No	Course Information (2019-2020)	
1	Unit name:	Engineering Electromagnetic I
2	Code:	EcE 31011
3	Classification:	Engineering subject
4	Credit value:	2.5 (2-1-0)
5	Semester/ Year Offered:	1/3
6	Pre-requisite:	Engineering Mathematics, Engineering Physics
7	Mode of delivery:	Lecture
8	Assessment system and breakdown of marks:	Tutorial, Assignment, Examination
	Tutorial, Assignment	30%
	Mid-term/ Final Examination	70%
9	Academic staff teaching unit:	Electronic Engineering
10	Course outcome of unit: After completion of this course, students will be able to 1. Discuss the principles and concepts of electric fields. 2. Apply the appropriate laws, theorems and techniques to solve electric field problems.	
11	Synopsis of unit: This course will provide all students with the fundamental concepts associated with electromagnetic fields. Important topics include: Maxwell's equations; electrostatic and steady- magnetic fields. Successful completion of this course will allow students to study more advanced topics in the area of microwave engineering.	
12	Topic: **Chapter Title** **1. Vector Analysis** 1.1 Scalar and Vectors 1.2 Vector Algebra 1.3 The Rectangular Coordination System 1.4 Vector Components and Unit Vectors 1.5 The Vector Field 1.6 The Dot Product	

	1.7 The Cross Product 1.8 Other Coordinate System: Circular Cylindrical Coordinates 1.9 The Spherical Coordinate System **2. Coulomb forces and Electric Field Intensity** 2.1 The Experiment Law of Coulomb 2.2 Electric Field Intensity 2.3 Field arising from a continuous volume charge distribution 2.4 Field of a Line Charge 2.5 Field of a Sheet Charge 2.6 Streamlines and Sketches of Fields **3. Electric Flux Density, Gauss's Law, and Divergence** 3.1 Electric Flux Density 3.2 Gauss's Law 3.3 Application of Gauss's Law: Some Symmetrical Charge Distributions 3.4 Application of Gauss's Law: Differential Volume Element 3.5 Divergence and Maxwell's First Equation 3.6 The Vector Operator and The Divergence Theorem **4. Energy and Potential** 4.1 Energy expended in moving a point charge in an electric Fields 4.2 The Line Integral 4.3 Definition of Potential Difference and Potential 4.4 The Potential field of a point charge 4.5 The potential field of a system of charges: conservation Property 4.6 Potential Gradient 4.7 The Electric Dipole 4.8 Energy density in the Electrostatic field
14	Main references: Engineering Electromagnetic, Eighth Edition by William H.Hayt, Jr. and John A. Buck
15	Additional references: