

## Bachelor of Technology (B.Tech)

### Batch 2018 – 2022

Course Code & Title	Electromagnetics			Semester	I
Faculty	Krishna Thyagarajan			Type	CORE
Contact Hours	2-0-2	Credits	3	Pre-requisites	None

#### Brief description of the Course:

The course covers properties of electric and magnetic fields and the equations governing these phenomena and how they predict the existence of electromagnetic waves.

#### Course Objectives

The main aim of this course is to introduce basic concepts of electric and magnetic fields, their properties and some applications. To show the existence of electromagnetic waves and to study their basic properties

#### Learning Outcome:

**At the end of the course, the students will be able to**

1. Calculate electrostatic fields and potentials, produced by regular shaped charged bodies.
2. To understand magnetic fields produced by variously shaped current carrying bodies.
3. To appreciate the interconnectedness of electric and magnetic phenomena and to realize the significance of Maxwell's equations,
4. To understand how these equations lead to electromagnetic waves

#### Course Outline:

Vector operators and coordinate systems; Gauss' law and its applications; Electrostatic potential; Electric fields in matter; Electric polarization, Bound charges, Displacement vector; Electric Permittivity and dielectric constant; Biot-Savart law; Ampere's law and applications; Magnetic fields in matter, Magnetization, Bound currents; Faraday's law of electromagnetic induction; Displacement current and the generalized Ampere's law; Maxwell's equations; Electromagnetic waves

**Equivalent Course: NIL**

#### EVALUATION COMPONENTS:

Components of Course Evaluation	Percentage Distribution
Mid Semester Examination	30%
End Semester Examination	45%
Lab Continuous evaluation	15%
Lab End Semester Examination	10%
Quizzes and Assignments	Nil
Total	100%

#### Text Book:

1. *Introduction to Electrodynamics*, David. J. Griffiths, 4<sup>th</sup> Edition, Prentice-Hall International, Eastern Economy Edition, 2012

**Reference Books:**

1. *Fundamentals of Physics*, D. Halliday, R. Resnick, & J. Walker, John Wiley & Sons, 10<sup>th</sup> Edition
2. *Physics, Vol. 1 & 2*, Resnick, Halliday and Krane, 5<sup>th</sup> edition, Wiley Student Edition