Tulsiramji Gaikwad-Patil College of Engineering and Technology
Wardha Road, Nagpur-441 108
NAAC Accredited (A+ Grade)
An Autonomous Institute affiliated to RTMNU Nagpur

Third Year (Semester-V) B.Tech.

BEEXX11: Power Plant System (Open Elective)

Teaching Scheme	
Lectures	3 Hrs/week
Tutorial	0 Hrs/week
Total Credit	3

Examination Scheme	
CT-1	15 Marks
CT-2	15 Marks
TA	10 Marks
ESE	60 Marks
Total	100 Marks
Duration of ESE: 03 Hrs 00 Min.	

Course Objective

Students will be able to

1	To familiarize the students to the working of power plants based on different fuels.
2	To introduce the students the working of renewable energy sources.
3	To expose the student's different types of tariffs and the terms related to economic generation. .

Course Contents

Unit I	**Thermal Station :** Selection of site for thermal station, main parts and working of thermal plant, boiler, types of boiler, coal handling system, pulverizes and coal burners, combustion system, draft, ash handling system, Dust collection system , Feed water treatment and condenser and cooling towers and cooling ponds.
Unit II	**Hydro station:** Selection of site, classification, power station structure, layout and control, construction & operation of different components like Dams, spillways, Gates, canal, penstocks, Advantages and disadvantage.
Unit III	**Nuclear station:** Factors for selection of site, main parts of reactor and their functions, reactor control, boiling water reactor, pressurized water reactor, their advantages, disadvantages, plant layout and working.
Unit IV	**Renewable Energy Sources** Introduction to solar energy, Solar energy collectors, solar energy storage, electrical power generation and other Miscellaneous applications of solar energy. Introduction to wind energy, Basic principles of wind energy conversion, site selection. Basic component of wind energy conversion system, Basic principle of Tidal power ,site selection, storage and plant layout for Tidal power plant
Unit V	**Tariff and Economic Aspect in power generation:** Different factors connected with generating station like connected load maximum demand, demand factor, load factor, diversity factor, plant capacity and utilization factor, load curve etc. Tariff: Flat rate tariff, two part tariff, block rate tariff, maximum demand tariff.

Text Books

T.1	Power Plant Engineering : P. K. Nag, TMH
T.2	Generation of Electrical Energy : Dr. B.R. Gupta, publisher S. Chand
T.3	An Introduction to Power Plant Technology authored : G.D. Rai
T.4	Power Plant Engineering: P.C. Sharma, Publisher: Kataria, S.K. & Sons (2004)
T.5	Non conventional Energy sources by G.D. Rai. 4th edition khanna publishers 2010.

Reference Books

R.1	Elements of Power Station Design: M.V. Deshpande, edition: Reprint, publisher: PHI Learning Pvt. Ltd., 2009.
R.2	Chakraborty, Sony, Power System Engineering, 15th Edition, Dhanpatrai & Sons, 2002
R.3	Power plant Engg - Elanchezhian- I.K. International Publications.

Useful Links	
1	NPTEL :: ElectricalEngineering - NOC: Power Plant Engineering
2	Power Plant Engineering (PPE) Notes Pdf - 2020 | SW (smartzworld.com)

	Course Outcomes	CL	Class Sessions
BEEXX11.1	**Analyze** the working and layout of Thermal power plants and the other systems comprising the plant.	4	9
BEEXX11.2	**Analyze** the working and layout of Hydro power plants and other systems comprising the plant.	4	9
BEEXX11.3	**Describe** the working principle and basic components of the nuclear power plant, voltage control, captive & Cogeneration.	3	9
BEEXX11.4	**Investigate** the role of renewable Energy sources.	2	9
BEEXX11.5	**Describe** factors involved in economics of power plant operation as well as understand and apply the concept of Tariff	3	9

HOD
Department Of Electrical Engineering
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Of Engineering And Technology
Nagpur

Dean Academics
Tulsiramji Gaikwad-Patil
College Of Engineering
and Technology, Nagpur

Vice-Principal
TulsiRamji Gaikwad Patil
College Of Engineering &
Technology, Nagpur

Principal
Tulsiramji Gaikwad Patil College Of
Engineering and Technology, Nagpur