## **PHYS 102: Principles of Physics II (3 credits)**

The course provides an overview of the fundamental principles of physics in areas of electricity and magnetism. Topics include electric field, Gauss law, electric potential, capacitance and dielectrics, current and resistance, direct current circuits, magnetic fields, sources of magnetic fields, Biot-Savart Law, Ampere’s Law, Faraday’s law, and Lenz’s Law. The course is designed for students requiring calculus-based physics.  *(Prerequisite: PHYS101, Co-requisite: PHYS102L)*

**Course Learning Outcomes:**

By the end of the course, students will be able to:

A1. Identify in detail the main theories and concepts behind electricity and magnetism in advanced way.

A2. Relate the main theories and concepts behind electricity and magnetism to real-life situation using some advanced skills.

B1. Solve defined and some undefined problems using combined theories and concepts of electricity and magnetism.

**Course Learning Materials:**

* Principles of Physics, by Walker, Halliday and Resnick, 10th Edition (Wiley)
* Physics for Scientists and Engineers, by R.A. Serway and J.W. Jewett, 7th edition (Thomson Brooks/ Cole) (2008)
* University Physics with Modern Physics, 2nd Edition, by Bauer and Westfall (McGraw-Hill International Edition)

**Course Content:**

1. Electric Field
2. Gauss Law
3. Electric Potential
4. Capacitance and Dielectrics
5. Direct Current Circuits
6. Magnetic Fields
7. Applications of Magnetic Fields
8. Lorentz Force
9. Sources of Magnetic Fields
10. Sources of Magnetic Fields
11. Induction and Inductance
12. Maxwell Equations