

**GOPAL KRISHNA COLLEGE OF
ENGINEERING AND TECHNOLOGY
GOURAHARI VIHAR, PO: RANIPUT, JEYPORE – 764 005**

LESSON PLAN

Name of the Subject: ENGINEERING THERMODYNAMICS(ET)

Name of the Faculty: Er. DIPAK KUMAR DIP

Subject Code:MEPC2002

Course Structure:3-0-0

Semester: 3rd Semester

Branch:Mechanical

Semester From: JULY to DECEMBER

No. of Weeks: 16

Week	Day	Theory / Practical Topics	Classes
		Unit 1 – Laws of Thermodynamics and Entropy	9
1	1	Review of First Law of Thermodynamics	1
	2	Review of Second Law of Thermodynamics	1
	3	First law analysis of steady flow systems	1
2	4	First law analysis of transient flow systems	1
	5	Entropy generation concept	1
	6	Entropy balance for closed systems	1
3	7	Entropy balance for steady flow systems	1
	8	Numerical problems on entropy	1
	9	Revision of Module-I	1
		Unit 2 – Availability and Exergy Analysis	9

Week	Day	Theory / Practical Topics	Classes
4	10	Available energy and quality of energy	1
	11	Availability for non-flow processes	1
	12	Availability for flow processes	1
5	13	Irreversibility and exergy concepts	1
	14	Exergy balance	1
	15	Second law efficiency	1
6	16	Numerical problems on exergy	1
	17	Revision of Module-II	1
	18	Tutorial/problem-solving session	1
		Unit 3 – Vapor Power Cycles	9
7	19	Carnot vapor cycle and limitations	1
	20	Rankine cycle	1
	21	Efficiency improvement methods of Rankine cycle	1
8	22	Reheat cycle	1
	23	Regenerative feed heating cycle	1
	24	Cogeneration systems (back pressure & pass-out turbines)	1
9	25	Numerical problems on vapor cycles	1
	26	Revision of Module-III	1

Week	Day	Theory / Practical Topics	Classes
	27	Tutorial session	1
		Unit 4 – Thermodynamic Relations and Gas Power Cycles	12
10	28	Maxwell relations	1
	29	Clapeyron equation	1
	30	TdS relations	1
11	31	Isothermal compressibility and volume expansivity	1
	32	Joule-Thomson coefficient	1
	33	Air standard cycles: Otto cycle	1
12	34	Diesel cycle	1
	35	Dual combustion cycle	1
	36	Brayton cycle	1
13	37	Numerical problems on gas power cycles	1
	38	Revision of Module-IV	1
	39	Tutorial/problem-solving	1
		Unit 5 – Air Compressors	9
14	40	Introduction to reciprocating compressors	1
	41	Reciprocating cycle without clearance	1

Week	Day	Theory / Practical Topics	Classes
	42	Reciprocating cycle with clearance	1
15	43	Volumetric efficiency	1
	44	Multistage compression and intercooling	1
	45	Optimum intercooler pressure	1
16	46	Numerical problems on compressors	1
	47	Overall revision	1
	48	Doubt clearing and exam preparation	1

Books Recommended

1. *Engineering Thermodynamics* by P.K. Nag
2. *Thermodynamics: An Engineering Approach* by Yunus A. Çengel and Michael A. Boles
3. *Engineering Thermodynamics* by R.K. Rajput
4. *Fundamentals of Engineering Thermodynamics* by Sonntag, Borgnakke and Van Wylen

NPTEL Lectures

1. <https://nptel.ac.in/courses/112105266>
2. <https://nptel.ac.in/courses/112103307/>