

<b>SEMESTER</b> <i>Second</i>	<b>DEPARTMENT</b> <i>General Engineering</i>	<b>COURSE TITLE</b> <i>Physics II</i>
<b>COURSE CODE</b> <i>EG202</i>	<b>HOURS:</b> 3 <b>UNITS:</b> 3	<b>COURSE SPECIFICATIONS</b> <i>Theoretical Contents</i>

**Part One**

**1. Electric Fields:**

- Properties of Electric Charges.
- Charging Objects by Induction.
- Coulomb's Law.
- The Electric Field.
- Electric Field of a Continuous Charge Distribution.
- Electric Field Lines.
- Motion of Charged Particles in a Uniform Electric Field.

**2. Gauss's Law:**

- Electric Flux.
- Gauss's Law.
- Application of Gauss's Law to Various Charge Distributions.

**3. Electric Potential:**

- Potential Difference and Electric Potential.
- Potential Differences 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

#### **4. *Magnetic Fields:***

- Magnetic Field and Forces.
- Magnetic Force Acting on a Current-Carrying Conductor.
- Torque on a Current Loop in a Uniform Magnetic Field.
- Motion of a Charged Particle in a Uniform Magnetic Field

#### **5. *Sources of Magnetic Field:***

- The Biot-Savart Law.
- The Magnetic Force between Two Parallel Conductors.
- Ampere's Law.
- The Magnetic Field of a Solenoid. Magnetic Flux.

#### **6. *Faraday's Law:***

- Faraday's Law of Induction.
- Motional emf.
- Lenz's Law.

### **Part Two**

#### **7. *Light and Optics:***

- The Nature of Light.
- Measurements of the Speed of Light.
- The Ray Approximation in Geometric Optics.
- Reflection.

- Refraction.
- Huygens's Principle.
- Dispersion and Prisms.
- Total Internal Reflection.
- Fermat's Principle.

**8. *Modern Physics:***

- The Principle of Galilean Relativity.
- The Michelson-Morley Experiment.
- Einstein's Principle of Relativity.

***References:***

1. *Fundamentals of physics*, Halliday, Resnick. 7<sup>th</sup> Edition.
2. *Physics for scientist and Engineers*, Serway Jewwett. 6<sup>th</sup> Edition