



INTRODUCTION TO ELECTRICAL ENGINEERING

PROF. BHIM SINGH

Department of Electrical Engineering
IIT Delhi

PRE-REQUISITES : Class 12th with Physics and Math, Diploma in Electrical Engineering

INTENDED AUDIENCE : B.Tech. First Year students in all branches of Engineering in the country and Industry persons working in electrical domain, self-learner having interest in Electrical Engineering

COURSE OUTLINE :

This course deals with fundamentals of Electrical Engineering. The steady state and transients circuit analysis methods for AC and DC electrical circuits are covered in detail. Some basic electronic devices along with digital circuits is also included in this course. The device characteristics along with application of BJT and diodes are also included in this course. Basics of various electrical machines and electrical measurements is also discussed along with numerical problems

ABOUT INSTRUCTOR :

Prof. Bhim Singh has received his B.E. (Electrical) from the University of Roorkee, India, in 1977 and his M.Tech. (Power Apparatus & Systems) and Ph.D. from the Indian Institute of Technology Delhi, India, in 1979 and 1983, respectively. In 1983, he joined the Department of Electrical Engineering, University of Roorkee (Now IIT Roorkee), as a Lecturer. He became a Reader there in 1988. In December 1990, he joined the Department of Electrical Engineering, IIT Delhi, India, as an Assistant Professor, where he has become an Associate Professor in 1994 and a Professor in 1997. He has been ABB Chair Professor from September 2007 to September 2012. He has also been CEA Chair Professor from October 2012 to September 2017. He has been Head of the Department of Electrical Engineering at IIT Delhi from July 2014 to August 2016. He has been the Dean, Academics at IIT Delhi from August 2016 to August 2019. He is JC Bose Fellow of DST, Government of India since December 2015. Prof. Singh is the Chairman of BOG, Maulana Azad National Institute of Technology, Bhopal, since 3rd July 2018 for 3 Years and Non official Independent Director, NTPC Limited, since 17th July 2018 for 3 Years. He is CEA Chair Professor since January 2019. Prof. Singh is also member of Governing Council of Central Power Research Institute.

COURSE PLAN :

- Week 1:** Introduction to the course and Analysis of DC Circuits
- Week 2:** Transient Response of First Order and Second Order Circuits
- Week 3:** Single Phase AC Circuits
- Week 4:** Resonance in AC Circuits and Three-phase AC circuits
- Week 5:** Diode based Circuits and Two-port Networks
- Week 6:** Bipolar Junction Transistors and Operational Amplifiers
- Week 7:** Digital Circuits
- Week 8:** Magnetic Circuits and Transformers
- Week 9:** Electromechanical Energy Conversion and DC Machines
- Week 10:** Three Phase Induction Machines and Single Phase Induction Machines
- Week 11:** Synchronous Machines
- Week 12:** Electrical Measurements