



ADVANCE POWER ELECTRONICS AND CONTROL

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INTENDED AUDIENCE : B.tech and M.tech and participants from the industry.

INDUSTRY SUPPORT : ABB, GE, STATCON ENERGIAA, BHEL

COURSE OUTLINE :

This course is suitable for UG (B.Tech) and M.tech studying in advance Power Electronics. This course describes modern topics of Power Electronics in terms of switches, topologies and control. More over the proposed course explains application of Power Electronics in drives, Power Systems and Renewable Energy and other utility. This application of the Power Electronics including all these fields have been discussed in detail with advanced switching topology and modern control techniques. Students of B.tech and M.tech and participants of industry will find this course beneficial not only for GATE and other competitive exam this proposed course will also help them to upgrade for the fast changing Power Electronics industry.

ABOUT INSTRUCTOR :

Prof. Avik Bhattacharya is working as Assistant Professor in IIT Roorkee from February 2014. Before joining IIT Roorkee he was research and development team of Danfoss Solar inverter and ABB. He has over a decade of experience in power quality issues and published four IEEE transaction on it. He is also teaching this course in IIT Roorkee for past two years for UG and PG (B.Tech fourth year and M.Tech) . His teaching is right blending of Industry, research and academic interest

COURSE PLAN :

Week 1 : Basic Concept of Switches and Device Physics

Week 2 : Device Physics, Application and Analysis of Switches and Single Phase Converter

Week 3 : Single Phase Converter, Three Phase Converter, Multipulse Converter and Effect of Source Inductance and PWM Rectifiers **Week 4 :** PWM Rectifiers and Power Factor Improvement Techniques and non- isolated DC- DC converters

Week 5 : Non- isolated and isolated DC- DC Converters and Choppers

Week 6 : Isolated DC- DC Converters IV and VSI & CSI, MLI and ZSI

Week 7 : SVM, AC to AC Converters, Cycloconverter and Matrix Converter

Week 8 : Linear Control in Power Electronics, Nonlinear Control in Power Electronics, Applications and Conclusions.