No	Course Information	
1	Unit name:	Electrical Safety of Low-Voltage Systems
2	Code:	EP 61014
3	Classification:	Engineering subject
4	Credit value:	1
5	Semester/ Year Offered:	1/6
6	Pre-requisite:	Power System Protection
7	Mode of delivery:	Lecture
8	Assessment system and breakdown of marks:	
	Tutorial	40%
	Attendance	30%
	Presentation	30%
9	Academic staff teaching unit:	
10	Course outcome of unit: In this course students will be able ➢ To define basic definitions and nomenclature ➢ To explain the fundamentals of electrical safety ➢ To explain mathematical principles of electrical safety ➢ To discuss the theory of ground potentials and ground resistances of electrodes ➢ To illustrate the effects of electric currents passing through the human body, and safety requirements ➢ To assess the methodologies of measurement	
11	Synopsis of unit: The course consist of electrical engineering students who need to know the principles of electrical safety. Background requirements include a knowledge of a.c. electric circuits, algebra, complex numbers, and basic calculus.. Topic: **Chapter Title**	
	1. Basic Definitions and Nomenclature -Introduction - Basic Definitions and Nomenclature	

2. Fundamentals of Electrical Safety
- Introduction
-Protection Against Direct Contact
-Protection Against Indirect Contact

3. Mathematical Principles of Electrical Safety
- Introduction
- Mathematical Definition of Safety
- Risk of Indirect and Direct Contact
- The Acceptable Residual Risk
- Safety and Risk of Basic Insulation
- Safety and Risk of Class 0 Equipment
- Safety and Risk of Class I Equipment
- Safety and Risk of Class II Equipment
- Safety and Risk of Electrical Separation

4. The Earth
- Introduction
- The Earth Resistance
- The Earth Potential
- Independent and Interacting Earth Electrodes
- Spherical Electrodes
- Voltage Exposure Upon Ground Faults
- Voltage or Current

5. Effects of Electric Currents Passing Through the Human Body, and Safety Requirements
- Introduction
- The Human Body as an Electrical System
- Influence of Frequency on the Effects of Current
- Physiological Response to Electrical Currents
- Permissible Body Current and Person's Body Mass
- Permissible Body Current Independent of Human Size
- Human Body Impedance
- Current Paths
- Permissible Prospective Touch Voltage
- Effects of Direct Currents

14. Testing the Electrical Safety
- Introduction
- Soil Resistivity Measurement
- Earth Resistance Measurement
- Earth Resistance Measurements in Industrial Facilities
- Earth Resistance Measurement in TT Systems
- Measurement of the Fault-Loop Impedance in TN Systems
- Touch Voltage Measurement in TN Systems (Low-Voltage Earth Faults)
- Step and Touch Voltage Measurements in TN Systems
- Fundamental Measurements in IT Systems
- Protective Conductor Continuity Test

	- Insulation Resistance
14	Electrical Safety of Low-Voltage Systems, *Dr. Massimo A. G. Mitolo* *Professional Engineer*
15	Additional references: -