

INDIAN INSTITUTE OF TECHNOLOGY TIRUPATI
PROFORMA FOR NEW COURSE

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| 1. | Title of the Course | Electromagnetic Fields |
| 2. | Course Number | EE2208 |
| 3. | Status of the Course | Core |
| 4. | Structure of Credits | 3-0-0-3 |
| 5. | Offered To | UG |
| 6. | New Course/Modification to | New |
| 7. | To be Offered by | Department of Electrical Engineering |
| 8. | To take effect from | July 2018 |
| 9. | Prerequisite | Nil |
| 10. | Whether approved by the Department | Yes |
| 11. | Course Objective: To provide an exposure to the basic concepts of electromagnetic field theory and its applications to engineering. | |
| 12. | Course Content: Static/quasi-static E & M fields: Poisson's and Laplace's equations, uniqueness theorem, general procedure for solving Poisson's or Laplace's equation, resistance and capacitance (examples of MEMS and P-N junction), magnetic fields, inductors and inductance, electric and magnetic field systems; Transmission lines: equations of current and voltage, standing waves and impedance transformation, power transfer on a transmission line, loss-less and low-loss transmission lines, discontinuity, bounce diagram and digital transmission lines; EM waves and waveguides: wave equation and plane-wave solution, energy conservation and Poynting theorem, wave propagation in loss-less and lossy media, waves at the interface (Fresnel's equation, TIR, Brewster's angle, skin depth), parallel plane waveguide and TEM modes, rectangular waveguides and resonators, optical waveguides, fiber optics and optical communications. | |
| 13. | Text book(s): 1. Rao N N, <i>Elements of Engineering Electromagnetics</i> , Pearson (1999). 2. Sadiku M N, <i>Elements of Electromagnetics</i> , Oxford (2001). | |
| 14. | Reference(s): 1. Cheng D K, <i>Field and Wave Electromagnetics</i> , Pearson (2013). 2. Hayt W H and Buck J A, <i>Engineering Electromagnetics</i> , McGraw Hill (2006). | |