

GYANMANJARI INSTITUTE OF TECHNOLOGY

Department of Mechanical Engineering

**LECTURE AND LAB/TUTORIAL PLAN**

Course Code :	2140907	Year/Semester :	BE II Year/ 4 <sup>TH</sup> Semester
Course Name :	Applied Thermal & Hydraulic Engineering	Academic Year :	20116-17/ EVEN
L -T- P :	3-0-0	Credit :	3
Course Detail :	Theory	Term Start Date :	16/01/2017
Course Coordinator :	Prof.Krunal Khiraiya	Term End Date :	18/05/2017
Team of Instructors :		Class Test 1 :	14/2/2017
		Class Test 2 :	13/3/2017
		Mid Term Exam :	27/3/2017

**Gyanmanjari Institute of Technology**  
Sidsar Road. Bhavnagar  
**Department of Mechanical Engineering**

**Lesson Plan**

Academic Year : 2016-17 Second Term			Sem. : 4th sem			
Name of Teacher : Krunal Khiraiya			Name of Department : Electric Engineering			
Subject : ATHE			Hrs./Week : 3			
Theory/Tutorial : Theory			Days :			
Sr. No.	Name of Unit/Topics	Hrs. Alloted	Planned Date	Actual Date	Teaching Aid Code	Remarks
<b>1</b>	<b>Module 1</b>	<b>10</b>				
A	Engineering application of thermodynamics	1	17/1/2017		5	
B	Steam power cycle-Rankine cycle	1	18/1/2017		5	
C	thermal efficiency of Rankine cycle	1	20/1/2017		5	
D	methods of improvement of thermal efficiency - regenerative and reheat	1	24/1/2017		5	
E	Mollier diagram Numerical	1	25/1/2017		5	
F	Gas turbine cycle- thermal efficiency	1	27/1/2017		5	
G	Brayton cycle, methods of improvement of thermal efficiency -regenerative, intercooler and reheat.	1	31/1/2017		5	
H	Refrigeration-vapour compression refrigeration system,	1	1/2/2017		5	
I	air cycle refrigeration system -bell column cycle, simple air craft refrigeration system-psychometric chart	1	3/2/2017		5	
J	<b>Class Test 1</b>	1	5/2/2017		5	
<b>2</b>	<b>Module 2</b>	<b>10</b>				
A	Module 2. Modes of Heat Transfer, Fourier Law of Conduction and Thermal Conductivity	1	5/2/2017		5	
B	Conduction of Heat Through A Slab, Conduction of Heat transfer through Hollow Cylinder	1	5/2/2017		2	
C	Convection and Heat Transfer Coefficient, Natural and Forced Convection,	1	7/2/2017		2,5	
D	Combined Conduction and Convection Heat Transfer, concept of thermal resistance	1	8/2/2017		2	
E	Critical thickness of insulation. Fins and their application.	1	10/2/2017		2	
F	Heat Through composite wall and cylinder.	1	14/2/2017		2,5	
G	Introduction to Radiation Heat Transfer, Concept of Black Body, Monochromatic and Total Emissive Power,	1	15/2/2017		5	
H	Concept of Gray Body and Emissivity, Kirchhoff's Law,	1	17/2/2017		5	
I	Heat Exchangers, LMTD, Overall Heat Transfer Coefficient, parallel and counter flow heat	1	19/2/2017		5	

	exchangers.					
J	Numerical	1	19/2/2017		5	
<b>3</b>	<b>Module 3</b>	<b>10</b>				
A	Fluid Mechanics - Fluid properties density, viscosity, surface tension and capillarity Newton's Law of viscosity	1	21/2/2017		5	
B	Absolute and gauge pressure. Manometers, Bourdon tube pressure gauge.	1	22/2/2017		5	
C	Pressure exerted by a liquid column. Numerical	1	28/2/2017		5	
D	Fluid dynamics Continuity equation, one dimensional flow along a streamline	1	1/3/2017		2,5	
E	Euler's momentum equation	1	3/3/2017		2,5	
F	Bernoulli's equation.	1	5/3/2017		2	
G	Flow measuring instruments-Venturimeter,	1	5/3/2017		5	
H	Flow measuring instruments orifice meter, nozzle meter, notches	1	7/3/2017		5	
I	Flow measuring instruments Pitot tubes and weirs	1	8/3/2017		5	
J	<b>Class Test 2</b>	1	10/3/2017		5	
<b>4</b>	<b>Module 4</b>	<b>12</b>				
A	Main Parts of a Centrifugal Pump, Work Done by the Centrifugal Pump (or by Impeller) on Water	1	14/3/2017		5	
B	Definitions of Heads and Efficiencies of a Centrifugal Pump, velocity diagram	1	15/3/2017		5	
C	Multistage Centrifugal Pumps, Specific Speed of a Centrifugal Pump	1	17/3/2017		5	
D	Priming of a Centrifugal Pump, Characteristic Curves of Centrifugal Pumps, Cavitation	1	19/3/2017		5	
E	Maximum Suction Lift (or Suction Height), Net Positive Suction Head (NPSH)	1	19/3/2017		5	
F	Positive displacement pumps- Reciprocating pumps: main parts, discharge work done and power required to drive a slip in a reciprocating pump	1	21/3/2017		5	
G	Turbines: Definitions of Heads and Efficiencies of a Turbine	1	22/3/2017		5	
H	Classification of Hydraulic Turbines, Pelton Wheel: main parts, Velocity Triangles and Work Done for Pelton Wheel	1	24/3/2017		5	
I	Radial Flow Reaction Turbines	1	5/4/2017		5	
J	Francis turbine: main parts, Velocity Triangles and Work Done by water on runner	1	7/4/2017		5	
K	Degree of Reactions, draft tube	1	11/4/2017		5	

L	speed, Characteristic Curves	1	12/4/2017		2,5	
<b>Teaching Aid Code:</b>		Sign of Teacher : _____  Sign of H.O.D : _____				
1	O.H.P					
2	L.C.D PROJECTER					
3	MODEL					
4	CHART					
5	OTHER (VIDEO)					
<i>* Remark column should cover any slippages and remedial action planned</i>						
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**Reference Books:**

1. D. S. Kumar, Fluid Mechanics and Fluid Power Engineering, S.K.Kartha and sons.
2. R. K. Bansal, Fluid Mechanics and Hydraulic machine, Laxmi Publications.
3. P. K. Nag, Power Plant Engineering, Tata McGraw Hill
4. Holman. J.P, Heat Transfer, McGraw Hill Publishing Co. Ltd.
5. D. S. Kumar, Heat and Mass Transfer, S K Kataria& Sons