#### **Course Number and Name**

BEE045 & Instrumentation and Control In Power Plant Industries

#### **Credits and Contact Hours**

3 & 45

### **Course Coordinator's Name**

Mr.Vijaaragavan

### **Text Books and References**

#### **Text Books:**

- 1. P. K. Nag, "Power Plant Engineering" 2<sup>nd</sup> Edition, Tata McGraw-Hill Education, 2002
- 2. Sam G. Dukelow, "The control of boilers" 2<sup>nd</sup> Edition, Research Triangle Park, 1991 **References:**
- 1. R.K.Jain, "Mechanical and Industrial Measurements", 10<sup>th</sup> Edition, Khanna Publishers, New Delhi,1995.
- 2. Bela G Liptak, "Instrumentation in the processing industries"1st edition, Chilton Book Co, Chilton Book Co; 1973.
- 3. https://app.knovel.com/web/toc.v/cid:kpPCITCBH4

#### **Course Description**

We can know about the various methods of power generation and its control methods.

Prerequisites	Co-requisites					
Control System	Nil					
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required, elective, or selected elective (as per Table 5-1)

Required

#### **Course Outcomes (COs)**

CO1: Measurement, Control System

CO2: To be familiar about the important parameters that has to be monitored and controlled CO3: To be familiar about the various parameters that has to be analyzed and measured analytically

CO4: To understand about the boilers.

CO5: To get an detailed knowledge about Nuclear Power Plant Instrumentation

Student Outcomes (SOs) from Criterion 3 covered by this Course													
	COs/SOs	а	b	с	d	e	f	g	h	i	j	k	1
	CO1	Н	Η	Η	Η	Η		Η	Η	Η	Η	М	М
	CO2	М			М	М	М	L	L				Н
	CO3	L	L	Η									Н
	CO4		Η	Η	Η								Н
	CO5	Η	М	Η					Η		Η		Н
List of Topics Covered													
UNIT IOVERVIEW OF POWER GENERATION9											9		

Brief survey of methods of power generation-Wind, Solar, Tidal, Geothermal, MHD, Fuel cells,

Biomass-Conventional energy resources-Hydro, Nuclear, Gas, Thermal-Comparison of various conventional power plants-Importance of Instrumentation and control in power generation-P&I diagrams-P&I diagram of boiler-co-generation

# UNIT II TURBINE MONITORING AND CONTROL

Electrical parameters-Current, Voltage, Power, Energy, Frequency, Power factor etc-Nonelectrical parameters-Flow of feed water, fuel, air and steam with correction factor for temperature and pressure-Speed, vibration, shell temperature monitoring and control-Steam pressure control-Lubricant oil temperature control- cooling system.

## UNIT III ANALYTICAL MEASUREMENT

Oxygen measurement in flue gas-CO2 in flue gas-Combustibles analyzers-Infrared flue gas analyzers-Smoke detector-Dust monitor-Closed Circuit Television-Fuel analyzers-Pollution monitoring instruments

## UNIT IV CONTROL LOOPS IN BOILERS

Combustion control-air-fuel ratio control-furnace draft control-drum level control- main steam and reheat steam temperature control-super heater control- attemperator- deaerator control-Distributed Control System in power plant interlocks in boiler operation. 188 IC-2013 SRM(E&T)

# UNIT V NUCLEAR POWER PLANT INSTRUMENTATION

Introduction-Nuclear physics-Classification of nuclear reactors-Basic reactor systems-P&I diagram of Nuclear power plant-Radiation detection instruments- nuclear reactor control systems and allied instrumentation

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