TCET/FRM/IP-02/09

Semester Plan

(Theory)

Semester: IIIrd

Subject: Adv. Thermodynamics

Sr.No	Prerequisite/ Bridge course:	Duration (Week /Hrs)	Modes of Learning
1	Prerequisite Course: Physics Maths	4 hours	Self Learning/ Revision

Sr. No	Module No.	Lesson No.	Topics Planned	Teaching Aid required	Planned Week
1	1	L 1.1	Thermodynamics and its importance Macroscopic and Microscopic view point,	Laptop , Projector, chalk , Board	17-07-2017
2	1	L 1.2	Thermodynamic System, Surrounding and Boundary	Laptop , Projector, chalk , Board	18-07-2017
3	1	L 2.1	Control Volume approach and Systems approach, Equilibrium – Thermal	Laptop , Projector, chalk , Board	19-07-2017
4	1	L 2.2	Pure Substance, Property – Intensive and Extensive	Laptop , Projector, chalk , Board	20-07-2017
5	1	L 2.3	Mechanical and thermodynamic, , State, Path, Process and Cycle.	Laptop , Projector, chalk , Board	21-07-2017
6	1	L 2.4	Point Function and Path Function, Quasi Static Process and processes like Isobaric,	Laptop , Projector, chalk , Board	24-07-2017
7	1	L 3.1	Function, Quasi Static Process and processes	Laptop , Projector, chalk , Board	25-07-2017
8	1	L 3.2	Adiabatic Process, Equations of state, Ideal gas Equation-; Specific gas constant and Universal Gas Constant	Laptop , Projector, chalk , Board	26-07-2017
9	2	L 3.3	Relation between Heat and Work-Joules Constant, First law of	Laptop , Projector, chalk , Board	27-07-2017
10	2	L 3.4	First law of thermodynamics for a closed system undergoing a	Laptop , Projector, chalk , Board	28-07-2017
11	2	L 4.1	First Law of Thermodynamics applied to open system – Steady	Laptop , Projector, chalk , Board	31-07-2017
12	2	L 4.2	Perpetual motion Machine of First kind, Application of first law	Laptop , Projector, chalk , Board	01-08-2017

TCET/FRM/IP-02/09

Semester Plan

(Theory)

Semester: IIIrd

Subject: Adv. Thermodynamics

Sr.No	Prerequisite/ Bridge course:	Duration (Week /Hrs)	Modes of Learning
1	Prerequisite Course: Physics Maths	4 hours	Self Learning/ Revision

Sr. No	Module No.	Lesson No.	Topics Planned	Teaching Aid required	Planned Week
13	2	L 4.3	Application of first law of thermodynamics to Open	Laptop , Projector, chalk , Board	02-08-2017
14	2	L 4.4	Steam Turbine, Pump, – Joules	Laptop , Projector, chalk , Board	03-08-2017
15	2	L 5.1	Heat Exchanger, Throttling Process	Laptop , Projector, chalk , Board	07-08-2017
16	2	L 5.2	Limitation of first law of thermodynamics, Thermal	Laptop , Projector, chalk , Board	08-08-2017
17	2	L 5.3	Heat Pump and Refrigerator, Second law of thermodynamics –	Laptop , Projector, chalk , Board	09-08-2017
18	2	L 5.4	Equivalence of Clausius and Kelvin Planck Statement,	Laptop , Projector, chalk , Board	10-08-2017
19	2	L 6.1	Causes of Irreversibility, Perpetual Motion Machine of	Laptop , Projector, chalk , Board	11-08-2017
20	2	L 6.2	Carnot cycle, Thermodynamic Temperature Scale and its	Laptop , Projector, chalk , Board	24-08-2017
21	3	L 6.3	Clausius Inequality, Clausius Theorem, Entropy is Property of	Laptop , Projector, chalk , Board	30-08-2017
22	3	L 6.4	Temperature Entropy Plot and its relationship with heat interactions	Laptop , Projector, chalk , Board	31-08-2017
23	3	L 7.1	Reciprocal Relation, Cyclic Relation Property relations	Laptop , Projector, chalk , Board	01-09-2017
24	3	L 7.2	Maxwell Relations, TdS equations, Heat capacity	Laptop , Projector, chalk , Board	04-09-2017
25	3	L 8.1	Volume Expansivity, Isothermal Compressibility,	Laptop , Projector, chalk , Board	05-09-2017
26	3	L 8.2	Clausius-Clapeyron Equation	Laptop , Projector, chalk , Board	06-09-2017

TCET/FRM/IP-02/09

Semester Plan

(Theory)

Semester: IIIrd

Subject: Adv. Thermodynamics

Sr.No	Prerequisite/ Bridge course:	Duration (Week /Hrs)	Modes of Learning
1	Prerequisite Course: Physics Maths	4 hours	Self Learning/ Revision

Sr. No	Module No.	Lesson No.	Topics Planned	Teaching Aid required	Planned Week
27	4	L 8.3	High grade and Low Grade Energy, Available and	Laptop , Projector, chalk , Board	07-09-2017
28	4	L 8.4	Dead State, Available energy with respect to a process and a	Laptop , Projector, chalk , Board	08-09-2017
29	4	L 9.1	Decrease of Available Energy When heat is transferred through	Laptop , Projector, chalk , Board	11-09-2017
30	4	L 9.2	Pure substance and Phase changes: Phase change processes	Laptop , Projector, chalk , Board	12-09-2017
31	4	L 9.3	Property diagrams for phase change process (T-v, T-s and p-h	Laptop , Projector, chalk , Board	13-09-2017
32	5	L 9.4	Understanding of Steam Table and Mollier chart with suitable	Laptop , Projector, chalk , Board	14-09-2017
33	5	L 10.1	Reciprocating Air Compressor, Single stage compressor –	Laptop , Projector, chalk , Board	15-09-2017
34	5	L 10.2	effect of clearance volume, volumetric efficiency, Free air	Laptop , Projector, chalk , Board	18-09-2017
35	5	L 10.3	Theoretical and actual indicator diagram	Laptop , Projector, chalk , Board	19-09-2017
36	5	L 10.4	Multistage compressors – Constructional details of	Laptop , Projector, chalk , Board	20-09-2017
37	5	L 11.1	Need of multistage, Computation of work done	Laptop , Projector, chalk , Board	21-09-2017
38	5	L 11.2	Volumetric efficiency, Condition for maximum efficiency, Inter	Laptop , Projector, chalk , Board	22-09-2017
39	5	L 11.3	Rotary Air Compressors- Classification, Difference between compressors and blowers	Laptop , Projector, chalk , Board	25-09-2017

TCET/FRM/IP-02/09

Semester Plan

(Theory)

Semester: IIIrd

Subject: Adv. Thermodynamics

Sr.No	Prerequisite/ Bridge course:	Duration (Week /Hrs)	Modes of Learning
1	Prerequisite Course: Physics Maths	4 hours	Self Learning/ Revision

Sr. No	Module No.	Lesson No.	Topics Planned	Teaching Aid required	Planned Week
40	6	L 11.4	Working and constructional details of roots blower, Screw type and vane type compressors	Laptop , Projector, chalk , Board	26-09-2017
41	6	L 12.1	Carnot cycle and its limitations as a vapour cycle	Laptop , Projector, chalk , Board	03-10-2017
42	6	L 12.2	Rankine cycle with different turbine inlet conditions	Laptop , Projector, chalk , Board	04-10-2017
43	6	L 12.3	Mean temperature of heat addition, Methods to improve	Laptop , Projector, chalk , Board	05-10-2017
44	6	L 12.4	Reheat cycle and Regeneration Cycle.	Laptop , Projector, chalk , Board	06-10-2017
45	6	L 13.1	Assumptions of Air Standard Cycle, Otto cycle	Laptop , Projector, chalk , Board	12-10-2017
46	6	L 13.2	Diesel Cycle and Dual cycle, Brayton Cycle	Laptop , Projector, chalk , Board	13-10-2017
47	6	L 13.3	Sterling Cycle and Ericsson Cycle	Laptop , Projector, chalk , Board	16-10-2017
48	6	L 13.4	Lenoir cycle and Atkinson cycle	Laptop , Projector, chalk , Board	21-10-2017
Remark:			Syllabus Coverage:	Practice Session: 2	
Course:					
No. of (lectures planned)/(lecture taken):					

Advanced course: Analysis of Flow inside the Engine	CFD	20 Hours	Online NPTELcourse videos with Hands on Training