High Voltage Engineering and Laboratory

ECE 5047

Credit Hours:
3.00

Course Levels:
Undergraduate (1000-5000 level)
Graduate (5000-8000 level)

Course Components:
Lecture
Lab

Course Description:
Dielectric strength and breakdown of gases, liquids, and solids, electric field design problems in power system equipment; laboratory study of high voltage insulation.

Prerequisites and Co-requisites:
Prereq: 3040 (341), and enrollment in ECE major, or Grad standing in Engineering, Biological Sciences, or Math and Physical Sciences.

Course Goals / Objectives:
- Apply the knowledge of mathematics and engineering, especially in the areas of high voltage engineering, electromagnetics, and power engineering
- Be able to design and conduct high voltage experiments through their experience in the High Voltage Laboratory
- Be able to interpret data by the use of statistics
- Be able to design a system, component or process, and apply simultaneously high voltage criteria
- Work and write reports together as team members
- Develop an ability to recognize, formulate and solve high voltage engineering problems
- Understand professional responsibility through meticulous safety procedures
- Communicate more efficiently, since weekly lab reports are required; and will practice report writing, programming, plotting and editing skills necessary for engineering practice
- Use modern simulation and programming tools to solve problems related to contemporary engineering issues, such as high voltage transmission line design for wind power
Course Topics:
- Introduction to high voltage engineering
- High voltage generation/measurements
- Electric and magnetic fields
- Breakdown in gases
- Breakdown in liquids
- Breakdown in solids
- Insulators, artificial aging
- Corona discharges
- Partial discharges
- Surge generators

Designation:
Elective