Discipline :MECHANICAL	Semester: 4th	Name of theTeachingFaculty Manash Kumar behera Lecturer (Stage-I),Mechanical Engineering
Subject: Thermal Engineering-II (TH:2)	No. of days/perweek classallotted: 3	Semester From date: 22/12/2025 to date:18-04-2026 No. of weeks:17
Week	**ClassDay**	**TheoryTopics:**
1st	1st	Air-standard Brayton cycle; Description with p-v and T-S diagrams
	2nd	Gas turbines Classification: open cycle gas turbines and closed cycle gas turbines;
	3rd	Comparison of gas turbine wjth reciprocating I.C. engines and steam turbines.
2nd	1st	Applications and limitations of gas turbines
	2nd	General lay-out of Open cycle constant pressure gas turbine; P-V and T-S diagrams and working;
	3rd	General lay-out of Closed cycle gas turbine; P-V and T-S diagrams and working.
3rd	1st	Principle of jet propulsion; Fuels used for jet propulsion;
	2nd	Applications of jet propulsion; Working of a turbojet engine
	3rd	Principle of Ram effect; Working of a Ram jet engine
4th	1st	Principle of Rocket propulsion; Working principle of a rocket engine
	2nd	Applications of rocket propulsion; Comparison of jet and rocket propulsions.
	3rd	Formation of steam under constant pressure; Industrial uses of steam;
5th	1st	Basic definitions: saturated liquid line, saturated vapor line, liquid region, vapor region, wet region, superheat region, critical point, saturated liquid, saturated vapor
	2nd	Basic definitions: saturation temperature, sensible heat, latent heat, wet steam, dryness fraction, wetness fraction
	3rd	Basic definitions: 2saturated steam, superheated steam, degree of superheat; Determination of enthalpy, internal energy, internal latent heat
6th	1st	entropy of wet, dry and superheated steam at a given pressure using steam tables and Mollier chart for the following processes: Isochoric process, Isobaric process, Hyperbolic process.

	2nd	Isothermal process, Isentropic process, Throttling process, Polytropic process;
	3rd	Simple direct problems on the above using tables and charts
7th	1st	Steam calorimeters: Separating, throttling, Combined Separating and throttling calorimeters
	2nd	Simple direct problems
	3rd	Function and use of steam boilers; Classification of steam boilers with examples
8th	1st	Brief explanation with line sketches of Cochran, Babcock and Wilcox Boilers
	2nd	Comparison of water tube and fire tube boilers; Description with line sketches and working of modern high pressure boilers Lamont and Benson boilers
	3rd	Boiler mountings: Pressure gauge, water level indicator, fusible plug, blow down cock, stop valve, safety valve, (dead weight type, spring loaded type, high pressure and low water safety alarm)
9th	1st	Boiler accessories: feed pump, economizer, super heater and air preheater; Study of steam traps & separators;
	2nd	Explanation of the terms: Actual evaporation, equivalent evaporation, factor of evaporation, boiler horse power and boiler efficiency
	3rd	Formula for the above terms without proof; Simple direct problems on the above
10th	1st	Draught systems (Natural, forced & induced)
	2nd	Flow of steam through nozzle; Velocity of steam at the exit of nozzle in terms of heat drop using analytical method
	3rd	Flow of steam through nozzle; Velocity of steam at the exit of nozzle in terms of heat drop using Mollier chart
11th	1st	Discharge of steam through nozzles
	2nd	Critical pressure ratio
12th	1st	Effect of friction in nozzles
	2nd	Super saturated flow in nozzles
	3rd	Working steam jet injector
13th	1st	Simple numerical problems.
	2nd	Simple numerical problems.
	3rd	Classification of steam turbines with examples; Difference between impulse & reaction turbines
14th	1st	Principle of working of a simple De-lavel turbine with line diagrams- Velocity diagrams
	2nd	Expression for work done, axial thrust, tangential thrust, blade and diagram efficiency, stage efficiency, nozzle efficiency

	3rd	Methods of reducing rotor speed; compounding for velocity, for pressure or both pressure and velocity
15th	1st	Working principle with line diagram of a Parson's Reaction turbine– velocity diagrams; Simple problems on single stage impulse turbines (without blade friction) and reaction turbine including data on blade height.
	2nd	Bleeding, re-heating and re-heating factors(Problems omitted); Governing of steam turbines: Throttle, By-pass & Nozzle control governing.
	3rd	Throttle, By-pass & Nozzle control governing.
16th	1st	Revision Module I
	2nd	Revision Module II
	3rd	Revision Module III
17th	1st	Revision Module IV
	2nd	Revision Module V
	3rd	Previous Year Question discussion

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MECHANICAL DEPT.

22/12/2025

Manash Kumar Behera
Lecturer (Stage-I)
GP, Gajapati

Discipline: MECHANICAL	Semester: 6th	NameoftheTeachingFaculty Manash Kumar Behera Lecturer (Stage-I),Mechanical Engineering
Subject: INDUSTRIAL ENGINEERING & MANAGEMENT(TH:1)	No. of days/perweek classallotted: 4	Semester From date: 22/12/2025Todate:18-04-26 No. of weeks:17
Week	ClassDay	TheoryTopics:
1st	1st	Selection of Site of Industry
	2nd	Define plant layout
	3rd	Describe the objective and principles of plant layout
	4th	Explain Process Layout, Product Layout
2nd	1st	Explain Combination Layout,Techniques to improve layout
	2nd	Principles of material handling equipment
	3rd	Plant maintenance,Importance of plant maintenance
	4th	Break down maintenance
3rd	1st	Preventive maintenance
	2nd	Scheduled maintenance
	3rd	Introduction to Operations Research and its applications
	4th	Define Linear Programming Problem
4th	1st	Solution of L.P.P. by graphical method
	2nd	Solution of L.P.P. by graphical method
	3rd	Evaluation of Project completion time by Critical Path Method
	4th	Evaluation of Project completion time by Critical Path Method
5th	1st	Evaluation of Project completion time by PERT
	2nd	Evaluation of Project completion time by PERT
	3rd	Explain distinct features of PERT with respect to CPM.
	4th	Classification of inventory.

6th	1st	Objective of inventory control.
	2nd	Describe the functions of inventories.
	3rd	Benefits of inventory control.
	4th	Costs associated with inventory.
7th	1st	Terminology in inventory control
	2nd	Explain and derive economic order quantity for Basic model
	3rd	Solving Numerical
	4th	Define and Explain ABC analysis.
8th	1st	Define Inspection and Quality control.Describe planning of inspection.
	2nd	Describe types of inspection.
	3rd	Advantages and disadvantages of quality control.
	4th	Study of factors influencing the quality of manufacture.
9th	1st	Explain the Concept of statistical quality control, Control charts X
	2nd	Control charts R
	3rd	Control charts (P and C – charts)
	4th	Methods of attributes. Concept of ISO 9001-2008.
10th	1st	Quality management system, Registration /certification procedure.
	2nd	Benefits of ISO to the organization
	3rd	Concept of JIT
	4th	Concept of Six sigma
11th	1st	Concept of 7S
	2nd	Concept of Lean manufacturing
	3rd	Introduction to production planning and control
	4th	Major functions of production planning and control

12th	1st	Methods of forecasting
	2nd	Different types of forecasting
	3rd	Concept of Routing,Scheduling
	4th	Concept of Dispatching
13th	1st	Concept of Controlling
	2nd	Types of production
	3rd	Concept of Mass production
	4th	Concept of Batch production
14th	1st	Concept of Job order production
	2nd	Principles of product and process planning.
	3rd	Revision of unit -I
	4th	Revision of unit -II
15th	1st	Revision of unit -III
	2nd	Revision of unit -IV
	3rd	Revision of unit -V
	4th	PYQ Discussion

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MBehera 22/12/2025

Manash Kumar Behera
Lecturer (Stage-I)
GP, Gajapati

Discipline: MECHANICAL	Semester :4th	Name of theTeachingFaculty Manash Kumar behera Lecturer (Stage-I),Mechanical Engineering
Subject: ESSENCE OF INDIAN KNOWLEDGE & TRADITION	No. of days/perweek classallotted: 2	Semester From date: 22/12/2025 to date:18-04-2026 No. of weeks:17
Week	ClassDay	TheoryTopics:
1st	1st	Define traditional knowledge, nature and characteristics
	2nd	scope and importance
2nd	1st	kinds of traditional knowledge (Unani / Siddha/ Ayurveda),
	2nd	Indigenous Knowledge (IK),
3rd	1st	Its Characteristics
	2nd	Traditionai knowledge vis-a-vis indigenous knowledge,
4th	1st	Traditional knowledge of Odisha
	2nd	The need for protecting traditional knowledge
5th	1st	The need for protecting traditional knowledge
	2nd	Significance of TK Protection
6th	1st	Significance of TK Protection
	2nd	Value of TK in global economy
7th	1st	Role of Government to harness TK.
	2nd	Role of Government to harness TK.
8th	1st	The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006
	2nd	The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006
9th	1st	Plant Varieties Protection and Farmer's Rights Act, 2001 (PPVFR Act)
	2nd	Plant Varieties Protection and Farmer's Rights Act, 2001 (PPVFR Act)
10th	1st	The Biological Diversity Act 2002 and Rules 2004
	2nd	The protection of traditional knowledge bill, 2016

11th	1st	Systems of traditional knowledge protection
	2nd	Legal concepts for the protection of traditional knowledge
12th	1st	Patents and traditional knowledge, Strategies to increase protection of traditional knowledge
	2nd	, Geographical Indications (GI).
13th	1st	Traditional knowledge and engineering
	2nd	Traditional medicine system, TK in agriculture
14th	1st	Traditional societies depend on it for their food and healthcare needs
	2nd	Importance of conservation and sustainable development of environment
15th	1st	Management of biodiversity
	2nd	Food security of the country and protection of TK
16th	1st	Revision
	2nd	Revision
17th	1st	Revision
	2nd	Revision

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22/12/25

Manash Kumar Behera
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