

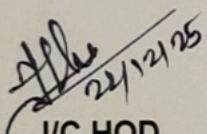
<b>Discipline</b> :MECHANICAL	<b>Semester:</b> <u>4<sup>th</sup></u>	<b>Name of the Teaching Faculty</b> <b>Manash Kumar behera</b> <b>Lecturer (Stage-I), Mechanical Engineering</b>
<b>Subject:</b> Thermal Engineering-II (TH:2)	<b>No. of days/per week class allotted:</b> 3	<b>Semester From date: 22/12/2025 to date:18-04-2026</b> <b>No. of weeks:17</b>
<b>Week</b>	<b>Class Day</b>	<b>Theory Topics:</b>
<b>1<sup>st</sup></b>	<b>1<sup>st</sup></b>	Air-standard Brayton cycle; Description with p-v and T-S diagrams
	<b>2<sup>nd</sup></b>	Gas turbines Classification: open cycle gas turbines and closed cycle gas turbines;
	<b>3<sup>rd</sup></b>	Comparison of gas turbine with reciprocating I.C. engines and steam turbines.
<b>2<sup>nd</sup></b>	<b>1<sup>st</sup></b>	Applications and limitations of gas turbines
	<b>2<sup>nd</sup></b>	General lay-out of Open cycle constant pressure gas turbine; P-V and T-S diagrams and working;
	<b>3<sup>rd</sup></b>	General lay-out of Closed cycle gas turbine; P-V and T-S diagrams and working.
<b>3<sup>rd</sup></b>	<b>1<sup>st</sup></b>	Principle of jet propulsion; Fuels used for jet propulsion;
	<b>2<sup>nd</sup></b>	Applications of jet propulsion; Working of a turbojet engine
	<b>3<sup>rd</sup></b>	Principle of Ram effect; Working of a Ram jet engine
<b>4<sup>th</sup></b>	<b>1<sup>st</sup></b>	Principle of Rocket propulsion; Working principle of a rocket engine
	<b>2<sup>nd</sup></b>	Applications of rocket propulsion; Comparison of jet and rocket propulsions.
	<b>3<sup>rd</sup></b>	Formation of steam under constant pressure; Industrial uses of steam;
<b>5<sup>th</sup></b>	<b>1<sup>st</sup></b>	Basic definitions: saturated liquid line, saturated vapor line, liquid region, vapor region, wet region, superheat region, critical point, saturated liquid, saturated vapor
	<b>2<sup>nd</sup></b>	Basic definitions: saturation temperature, sensible heat, latent heat, wet steam, dryness fraction, wetness fraction
	<b>3<sup>rd</sup></b>	Basic definitions: 2saturated steam, superheated steam, degree of superheat; Determination of enthalpy, internal energy, internal latent heat
<b>6<sup>th</sup></b>	<b>1<sup>st</sup></b>	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.

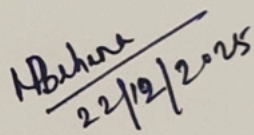


	2 <sup>nd</sup>	Isothermal process, Isentropic process, Throttling process, Polytropic process;
	3 <sup>rd</sup>	Simple direct problems on the above using tables and charts
7 <sup>th</sup>	1 <sup>st</sup>	Steam calorimeters: Separating, throttling, Combined Separating and throttling calorimeters
	2 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



	3 <sup>rd</sup>	Methods of reducing rotor speed; compounding for velocity, for pressure or both pressure and velocity
15 <sup>th</sup>	1 <sup>st</sup>	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.
	2 <sup>nd</sup>	Bleeding, re-heating and re-heating factors(Problems omitted); Governing of steam turbines: Throttle, By-pass & Nozzle control governing.
	3 <sup>rd</sup>	Throttle, By-pass & Nozzle control governing.
16 <sup>th</sup>	1 <sup>st</sup>	Revision Module I
	2 <sup>nd</sup>	Revision Module II
	3 <sup>rd</sup>	Revision Module III
17 <sup>th</sup>	1 <sup>st</sup>	Revision Module IV
	2 <sup>nd</sup>	Revision Module V
	3 <sup>rd</sup>	Previous Year Question discussion

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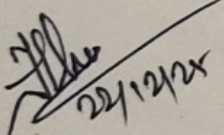
<b>Discipline:</b> <b>MECHANICAL</b>	<b>Semester:</b> <b>6th</b>	<b>Name of the Teaching Faculty</b> <b>Manash Kumar Behera</b> <b>Lecturer (Stage-I), Mechanical Engineering</b>
<b>Subject:</b> <b>INDUSTRIAL ENGINEERING &amp; MANAGEMENT (TH:1)</b>	<b>No. of days/per week class allotted:</b> <b>4</b>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

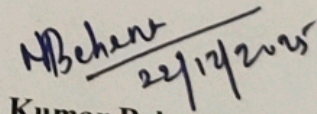


6 <sup>th</sup>	1 <sup>st</sup>	Objective of inventory control.
	2 <sup>nd</sup>	Describe the functions of inventories.
	3 <sup>rd</sup>	Benefits of inventory control.
	4 <sup>th</sup>	Costs associated with inventory.
7 <sup>th</sup>	1 <sup>st</sup>	Terminology in inventory control
	2 <sup>nd</sup>	Explain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



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

  
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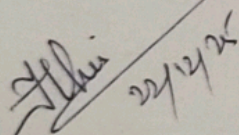
  
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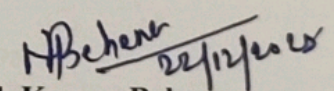


<b>Discipline:</b> MECHANICAL	<b>Semester</b> :4 <sup>th</sup>	<b>Name of the Teaching Faculty</b> Manash Kumar behera Lecturer (Stage-I), Mechanical Engineering
<b>Subject:</b> ESSENCE OF INDIAN KNOWLEDGE & TRADITION	<b>No. of days/per week class allotted:</b> 2	<b>Semester From date: 22/12/2025 to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