

M.E Semester: 1 Mechanical Engineering (Thermal Engineering)
Subject Name: BOILER TECHNOLOGY

A. Teaching Scheme Course Objective

- To present a problem oriented in depth knowledge of Boiler Technology
- To address the underlying concepts and methods behind Boiler Technology

B. Teaching / Examination Scheme

SUBJECT		Teaching Scheme				Total Credit	Evaluation Scheme					Total Marks
		L	T	P	Total		THEORY		IE	CIA	PR. / VIVO	
CODE	NAME	Hrs	Hrs	Hrs	Hrs		Hrs	Marks	Marks	Marks	Marks	
METH106-A	Boiler Technology	3	0	0	3	3	3	70	30	20	0	120

C. Detailed Syllabus

1. INTRODUCTION: Parameter of a Steam Generator-Thermal Calculations of a Modern steam Generator - Tube Metal Temperature Calculation and choice of Materials - Steam Purity Calculations and Water Treatment
2. HEAT BALANCE: Heat transfer in Furnace - Furnace Heat Balance - Calculation of Heating Surfaces - Features of Firing Systems for solid -Liquid and Gaseous Fuels-Design of Burners
3. BOILER DESIGN: Design of Boiler Drum - Steam Generator Configurations For Industrial Power and Recovery Boilers – Pressure Loss and Circulation in Boilers
4. DESIGN OF ACCESSORIES: Design of Air Preheaters - Economizers and Superheated for high Pressure Steam Generators - Design Features of Fuel Firing Systems and Ash Removing Systems
5. BOILER CODE: IBR and International Regulations - ISI Code's Testing and Inspection of Steam Generator - Safety Methods in Boilers - Factor of Safety in the Design of Boilers Drums and Pressure Parts - Safety of Fuel Storage and Handling - Safety Methods for Automatic Operation of Steam Boilers

D. Lesson Planning

Sr.No.	Date/Week	Unit No.	% Weightage	Topic No:
1	1 st , 2 nd , 3 rd	Unit 1	20 %	1
2	4 th , 5 th , 6 th	Unit 2	20 %	2
3	7 th , 8 th , 9 th	Unit 3	20 %	3
4	10 th , 11 th , 12 th	Unit 4	20 %	4
5	13 th , 14 th , 15 th	Unit 5	20 %	5

E. Instructional Method & Pedagogy

1. At the start of course, the course delivery pattern , prerequisite of the subject will be discussed.
2. Lecture may be conducted with the aid of multi-media projector, black board, OHP etc. & equal weightage should be given to all topics while teaching and conduction of all examinations.
3. Attendance is compulsory in lectures and laboratory, which may carries five marks in overall evaluation.
4. One/Two internal exams may be conducted and total/average/best of the same may be converted to equivalent of 30 marks as a part of internal theory evaluation.
5. Assignment based on course content will be given to the student for each unit/topic and will be evaluated at regular interval. It may carry an importance of ten marks in the overall internal evaluation.
6. Surprise tests/Quizzes/Seminar/Tutorial may be conducted and having share of five marks in the overall internal evaluation.

F. Students Learning Outcomes

- The student can identify different areas of Applied Mathematics Boiler Technology.
- Can find the applications of all the areas in day to day life.

G. Recommended Study Materials

• **Text & Reference Books**

1. David Gunn, Robert Horton, Industrial Boilers - Longman Scientific & Technical Publication, 1986
2. Carl Schields, Boilers - Type, Charecteristics and Functions, McGraw Hill Publishers, 1982
3. Modern Power Station Practice(8 vol) - Central Electricity Generation Board, 1980
4. Large Boiler Furnaces, Richard Dolezal Elsevier Publishing Company, 1980

• **Websites:**

1. <http://www.volund.uk>
2. <http://www.aee.vatech.co.at>
3. <http://www.thermomax.com>
4. <http://www.pages.hotbot.com>

