

WEEK	DATE	TOPICS	OBJECTIVES
1	September 9- 13	Electrical Quantities 1.1-1.7	<ul style="list-style-type: none"> • Use the equation $Q = It$ to solve problems • Define the coulomb • Define the volt • Use the equation $V = IR$ to solve problems • Define and use the term resistivity ρ using the equation $R = (\rho l)/A$ • Explain drift velocity • Derive and use the equation $I = nevA$
2	September 16- 20	Electrical circuits 2.1-2.5	<ul style="list-style-type: none"> • I-V characteristics for metals, semiconductors and filament lamp • Resistance versus temperature curves for thermistors with negative temperature coefficients. • Distinguish between e.m.f. and p.d. • Solve problems using terminal p.d. • Draw and interpret circuit diagrams using Kirchoff's law.
3	Sep 23- 27		<ul style="list-style-type: none"> • Use Kirchoff's laws to solve problems involving circuit networks • Revision and Graded class work # 1
4	Sep 30 – oct 4	Electrical circuits continued 2.6-2.9	<ul style="list-style-type: none"> • Derive and use formula for two or more resistors a) in series b) in parallel. • Use the potential divider as source of variable and fixed p.d. • Use the Wheatstone bridge as a means of comparing resistance, treating it as a double potential divider.
5	Oct 7- 11		<ul style="list-style-type: none"> • Revision and graded class work # 2
6	Oct 17- 21 Oct 14-16 Oct 22 - 25		<p>Mid term break Lab # 1 and Lab # 2 First Six week test</p>
7	Oct 28-Nov 1	Electric Fields 3.1-3.13	<ul style="list-style-type: none"> • Explain the difference between electrical insulators and conductors • Discuss a) applications of electrostatic phenomena and b) hazards associated with charging by friction. • Explain the action of lightning rods in the protection of buildings. • Use Coulomb's law to solve problems • Use $E = \frac{Q}{4\pi\epsilon_0 r^2}$ for the field strength due to a point charge.

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			<ul style="list-style-type: none"> Calculate the field strength between two charged metal plates using $E = V/d$
8	Nov 4 - 8	Electric fields (Cont'd)	<ul style="list-style-type: none"> Calculate the force on a charge in a uniform electric field using $F = EQ$. Describe effect of electric field on charges moving in it. Compare motion of charged particles moving in electric field to movements in a gravitational field and solve numerical problems <p>LAB #3</p>
9	Nov 11- 14	Electric fields (Cont'd)	<ul style="list-style-type: none"> Recall that field strength is numerically equal to potential gradient Use the equation $V = Q/4\pi\epsilon_0 r$ for the potential due to a point charge. Calculate the potential at a point due to several point charges Worksheet
10	Nov 18 - 22	Capacitors 4.1-4.7	<ul style="list-style-type: none"> Explain the 'farad' and use $C = Q/V$ and $C = \epsilon A/d$ to solve problems. Derive and use formulae for capacitors a) in series b) in parallel Use the formulae for energy stored as $W = CV^2/2 = QV/2 = Q^2/2C$ Recall and use the exponential equations for discharge of capacitors Sketch graphs for a) charging b) discharging a capacitor. Class quiz # 3
11	Nov 25 - 29	Magnetic Fields 5.1-5.3	<ul style="list-style-type: none"> Explain magnetic flux density and the 'tesla'. Sketch magnetic flux patterns due to long straight wire, flat circular coil and solenoid Use expression for magnetic flux density associated with long straight wire, flat circular coil and solenoid Example: $B = \mu_0 nI$
12	Dec 2- 6		<ul style="list-style-type: none"> 2nd six week test
13	Dec 9- 13	Magnetic forces 6.1-6.11	<ul style="list-style-type: none"> Use Fleming's left hand rule effectively Recall and use the equation $F = BIL \sin\theta$ to solve problems. Explain how to measure flux density using a current balance. Predict the direction of the force on a moving charge in a magnetic field.

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(Cont'd)			<ul style="list-style-type: none"> ● Use the expression $F = BQv\sin\theta$ to solve problems. ● Solve problems for charged particles moving in electric and magnetic fields perpendicular to each other. ● Describe the effect of soft iron core on the magnetic field due to a solenoid ● Explain principle of the electromagnet and how it is used in door locks, switches and other applications. ● Explain the origin of forces between current carrying conductors and predict the direction of the forces. ● Explain the Hall Effect. ● Use the Hall probe to measure Flux density.
13	Optional	Electromagnetic Induction 7.1-7.9	<ul style="list-style-type: none"> ● Explain magnetic flux and magnetic flux linkage using the relevant equations $\Phi = BA$ and $\phi = BAN$ to solve problems ● Explain the 'weber'. ● Describe and interpret experiments that demonstrate electromagnetic induction and the associated variables. ● Determine induced e.m.f. using Faraday's law. ● Use Lenz's law to determine direction of induced e.m.f. and discuss its application to energy conservation. ● Explain applications of electromagnetic induction. ● Explain the principle of operation of the simple transformer. ● Use the relationship $N_s/N_p = V_s/V_p = I_p/I_s$ for the ideal transformer