

Course Number and Name												
BEE505 & Power Generation Systems												
Credits and Contact Hours												
3 & 45												
Course Coordinator's Name												
Mr.K.S.Prasad												
Text Books and References												
Text Books:												
. 1. Nagpal.G.R, "Power plant engineering", Khanna Publishers, New Delhi, 2001.												
2. Uppal.S.L, "Electrical Power", Khanna Publishers, New Delhi, 1997.												
References:												
1. Soni, Gupta, Bhatnagar, "A Course in Electrical Power", Dhanpat Rai & Sons, Delhi.1992.												
2. Sam.G,Dukelow, "The control of boilers", Instrument Society of America,1991												
3. Nagrath.I.J, and Kothari.D.P, "Modern Power System Analysis", Tata McGraw Hill, 3rd Edition, 2003.												
4. Wadhwa, C.L., "Generation, Distribution and Utilization of Electric Energy", New Age International Ltd.,3rd Edition,2011												
5. Gupta.B.R, "Generation of Electrical energy" , Eurasia Publishing House(p)Ltd,New Delhi,2003												
6. Deshpande.M.V, "Elements of Electrical Power Station design", Pitman, NewDelhi.1991.												
7. Anne-Marie Borbely, Jan F.Kreider, "Distributed Generation", CRC Press LLc, 2001.												
8. Jain.R.K, "Mechanical and industrial Measurements", Khanna Publishers, New Delhi, 1995.												
9. http://nptel.ac.in/courses/108102047/												
Course Description												
To understand the working of different types of power generation systems and to realize the necessity for interconnected operation of different power stations.												
Prerequisites						Co-requisites						
Basic Mechanical Engineering						Nil						
required, elective, or selected elective (as per Table 5-1)												
Required												
Course Outcomes (COs)												
CO1: To learn the economics connected with power generation												
CO2: To learn generation of electrical power from different types of power plants like thermal ,nuclear and hydro power stations.												
CO3: To understand the measurement of various parameter in power plant and power plant instrumentation.												
CO4: To understand the monitoring and control concepts of the of the boiler and turbine.												
CO5: To understand the concepts of generation of electrical power using non-conventional energy resources.												
Student Outcomes (SOs) from Criterion 3 covered by this Course												
COs/SOs	a	b	c	d	e	f	g	h	i	j	k	l

CO1	M	H	H		H	M	L	M	L	H	H	H
CO2	H	H	M		H	M	M	M	M	H	M	H
CO3	H	H	H		H	M	M	H	M	H	M	H
CO4	H	H	M		H	H	M	M	L	H	H	H
CO5	H	H	H		H	M	M	M	H	H	H	H

List of Topics Covered

UNIT I ECONOMICS OF GENERATION 9

Load and load duration curve – Load, demand and diversity factors – Plant capacity and plant use factors – choice of type of generation – choice of size and number of unit – cost of energy generated – Tariffs.

UNIT II THERMAL, NUCLEAR AND HYDRO POWER PLANTS 9

Location, Layout and working of steam ,diesel and gas power plants - Principles of nuclear power generation, Types of nuclear power plants and their comparison, Layout and working of nuclear power plants, Advantages and disadvantages of nuclear energy-Layout and working, Types of hydroelectric power plants, Advantages of hydro generation, Environmental issues.

UNIT III POWER PLANT INSTRUMENTATION 9

Importance of instrumentation in power plants, P & I diagram of boiler- Measurements of non-electrical parameters, flow of feed water, air, steam, radiation detector, smoke density measurement-analyzers, flue gas oxygen analyzer, chromatography, PH meter, pollution monitoring instruments.

UNIT IV BOILER, TURBINE-MONITORING AND CONTROL 9

Combustion control - furnace draft control-drum level control- deaerator control- boiler interlocks-speed, vibration, temperature monitoring control of turbine- lubrication and cooling system of turbine.

UNIT V NON CONVENTIONAL PLANTS 9

Introduction to the concept of distributed generation –basics on distributed generation Technologies- Effect on system operation. Basic concepts, Principle of working and layout of MHD, Solar, Wind, Tidal, Biomass and Geothermal Power Generation Systems.