MITS SCHOOL OF ENGINEERING, BHUBANESWAR

Lesson Plan

Name of the Subject: Production technology (TH 1) **Semester:** 3rd Sem (Mechanical)

Name of the Faculty: Mr. Somanatha jena

Lecturer	Topics Plan to be Covered	Chapter	Reference
L-01	***Metal Forming Processes***	CH-1	***Production Technology, Vol- I& II O.P. Khanna Page-(1-29)***
L-02	Extrusion: Definition & Classification		
L-03	Explain direct, indirect .		
L-04	Explain Impact extrusion process.		
L-05	Define rolling. Classify it.		
L-06	Explain cold rolling process.		
L-07	Explain Hot rolling process.		
L-08	List the different types of rolling mills used in Rolling process		
L-09	Discuss about all the topics		
L-10	***Welding***	CH-2	***Production Technology, Vol- I& II O.P. Khanna Page-(30-45)***
L-11	Define welding and classify various welding processes.		
L-12	Explain fluxes used in welding		
L-13	Explain Oxy-acetylene welding process		
L-14	Explain various types of flames used in Oxy-acetylene welding		
L-15	Explain Arc welding process.		
L-16	Specify arc welding electrodes.		
L-17	Define resistance welding and classify it.		
L-18	Describe various resistance welding processes		
L-19	Explain TIG welding process		
L-20	MIG welding process		
L-21	State different welding defects .		
L-22	State different welding causes and remedies.		
L-23	Discuss about all the topics		
L-24	***Casting***	CH-3	***Production Technology, Vol- I& II O.P. Khanna Page-(46-62)***
L-25	Define Casting and Classify the various Casting processes.		
L-26	Explain the procedure of Sand mould casting.		
L-27	Explain different types of molding sands with their composition		
L-28	Classify different pattern .		
L-29	State various pattern allowances		
L-30	Classify core		
L-31	Describe construction and working of cupola Furnace.		
L-32	Describe construction and working of crucible Furnace		
L-33	Explain die casting method.		
L-34	Explain centrifugal casting .		
L-35	Explain true centrifugal casting,		
L-36	Explain various casting defects		
L-37	With their causes and remedies		
L-38	Discuss about all the topics		
L-39	***Powder Metallurgy***	CH-4	***Production Technology, Vol- I& II O.P. Khanna Page-(63-78)***
L-40	Define powder metallurgy process.		
L-41	State advantages of powder metallurgy technology technique		
L-42	Describe the methods of producing components by powder		
L-43	Explain sintering.		
L-44	Economics of powder metallurgy.		
L-45	Discuss about all the topics		
L-46	***Press Work***	CH-5	***Production Technology, Vol- I& II O.P. Khanna Page-(79-90)***
L-47	Describe Press Works: blanking,		
L-48	Describe Piercing and trimming.		
L-49	List various types of die and punch		
L-50	Explain simple, dies		
L-51	Compound & Progressive dies		
L-52	Describe the various advantages & disadvantages of above dies		
L-53	Discuss about all the topics		
L-54	***Jigs and fixtures***	CH-6	***Production Technology, Vol- I& II O.P. Khanna Page-(91-105)***
L-55	Define jigs and fixtures		
L-56	State advantages of using jigs and fixtures		
L-57	State the principle of locations		
L-58	Describe the methods of location with respect to 3-2-1 point		
L-59	List various types of jig and fixtures.		
L-60	Discuss about all the topics		

MITS SCHOOL OF ENGINEERING, BHUBANESWAR

Lesson Plan

Name of the Subject: Strength of Material (TH2) Semester: 3rd Sem. (Mechanical)

Name of the Faculty: Miss Shuvashree Paital

Lecturer	Topics Plan to be Covered	Chapter as per	Reference books/Chapter/Page
L-01	Types of load, stresses & strains,(Axial and tangential) Hooke's law	CH-1	Strength Of Material 4th Edition by Dr.R.K. Bansal Page No.- (1-58), (59-84),(143-169)
L-02	Bulk modulus, Modulus of rigidity, Poisson's ratio, derive the relation		
L-03	Simple problems on above Topics, Principle of super position		
L-04	stresses in composite section		
L-05	Simple problems on above Topics.		
L-06	Temperature stress, determine the temperature stress in composite bar		
L-07	Simple problems on above Topics.		
L-08	Strain energy and resilience, Stress due to gradually applied		
L-09	Stress due to suddenly applied and impact load		
L-10	Simple problems on above Topics.		
L-11	Simple problems on above Topics		
L-12	Revision of above Topics		
L-13	Definition of hoop and longitudinal stress, strain, Derivation of hoop		
L-14	Derivation of hoop strain, longitudinal strain and volumetric strain		
L-15	Simple problems on above Topics.		
L-16	Computation of the change in length, diameter and volume		
L-17	Simple problems on above Topics.		
L-18	Simple problems on above Topics.		
L-19	Revision of above Topics		
L-20	Determination of normal stress, shear stress and resultant stress on		
L-21	Simple problems on above Topics.		
L-22	Determination of normal stress, shear stress and resultant stress on		
L-23	Simple problems on above Topics.		
L-24	Determination of normal stress, shear stress and resultant stress on		
L-25	Location of principal plane and computation of principal stress		
L-26	Simple problems on above Topics.		
L-27	Location of principal plane and computation of principal stress and Maximum shear		
L-28	Simple problems on above Topics.		
L-29	Simple problems on above Topics.		
L-30	Revision of above Topics		
L-31	Types of beam and load ,Concepts of Shear force and bending moment		
L-32	Shear Force and Bending moment diagram and its salient features		
L-33	Shear Force and Bending moment diagram and its salient features		
L-34	Shear Force and Bending moment diagram and its salient features		
L-35	Shear Force and Bending moment diagram and its salient features illustration in		
L-36	Simple problems on above Topics.		
L-37	Simple problems on above Topics.		
L-38	Simple problems on above Topics.		
L-39	Revision of above Topics		
	THEORY OF SIMPLE BENDING		Strength Of Material 4th Edition by Dr.R.K. Bansal
L-41	Assumptions in the theory of bending, Bending equation.		
L-42	Moment of resistance, Simple problems on above Topics.		
L-43	Section modulus& neutral axis, Simple problems on above Topics.		
L-44	Simple problems on above Topics		
L-45	Simple problems on above Topics.		
L-46	COMBINED DIRECT & BENDING STRESSES		Strength Of Material 4th Edition by Dr.R.K. Bansal
L-47	Direct stresses, Bending stresses, Maximum& Minimum stresses.		
L-48	Simple problems on above Topics.		
L-49	Buckling load computation using Euler's formula (no derivation) in		
L-50	Simple problems on above Topics		
L-51	Revision of above Topics		
L-52	TORSION	CH-7	Strength Of Material 4th Edition by Dr.R.K. Bansal Page No.-(672-739)
L-53	Assumption of pure torsion ,The torsion equation for solid circular shaft		
L-54	Simple problems on above Topics.		
L-55	The torsion equation for hollow circular shaft		
L-56	Simple problems on above Topics.		
L-57	Comparison between solid and hollow shaft subjected to pure torsion		
L-58	Revision of above Topics		
L-59	Simple problems on above Topics		
L-60	Revision of above Topics		

MITS SCHOOL OF ENGINEERING, BHUBANESWAR Lesson Plan

Name of the Subject: Engineering Material (TH3) **Semester:** 3rd Sem.(Mech)

Name of the Faculty: Mr Debasis Barik

Lecturer No	Topics Plan to be Covered	Chapter	Reference
L-01	**Engineering materials and their properties**	CH-1	A Textbook of Material Science and Metallurgy By-O.P.Khanna (3.1-3.34)
L-02	Material classification into ferrous and non ferrous category		
L-03	Properties of Materials, Physical , Chemical and Mechanical		
L-04	Performance requirements Material Reliability and safety		
L-05	Discuss about all the topics		
L-06	**Ferrous Materials and alloys**	CH-2	A Textbook of Material Science and Metallurgy By-O.P.Khanna (5.1-5.41)
L-07	Characteristics and application of ferrous materials		
L-08	Classification, composition and application of low carbon steel		
L-09	Medium carbon steel and High carbon steel		
L-10	Alloy steel: Low alloy steel, High alloy steel, tool steel		
L-11	Stainless steel High alloy steel, tool steel		
L-12	Stainless steel Tool steel: Effect of various alloying elements such as		
L-13	Tool steel: Effect of various alloying elements such as Cr, Mn, Ni,		
L-14	Discuss about all the topics		
L-15	**Iron – Carbon system**	CH-3	A Textbook of Material Science and Metallurgy By-O.P.Khanna (40.1-40.36)
L-16	Concept of phase diagram and cooling curves		
L-17	Features of Iron-Carbon diagram with salient micro-constituents		
L-18	Micro-constituents of Iron and Steel		
L-19	Discuss about all the topics		
L-20	**Crystal imperfections**	CH-4	A Textbook of Material Science and Metallurgy By-O.P.Khanna (37.1-37.13)
L-21	Crystal defines, classification of crystals		
L-22	Ideal crystal and crystal imperfections		
L-23	Classification of imperfection		
L-24	Point defects, line defects, surface defects and volume defects		
L-25	Types and causes of point defects, Edge dislocation		
L-26	Screw dislocation, Effect of imperfection on material properties		
L-27	Deformation by slip and twinning		
L-28	Effect of deformation on material properties		
L-29	Discuss about all the topics		
L-30	**Heat Treatment**	CH-5	A Textbook of Material Science and Metallurgy By-O.P.Khanna (43.1-43.51)
L-31	Purpose of Heat treatment, Process of heat treatment: Annealing,		
L-32	normalizing, hardening, tampering, stress relieving		
L-33	Surface hardening: Carburizing and Nitriding Effect of heat		
L-34	Effect of heat treatment on properties of steel Hardenability of steel		
L-35	Discuss about all the topics		
L-36	**Non-ferrous alloys**	CH-6	A Textbook of Material Science and Metallurgy By-O.P.Khanna (6.1-6.29)
L-37	Aluminum alloys: Composition, property and usage of Duralmin,		
L-38	y- alloy. Copper alloys: Composition, property and usage of Copper-		
L-39	Aluminum, Copper-Tin, Babbit , Phosperous bronze, brass, Copper-		
L-40	Predominating elements of lead alloys, Zinc alloys and Nickel alloys		
L-41	Low alloy materials like P-91, P-22 for power plants and other		
L-42	High temperature services. High alloy materials like stainless steel		
L-43	Grades of duplex, super duplex materials		
L-44	Discuss about all the topics		
L-45	**Bearing Material**	CH-7	A Textbook of Material Science and Metallurgy By-O.P.Khanna (9.1-9.8)
L-46	Classification, composition, properties and uses of Copper base,		
L-47	Tin Base, Lead base, Cadmium base bearing materials		
L-48	Discuss about all the topics		
L-49	**Spring materials**	CH-8	A Textbook of Material Science and Metallurgy By-O.P.Khanna (10.1-10.4)
L-50	Classification, composition, , properties and uses of Iron- base and		
L-51	Copper base spring material		
L-52	Discuss about all the topics		
L-53	**Polymers**	CH-9	A Textbook of Material Science and Metallurgy By-O.P.Khanna (20.1-20.38)
L-54	Properties and application of thermosetting and thermoplastic		
L-55	Polymers properties of elastomers Properties of elastomers		
L-56	Discuss about all the topics		
L-57	**Composites and Ceramics**	CH-10	A Textbook of Material Science and Metallurgy By-O.P.Khanna (23.1-23.31)
L-58	Classification, composition, properties and uses of particulate		
L-59	Based and fiber reinforced composites		
L-60	Classification and uses of ceramics		

MITS SCHOOL OF ENGINEERING, BHUBANESWAR

Lesson Plan

Name of the Subject: Thermal Engineering-I (TH4) **Semester:** 3rd Sem.(Mech)

Name of the Faculty: Mr Subrat Kumar Ghosh

Lecturer No	Topics Plan to be Covered	Chapter	Reference
L-01	Thermodynamic Systems (closed, open, isolated)	CH-1	Thermodynamic concept & Terminology (R.S. Khurmi) (Page No-1-30)
L-02	Thermodynamic properties of a system pressure, volume, temperature		
L-03	Entropy,enthalpy, Internal energy and units of measurement .		
L-04	Intensive and extensive properties		
L-05	Define thermodynamic processes, path, cycle , state, path function, point		
L-06	Thermodynamic Equilibrium		
L-07	Quasi-static Process.		
L-08	Conceptual explanation of energy and its sources		
L-09	Work , heat and comparison between the two		
L-10	Mechanical Equivalent of Heat.		
L-11	Work transfer, Displacement work		
L-12	Numerical Problems		
L-13	State & explain Zeroth law of thermodynamics	CH-2	Laws of Thermodynamics (R.S. Khurmi) (Page No-1-30)
L-14	State & explain First law of thermodynamics		
L-15	Limitations of First law of thermodynamics		
L-16	Application of First law of Thermodynamics		
L-17	Steady flow energy equation		
L-18	Its application to turbine and compressor		
L-19	Second law of thermodynamics		
L-20	Claucius & Kelvin Plank statements		
L-21	Application of second law in heat engine		
L-22	Heat pump, refrigerator		
L-23	determination of efficiencies & C.O.P		
L-24	Solve simple numerical		
L-25	Solve simple numerical		
L-26	Solve simple numerical		
L-27	Laws of perfect gas: Boyle's law, Charle's law, Avogadro's law,	CH-3	Properties Processes of perfect gas (R.S. Khurmi) (Page No-103-152)
L-28	Dalton's law of partial pressure, Guy lussac law		
L-29	General gas equation, characteristic gas constant, Universal gas		
L-30	Explain specific heat of gas (Cp and Cv)		
L-31	Relation between Cp & Cv.		
L-32	Enthalpy of a gas.		
L-33	Work done during a non- flow process		
L-34	Application of first law of thermodynamics to various non flow Pprocess		
L-35	Isothermal, Isobaric, Isentropic and polytrophic process.		
L-36	Solve simple problems on above.		
L-37	Solve simple problems on above.		
L-38	Solve simple problems on above.		
L-39	Explain & classify I.C engine.	CH-4	Internal combustion engine (R.S. Khurmi) (Page No-582-610)
L-40	Terminology of I.C Engine such as bore, dead centers		
L-41	Stroke volume, piston speed &RPM.		
L-42	Explain the working principle of 2-stroke & 4- stroke engine		
L-43	C.I & S.I engine.		
L-44	Differentiate between 2-stroke & 4- stroke engine C.I & S.I engine		
L-45	Solve simple problems on above.		
L-46	Carnot cycle	CH-5	Air Standard Cycle (R.S. Khurmi) (Page No5821-637)
L-47	Otto cycle.		
L-48	Diesel cycle.		
L-49	Dual cycle.		
L-50	Solve simple numerical		
L-51	Solve simple numerical		
L-52	Solve simple numerical		
L-54	Define Fuel.	CH-6	Fuels and Combustion (R.S. Khurmi) (Page No5821-637)
L-55	Types of fuel.		
L-56	Application of different types of fuel.		
L-57	Heating values of fuel.		
L-58	Quality of I.C engine fuels Octane number, Cetane number.		
L-59	Quality of I.C engine fuels Octane number, Cetane number.		
L-60	Solve simple numerical		

MITS School Of Engineering, Bhubaneswar

Name of the Faculty:- Mrs.Anima Sahoo (TH5) **LESSON PLAN Sem: 3rd (Civil/Electrical/Mechanical Engg)**

Subject: -Environmental Studies

Lect no	Topic to be Covered	Chapter as Syllabus	Reference book
	The multidisciplinary structure of Environment	Ch:1	Concepts in Environmental Studies, D.D. Mishra, S.Chand Page 5 - 35
L-01	Definition and scope		
L-02	Importance of environment		
L-03	Needs for public awarness		
	Natural Resources	Ch-2	Concepts in Environmental Studies, D.D. Mishra, S.Chand Page 37 - 53
L-04	Renewable and non-renewable resources		
L-05	Forest resources, Water resources, Mineral resources		
L-06	use of alternate energy sources, case studies		
L-07	Land resources-land as a resources.land degradation.		
L-08	man induces land slides, soil erosion, and desertification		
L-09	Role of individual in conservation of natural resources		
L-10	Equitable use of resources and sustainable life style.		
	Systems	Ch-3	Concepts in Environmental Studies, D.D. Mishra, S.Chand Page 56 - 75
L-11	Concept of an eco system.		
L-12	Structure of an eco system.		
L-13	function of an eco system.		
L-14	Producers, consumers, decomposers.		
L-15	Energy flow in the eco systems.		
L-16	Energy flow in the eco systems.		
L-17	Ecological succession.		
L-18	Food chains, food webs.		
L-19	Ecological Pyramids.		
	Biodiversity and it's Conservation	Ch-4	Concepts in Environmental Studies, D.D. Mishra, S.Chand Page 80 - 105
L-20	Introduction-Definition: genetics, species and ecosystem diversity.		
L-21	Biogeographically classification of India.		
L-27	Value of biodiversity.		
L-28	consumptive use, productive use.		
L-29	Social,ethical,aesthetic,optim value.		
L-30	Biodiversity at global, national and local level.		
L-31	Threats to biodiversity: Habitats loss.		
L-32	poaching of wild life, man wildlife conflicts.		
	Environmental Pollution		
L-33	Definition Causes of Air pollution.		
L-34	effects and control measures of Air pollution.		
L-36	Definition Causes of water pollution.		
L-37	effects and control measures of water pollution.		
L-38	Definition Causes of soil pollution.		
L-39	Effects and control measures of soil pollution.	Ch-5	Concepts in Environmental Studies, D.D. Mishra, S.Chand
L-40	Definition Causes of marine pollution.		
L-41	effects and control measures of marine pollution.		
L-42	Definition Causes of thermal pollution.		
	Social issues and the Environment	Ch-6	Concepts in Environmental Studies, D.D. Mishra, S.Chand Page 139 - 165
L-43	Form unsustainable to sustainable development.		
L-44	Urban problems related to energy.		
L-45	Water conservation.		
L-46	rain water harvesting, water shed management.		
L-47	Environmental ethics: issue and possible solutions.		
L-48	Climate change, global warming.		
L-49	acid rain, ozone layer depletion.		
L-50	Nuclear hazards.		
L-51	Air prevention and control pollution act.		
L-52	Waterprevention and control pollution act.		
L-53	Public awareness.		
	Human population and the environment	Ch-7	Concepts in Environmental Studies, D.D. Mishra, S.Chand Page 169 - 201
L-54	Population growth and variation among nations.		
L-55	Population explosion.		
L-56	family welfare program.		
L-57	Environment and human health.		
L-58	Human rights.		
L-59	Value education		
L-60	Role of information technology		

MITS School of Engineering, Bhubaneswar
Department of Mechanical Engineering
Lab Lesson Plan

Name of the Subject: -MECHANICAL ENGINEERING DRAWING (PR1)
Name of the Faculty: - Mr Debasis Barik **Semester:-**3rd

VENUE: MED Lab

Experiment No	Name of the Experiment	Name of the Equipment	Venue
01	Bolt, nut and threads	Drawing Board	Drawing Hall
02	Cotter joint	Drawing Board	Drawing Hall
03	Knuckle joint	Drawing Board	Drawing Hall
04	Rigid pedestal bearing	Drawing Board	Drawing Hall
05	Foot step bearing	Drawing Board	Drawing Hall
06	Simple Screw jack	Drawing Board	Drawing Hall
07	Connecting rod of IC Engine	Drawing Board	Drawing Hall
08	Boiler safety valve	Drawing Board	Drawing Hall
09	Spring loaded valve	Drawing Board	Drawing Hall
10	Hydraulic non return valve	Drawing Board	Drawing Hall
11	Flat belt pulley	Drawing Board	Drawing Hall

MITS School of Engineering, Bhubaneswar
Department of Mechanical Engg.
Lab Lesson Plan

Name of the Subject: - MECHANICAL ENGINEERING LABORATORY (PR2)
Name of the Faculty: - Miss Shuvashree Paital **Semester:-**3rd

VENUE: ME Lab

Experiment No	Name of the experiment	Name of the Equipment	Venue
01	Determine end reactions in a simply supported beam using parallel force apparatus.	Searle's apparatus	ME Lab
02	Determination of Young's modulus using Searle's apparatus	Universal testing machine	ME Lab
03	Determination of torsional rigidity of the shaft using torsion testing machine	Screw Jack with its handle	ME Lab
04	Determination of salient points (Young's modulus, yield point, fracture point) from stress- strain curve using Universal Testing Machine	Piezometer & Manometer	ME Lab
05	Determination of hardness number by Rockwell/Vickers hardness testing machine	Bernoulli's Apparatus with venturi-meter	ME Lab
06	Determination of toughness using Impact testing machine (Charpy/Izod)	Bernoulli's Apparatus	ME Lab
07	Determination of Flash point and fire point.	Centrifugal pump & Pelton Turbine	ME Lab
08	Joule's experiment	Cochran Boiler	ME Lab

MITS School of Engineering, Bhubaneswar
Department of Mechanical Engg.

Lab Lesson Plan

Name of the Subject: - Workshop Lab (PR3)
Name of the Faculty: - Mr. Somanatha Jena **Semester:-**3rd

VENUE: Workshop Lab

Experiment No	Name of the experiment	Name of the Equipment	Venue
01	Preparation of caliper	Steel Rule, Scribbler, Marking Gauge, Try Square, Hand drill, Hammer, Punch, Safety Goggle, Divider, C-Clamp, Claw hammer, Lathe Machine, Angle Plate, Bench Vice, Vernier Caliper, Files, Anvil, Sledge Hammer, Welding Machine, Electrode, Tongue,	Yes
02	Preparation of try square		Yes
03	Preparation of hammer, square , Hexagonal		Yes
04	Preparation of door ring with hook		Yes
05	Preparation of hexagonal head bolt		Yes
06	Preparation of octagonal flat chisel		Yes
07	Cutting of slot, botch, mortise and Tenon Joint		Yes
08	Preparation of single dove tail joint		Yes
09	Lap & Butt Joint using Arc Welding		Yes
10	Joining Two non-ferrous parts through		Yes
11	Lap Joint using Gas Welding	Oxygen & Ecetelyne Cylinder Pressure Gauge, Pressure regulator, Hose Pipe, Welding Torch	Yes

MITS SCHOOL OF ENGINEERING, BHUBANESWAR

Lesson Plan

Name of the Subject: Fluid Mechanics **Semester:** 4th Sem. (Mechanical)

Name of the Faculty:Er.Subrat Kumar Ghosh

Lecturerer No.	Topics Plan to be Covered	Chapter as per syllabus	Reference books.
	PROPERTIES OF FLUID	**CH-1**	**R.K BANSAL**
L-01	Define fluid, Description of fluid properties like Density, Specific weight.		
L-02	Description of fluid properties like specific gravity, specific volume.		
L-03	Solve simple problems.		
L-04	Definitions and Units of Dynamic viscosity.		
L-05	Definitions and Units of kinematic viscosity.		
L-06	Solve simple problems.		
L-07	Surface tension Capillary phenomenon		
L-08	Solve simple problems.		
L-09	Revision of above Topics		
	FLUID PRESSURE AND ITS MEASUREMENTS	**CH-2**	**R.K BANSAL**
L-10	Definitions and units of fluid pressure, pressure intensity and pressure head.		
L-11	Statement of Pascal's Law.		
L-12	Concept of atmospheric pressure, gauge pressure, vacuum pressure and absolute pressure.		
L-13	Pressure measuring instruments Manometers (Simple and Differential).		
L-14	Description of different types of Simple Manometer: Piezometer,U-Tube Manometer.		
L-15	Solve simple problems on Simple Manometer: Piezometer &U-Tube Manometer.		
L-16	Description of different types of Simple Manometer: Single Column Manometer (U-Tube Differential Manometer).		
L-17	Description of different types of Simple Manometer: Single Column Manometer (Inverted U-Tube Differential Manometer).		
L-18	Solve simple problems on Simple Manometer: Single Column Manometer (U-Tube Differential Manometer).		
L-19	Solve simple problems on Simple Manometer: Single Column Manometer (Inverted U-Tube Differential Manometer).		
L-20	Description of Bourdon tube pressure gauge.		
L-21	Solve simple problems on Bourdon tube pressure gauge.		
L-22	Revision of above Topics		
	HYDROSTATICS	**CH-3**	**R.K BANSAL**
L-23	Definition of hydrostatic pressure, Total pressure and centre of pressure.		
L-24	Description of centre of pressure on: Vertical immersed bodies.		
L-25	Solve simple problems on centre of pressure on: Vertical immersed bodies.		
L-26	Description of centre of pressure on:		

	Horizontal immersed bodies.		
L-27	Solve simple problems on centre of pressure on: Vertical immersed bodies.		
L-28	Description of Archimedes 'principle, concept of buoyancy, meta center and meta centric height (Definition only).		
L-30	Solve simple problems on meta center and meta centric height.		
L-31	Concept of floatation.		
L-32	Solve simple problems on floatation.		
L-33	Revision of above Topics		
	KINEMATICS OF FLOW		**R.K BANSAL**
L-34	Types of fluid flow.		
L-35	Continuity equation (Statement and proof for one dimensional flow).		
L-36	Solve simple problems		
L-37	Bernoulli's theorem (Statement and proof).		
L-38	Solve simple problems.	**CH-4**	
L-39	Applications and limitations of Bernoulli's theorem: Venturimeter.		
L-40	Applications and limitations of Bernoulli's theorem: Pitot tube.		
L-41	Solve simple problems.		
L-42	Revision of above Topics		
	ORIFICES, NOTCHES & WEIRS		**R.K BANSAL**
L-43	Define orifice & Flow through orifice.		
L-44	Orifices coefficient & the relation between the orifice coefficients.		
L-45	Solve simple problems.		
L-46	Classifications of notches & weirs & Discharge over a rectangular notch or weir.	**CH-5**	
L-47	Solve simple problems.		
L-48	Discharge over a triangular notch or weir		
L-49	Solve simple problems.		
L-50	Revision of above Topics.		
	FLOW THROUGH PIPE		**R.K BANSAL**
L-51	Definition of pipe & Loss of energy in pipes.		
L-52	Head loss due to friction: Darcy's and Chezy's formula (Expression only).		
L-53	Solve Problems using Darcy's and Chezy's formula.		
L-54	Hydraulic gradient and total gradient line.	**CH-6**	
L-55	Solve simple problems.		
L-56	Revision of above Topics.		
	IMPACT OF JETS		**R.K BANSAL**
L-56	Impact of jet on fixed vertical flat plates: Case-1.		
L-57	Solve simple problems.		
L-58	Impact of jet on fixed vertical flat plates: Case-2.		
L-59	Solve simple problems.		
L-60	Impact of jet on fixed vertical flat plates: Case-3.		
L-61	Solve simple problems.		
L-62	Impact of jet on moving vertical flat plates: Case-1.	**CH-7**	
L-63	Solve simple problems.		

L-64	Impact of jet on moving vertical flat plates: Case-2.		
L-65	Solve simple problems.		
L-66	Impact of jet on moving vertical flat plates: Case-3.		
L-67	Solve simple problems.		
L-68	Derivation of work done on series of vanes.		
L-69	Condition for maximum efficiency series of vanes.		
L-70	Solve simple problems.		

MITS SCHOOL OF ENGINEERING, BHUBANESWAR

Lesson Plan

Name of the Subject: manufacturing technologySemester: 4th.(Mech)
Name of the Faculty: Mr. Somanatha jena

Lecturerer No.	Topics Plan to be Covered	Chapter as per syllabus	Reference books/Chapter/Page No.
	SIMPLE STRESS& STRAIN	**Ch-1**	**Workshop technology (Virender Narula) (24-49)**
L-01	**Tool Materials**		
L-02	Composition of various tool materials		
L-03	Physical properties& uses of such tool materials		
L-04	**Cutting Tools**	**Ch2**	**Manufacturing technology (Dr.P.C. Sharma) (55-73)**
L-05	Cutting action of various and tools such as Chisel, hacksaw blade, dies and reamer		
L-06	Turning tool geometry and purpose of tool angle		
L-07	Machining process parameters (Speed, feed and depth of cut)		
L-08	Coolants and lubricants in machining and purpose		
L-09	**Lathe Machine**	**Ch-3**	**Workshop technology (Virender Narula) (253-264)**
L-10	Construction and working of lathe and CNC lathe		
L-11	Major components of a lathe and their function		
L-12	Operations carried out in a lathe(Turning, thread cutting, taper turning, internal machining, parting off, facing, knurling)		
L-13	Safety measures during machining		
L-14	**Capstan lathe**		
L-15	Difference with respect to engine lathe		
L-16	Major components and their function		
L-17	Define multiple tool holders		
L-18	Turret Lathe		
L-19	Difference with respect to capstan lathe		
L-20	Major components and their function		
L-21	Draw the tooling layout for preparation of a hexagonal bolt &bush		
L-22	**Shaper**	**Ch-4**	**Workshop technology (Virender Narula) (268-273)**
L-23	Potential application areas of a shaper machine		
L-24	Major components and their function		
L-25	Explain the automatic able feed mechanism		
L-26	Explain the construction &working of tool head		
L-27	Explain the quick return mechanism through sketch		
L-28	State the specification of a shaping machine.		
L-29	**Planning Machine**	**Ch-5**	**Workshop technology (Virender Narula) (275-278)**
L-30	Application area of a planer and its difference with respect to shaper		
L-31	Major components and their functions		
L-32	The table drive mechanism		
L-33	Working of tool and tool support		
L-34	Clamping of work through sketch.		
L-35	**Milling Machine**	**Ch-6**	**Workshop technology (Virender Narula) (279-286)**
L-36	Types of milling machine and operations performed by them and also same for CNC milling machine		
L-37	Explain work holding attachment		

L-38	Construction & working of simple dividing head, universal dividing head		
L-39	Construction & working of simple dividing head, universal dividing head		
L-40	Procedure of simple and compound indexing		
L-41	Illustration of different indexing methods		
L-42	**Slotted** (I)Major components and their function (ii)Construction and working of slotter machine (iii) Tools used in slotte**r**	**Ch-7**	**Workshop technology (Virender Narula)**
L-43	**Grinding** Significance of grinding operations (i) Manufacturing of grinding wheels (ii)Criteria for selecting of grinding wheels (iii)Specification of grinding wheels with example Working of □ Cylindrical Grinder □ Surface Grinder □ Centreless Grinder	**Ch-8**	**Workshop technology (Virender Narula) (287-294)**
L-44	**Internal Machining operations**	**Ch-09**	**Workshop technology (Virender Narula)**
L-45	Classification of drilling machines		
L-46	Bench drilling machine		
L-47	Pillar drilling machine		
L-48	Radial drilling machine		
L-49	**Boring**		
L-50	Basic Principle of Boring		
L-51	Different between Boring and drilling		
L-52	**Broaching**		
L-53	Types of Broaching(pull type, push type)		
L-54	Advantages of Broaching and applications		
L-55	**Surface finish, lapping** (i)Definition of Surface finish (ii)Description of lapping& explain their specific cutting.	**Ch-10**	**Workshop technology (Virender Narula)**

MITS SCHOOL OF ENGINEERING, BHUBANESWAR

Lesson Plan

Name of the Subject: Thermal Engineering-II **Semester:** 4th Sem. (Mechanical)

Name of the Faculty: Miss Shuvashree Paital

Lecturerer No.	Topics Plan to be Covered	Chapter as per syllabus	Reference books/Chapter/Page No.
	PERFORMANCE OF I.C ENGINE	**CH-1**	**Thermal Engineering 6th Edittion By R.K Rajput**
L-01	Define mechanical efficiency, Indicated thermal efficiency, Relative Efficiency.		
L-02	Define brake thermal efficiency overall efficiency Mean effective pressure &specific fuel consumption.		
L-03	Define air-fuel ratio & calorific value of fuel.		
L-04	Work out problems to determine efficiencies & specific fuel consumption.		
L-05	Work out problems to determine efficiencies & specific fuel consumption.		
L-06	Revision of above Topics.		
	AIR COMPRESSOR	**CH-2**	**Thermal Engineering 6th Edittion By R.K Rajput**
L-07	Explain functions of compressor & industrial use of compressor air.		
L-08	Classify air compressor & principle of operation.		
L-09	Describe the parts of reciprocating Air compressor.		
L-10	Describe the working principle of reciprocating Air compressor.		
L-11	Explain the terminology of reciprocating compressor such as bore, stroke, pressure ratio free air delivered &Volumetric efficiency.		
L-12	Derive the work done of single stage compressor with clearance.		
L-13	Solve simple problems on single stage compressor with clearance.		
L-14	Derive the work done of single stage compressor without clearance.		
L-15	Solve simple problems on single stage compressor without clearance.		
L-16	Derive the work done of two stage compressor with clearance		
L-17	Solve simple problems on two stage compressor with clearance.		
L-18	Derive the work done of two stage compressor without clearance		
L-19	Solve simple problems on two stage compressor without clearance.		
L-20	Revision of above Topics.		
	PROPERTIES OF STEAM	**CH-3**	**Thermal Engineering**
L-21	Difference between gas & vapours. Formation of steam.		
L-22	Representation on P-V, T-S, H-S, & T-H diagram.		
L-23	Definition & Properties of Steam.		
L-24	Use of steam table & mollier chart for finding unknown properties.		

L-25	Solve simple problems on steam table & mollier chart.		**6th Edittion By R.K Rajput**
L-26	Define Non flow & flow process of vapour.		
L-27	Representation on P-V, T-S & H-S, diagram of Non flow process.		
L-28	Solve simple problems of Non flow process on steam table & mollier chart.		
L-29	Representation on P-V, T-S & H-S, diagram of flow process.		
L-30	Solve simple problems of flow process on steam table & mollier chart.		
L-31	Determine the changes in properties & solve simple numerical.		
L-32	Revision of above Topics		
	STEAM GENERATOR	**CH-4**	**Thermal Engineering 6th Edittion By R.K Rajput**
L-33	Classification & types of Boiler.		
L-34	Important terms for Boiler.		
L-35	Description & working of fire tube Boiler.		
L-36	Description & working of Water tube Boiler.		
L-37	Comparison between fire tube & Water tube Boiler.		
L-38	Description & working of common boilers Cochran & Lancashire Boiler.		
L-39	Description & working of common boilers Babcock & Wilcox Boiler.		
L-40	Description & working of Boiler Draught (Forced, induced & balanced).		
	Comparison between Forced induced & balanced Draught.		
L-41	Description & working of Boiler mountings.		
L-42	Description & working of Boiler accessories		
L-43	Revision of above Topics		
	STEAM POWER CYCLES	**CH-5**	**Thermal Engineering 6th Edittion By R.K Rajput**
L-44	Carnot cycle with vapour.		
L-45	Derive work & efficiency of the Carnot cycle.		
L-46	Solve simple problems on Carnot cycle.		
L-47	Derive Rankine cycle Representation in P-V, T-S & h-s diagram.		
L-48	Derive Work & Efficiency of the Rankine cycle.		
	Solve simple problems on Rankine cycle.		
L-49	Effect of Various end conditions in Rankine cycle.		
L-50	Describe Reheat Rankine cycle.		
L-51	Describe Regenerative Rankine cycle.		
L-52	Solve simple problems on Reheat Rankine cycle & Regenerative Rankine cycle.		
L-53	Revision of above Topics.		
	HEAT TRANSFER	**CH-6**	**Thermal Engineering**
L-54	Describe Modes of Heat Transfer (Conduction, Convection & Radiation).		
L-55	Derive Fourier law of heat conduction and thermal conductivity (k).		
L-56	Derive Newton's laws of cooling& Heat transfer co-efficient (h).		

L-57	Solve simple problems Conduction, Convection.		**6th Edittion By R.K Rajput**
L-58	Derive Radiation of heat transfer (Stefan, Boltzmann & Kirchhoff's law) only statement.		
L-59	Describe Black body Radiation. Definition of Emissivity, absorptivity, & transmissibility.		
L-60	Revision of above Topics.		

MITS SCHOOL OF ENGINEERING, BHUBANESWAR

Lesson Plan

Name of the Subject: Theory of Machine **Semester:** 4th Sem. (Mechanical)
Name of the Faculty: Mr. Debasis Barik

Lecturerer No.	Topics Plan to be Covered	Chapter as per syllabus	Reference books
L-01	Link, kinematic chain, mechanism.	CH-1	Simple Mechanism (R.S Khurmi)
L-02	Machine, Its Function, Inversion.		
L-03	Four bar link mechanism.		
L-04	Lower pair and higher pair.		
L-05	Cam and followers.		
L-06	Driver & Driven.		
L-07	Bar mechanism and its inversion.		
L-08	Discussion of bar with neat sketch.		
L-09	Numerical of above.		
L-10	Friction between nut and screw for square thread.	CH-2	Friction (R.S Khurmi)
L-11	Screw jack, Bearing.		
L-12	Bearing and its classification.		
L-13	Description of roller, needle roller& ball bearings.		
L-14	Torque transmission in flat pivot& conical pivot bearings.		
L-15	Flat collar bearing of single and multiple types.		
L-16	Torque transmission for single and multiple clutches.		
L-17	Working of simple frictional brakes.		
L-18	Working of Absorption type of dynamometer.		
L-19	Numerical of above.		
L-20	Numerical of above.		
L-21	Numerical of above.		
L-22	Concept of power transmission.	CH-3	Power Transmission (R.S Khurmi)
L-23	Type of drives, belt, gear and chain drive.		
L-24	Computation of velocity ratio, length of belts (open and cross) with and without slip.		
L-25	Ratio of belt tensions, centrifugal tension and initial tension.		
L-26	Power transmitted by the belt.		
L-27	Determine belt thickness and width for given permissible stress for open.		
L-28	Crossed Belt considering centrifugal tension.		
L-29	V-belts and V-belts pulleys.		
L-30	Concept of crowning of pulleys.		
L-31	Gear drives and its terminology.		

L-32	Gear trains, working principle of simple.		
L-33	Compound, reverted and epicyclic gear trains.		
L-34	Function of governor.	**CH-4**	Governors and Flywheel (R.S Khurmi)
L-35	Classification of governor.		
L-36	Working of Watt, Porter, Proel and Hartnell governors.		
L-37	Conceptual explanation of sensitivity, stability and isochronisms.		
L-38	Function of flywheel.		
L-39	Comparison between flywheel &governor.		
L-40	Comparison between flywheel &governor.		
L-41	Fluctuation of energy and coefficient of fluctuation of speed.		
L-42	Concept of static and dynamic balancing.	**CH-5**	Balancing of Machine (R.S Khurmi)
L-43	Static balancing of rotating parts.		
L-44	Principles of balancing of reciprocating parts.		
L-45	Causes and effect of unbalance.		
L-46	Difference between static and dynamic balancing.		
L-47	Causes and effect of unbalance.		
L-48	Causes and effect of unbalance.		
L-49	Numerical of above.		
L-50	Concept of static and dynamic balancing.	**CH-6**	Vibration of machine parts (R.S Khurmi)
L-51	Static balancing of rotating parts.		
L-52	Principles of balancing of reciprocating parts.		
L-53	Causes and effect of unbalance.		
L-54	Difference between static and dynamic balancing.		
L-55	Difference between static and dynamic balancing.		
L-56	Numerical of above.		

MITS SCHOOL OF ENGINEERING, BHUBANESWAR

Lesson Plan

Name of the Subject: Entrepreneurship and Mgt & Smart Technology (TH1)

Name of the Faculty: Mr. Debasis Sahoo **SEM:** 5th Sem (All Branch)

Lect	Topics Plan to be Covered.	Chapter	Reference.
L-01	**Entrepreneurship:** Concept /Meaning of Entrepreneurship	**CH-1**	Industrial Engg. & Management by O.P Khanna/Ch-32
L-02	Need of Entrepreneurship		
L-03	Characteristics, Qualities and Types of entrepreneur, Functions		
L-04	Barriers in entrepreneurship & Entrepreneurs vrs. Manager		
L-05	Forms of Business Ownership: Sole proprietorship, partnership forms and others		
L-06	Types of Industries, Concept of Start-ups		
L-07	Entrepreneurial support agencies at National, State, District Level (Sources):		
L-08	DIC, NSIC,OSIC, SIDBI, NABARD, Commercial Banks, KVIC etc		
L-09	Technology Business Incubators (TBI) and Science and Technology Entrepreneur Parks		
L-10	**Market Survey and Opportunity Identification:** Business Planning	**CH-2**	Production and Operation Management by Panneerselvam/Ch-8
L-11	SSI, Ancillary Units, Tiny Units, Service sector Units		
L-12	Time schedule Plan, Agencies to be contacted for Project Implementation		
L-13	Assessment of Demand and supply and Potential areas of Growth		
L-14	Identifying Business Opportunity		
L-15	Final Product selection		
L-16	**Project Report Preparation:** Preliminary project report	**CH-3**	Production and Operation Management by Panneerselvam/Ch-11
L-17	Detailed project report, Techno economic Feasibility		
L-18	Project Viability		
L-19	**Management Principles:** Definitions of management	**CH-4**	Ind. Engg. & Mang O.P Khanna/Ch-32
L-20	Principles of management		
L-21	Functions of management (planning, organizing, staffing, directing and controlling etc.)		
L-22	Level of Management in an Organization		
L-23	**Functional Areas of Management:** Production management, Functions, Activities	**CH-5**	Industrial Engg. & Management by O.P Khanna/Ch-8&24
L-24	Productivity, Quality control Production Planning and control		
L-25	Inventory Management, Need for Inventory management Models/Techniques of Inventory		
L-26	Financial Management, Functions of Financial management, Management of Working		
L-27	Costing (only concept), Break even Analysis, Accounting Terminologies: Book Keeping,		
L-28	Journal entry, Petty Cash book, P&L Accounts, Balance Sheets		
L-29	Marketing Management, Concept of Marketing and Marketing Management		
L-30	Marketing Techniques, Concept of 4P s (Price, Place, Product, Promotion)		
L-31	Human Resource Management: Functions of Personnel Management		
L-32	Manpower Planning, Recruitment, Sources of manpower, Selection process, Method of		
L-33	Methods of Training & Development, Payment of Wages		
L-34	**Leadership and Motivation:** Leadership, Definition and Need/Importance	**CH-6**	Ind. Engg. & Mang by O.P Khanna/Ch-17
L-35	Qualities and functions of a leader, Manager Vs Leader, Style of Leadership		
L-36	Motivation: Definition and characteristics, Importance of motivation		
L-37	Factors affecting motivation, Theories of motivation, Methods of Improving Motivation		
L-38	Importance of Communication in Business, Types and Barriers of Communication		
L-39	**Work Culture, TQM & Safety:** Human relationship and Performance in Organization	**CH-7**	Total Quality Management by V. Jayakumar /Ch-7
L-40	Relations with Peers, Superiors and Subordinates,		
L-41	TQM concepts: Quality Policy, Quality Management, Quality system		
L-42	Accidents and Safety, Cause, preventive measures, General Safety Rules, (PPE)		
L-43	**Legislation:** Intellectual Property Rights(IPR), Patents, Trademarks, Copyrights	**CH-8**	Ind. Engg. & Mang O.P Khanna/Ch-22
L-44	Features of Factories Act 1948 with Amendment (only salient points)		
L-45	Features of Payment of Wages Act 1936 (only salient points)		
L-46	**Smart Technology:** Concept of IOT, How IOT works, Components of IOT	**CH-9**	Prod & Operation Mgt by Panneerselvam/ Ch-8
L-47	Characteristics of IOT, Categories of IOT, Applications of IOT- Smart Cities, Smart		
L-48	Smart Home, Smart Healthcare, Smart Ind, Smart Agri, Smart Energy Magt etc.		

MITS SCHOOL OF ENGINEERING, BHUBANESWAR

Lesson Plan

Name of the Subject: Design of Machine Element (TH2) **Semester: 5th** Sem (Mechanical)

Name of the Faculty: Mr Debasis Barik

Lecture	Topics Plan to be Covered	Chapter as per	Reference
L-01	IntroducƟon to Machine Design and Classifyit	CH-1	Machine Design by R.S. KHURMI & J.K. GUPTA Page No.-(1-15), (16-52),(87-119)
L-02	Different mechanical engineering materials used in design with their uses		
L-03	Mechanical and physical properƟes designmaterials		
L-04	Define working stress, yield stress, ulƟmatestress & factor of safety		
L-05	Simple problems on above Topics.		
L-06	stress –strain curve for M.S & C.I		
L-07	Modes of Failure (By elasƟc deflecƟon,general yielding & fracture)		
L-08	State the factors governing the design ofmachine elements.		
L-09	Describe design procedure.		
L-10	Revision of above Topics		
L-11	Simple problems on above Topics.		
L-12	Joints and their classification	CH-2	Machine Design by R.S. KHURMI & J.K. GUPTA Page No.-(341-376),(281-340)
L-13	State types of welded joints, State advantages of welded joints over other joints		
L-14	Design of welded joints for eccentric loads		
L-15	Simple problems on above Topics.		
L-16	State types of riveted joints and types ofrivets		
L-17	Important Terms Used in Riveted Joints		
L-18	Caulking and Fullering, Describe failure ofriveted joints.		
L-19	Determine strength & efficiency of rivetedjoints		
L-20	Simple problems on above Topics.		
L-21	Design riveted joints for pressure vessel		
L-22	Simple problems on above Topics.		
L-23	Solve problems on Welded Joint and RivetedJoints		
L-24	Revision of above Topics		
L-25	Simple problems on above Topics.		
L-26	Introduction ,State function of shafts, State materials for shafts	CH-3	Machine Design by R.S. KHURMI & J.K. GUPTA Page No.-(509-557)-(470-478)
L-27	Design solid & hollow shaŌs to transmit agiven power at given rpm based on Strengt		
L-28	Case-1 ShaŌs subjected to twisƟng momentor torque only & Case-2 ShaŌs subjecte		
L-29	Case-3 ShaŌs subjected to combinedtwisƟng and bending moments		
L-30	Simple problems on above Topics		
L-31	Case-4 ShaŌs subjected to axial loads in addiƟon to combined torsional and bendingl		
L-32	Simple problems on above Topics		
L-33	Design solid & hollow shaŌs to transmit agiven power at given rpm based on Rigidity,		
L-34	Simple problems on above Topics.		
L-35	State funcƟon of keys, types of keys &material of keys		
L-36	Describe failure of key, effect of key way		
L-37	Design rectangular sunk key considering its failure against shear & crushing. Simplepr		
L-38	Design rectangular sunk key by usingempirical relaƟon for given diameter of shaŌ. Si		
L-39	State specification of parallel key, gib-headkey, taper key as per I.S		
L-40	Revision of above Topics		
L-41	Simple problems on above Topics.		
L-42	Design of ShaŌ Coupling, Requirements of agood shaŌ coupling, Types of Coupling	CH-4	Machine Design by R.S. KHURMI & J.K. GUPTA Page No.-(478-508)
L-43	Design of Sleeve or Muff-Coupling.		
L-44	Simple problems on above Topics		
L-45	Design of Clamp or Compression Coupling		
L-46	Simple problems on above Topics		
L-47	Revision of above Topics		
L-48	Simple problems on above Topics.		
L-49	Introduction, Types of Springs.	CH-5	Machine Design by R.S. KHURMI & J.K. GUPTA Page No.-(820-884)
L-50	Material for Helical Springs, Standard Size of Spring Wire		
L-51	Terms used in Compression Springs		
L-52	Stresses in Helical Springs of Circular Wire		
L-53	Simple problems on above Topics		
L-54	Deflection of Helical Springs of Circular Wire.		
L-55	Simple problems on above Topics		
L-56	Surge in Spring		
L-57	Simple problems on above Topics		
L-58	Solve numerical on design of closed coil helical compression spring.		
L-59	Revision of above Topics		

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Lesson Plan

Name of the Subject: Hydraulic Machines & Industrial Fluid Powe(TH3) **Semester:** 5th Sem(Mech.)

Name of the Faculty: Mr.Subrat Kumar Ghosh

Lecturer	Topics Plan to be Covered	Chapter as per	Reference books/Chapter/Page No.
L-01	Definition and classification of hydraulic turbines	CH-1	**HYDRAULIC TURBINES** (R K BANSAL) Page No- 853-944
L-02	Construction and working principle of impulse turbine		
L-03	Velocity diagram of moving blade work doneof impulse turbine.		
L-04	Derivation of various efficiencies of impulse turbine.		
L-05	Velocity diagram of moving blades, work done of Francis Turbine		
L-06	Various efficiencies of Francis turbine.		
L-07	Velocity diagram of moving blades, work done		
L-08	Derivation of various efficiencies of Kaplan turbine		
L-09	Distinguish between impulse turbine and reaction turbine cont		
L-10	Distinguish between impulse turbine and reaction turbine		
L-11	Turbine,Pump,Hydraulic turbine,mixed flow		
L-12	Hydraulic system, its merit and demerits	CH-2	**HYDRAULIC CONTROL SYSTEM** (R K BANSAL) https://www.slideshare.net/nagarajukondrasi/hydrauliccontrol-system-139261041
L-13	Hydraulic system, its merit and demerits		
L-14	Hydraulic accumulators		
L-15	Pressure control valves		
L-16	Pressure relief valves		
L-17	Pressure regulation valves cont		
L-18	Pressure regulation valves		
L-19	Flow control valves		
L-20	Throttle valves		
L-21	Operation of double acting cylinder		
L-22	Operation of double acting cylinder		
L-23	Comparison of hydraulic and pneumatic system		
L-24	Numerical on above		
L-25	Elements –filter-regulator-lubrication unit	CH-3	**PNEUMATIC CONTROL SYSTEM** (R K BANSAL) https://en.wikipedia.org/wiki/Pneumatic
L-26	Pressure control valves		
L-27	Pressure relief valves		
L-28	Pressure regulation valves		
L-29	Direction control valves		
L-30	Flow control valves		
L-31	Throttle valves		
L-32	ISO Symbols of pneumatic components		
L-33	Pneumatic circuits		
L-34	Direct control of single acting cylinder		
L-35	Operation of double acting cylinder		
L-36	Operation of double acting cylinder		
L-37	Schematic diagram of Pneumatic control system with all parts.		
L-38	Schematic diagram of Pneumatic control system with all parts.		
L-39	Schematic diagram of Pneumatic control system with all parts.		
L-40	Pressure relief valve all parts .		
L-41	Pressure regulation valves all parts		
L-42	Numerical on above		
L-43	Throttle valves Function.		
L-44	Construction and working principle of centrifugal pumps	CH-4	**CENTRIFUGAL PUMPS** (R K BANSAL) Page No- 945-992
L-45	Work done and derivationvarious efficiencies ofcentrifugal pumps.		
L-46	Work done and derivationvarious efficiencies ofcentrifugal pumps.		
L-47	Numerical on above		
L-48	Numerical on above		
L-49	Numerical on above		

MITS SCHOOL OF ENGINEERING, BHUBANESWAR Lesson LESSON PLAN

Name of the Subject: Mechatronics (TH4) **Semester: 5th** Sem.(Mech)

Name of the Faculty: Mr Debasis Barik

Lecturer	Topics Plan to be Covered	Chapter as	Reference
L-01	**INTRODUCTION TO MECHATRONICS**	CH-1	**MECHATRONICS (W. Bolton) Page-(1-28)**
L-02	Definition of Mechatronics		
L-03	Advantages & disadvantages of Mechatronics		
L-04	Application of Mechatronics		
L-05	Discuss about the topic		
L-06	Scope of Mechatronics in Industrial Sector		
L-07	Discuss about the industrial sector		
L-08	Components of a Mechatronics System		
L-09	Importance of mechatronics in automation		
L-10	Revision		
L-11	**SENSORS AND TRANSDUCERS**	CH-2	**MECHATRONICS (W. Bolton) Page-(29-43)**
L-12	Defination of Transducers		
L-13	Classification of Transducers		
L-14	Electromechanical Transducers		
L-15	Transducers Actuating Mechanisms		
L-16	Discuss about the topic		
L-17	Displacement Sensors		
L-18	Positions Sensors		
L-19	Velocity, motion		
L-20	Force and pressure sensors.		
L-21	Temperature and light sensors.		
L-22	**ACTUATORS-MECHANICAL, ELECTRICAL**	CH-3	**MECHATRONICS (W. Bolton) Page-(44-57)**
L-23	Mechanical Actuators		
L-24	Machine, Kinematic Link, Kinematic Pair		
L-25	Mechanism, Slider crank Mechanism		
L-26	Gear Drive, Spur gear		
L-27	Bevel gear, Helical gear		
L-28	Worm gear		
L-29	Discuss about the topic		
L-30	Belt & Belt drive		
L-31	Bearings		
L-32	Electrical Actuator		
L-33	Switches and relay		
L-34	Solenoid		
L-35	D.C Motors		
L-36	A.C Motors		
L-37	Stepper Motors		
L-38	Specification and control of stepper motors		
L-39	Servo Motors D.C & A.C		
L-40	Discuss about the topic		
L-41	**PROGRAMMABLE LOGIC CONTROLLERS(PLC)**	CH-4	**MECHATRONICS (W. Bolton) Page-(58-73)**
L-42	Introduction		
L-43	Advantages of PLC		
L-44	Selection and uses of PLC		
L-45	Discuss about the topic		
L-46	Architecture basic internal structures		
L-47	Input/output Processing		
L-48	Input/output Programming		
L-49	Mnemonics		
L-50	Master and Jump Controllers		
L-51	Discuss about the topic		
L-52	**ELEMENTS OF CNC MACHINES**	CH-5	**CAD/CAM/CIM (R.RADHAKRISHNA/S,SUBRAMANIAN) Page-(1-53)**
L-53	Introduction to Numerical Control		
L-54	Numerical Control of machines and CAD/CAM		
L-55	NC machines		**CAD/CAM/CIM**

MITS SCHOOL OF ENGINEERING, BHUBANESWAR

Lesson Plan

Name of the Subject: Refrigeration & Air conditioning. (TH5) **Semester: 5th** Sem (Mechanical)

Name of the Faculty: Miss Shuvashree Paital

Lecturer	Topics Plan to be Covered	Chapter	Reference
L-01	**AIR REFRIGERATION CYCLE:: -**Definition of Refrigeration & unit of Refrigeration.	CH-1	REFRIGERATION & AIR-CONDITIONING BY R.S.KHURMI . (PAGE NO:: 38-67)
L-02	Definition of COP, Refrigerating effect (R.E)		
L-03	Principle of working of open and closed air system of refrigeration.		
L-04	Numerical on above		
L-05	Numerical on above		
L-06	Calculation of COP of Bell-Coleman cycle and numerical on it.		
L-07	**SIMPLE VAPOUR COMPRESSION REFRIGERATION SYSTEM::-** Diagram & its Types.	CH-2	REFRIGERATION & AIR-CONDITIONING BY R.S.KHURMI . (PAGE NO:: 108-160)
L-08	Cycle with dry saturated vapors after compression.		
L-09	Cycle with wet vapors after compression.		
L-10	Cycle with superheated vapors after compression.		
L-11	Cycle with superheated vapors before compression.		
L-12	Cycle with sub cooling of refrigerant.		
L-13	Representation of above cycle on temperature entropy and pressure enthalpy diagram.		
L-14	Numerical on above (determination of COP,mass flow)		
L-15	Numerical on above		
L-16	Numerical on above		
L-17	**VAPOUR ABSORPTION REFRIGERATION SYSTEM::-**Working Principle SVARS.	CH-3	REFRIGERATION & AIR-CONDITIONING BY R.S.KHURMI . (PAGE NO:: 238-249)
L-18	Practical vapor absorption refrigeration system.		
L-19	Numerical on above		
L-20	COP of an ideal vapor absorption refrigeration system& Numerical on COP.		
L-21	**REFRIGERATION EQUIPMENTS::-**Important term of Refrigerant Compressor.	CH-4	REFRIGERATION & AIR-CONDITIONINGBY R.S.KHURMI . (PAGE NO:: 312-315,330-337,352-361)
L-22	working and constructional details of reciprocating and rotary compressors.		
L-23	Numerical on above		
L-24	Numerical on above		
L-25	Centrifugal, Hermetically & Semi Hermetically Sealed compressor only theory.		
L-26	**CONDENSERS::-** Cooling tower and spray pond. , Heat rejection Ratio.		
L-27	working and constructional details of air cooled and water cooled condenser.		
L-28	Numerical on above		
L-29	**EVAPORATORS::-** Working, Construction and Types of Evaporators.		
L-30	Bare tube coil evaporator, finned evaporator, shell and tube evaporator.		
L-31	**REFRIGERANTS & APPLICATION::-**Capillary tube, Automatic & Thermostatic Expansion Valve.	CH-5	REFRIGERATION & AIR-CONDITIONING BY R.S.KHURMI . (PAGE NO:: 250-269)
L-32	**REFRIGERANTS::-** Classification and Designation of Refrigerant.		
L-33	Thermodynamics and Chemical properties of Refrigerant.		
L-34	commonly used refrigerants(R-11,R-12,R-22,R-134a,R-717),Substitute for CFC.		
L-35	Numerical on above		
L-36	**Applications of refrigeration::-**Cold storage, Dairy Refrigeration, Ice plant, water cooler.		
L-37	Numerical on above		
L-38	**PSYCHOMETRICS &COMFORT AIR CONDITIONING SYSTEMS::-**Terms, chart & use.	CH-6	REFRIGERATION & AIR-CONDITIONING BY R.S.KHURMI . (PAGE NO:: 421-481)
L-39	**Psychometric processes::-**		
L-40	Heating and Humidification.		
L-41	Total heating of a cooling process.		
L-42	SHF, BPF.		
L-43	Adiabatic mixing.		
L-44	Adiabatic cooling with humidification.		
L-45	Cooling and Dehumidification.		
L-46	Sensible heating and cooling.		
L-47	Problems on above.		
L-48	Effective temperature and Comfort chart.		
L-49	Numerical on above		
L-50	Numerical on above		
L-51	Adiabatic saturation of air by evaporation of water.		
L-52	Numerical on above		
L-53	**AIR CONDITIONING SYSTEMS::-**	CH-7	REFRIGERATION & AIR-CONDITIONING BY R.S.KHURMI . (PAGE NO:: 497-532)
L-54	Factors affecting comfort air conditioning.		
L-55	Equipment used in an air-conditioning.		
L-56	Classification of air-conditioning system.		
L-57	Winter Air Conditioning System.		
L-58	Summer Air Conditioning System.		
L-59	Numerical on above.		

MITS School of Engineering, Bhubaneswar
Department of Mechanical Engineering
Lab Lesson Plan

Name of the Subject: - RAC LAB (PR1)
Name of the Faculty: - Miss Shuvashree Paital **Semester:-5th**

Experiment No	Name of the experiment	Name of the Equipment	Venue
01	Study the construction features of Domestic Refrigerator.	Domestic Refrigerator test rig	ME Lab
02	Study the construction features of water cooler.	water cooler test rig	ME Lab
03	Study the construction features of window air conditioner	Window Air Conditioner test rig	ME Lab
04	Study the construction features of split air conditioner	Split Air Conditioner test rig	ME Lab
05	Determine the capacity and cop of vapour compression Refrigerator test rig	Vapour compression test rig	ME Lab
06	Determine the capacity and cop of water cooler	Water cooler test rig	ME Lab
07	Determine the capacity and cop of window air conditioner	Window Air Conditioner test rig	ME Lab
08	Determine the capacity and cop of split air conditioner	Split Air Conditioner test rig	ME Lab
09	Determine the capacity and cop of vapour absorption Refrigerator test rig	Vapour absorption test rig	ME Lab
10	Complete charging of a domestic refrigerator and its leak test	Domestic Refrigerator test rig	ME Lab

MITS School of Engineering, Bhubaneswar
Department of Mechanical Engineering
Lab Lesson Plan

Name of the Subject: - HM & IFP Lab **(PR2)**
Name of the Faculty: - Mr Subrat Kumar Ghosh **Semester:-5th**

Experiment No	Name of the experiment	Name of the Equipment	Venue
01	Performance test on impulse turbine and to find out the efficiency	Impulse Turbine Test Rig	ME Lab
02	Performance test on kaplan turbine and to find out the efficiency	Kaplan turbine Test Rig	ME Lab
03	Performance test on Francis turbine and to find out the efficiency	Francis turbine Test Rig	ME Lab
04	Performance test on centrifugal pump and to find out the characteristic curves	Centrifugal pump Test Rig	ME Lab
05	Direct operation of single &double acting pneumatic cylinder.	Pneumatic Trainer Kit	ME Lab
06	Operating double acting pneumatic cylinder with quick exhaust valve	Pneumatic Trainer Kit	ME Lab
07	Speed control double acting pneumatic cylinder using metering in and metering out circuits.	Hydraulic Trainer Kit	ME Lab
08	Direct operation of single &double acting hydraulic cylinder	Hydraulic Trainer Kit	ME Lab
09	Direct operation of hydraulic motor	Hydraulic Trainer Kit	ME Lab
10	Speed control double acting hydraulic cylinder using metering in & metering out circuits.	Hydraulic Trainer Kit	ME Lab

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Department of Mechanical Engineering
Lab Lesson Plan

Name of the Subject: - CAD/CAM Lab (PR3)
Name of the Faculty: - Mr Debasis Barik **Semester:-5th**

Experiment No	Name of the experiment	Name of the Equipment	Venue
01	Drawings of Rectangle, circle, polygon and its dimensioning	DESKTOP COMPUTER with UPS AUTOCAD SOFTWARE 2D/3D	YES
02	Gib and cutter joint & Print the orthographic view of the assembled 3Ddrawing	DESKTOP COMPUTER with UPS AUTOCAD SOFTWARE 2D/3D	YES
03	Screw Jack & Print the orthographic view of the assembled 3Ddrawing	DESKTOP COMPUTER with UPS AUTOCAD SOFTWARE 2D/3D	YES
04	Connecting Rod & Print the orthographic view of the assembled 3Ddrawing	DESKTOP COMPUTER with UPS AUTOCAD SOFTWARE 2D/3D	YES
05	Bearing Block & Print the orthographic view of the assembled 3Ddrawing	DESKTOP COMPUTER with UPS AUTOCAD SOFTWARE 2D/3D	YES
06	Study of CNC lathe, milling	CNC TURNING MACHINE/ CNC MILLING MACHINE	NO
07	Study of international codes; G-Codes and M –Codes	CNC APPLICATION	NO
08	Format –Dimensioning methods	CNC APPLICATION	NO
09	Programme writing –Turning Simulator-Milling simulator IS practice-commands menus	CNC TURNING MACHINE/CNC MILLING MACHINE	NO
10	Editing the programme in the CNC MACHINES	CNC TURNING MACHINE/CNC MILLING MACHINE	NO
11	Execute the programme in the CNC machines	CNC TURNING MACHINE/CNC MILLING MACHINE	NO
12	Print the programme and make the component in the CNC machine	CNC TURNING MACHINE/CNC MILLING MACHINE	NO
13	Using canned cycle-create a part programme for thread cutting, grooving and produce component in the CNC Turning Machine	CNC TURNING MACHINE	NO
14	Using Linear interpolation and Circular Interpolation-Create a part programme for grooving and produce component in the CNC Milling Machine	CNC MILLING MACHINE	NO

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Lesson Plan

Name of the Subject: Automobile Engineering & Hybrid Vehicles **Semester:** 6th Sem.(Mech)
Name of the Faculty: Miss Shuvashree Paital

Lecturerer No.	Topics Plan to be Covered	Chapter as per syllabus	Reference books/Chapter/Page No.
	INTRODUCTION & TRANSMISSION SYSTEM	**CH-1**	Automobile Engineering By R.B.Gupta
L-01	Automobiles Definition, need and classifications.		
L-02	Layout of automobile chassis with major components (Line diagram).		
L-03	Clutch system & their needs.		
L-04	Clutch types (single & multiple) and their working principle with sketch.		
L-05	Gear Box & Purpose of gear box.		
L-06	Construction and working of a 4 speed gear box.		
L-07	Concept of automatic gear changing mechanisms.		
L-08	Propeller shaft & Constructional features.		
L-09	Differential & their needs, Types Differential.		
L-10	Working principle of Differential.		
L-11	Revision of above Topics		
	BRAKING SYSTEM	**CH-2**	Automobile Engineering By R.B.Gupta
L-12	Braking systems in automobiles& their needs, types Braking systems in automobiles.		
L-13	Describe the working principle of Mechanical Brake with sketch.		
L-14	Describe the working principle of Hydraulic Brake with sketch.		
L-15	Describe the working principle of Air Brake with sketch.		
L-16	Describe the working principle of Air assisted Hydraulic Brake with sketch.		
L-17	Describe the working principle of Vacuum Brake with sketch.		
L-18	Revision of above Topics		
	IGNITION & SUSPENSION SYSTEM	**CH-3**	Automobile Engineering By R.B.Gupta
L-19	Describe the Battery ignition system.		
L-20	Describe the Magnet ignition system.		
L-21	Spark plugs: Purpose, construction and specifications.		
L-22	State the common ignition troubles and its remedies.		
L-23	Description of the conventional suspension system for Rear axle.		
L-24	Description of the conventional suspension system for Front axle.		
L-25	Description of independent suspension system used in cars (coil spring and tension		

	bars.		
L-26	Constructional features of a telescopic shock absorber.		
L-27	Working of a telescopic shock absorber.		
L-28	Revision of above Topics.		
	COOLING AND LUBRICATION	**CH-4**	Automobile Engineering By R.B.Gupta
L-29	Engine cooling systems & their needs.		
L-30	Classification of Engine cooling systems.		
L-31	Describe defects of cooling systems.		
L-32	Describe the remedial measures of cooling systems.		
L-33	Describe the Function of lubrication.		
L-34	Describe the lubrication System of I.C. engine		
L-35	Revision of above Topics.		
	FUEL SYSTEM	**CH-5**	Automobile Engineering By R.B.Gupta
L-36	Describe Air fuel ratio.		
L-37	Describe Carburetion process for Petrol Engine.		
L-38	Describe Multipoint fuel injection system for Petrol Engine		
L-39	Describe the working principle of fuel injection system for multi cylinder Engine		
L-40	Filter for Diesel engine		
L-41	Describe the working principle of Fuel feed pump and Fuel Injector for Diesel engine		
L-42	Revision of above Topics.		
	ELECTRIC AND HYBRID VEHICLES	**CH-6**	Automobile Engineering By R.B.Gupta
L-43	Introduction, Social and Environmental importance of Hybrid and Electric Vehicles.		
L-44	Description of Electric Vehicles.		
L-45	Description the operational advantages of Electric Vehicles.		
L-46	Description the present performance and applications of Electric Vehicles		
L-47	Battery for Electric Vehicles.		
L-48	Classify the Battery types for Electric Vehicles.		
L-49	Describe the fuel cells for Electric Vehicles.		
L-50	Hybrid vehicles & their types.		
L-51	Describe Electric Vehicles: Parallel, Series, Parallel and Series configurations		
L-52	Drive train		
L-53	Solar powered vehicles		
L-54	Revision of above Topics.		

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Lesson Plan

Name of the Subject: Advance Manufacturing Processes **Semester:** 6th Sem.(Mech.)
Name of the Faculty: Mr. DEBASIS ABRIK **Academic year:** 2021-22

Lecturerer No.	Topics Plan to be Covered	Chapter as per syllabus	Reference books/Chapter/Page No.
	Modern Machining Processes	**CH-1**	**Production technology – Vol-II O.P.KHANNA CH- Modern Machining Processes**
L-01	Comparison of advanced manufacturing process with traditional machining		
L-02	Ultrasonic Machining: principle		
L-03	Ultrasonic Machining:Description of equipment, applications.		
L-04	Electric Discharge Machining: Principle, Description of equipment,		
L-05	Dielectric fluid, tools (electrodes), Process parameters, Output characteristics, applications.		
L-06	Wire cut EDM: Principle, Description of equipment,		
L-07	Wire cut EDM: controlling parameters; applications.		
L-08	Abrasive Jet Machining: principle, description of equipment,		
L-09	Abrasive Jet Machining: Material removal rate, application.		
L-10	Electro Chemical Machining: principle, description of equipment		
L-11	Electro Chemical Machining: Material removal rate, application.		
L-12	Plasma Arc Machining – principle, description of equipment.		
L-13	Plasma Arc Machining : Material removal rate, Process parameters, performance characterization, Applications		
L-14	Electron Beam Machining - principle, description of equipment, Material removal rate		
L-15	Electron Beam Machining : Process parameters, performance characterization, Applications.		
	Plastic Processing:	**CH-2**	**Production technology – Vol-II O.P.KHANNA CH- Plastic Processing**:
L-16	Processing of plastics.		
L-17	Moulding processes: Injection moulding		
L-18	**Compression moulding**		
L-19	Transfer moulding.		
L-20	Extruding		
L-21	Casting		
L-22	Calendering		
L-23	Fabrication methods		
L-24	Sheet forming		
L-25	Blow moulding		
L-26	Laminating plastics (sheets, rods & tubes)		
L-27	Reinforcing.		
L-28	Applications of Plastics.		
	Additive Manufacturing Process:	**CH-3**	**Production technology – Vol-II O.P.KHANNA CH- Additive Manufacturing Process:**
L-29	Introduction, Need for Additive Manufacturing		
L-30	Fundamentals of Additive Manufacturing		
L-31	AM Process Chain		
L-32	dvantages and Limitations of AM, Commonly		

	used Terms		
L-33	Classification of AM process,		
L-34	Fundamental Automated Processes		
L-35	Distinction between AM and CNC		
L-36	other related technologies.		
L-37	Application –Application in Design, Aerospace Industry, Automotive Industry, Jewelry Industry, Arts and Architecture. RP Medical and Bioengineering Applications.		
L-38	Web Based Rapid Prototyping Systems.		
L-39	Concept of Flexible manufacturing process		
L-41	Concurrent engineering		
L-42	Production tools like capstan lathes		
L-43	Turret lathes		
L-44	Rapid prototyping processes.		
	Special Purpose Machines (SPM)	**CH-4**	**Production technology – Vol-II O.P.KHANNA CH- Special Purpose Machines (SPM)**
L-45	Concept, General elements of SPM		
L-46	General elements of SPM revision		
L-47	Productivity improvement by SPM		
L-48	Productivity improvement by SPM revision		
L-49	Principles of SPM design.		
L-50	Principles of SPM design. revision		
	Maintenance of Machine Tools	**CH-5**	**Production technology – Vol-II O.P.KHANNA CH- Special Purpose Machines (SPM)**
L-51	Types of maintenance, ,.		
L-52	Repair cycle analysis,		
L-53	Repair complexity,		
L-54	Maintenance manual		
L-55	Maintenance records		
L-56	Housekeeping		
L-57	Introduction to Total Productive Maintenance (TPM)		

MITS SCHOOL OF ENGINEERING, BHUBANESWAR

Lesson Plan

Name of the Subject: Power Station Engineering **Semester:** 6th Sem. (Mechanical)
Name of the Faculty: Mr. Subrat Kumar Ghosh

Lecturerer No.	Topics Plan to be Covered	Chapter as per syllabus	Reference books/Chapter/Page No.
	INTRODUCTION	**CH-1**	Power Plant Engineering By R.K Rajput
L-01	Describe sources of energy & Explain concept of Central and Captive power station.		
L-02	Classify power plants.		
L-03	Importance of electrical power in day today life. Overview of method of electrical power generation.		
L-04	Revision of above Topics		
	THERMAL POWER STATIONS	**CH-2**	Power Plant Engineering By R.K Rajput
L-05	Layout of steam power stations.		
L-06	Explain Steam power cycle.		
L-07	Explain Carnot vapour power cycle with P-V, T-s diagram and determine thermal efficiency.		
L-08	Solve Simple Problems		
L-09	Explain Rankine cycle with P-V, T-S & H-s diagram.		
L-10	Determine thermal efficiency; Work done, work ratio, and specific steam Consumption of Rankine Cycle.		
L-11	Solve Simple Problems.		
L-12	List of thermal power stations in the state with their capacities.		
L-13	Boiler Accessories:Operation of Air pre heater, Operation of Economiser.		
L-14	Operation Electrostatic precipitator and Operation of super heater.		
L-15	Need of boiler mountings and operation of boiler.		
L-16	Explain the boiler mountings.		
L-17	Explain Draught systems: Natural draught, Forced draught.		
L-18	Explain balanced draught & with their advantages & disadvantages.		
L-19	Advantages & disadvantages of Steam prime movers.		
L-20	Performance of steam turbine: Explain Thermal efficiency, Stage efficiency and Gross efficiency.		
L-21	Solve Simple Problems		
L-22	Steam condenser: Function of condenser.		
L-23	Classification of condenser.		
L-24	Function of condenser auxiliaries such as hot well.		
L-25	Function of Condenser extraction pump, air extraction pump, and circulating pump.		
L-26	Cooling Tower: Function and types of cooling tower, and spray ponds.		
L-27	Selection of site for thermal power stations.		
L-28	Revision of above Topics		
	NUCLEAR POWER STATIONS	**CH-3**	Power Plant Engineering
L-29	Classify nuclear fuel (Fissile & fertile material).		
L-30	Explain fusion and fission reaction.		

L-31	Explain working of nuclear power plants with block diagram.		By R.K Rajput
L-32	Explain the working of nuclear reactor.		
L-33	Explain the construction of nuclear reactor.		
L-34	Compare the nuclear and thermal plants.		
L-35	Explain the disposal of nuclear waste.		
L-36	Selection of site for nuclear power stations		
L-37	List of nuclear power stations.		
L-38	Revision of above Topics		
	DIESEL ELECTRIC POWER STATIONS	**CH-4**	Power Plant Engineering By R.K Rajput
L-39	State the advantages and disadvantages of diesel electric power stations.		
L-40	Explain briefly different systems of diesel electric power stations.		
L-41	Explain briefly Fuel storage and fuel supply system.		
L-42	Explain briefly Fuel injection system.		
L-43	Explain briefly Air supply system, Exhaust system, cooling system.		
L-44	Explain briefly Lubrication system, starting system, governing system.		
L-45	Selection of site for diesel electric power stations.		
L-46	Performance and thermal efficiency of diesel electric power stations.		
L-47	Revision of above Topics		
	HYDEL POWER STATIONS	**CH-5**	Power Plant Engineering By R.K Rajput
L-48	State advantages and disadvantages of hydroelectric power plant.		
L-49	Classify and explain the general arrangement of storage type hydroelectric project.		
L-50	Explain operation of hydroelectric power plant.		
L-51	Selection of site of hydel power plant.		
L-52	List of hydro power stations with their capacities and number of units in the state.		
L-53	Types of turbines and generation used.		
L-54	Slove simple problems.		
L-55	Revision of above Topics		
	GAS TURBINE POWER STATIONS	**CH-6**	Power Plant Engineering By R.K Rajput
L-56	Selection of site for gas turbine stations.		
L-57	Fuels for gas turbine.		
L-58	Elements of simple gas turbine power plants.		
L-59	Merits, demerits and application of gas turbine power plants.		
L-60	Revision of above Topics		