

GOVERNMENT POLYTECHNIC KORAPUT

Th3. Elements of Mechanical Engineering

Name of the Course: Diploma in Electrical Engineering			
Faculty: N Bikash Rao		Semester Start Date: 01/08/2023 End Date : 30/11/2023	
Course code:	Th3	Semester	3 rd
Total Period:	60	Examination	3Hrs
Theory periods:	4P/Week	Internal Assessment	20
Maximum marks:	100	End Semester Examination	80

DEPARTMENT OF ELECTRICAL ENGINEERING

Vision:-

To create competent & industry ready Electrical Diploma Engineers with professional and social values to meet future challenges.

Mission:-

- To prepare diploma holders through "qualitative competency based education system" to compete with national requirement along with core values.
- To produce dynamic Electrical Engineers to serve the society and industry.
- To develop leadership qualities, communication skills, critical thinking and attitude for Lifelong Learning.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

PEO1:	Apply technical knowledge and skills learned in the field of electrical engineering to excel in professional and/or higher education.
PEO2;	To provide students an excellent academic environment and make them aware of the needs of Society and Industry to become a successful Professional/Entrepreneur.
PEO3:	To engage in lifelong learning, career enhancement to adopt emerging technologies.

Course Outcomes:-

CO1:	Enhancement of fundamental knowledge of Thermodynamics.
CO2:	Enhancement of fundamental knowledge I.C engine.
CO3:	Evaluate the properties of steam.
CO4:	Explain the principle of working of Boilers, Turbines and condensers and their uses.



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TOPIC WISE DISTRIBUTION OF PERIODS

SL.NO	TOPIC	PERIODS
1.	THERMODYNAMICS	06
2.	PROPERTIES OF STEAM	05
3.	BOILERS	10
4.	STEAM ENGINES	10
5.	STEAM TURBINES	06
6.	CONDENSER	04
7.	I.C. ENGINE	04
8.	HYDROSTATICS	05
9.	HYDROKINETICS	05
10.	HYDRAULIC DEVICES AND PNEUMATICS	05
	TOTAL	60

LESSON PLAN

Week	Class Day	Theory/Practical Topics
1 ST	1 ST	Introduction to thermodynamics, scope of thermodynamics, approach to thermodynamics
	2 ND	Thermodynamic system, properties, path, state, process
	3 RD	Thermodynamic equilibrium, point function, path function, reversible process
	4 TH	Heat transfer & work transfer
2 ND	1 ST	First law of thermodynamics
	2 ND	Law's of perfect gas
	3 RD	Specific heat capacity, cp, cv
	4 TH	Relationship between cp & cv
3 RD	1 ST	Pure substance, formation of steam
	2 ND	T-v, T-s diagram of water
	3 RD	P-t, p-v diagram of water, dry steam, wet steam
	4 TH	Dryness fraction, mollier diagram
4 TH	1 ST	Numericals related pure substance
	2 ND	Numericals related pure substance
	3 RD	Boiler. Uses, classification
	4 TH	Types of boiler
5 TH	1 ST	Cochran boiler
	2 ND	Babcock & Willcox boiler
	3 RD	Boiler mountings
	4 TH	Boiler mountings
6 TH	1 ST	Boiler mountings
	2 ND	Boiler mountings
	3 RD	Boiler accessories
	4 TH	Boiler accessories
7 TH	1 ST	Steam engine, classification
	2 ND	Parts of steam engine

8 TH	4 TH	Indicator diagram, expression for mean effective pressure
	1 ST	Indicator power, brake power
	2 ND	Indicated thermal efficiency, brake thermal efficiency, overall efficiency

9 TH	3 RD	Numericals
	4 TH	Numericals
	1 ST	Numericals
	2 ND	Numericals
10 TH	3 RD	Steam turbine & its classification
	4 TH	Impulse turbine
	1 ST	Reaction turbine
	2 ND	Difference between impulse & reaction turbine
11 TH	3 RD	Condenser & its classification
	4 TH	Jet condenser & types
	1 ST	Jet condenser & types
	2 ND	Surface condenser & types
12 TH	3 RD	Surface condenser & types
	4 TH	I.C engine, classification
	1 ST	Parts of IC engine, terminology related IC engine
	2 ND	4-stroke, 2-stroke diesel engine
13 TH	3 RD	4-stroke, 2-stroke petrol engine
	4 TH	Difference between 4-stroke, 2-stroke, petrol & diesel engine
	1 ST	Properties of fluid
	2 ND	Properties of fluid
14 TH	3 RD	Pressure measuring instruments
	4 TH	Pressure measuring instruments
	1 ST	Types of fluid flow,
	2 ND	Continuity equation,
15 TH	3 RD	Energy of fluids, Bernoulli's equation
	4 TH	Bernoulli's equation
	1 ST	Hydraulic intensifier
	2 ND	Hydraulic lift
	3 RD	Hydraulic accumulator
	4 TH	Hydraulic ram

LEARNING RESOURCES:

- 1 Thermal Engineering R.S. Khurmi & Chhand
- 2 Hydraulics & Hydraulic M/Cs A.R. Basu Dhanpat Rai & Co.
- 3 Thermal Engineering A.S. Sarad Satyaprakashan
- 4 Hydraulics & Hydraulic M/Cs R.K. Bansal Laxmi Publishers

Sign. Of Faculty
concerned

N. V. Bhatnagar
01/08/23

Signature of
HOD