

ME- 414E PROJECT

Week	Practical	
	Practical Day	Topic
1.	1.	Introduction
	2.	Project allotment
	3.	Project allotment
2.	4.	Pre-synopsis presentation
	5.	Pre-synopsis presentation
	6.	Discussion and guidance
3.	7.	Discussion and guidance
	8.	Discussion and guidance
	9.	Progress presentation
4.	10.	Discussion and guidance
	11.	Discussion and guidance
	12.	Progress presentation
5.	13.	Discussion and guidance
	14.	Discussion and guidance
	15.	Progress presentation
6.	16.	Discussion and guidance
	17.	Discussion and guidance
	18.	Viva-Voice-I
7.	1 st Minor test week	
8.	13.	Discussion and guidance
	14.	Discussion and guidance
	15.	Progress presentation
9.	16.	Discussion and guidance
	17.	Discussion and guidance
	18.	Progress presentation
10.	19.	Discussion and guidance
	20.	Discussion and guidance
	21.	Progress presentation
11.	22.	Discussion and guidance
	23.	Discussion and guidance
	24.	Progress presentation
12.	25.	Discussion and guidance
	26.	Discussion and guidance
	27.	Guidelines for project report writing
13.	28.	Project Submission
	29.	Presentations, Viva-Voice and Evaluation
	30.	Presentations, Viva-Voice and Evaluation
14.	2 nd Minor test week	
15.	31.	Final Project Report Submission
	32.	Final Project Report Submission
	33.	Final Project Report Submission

POWER PLANT ENGINEERING

Week	Theory	
Unit-I : Introduction		
1 st	1	Energy resources and their availability
	2	Types of power plants
	3	Selection of the plants
	4	Basic thermodynamic cycles used in power plants.
Unit II -Hydro Electric Power Plants		
2 nd	5	Rainfall and run-off measurements and plotting of various curves for estimating stream flow and size of reservoir
	6	Rainfall and run-off measurements and plotting of various curves for estimating stream flow and size of power plants design,
	7	Construction and operation of different components and site selection of hydro-electric power plants
	8	Comparison with other types of power plants
Unit III -Steam Power Plants		
3 rd	9	Flow sheet and working of modern-thermal power plants
	10	Super critical pressure steam stations site selection , preparation , coal storage and coal handling systems
	11	Feeding and burning of pulverized fuel ash handling systems
	12	Dust collection-mechanical dust collector and electrostatic precipitator
Unit IV -Combined Cycles		
5 th	13	Constant pressure gas turbine power plants
	14	Arrangements of combined plants steam gas and gas turbine power plants
	15	Re-powering systems with gas production from coal
	16	Re-powering systems with gas production from using PFBC systems with organic fluids
6 th	17	Meaning and Definitions of Thermodynamic
	18	Parameters affecting Thermodynamic
	19	Efficiency of combined cycles
	20	Problems and Solutions
7 th	1st Minor Test	
Unit V -Nuclear Power Plants		
8 th	21	Principles of nuclear energy
	22	Basic nuclear reactions
	23	Nuclear reactors-PWR
	24	Nuclear reactors- BWR, CANDU
9 th	25	Sodium graphite, Fast breeder
	26	Homogeneous; gas cooled
	27	Advantages and limitations
	28	Nuclear power station waste disposal.
Unit VI -Power Plant Economics		
10 th	29	Load curve, Different terms and definitions
	30	Cost of electrical energy
	31	Tariffs methods of electrical energy
	32	Performance & operating of power plants
11 th	33	Characteristics of power plants
	34	Incremental rate theory, input-out put curves
	35	Heat rate, economic load sharing
	36	Problems and Solutions
Unit VII- Non-Conventional Power Generation		
12 th	37	Solar radiation estimation
	38	Solar energy
	39	Collectors
	40	Low, medium & high temperature power plants
13 th	41	OTEC
	42	Wind power plants
	43	Tidal, Geothermal power plants,
	44	Problems and Solutions
14 th	2nd Minor Test	
Unit VIII -Direct Energy Conversion Systems		
15 th	45	Fuel cell
	46	MHD power generation-principle open & closed cycles systems
	47	Thermoelectric power generation
	48	Thermionic power generation.

ME- 488 E, MODERN MANUFACTURING PROCESSES

week	Lecture Day	Topic (Including Assignment/Test)
		Unit-I Mechanical Processes
1 st	1	Syllabus Introduction , Unconventional machining processes
	2	Classification, considerations in process selection
	3	USM process, Elements of process, metal removal mechanism
	4	Effect of parameters, economic considerations
2 nd	5	Applications, limitations of the process, advantages and disadvantages of USM
	6	Jet Machining- Variables in AJM, metal removal rate in AJM
	7	Water Jet Machining- Jet cutting equipments, process details
	8	Advantages and applications of WJM
		Unit-III Thermal Metal Removal Processes
3 rd	9	Electric Discharge Machining (EDM) or spark erosion machining processes
	10	Mechanism of metal removal, spark erosion generators
	11	Electrode feed control, dielectric fluids in EDM
	12	Flushing, electrodes for spark erosion, selection of electrode material
4 th	13	Tool electrode design, surface finish of EDM
	14	Machining accuracy, machine tool selection, applications
	15	Wire cut EDM
	16	Laser beam machining (LBM)
5 th	17	Apparatus, material removal
	18	Cutting speed and accuracy of cut
	19	Metallurgical effects, advantages and limitations of LBM
	20	Problems and Solutions
6 th	21	Problems and Solutions
	22	presentation
	23	presentation
	24	Assignment- 1
7 th		1st Minor Test
		Unit-II Electrochemical and Chemical Metal Removal Processes
8 th	25	Electrochemical Machining-Elements of ECM process
	26	Tool work gap, chemistry of the process, metal removal rate Of ECM
	27	Accuracy, surface finish and other work material characteristics
	28	ECM economics, advantages, applications, limitations.
9 th	29	Electrochemical Grinding Machining
	30	Material removal, surface finish of ECG
	31	Accuracy, advantages, applications of ECG
	32	Problems and Solutions
10 th	33	Problems and Solutions
	34	Presentation
	35	Presentation
	36	Presentation
		Unit-IV Plasma Arc Machining (PAM):
11 th	37	Plasma arc machining, principles
	38	Plasma, non thermal generation of plasma, mechanism of metal removal,
	39	PAM parameters, equipments for D.C. plasma torch unit
	40	Safety precautions, economics, of PAM
12 th	41	Applications of plasma jet
	42	Electron Beam Machining (EBM)
	43	Generation and control of electron beam
	44	Theory of electron beam machining
13 th	45	Process capabilities and limitations.
	46	Problems and Solutions
	47	Presentation
	48	Assignment-II
14 th		2nd Minor Test

COMPUTER AIDED DESIGN & MANUFACTURING

Week	Theory		Practical	
	Lecture Day	Topic (Including Assignment/Test)		Not Teaching
Unit I Introduction				
1 st	1	Introduction to CAD/CAM, Historical Developments, Industrial look at CAD/CAM		
	2	Introduction to CIM; Basics of Geometric and Solid Modeling		
	3	Explicit, Implicit, Intrinsic and Parametric Equations, Coordinate Systems		
	4	Problems and Solutions		
Unit II Transformations				
2 nd	5	Introduction, Transformation of Points and Line		
	6	2-D rotation, Reflection, Scaling and Combined Transformation		
	7	Homogeneous Coordinates, 3-D Scaling, Shearing, Rotation, Reflection and Translation		
	8	Problems and Solutions		
3 rd	9	Combined Transformations		
	10	Orthographic and Perspective Projections		
	11	Reconstruction of 3-D Objects		
	12	Problems and Solutions		
Unit III Curves				
4 th	13	Algebraic and Geometric Forms		
	14	Tangents and Normal		
	15	Blending Functions Reparametrization		
	16	Problems and Solutions		
5 th	17	Straight Lines, Conics		
	18	Cubic Splines, Bezier Curves		
	19	B-Spline Curves		
	20	Problems and Solutions		
Unit IV Surfaces				
6 th	21	Algebraic and Geometric Forms, Tangents and Normal		
	22	Blending Functions, Reparametrization		
	23	Sixteen Point Form, Four Curve Form		
	24	Problems and Solutions		
7 th		1st Minor Test		
8 th	25	Plane Surface, Ruled Surface, Surface of Revolution		
	26	Tabulated Cylinder, Bi-cubic Surface, Bezier Surface, B-spline Surface		
	27	Problems and Solutions		
	28	Assignment 1		
Unit-V Solids				
9 th	29	Solid Models and Representation Scheme		
	30	Boundary Representation		
	31	Constructive Solid Geometry		
	32	Problems and Solutions		
10 th	33	Sweep Representation		
	34	Cell Decomposition		
	35	Spatial Occupancy Enumeration		
	36	Problems and Solutions		

Unit- :VI Automation and Numerical Control

11 th	37	Introduction, Fixed, Programmable and Flexible Automation		
	38	Types of NC systems, MCU and other Components		
	39	NC Manual Part Programming		
	40	Problems and Solutions		
12 th	41	Coordinate Systems, G & M codes		
	42	Part Program for Simple Parts		
	43	Computer Assisted Part Programming		
	44	Problems and Solutions		
Unit-VII Group Technology				
13 th	45	Part families, Part Classification and Coding		
	46	Production Flow Analysis		
	47	Machine cell Design, Advantages of GT		
	48	Problems and Solutions		
14 th	2nd Minor Test			
Unit-VIII Flexible Manufacturing Systems & Computer aided process planning				
15 th	49	Introduction, FMS components, Types of FMS, FMS Layouts, Planning for FMS		
	50	Advantages and Applications Conventional Process Planning		
	51	Types of CAPP, Steps in Variant Process Planning, Planning for CAPP		
	52	Assignment-II		

NON-CONVENTIONAL ENERGY

Week	Theory		Practical	
	Lecture Day	Topic (Including Assignment/Test)		N.A
Unit I Introduction				
1 st	1	Sources of Energy		
	2	Trends of energy consumption		
	3	Introduction about non conventional sources		
	4	Problems and solutions		
2 nd	5	Conventional and Renewable		
	6	Fossil Fuel – Availability and Limitations		
	7	Need to develop new energy sources		
	8	Problems and Solutions		
Unit II Solar Energy				
3 rd	9	Solar Radiation Characteristics and Estimation		
	10	Solar Collectors, Flat Plate and Concentrating types		
	11	Their Comparative Study, Design and Material Selection		
	12	Problems and Solutions		
4 th	13	Efficiency. Selective Paints and Surfaces		
	14	Heating of Air and Water for Building and other uses		
	15	Thermal Storages, Solar Ponds		
	16	Problems and Solutions		
5 th	17	Solar Pumps, Solar Power, Solar Cookers		
	18	Direct Conversion of Solar energy to Electricity and its various uses		
	19	Materials, Limitations and Costs		
	20	Problems and Solutions		
Unit III Bio-conversion				
6 th	21	Generation of Bio-Gas		
	22	Digesters and Their Design		
	23	Selection of Material		
	24	Problems and Solutions		
7 th		1st Minor Test		
8 th	25	Feed to Digester, Paralytic Gasification		
	26	Production of Hydrogen		
	27	Algae Production and Their Uses		
	28	Problems and Solutions.		
Unit-IV Wind Energy				
9 th	29	Introduction of Wind Energy		
	30	Types of Rotors		
	31	Horizontal Axis and Vertical Axis Systems		
	32	Problems and Solutions		
10 th	33	System Design		

	34	Site Selection		
	35	Problems and Solutions		
	36	Assignment-I		
Unit- :V Geo-thermal Energy				
11 th	37	Introduction and Sites		
	38	Potentiality and Limitation		
	39	Study of Different Conversion Systems		
	40	Problems and Solutions		

Unit- :VI Tidal Energy				
12 th	41	Introduction and Sites		
	42	Potentiality and Possibility of Harnessing from Site		
	43	Limitations		
	44	Problems and Solutions		
Unit-VII Ocean Thermal Energy				
13 th	45	Introduction		
	46	Principle of Utilization and its Limitations		
	47	Description of Various Systems		
	48	Problems and Solutions		
14 th	2nd Minor Test			
Unit-VIII Other non-conventional energy sources				
15 th	49	Fluidized Bed Combustions		
	50	Heat from Waste and other sources		
	51	Problems and Solutions		
	52	Assignment-II		