SYLLABUS

Course Code	Course Num.	Course Name	Credit Hours	Lec.	Lab.	Tut.	Private study	Pre-requisites	Co-requisites	Course Level	Language
PHY	118	Physics (2)	3	2	2	0	5	PHY 117	PHY 120	2	English

A. Course Description

Physics (2) is the second part of one-year course in physics. In this course, students will learn basis of physics, i.e. electricity and magnetism. This course, describe the relationships that hold for electricity and magnetism and the interactions between them and also the magnetic fields, forces, and potentials involved in the interaction of point charges and of currents. Application of different laws (Coulomb, Ohm, Lenz, Kirchhoff, Faraday to solve problems in electromagnetism).

B. Course Outcomes

At the end of this course the student will be able to**:**

1. Build up basic skills necessary for solving problems with practical applications by using physical principles.
2. Learn and understand the basic knowledge in electrostatics and magneto-statics.
3. Demonstrate the ability to formulate, interpret and draw inferences from their knowledge.
4. Demonstrate competence with a wide variety of mathematical tools and techniques.
5. Develop a good understanding and appreciation of electrostatics and magneto-statics.

C. References

Required Textbook

Serway R.A. and Jewett J.W., ***Physics for Scientists and Engineers with Modern Physics,*** 9th Edition, Brooks/Cole, Belmont, CA, USA (2014).

Other references

- Halliday D. and Resnick R., Physics, 9thEdition, John wiley & sons (2011).

Course Website: http://www.imamm.org/

D. Topics Outline

1. ***Electric Fields:*** *Properties of electric charges, Charging objects by induction, Coulomb's law, Electric field, Electric field of a continuous charge distribution, Electric field lines, Motion of a charged particle in a uniform electric field (Contact hours: 8).*
2. ***Gauss's Law:*** *Electric flux, Gauss's law, Application of Gauss's law to various charge distributions, Conductors in electrostatic equilibrium (Contact hours: 8).*
3. ***Electric Potential:*** *Electric potential and potential difference, Potential difference in a uniform electric field, Electric potential and potential energy due to point charges, Obtaining the value of the electric field from the electric potential, Electric potential due to continuous charge distributions, Electric potential due to a charged conductor (Contact hours: 8).*
4. ***Capacitance and Dielectrics:*** *Definition of capacitance, Calculating capacitance, Combinations of capacitors, Energy stored in a charged capacitor, Capacitors with dielectrics, Electric dipole in an electric field (Contact hours: 8).*

5. ***Direct Current Circuits:*** *Electric current, Resistance, Resistance and temperature, Electrical power, Electromotive force, Resistors in series and parallel, Kirchhoff's rules, RC circuits (Contact hours: 6).*
6. ***Sources of the Magnetic Field:*** *Magnetic fields and forces, Motion of a charged particle in a uniform magnetic field, Magnetic force acting on a current-carrying conductor, Torque on a current loop in a uniform magnetic field, Biot–Savart law, Magnetic force between two parallel conductors, Ampère's law, Magnetic field of a Solenoid, Gauss's law in magnetism (Contact hours: 8).*
7. ***Faraday's Law and Inductance:*** *Faraday's law of induction, Motional emf, Lenz's law, Induced emf, Self-induction and Inductance, RL circuits, Energy in a magnetic field, Mutual inductance, RLC Circuit (Contact hours: 8).*
8. ***Alternating-Current Circuits:*** *AC sources, Resistors in an AC circuit, Inductors in an AC circuit, Capacitors in an AC circuit, RLC series circuit, Power in an AC circuit, Resonance in a series RLC circuit, Transformer and power transmission (Contact hours: 6).*

E. Office Hours

Office hours give students the opportinuity to ask in-depth questions and to explore points of confusion or interest that cannot be fully addressed in class.

F. Exams & Grading System

The semi-official dates of the exams for this course are:

- **Midterm 1:** 6th or 7th week.
- **Midterm 2:** 11th or 12th week.
- **Quizzes & Homeworks:** During the semester.
- **Final Exam:** 16th week.
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Your course grade will be based on your semester work as follows:

Midterm 1: 20 %	**Midterm 2:** 20 %	**Final Exam:** 40 %
Quizzes, Homework, Attendance & Participation: 20 %		

The grading distribution:

A+	A	B+	B	C+	C	D+	D	F
[95, 100]	[90, 95)	[85, 90)	[80, 85)	[75, 80)	[70, 75)	[65, 70)	[60, 65)	[0, 60)

G. Student Attendance/Absence

Only three situations will be considered as possible excused absences:

- Occurrence of a birth or death in the immediate family will be excused. ("Immediate family" is defined by the University as spouse, grandparents, parents, brother, or sister).
- Severe illness in which a student is under the care of a doctor and physically unable to attend class will be excused. Students are not excused for a doctor's appointment. Do not make appointments that conflict with rehearsals. Notes from the University Health Center will be accepted.

Executive Rules for Study Regulations and Exams
goo.gl/ykm7t3