EE426-3: High Voltage Engineering

Course code and name	EE426-3: High Voltage Engineering
Credits units	3 Credit units
Contact hours	5 Contact hours: 2 lecture, 1 tutorial and 2 practical
Instructor name	Dr. Ghareeb Moustafa Ghareeb
Textbook	Abdulrhman Ali Al-Arainy, "Fundamentals of High Voltage Engineering", (King Saud University, 2005
Other supplemental materials	M.S. Naidu and V. Kamaraju, High Voltage Engineering, Tata McGraw-Hill, 4th Edition, 2009
	Specific course information
a. Course description	The course aims to teach the students the basic concepts of high voltage engineering, students should recognize the concepts and principle of generation of high voltage for testing purpose; generation of high AC, DC and impulse voltage, Methods used for measuring high voltage AC, DC and Impulse, also methods for measuring high current, breakdown voltage in Gases and the application of gases in power system, breakdown voltage in solid and liquid insulation and there using in power system. Understand and measuring ground resistance. Describe the construction of high voltage cable
b. Prerequisite	EE323-3
c. Required / Elective	Required
	Course Learning Outcomes
<u>CLO of the Lecture Activities:</u> CLO1: Describe the principles of the generation and measurement of high voltage AC, DC and impulse voltages. CLO2: Explain the Electric Field and electrical breakdown phenomena in gases, liquids and solids and relate principles of application of these materials to the design of high voltage insulation. LO3: Solve high voltage engineering problems relating to Generation and measurement of High voltage.	

CLO4: Solve high voltage engineering problems relating to breakdown voltage and corona onset voltage.

CLO5: Design switching impulse circuit and Lightning impulse circuit.

CLO6: Solve high voltage engineering problems relating to Electric field.

CLO of the Laboratory Activities:

CLO1: Verify theory and to improve knowledge learned in class.

CLO2: Formulate and solve problems related to theory.

CLO3: Design and safety conducts an experimental procedure.

CLO4: Independently perform accurate quantitative measurements, interpret experimental results, perform calculations on these results and draw a reasonable, accurate conclusion.

CLO5: Communicate critical analysis of scientific information through written reports.

CLO6: Be integrated inside a group of work and respect the team working.

Brief list of topics to be covered

- Introduction for high voltage engineering
- Generation of High D.C. Voltages
- Generation of High A.C. Voltages
- Generation of Impulse Voltages
- Measurement of High voltage
- Electric Fields
- High Voltage Insulation
- Mechanism of Breakdown of Gases
- Mechanism of Breakdown in Liquid Dielectrics
- Mechanism of Breakdown in Solid Dielectric

Mapping Course Learning Outcomes to Student Outcomes

	Lecture Activities						
	SO1	SO2	SO3	SO4	SO5	SO6	SO7
CLO1							
CLO2							

CLO3							
CLO4							
CLO5							
CLO6							

	Laboratory Activities						
	SO1	SO2	SO3	SO4	SO5	SO6	SO7
CLO1							
CLO2							
CLO3							
CLO4							
CLO5							
CLO6							