POWER PLANT ENGINEERING

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IIT Roorkee

INTENDED AUDIENCE : UG students of Mechanical Engineering
INDUSTRIES APPLICABLE TO : All power plant industries

COURSE OUTLINE :
This course provides a simple understanding of the power plant engineering. The course contains the details of steam and gas thermal power plants, hydro power plants, nuclear power plants, along with solar, wind and geothermal energy power systems in addition to the direct energy conversion. The economics of power generation and the environmental aspect of power generation are also being addressed in this course.

ABOUT INSTRUCTOR :
Prof. Ravi Kumar is a Professor in the Department of Mechanical & Industrial Engineering, Indian Institute of Technology Roorkee. He has been teaching thermal engineering courses in the Department and is actively involved in the research related with Solar Energy. He is a member of ASME, ASHRAE and IIFIIR.

COURSE PLAN :

Week 1: The energy scenario, steam power plants, fuel handling, ash handling, chimney draught

Week 2: Fossil fuel steam generators, high pressure boilers, performance of boilers, fuels and combustion, steam turbines

Week 3: Impulse turbines, reaction turbines, feed water treatment, steam condensers, problem solving

Week 4: Condensate feed water system, circulating water system, gas turbine cycles, combined cycles, hydro-electric, power plants

Week 5: Classification of hydro-plants , hydraulic turbines, hydro plant controls, problem solving

Week 6: Principles of nuclear energy, thermal fission reactors and Power Plants, Fast breeder reactors, solar energy, solar thermal energy

Week 7: Solar thermal energy, direct energy conversion, wind energy, geothermal energy, energy from oceans

Week 8: Energy storage, economics of power generation, environmental aspect of power generation, problem solving