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Sub: ELECTROMAGNETIC FIELDS & TRANSMISSION LINES [EC203]

Class: EC III Year and IV Year

1. Innovation in teaching and learning:

- **Demonstration using industrial standard simulation software**
- **Group Assignments**
- **Teaching through ICT**

2. Monthly Guest lectures Inter and Intra discipline subjects

In India, it is observed that the subjects like Electromagnetic theory, Antenna and Wave Propagation, Microwave Engineering etc. in undergraduate program of ECE is losing interest among the students due to its complicated mathematical nature and requirement of lot of imaginations. We will begin by outlining the details of how electromagnetic is taught in the electrical engineering program offered at We will also discuss how our methods are and should be adapted to teach wave propagation without discouraging students. Teaching electromagnetic in English is an increasingly challenging task due to lot of complexity is involved including imagination. Secondly, students feel that electromagnetic is a difficult and demanding subject, as opposed to digital systems design, for instance, which is believed to be easier to grasp and more rewarding. Finally, because of a recent phenomenon of de-industrialization. Undergraduate program is comparable in each country and that students' interest in Electromagnetism (EM) is continuously declining. During the second year, students are first introduced to static and magnetic fields during a basic EM course; the course on electromagnetic fields (Maxwell's equations) is often given in the third year. Furthermore, in all countries, teaching electromagnetism should be combined with teaching mathematics, such as linear algebra, vector calculus, integral calculus, and the study of complex variable functions. Therefore, with the motivation developed during various faculty development programs on effective teaching, following are some innovative teaching and learning practices experimented during last year-As a result, RF communication based industries are lacking qualified antenna designers and microwave engineers to cater the needs.

Demonstration using industrial standard simulation software–

Description of the method- The subjects mentioned above based upon laws of electricity and magnetism which were established through experimentation. Therefore, they require strong physical reasoning to establish the electromagnetic phenomenon.

The parameters under investigations like radiation patterns require a strong imagination and thinking capability. Use of electromagnetic structure simulation software provided a virtual environment to observe and analyze the physical picture of every mathematical postulated one carries out. To address this and to create interest among student's simulation studies-based experiments can be demonstrated during theoretical concepts are being taught. Also arranging extension lectures by inviting Industry experts and Senior teachers from IIT's and NIT's who is having vast expertise in this subject. As a part of this Innovation MATLAB S/w exercise can be given as assignments. So that students can grasp.

Significant results observed– The demonstration using simulation software enables the students to develop clear understanding of the concept maintaining the theoretical aspect in mind. It gives an understanding of the approach used by the industry to develop and design a prototype or a product.

Group Assignments–

Description of the method– The students were asked to submit a group assignment in the form of course project in a form to investigate any practical electromagnetic structure on several parameters and present the review. They were also asked to simulate the product on the EM software available in the laboratory. The objective is to develop technical and soft management skills in the student.

Significant results observed– The students develop soft management skills like teamwork, coordination, decision making, organizational behaviour, leadership, time management and presentation skills along with the enhancement in technical skills through in-depth investigation, product design, prototype, working in RF environment and calibration of test instruments.