a Dipole,
Experiment 2: Magnetic Dipole in a Helmholtz Coil
Course Notes: Sections 8.4, 8.6.4, 8.10.4, 8.13, 9.5, 9.9

W07D2 W/R Mar

Test 2 Review

Exam 2 Thursday Mar 21

7:30 pm –9:30 pm

W7D3 F

No Class

Week Eight Spring Break

Week Nine Faraday's Law

W09D1 M/T Apr 1/2
Reading

Creating Fields: Ampere's Law
Course Notes: Sections 9.3-9.4, 9.7, 9.10.2

W09D2 W/R Apr 3/4
Reading

Faraday's Law; Expt.3: Faraday's Law,
Course Notes: Sections 10.1-10.4

W09D3 W F Apr 5
Reading

PS06: Ampere's Law and Faraday's Law Problem
Solving Faraday's Law;
Course Notes: Sections 9.10.2; 10.7, 10.9-10

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

Problem Set 7 Due Tuesday April 9 at 9 pm

W10D1 M/T Apr 8/9
Reading

Inductance & Magnetic Energy,
Course Notes: Sections 11.1-3

W10D2 W/R Apr 10/11
Reading

DC Circuits & Kirchhoff's Loop Rules;
Course Notes: Sections 7.1-7.5

W10D3 F Apr 12

PS07: PhET: Building a Circuit 7.1-7.5, 7.10

Week Eleven Exam 3

Problem Set 8 Due Tuesday April 16 at 9 pm

W11D1 M/T Apr 15/16

Patriot's Day Holiday

W11D2 W/R Apr 17/18

Exam 3 Review

Exam 3 Thursday April 18 7:30 pm –9:30 pm

W11D3 F Apr 19

No Class

Week Twelve Undriven RLC Circuits

W12D1 M/T Apr 22/23
Reading

RC and LR Circuits;
Course Notes: Sections 7.7-7.8, 7.11.3, 11.4-11.6,
11.12.2, 11.13.4-11.13.5

W12D2 W/R Apr 24/25
Reading

Undriven RLC Circuits; Expt. 4: Undriven RLC Circuits
Course Notes: Sections 11.7-11.9, 11.10, 11.13.6

Drop Date Thurs Apr 20

W12D3 F Apr 26
Reading

PS08: Undriven RLC Circuits
Course Notes: Sections 11.8-9, 11.12-11.13

Week Thirteen EM Waves

Problem Set 9 Due Tuesday April 30 at 9 pm

W13D1 M/T Apr 29/30
Reading

Maxwell's Equations and Displacement Current; One
Dimensional Wave Equation
Course Notes: Sections 13.1-13.4

W13D2 W/R May 1/2
Reading

Maxwell's Equations and One Dimensional Wave
Equation
Course Notes: Sections 13.5-13.7

W13D3 F May 3
Reading

PS09: Maxwell's Equations; Displacement Current; EM
Waves
Course Notes: Sections 13.9, 13.11, 13.12

**Week Fourteen Interference
and Diffraction**

Problem Set 10 Due Tuesday May 7 at 9 pm

W14D1 M/T May 6/7
Reading

Polarization Expt 5 MW; Interference
Course Notes: Sections 13.8, 13.10, 14.1-14.3

W14D2 W/R May 8/9
Reading

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

W14D3 F May 10
Reading

PS10 Interference and Diffraction
Course Notes: Section 14.9-14.11

Week Fifteen Poynting Vector and Energy Flow; Final Review

W15D1 M/T May 13/14
Reading

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

W15D2 W/R May 15/16

Final Review

**Final Exam Monday Morning May 20 from 9 am-12 noon
Johnson Athletic Center Track 2nd floor**