MECHANICAL ENGINEERING

STEAM AND GAS POWER SYSTEMS

PROF. RAVI KUMAR
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IIT Roorkee

TYPE OF COURSE : Rerun | Core | UG/PG
PRE - REQUISITES : None
INDUSTRY SUPPORT : BHEL, NTPC and other private power industries.
COURSE DURATION : 8 weeks (25 Feb'19 - 19 Apr'19)
EXAM DATE : 28 Apr 2019

COURSE OUTLINE :

This Course provides a simple understanding of the steam and gas power systems. The course contains the analysis of vapour power cycle i.e. Rankine cycle, steam generators and their accessories, Performance of Boilers and combustion of fuel, high pressure boilers, flow through steam and gas nozzles, different type of steam turbines for power generation and condensers. The gas turbine cycle, working of gas turbines, centrifugal compressors, axial compressors and combustion chamber of gas turbines.

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 to UG and PG students of the Department. He is a member of ASME, ASHRAE and IIFIIR. He has supervised number of masters and doctoral students in this area.

COURSE PLAN :

Week 1 : Review of Thermodynamics, Rankine Cycle, Performance of Rankine Cycle, Binary Vapour Cycle and Co-generation, Problem Solving.

Week 2 : Steam Generators, Fire Tube Boilers, Water Tube Boilers, Boiler Mountings and Accessories, High Pressure Boilers- LaMont and Benson Boilers.

Week 3 : High Pressure Boilers- Loeffer and Velox Boilers, Draught, Performance of Boilers, Combustion of Fuel,Problem Solving.

Week 4 : Boiler Trial, Nozzles and Diffusers-Momentum and Continuity Equations, Nozzles and Diffusers-Efficiency and Critical Pressure, Nozzles and Diffusers-General Relationship and supersaturated Flow, Problem Solving.

Week 5 : Steam Turbines, Compounding of Steam Turbines, Impulse Steam Turbines, Impulse Steam Turbine Performance,Problem Solving.

Week 6 : Impulse-Reaction Steam Turbines, Impulse-Reaction Turbine Performance, Energy Losses in Steam Turbines,Condensers, Problem Solving.

Week 7 : Gas Turbine Cycles, Gas Turbine Cycles- Performance Evaluation, Gas Turbine Cycles- Modifications, Problem Solving,Centrifugal Compressors.

Week 8 : Centrifugal Compressor Characteristics, Axial Flow Compressors, Axial Flow Compressor Characteristics, Jet Propulsion,Problem Solving.