



Course description:

In this course students are expected to learn about Vector Algebra, Electrostatic, (The electric field, Divergence and Curl of Electrostatic Fields, Electric Potential, Work and energy, Conductors), introduce the special techniques (Laplace's Equation, The Method of Images, Separation of Variables, Multipole Expansion), electric fields in matter (Polarization, the field of a polarized object, the electric displacement, linear dielectrics).

Aims of the course:

1. To study the electrostatic (The electric field, Divergence and Curl of Electrostatic Fields, Electric Potential, Work and energy, Conductors).
2. To introduce the special techniques (Laplace's Equation, The Method of Images, Separation of Variables, Multipole Expansion).
3. To examine electric fields in matter (Polarization, the field of a polarized object, the electric displacement, linear dielectrics).
4. To develop problem solving skills in the above area.

Intended Learning Outcomes: (ILOs)

A. Knowledge and Understanding

- A1. Concepts and Theories:** Use the principles of electromagnetism theory.
- A2. Contemporary Trends, Problems and Research:** Comprehend the meaning of Electrostatic, Polarization and the special techniques of electromagnetism.
- A3. Professional Responsibility:** Use computer, graphical and algebraic tools to analyze electromagnetic problems.

B. Subject-specific skills

- B1. Problem solving skills:** Students solve problems on the board. I giving them group assignments and homeworks and encourage group projects, but I can say that technology has become an integral part of their lives, and use computer programs to draw and solve mathematical equations, derivation and integration and they feel confident in this area.
- B2. Modeling and Design:** Not applicable.
- B3. Application of Methods and Tools:** Use the special techniques (Laplace's Equation, The Method of Images, Separation of Variables, and Multipole Expansion).

C. Critical-Thinking Skills

- C1. Analytic skills:** Assess the factors that affect electrostatic properties in free and matter medium.
- C2. Strategic Thinking:** Formulate plans designed to achieve maximum useful of the special techniques that the student uses to solve the electrostatic problems.
- C3. Creative thinking and innovation:** Devise easy methods to solve the electrostatic problems.

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1. Communication:

1. Students will be able to communicate with teacher, ask questions, solve problems, and use computers.
2. Students ask questions during the lecture, work in groups, and communicate with each other and with me electronically, and periodically visit the sites I recommended.

D2. Teamwork and Leadership:

1. I encourage the student to attend lectures regularly by giving bonus marks for attendance, give students tasks, and ask questions about previous lectures.
2. Mutual respect is between the lecturer and students and among students themselves. I deal with them as young mature people, responsible for their actions and schedules.
3. I apply educational standards and behavioural control when they work in groups, I can assess the response of students as a whole and the team spirit and good character.
4. I enable students to communicate with me discuss any needs they have related to the course, and I welcome students' comments when they face challenging problems.



