

Maulana Abul Kalam Azad University of Technology, West Bengal*(Formerly West Bengal University of Technology)***Syllabus for B. Tech in Electrical Engineering**

(Applicable from the academic session 2018-2019)

Name of the course	THERMAL POWER ENGINEERING		
Course Code:ES-EE-401	Semester: 4th		
Duration: 6 months	Maximum Marks: 100		
Teaching Scheme	Examination Scheme		
Theory: 3 hrs/week	Mid Semester Exam: 15 Marks		
Tutorial: 0 hr/week	Assignment & Quiz: 10 Marks		
Practical: hrs/week	Attendance: 05 Marks		
Credit Points: 3	End Semester Exam: 70 Marks		
Objective:			
1.	To learn the principle of operation of different types of boilers and Turbines		
2.	To learn the principle of operation of IC engines and Gas turbines		
6.	To acquire problem solving skills to solve problems of boilers, turbines, IC engines and Gas turbines		
Pre-Requisite			
1.	Mathematics (BS M102 & BS M201)		
Unit	Content	Hrs	Marks
1	Boilers: Water Tube & Fire Tube boilers, Circulating Principles, Forced Circulation, Critical pressure, Superheaters, Reheaters, attemperators, induced draught, forced draught and secondary air Fans, Boiler performance analysis and heat balance. Combustion Systems, Environmental Protection – ESP, Cyclone Separator, Dust Collector etc.	12	
2	Turbines: Rotary Thermodynamic devices – Steam turbines & their classifications – Impulse & Reaction typeTurbines, Thermodynamics of compressible fluid-flow, equation and continuity – Isentropic flow through nozzles, velocity diagram, Blade efficiency, optimum velocity ratio, multi-staging, velocity & pressure compounding, losses in turbines, erosion of turbine blades, turbine governing, performance analysis of turbine, Condensing system.	12	
3	IC Engines: IC Engines – classification, Analysis of a standard cycle, fuel characteristic of SI & CI Engine, Combustion, Engine performance Automotive Engine exhaust emission and their control	6	
4	Gas Turbines: Gas turbine Analysis – Regeneration - Reheating, Isentropic efficiency Combustion efficiency	5	

Text books:

1. Engineering Thermodynamics, P.K. Nag, 6th Edition , Mc Graw Hill Education Pvt. Ltd
2. Power Plant Engineering, P K Nag, 4th Edition, Mc Graw Hill Education Pvt. Ltd
3. Thermal Engineering , P.S. Ballaney, 25th Edition , Khanna publishers

4. Power Plant Engineering, Domkundwar, Arora, Dhanpat Rai & Co.

Reference books:

1. Thermodynamics , Cengel , 6th Edition, Tata Mc Graw- Hill Education.
2. Power Plant Technology ,M M El-Wakil 1st Edition, Tata McGraw Hill
3. Heat and Thermodynamics, M W Zemansky & R.H.Dittman , 8th Edition, McGraw Hill

Course Outcome:

After completion of this course, the learners will be able to

1. describe the function of different components of boilers. Engines and turbines
2. explain the principle of operation of different types of boilers, turbines, IC engines and Gas turbines.
3. solve numerical problems of boilers, turbines, IC engines and Gas turbines.
4. analyze the performance of boilers, engines and turbines.
5. determine efficiency of boilers, engines and turbines.
6. explain methods to control boiler, engines and turbines parameters.

Special Remarks (if any)

The above-mentioned outcomes are not limited. Institute may redefine outcomes based their program educational objective.