Gondwana University, Gadchiroli

Faculty of Engineering and Technology

B.E. (MECHANICAL ENGINEERING): SEVENTH SEMESTER

ME701: ELECTIVE – I

ME7011: POWER PLANT ENGINEERING (Theory)

CREDITS: 03

Teaching Scheme	**Examination Scheme**
Lectures: 3 Hours/Week	Duration of Paper: 03 Hours
Tutorial: 1 Hour/Week	University Assessment: 80 Marks
	College Assessment: 20 Marks

UNIT – I **[9 Hrs.]**

Steam Power Plant (Coal Based)
Layout, Coal Handling, Ash handling, feed water, cooling water, Pulverized fuel firing; dust collection, draught system, Fuel Burners.

UNIT – II **[9 Hrs.]**

Important component of Coal Based steam power plant
Steam generator (Boilers), Types, High pressure boiler, Super critical boilers, Steam turbines; types and governing of steam turbines, Condensers (Numerical); cooling towers.

UNIT – III **[9 Hrs.]**

Nuclear Reactor
Nuclear reactor material; Breeder reactor; CANDU; PWR (Pressurised Water Reactor); Liquid metal cooled reactor; Radiation shielding; waste disposal of Nuclear reactor; economics of Nuclear Power Plant.

UNIT – IV **[9 Hrs.]**

Hydroelectric Power plants
Runoff; Hydrograph and flow duration curve; mass curve; selection of site; types of hydro electric power plant such as storage plant, runoff river plant, pumped storage power plant; Water turbines & its types; Draft tube; surse tank; governing of turbine; combine operation of hydro electric power plant with steam, nuclear, diesel & gas turbine power plant (working)

UNIT – V **[9 Hrs.]**

Economics of Power Plant
Cost analysis, load curves; tariffs, economics of combine power plant, economic loading of power plant, capacity scheduling and energy problems, depreciation and various methods of calculation, waste heat recovery system, compressed air storage plant.

BOOKS RECOMMENDED:

1) Power Plant Engineering by D.K.Nag
2) Power Plant Engineering by Domkundwar

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ME701: ELECTIVE – I

ME7012: FINITE ELEMENT METHOD (Theory)

CREDITS: 03

Teaching Scheme
Lectures: 3 Hours/Week
Tutorial: 1 Hour/Week

Examination Scheme
Duration of Paper: 03 Hours
University Assessment: 80 Marks
College Assessment: 20 Marks

UNIT – I **[12 Hrs.]**

Fundamentals of stress & strain, Stress & strain components, Stress strain relationship Elastic constants, Plane stress, Plane strain, Differential equation of equilibrium, Compatibility equations, Boundary conditions, Saint Venant`s principle, Airy`s stress function. (Only introduction is expected)

Fundamental concepts of FEM - Historical background, Scope of FEM in engineering applications, Principles of minimum potential energy, Concept of virtual work, Raleigh- Ritz Method, FEM analysis procedure. Mathematical understanding required for FEM, Matrix algebra & operations, Eigen values & Eigen vectors, Methods for solution of simultaneous equations, like Gauss elimination, Matrix decomposition method. Concept of discritization of body into elements, degrees of freedom, bandwidth, Basic types of 2-D & 3-D elements, Displacement models, Convergence requirements, shape functions. Commercial FE Softwares.

UNIT – II **[12 Hrs.]**

Finite element modeling & analysis using Bar & Beam elements - Stiffness matrix, Assembly, Boundary conditions, Load vector, Temperature effects.
Two dimensional plane truss - Local & Global co-ordinate system, element stiffness matrix, assembly, boundary conditions, load vector, force & stress calculations.

UNIT – III **[12 Hrs.]**

Two dimensional problems using CST & LST - Formulation of CST & LST elements, Elemental stiffness matrix, assembly, boundary conditions, load vector, stress calculations, temperature effect. Axi-symmetric solids subjected to axi-symmetric loading - Axi-symmetric formulation using CST ring element, stiffness matrix, boundary conditions, load vector, calculation of stresses.

UNIT – IV **[12 Hrs.]**

Introduction to Isoparametric & Higher order elements. Introduction to Numerical Integration. Introduction to dynamic analysis, formulation of mass matrix for one dimensional bar element, free vibration analysis using one dimensional bar element. Torsion of prismatic bars using triangular elements.

Steady state one dimensional & two dimensional heat conduction problems using I-D & triangular elements respectively. Programming aspects of FEM - Algorithms for, reading Finite Element modeling data, formation of elemental stiffness matrix, formation of elemental load vector, assembly of individual elemental stiffness matrix into global stiffness matrix, assembly of individual elemental load vector into global load vector, application of boundary conditions, solution of equations, determination of stresses & strains. Pre & Post processing in FEA

BOOKS RECOMMENDED:

1. Introduction to Finite Elements in Engineering - Chandrupatla & Belegundu
2. Theory of Elasticity - S. P. Timoshenko
3. Concept and Applications of Finite Element Analysis - R. D. Cook.
4. The Finite Element Method - A Basic Introduction to Engineers. D. W. Griffiths, D.A. Nethercot, Granada Publishing.

ME701: ELECTIVE – I

ME7013: TOOL DESIGN (Theory)

CREDITS: 03

Teaching Scheme
Lectures: 3 Hours/Week
Tutorial: 1 Hour/Week

Examination Scheme
Duration of Paper: 03 Hours
University Assessment: 80 Marks
College Assessment: 20 Marks

UNIT – I **[9 Hrs.]**

Design of Single Point Cutting Tool Form tools- Introduction, Types, design of form tools. Drills- Introduction, Types, Geometry, Design of drill. Milling cutters - Introduction, Types, Geometry, Design of milling cutters, Reamers Taps & Broaches - constructional features only

UNIT-II **[9 Hrs.]**

Press Tool Design Introduction, Press tool equipments, arrangement of guide posts . Press selection , press working terminology, Working of a cutting die, Types of dies- Simple dies, inverted die, compound dies, combination dies, progressive dies, Transfer dies, Multiple dies. Principle of metal cutting, strip layout, clearance, angular clearance, clearance after considering elastic recovery, cutting forces, method of reducing cutting forces, Die block, Die block thickness, Die opening. Fastening of die block, back up plate, Punch, Methods of holding punches, Strippers. Stoppers, Stock stop, Stock guide, Knock cuts, Pilots. Blanking & Piercing die design - Single & progressive dies.

UNIT – III **[9 Hrs.]**

Bending Forming & Drawing dies Bending methods - Bending Terminology, V-Bending, Air bending, bottoming dies, Wiping dies, spring back & its prevention, channel dies. Design Principles - Bend radius, Bend allowance, Spanking, width of die opening, Bending pressure.

Forming Dies- Introduction. Types - solid form dies, pad type form dies, curling dies, Embossing dies, coining dies , Bulging dies, Assembly dies. Drawing Dies - Introduction. Difference between blending, forming & drawing, Metal flow during drawing, Design, Design consideration - Radius of draw die.. Punch radius, Draw clearance, Drawing speed, Calculating blank size, Number of draws, Drawing pressure, Blank holding pressure.

UNIT – IV **[9 Hrs.]**

Forging Die Design & mould Design Forging Die Design: Introduction, Classification of forging dies, Single impression dies, Multiple Impression dies. Forging design factors - Draft, fillet & corner radius, parting line, shrinkage & die wear, mismatch.

finish allowances, webs & ribs Preliminary forging operation-fullering, edging, bending, drawing, flattering, blacking finishing, cutoff. Die design for machine forging - determination of stock - size in closed & open die forging. Tools for flash trimming & hole piercing, materials & manufacture of forging dies .Mould Design: of Simple Blow Moulds for Articles such as bottles, cans Design of simple two plate injection moulds , Mould Materials.

UNIT-V **[9 Hrs.]**

Design of jigs & fixture:- Introduction, locating & clamping - locating devices, radial or angular location, V - location, bush location, design principle for location purpose, principle for clamping purposes, design principles common to jigs & fixtures. Drilling Jigs :- Design principles, drill bushes, design principles for drill bushings, Types of drilling jigs - Template jig, plate type jig, open type jig, swinging leaf jig, Box type jig, channel type jig. Jig feet. Milling Fixtures: - Essential features of a milling fixtures, milling machine vice, Design principles for milling fixtures, Indexing jig & fixtures, Automatic clamping devices.

BOOKS RECOMMENDED:

1. Production Engineering - P.C. Sharma S. Chand Publication
2. Tool Design - Donaldson TMH

ME701: ELECTIVE – I

ME7014: INDUSTRIAL ROBOTICS (Theory)

CREDITS: 03

Teaching Scheme
Lectures: 3 Hours/Week
Tutorial: 1 Hour/Week

Examination Scheme
Duration of Paper: 03 Hours
University Assessment: 80 Marks
College Assessment: 20 Marks

UNIT – I **[9 Hrs.]**

Automation and Robotics, Robot anatomy, configuration of robots, joint notation schemes, work volume, introduction to manipulator kinematics, position representation, forward and reverse transformations of a 2- DOF arm, a 3- DOF arm in two dimension , a 4 – DOF arm in three dimension, homogeneous transformations in robot kinematics, D-H notations, solving kinematics equations, introduction to robot arm dynamics.

UNIT – II **[9 Hrs.]**

Basic control system models, slew motion, joint –interpolated motion and straight line motion, controllers like on/off, proportional, integral, proportional plus integral, proportional plus derivative, proportional plus integral plus derivative.

UNIT – III **[9 Hrs.]**

Robot actuation and feedback components position and velocity sensors, actuators and power transmission devices, mechanical grippers , vacuum cups, magnetic grippers, pneumatic, electric , hydraulic and mechanical methods of power and control signals to end effectors.

UNIT – IV **[9 Hrs.]**

General considerations in robot material handling, material transfer applications, pick and place operations, palletizing and related operations, machine loading and unloading, die casting, plastic molding, forging, machining operations, stamping press operations using robots.

Application of robot in spot welding continuous are welding, spray coatings, Robots in Assembly Operations.

UNIT – V **[9 Hrs.]**

Robot cell layouts, multiple robots and machine interface, other considerations in work cell design, work cell control, interlocks, error detection and recovery, work cell controller, robot cycle time analysis.

TEXT BOOK:

1. Industrial Robotics, M. P. Groover, M. Weiss , R.N. Nagel, N.G. Odrey, McGraw Hill International, Koren Robotics, 1986

2. Robotic Technology & Flexible Automation, S.R.Deb, McGraw Hill International, 994

REFERENCE S BOOKS:

1. Robptic Engineering - An Integrated Approach , Richard D. Klafter, Thomas A.Chmielewski, M. Negin, PHI Publication

2. Robotics, K .S.Fu , R. C. Gonzales , C.S.G.Lee, Tata Mc Graw Hills, International Edition, 1987

3. Introduction to Robotics – Analysis, System, Application, Saeed B. Niku, Pearson Education.

ME702: INDUSTRIAL ENGINEERING (Theory)

CREDITS: 04

Teaching Scheme
Lectures: 3 Hours/Week
Tutorial: 1 Hour/Week

Examination Scheme
Duration of Paper: 03 Hours
University Assessment: 80 Marks
College Assessment: 20 Marks

UNIT-I **[9 Hrs.]**

Production Planning and Control :- Definition, objectives of PPC, functions of PPC, types of production. Value analysis and value Engineering. Introduction, steps involved in value analysis. Applications in Manufacturing.

Forecasting :- Need for forecasting, classification of forecasting methods, like judgmental technique, time series analysis, least square method, moving average method, exponential smoothing method.

UNIT-II **[9 Hrs.]**

Work Study :- Productivity - Concept & objectives of productivity, Types of productivity, factors affecting productivity. Tools & techniques to improve productivity, Measurement of productivity. Work study & Method study :- Definitions, objectives, steps in method study, process charts, string diagram, motion study, micro motion study, SIMO chart.

UNIT-III **[9 Hrs.]**

Work Measurement :- Objectives, definition, stop watch study, work sampling, PMTs, MTM & work factor method.
Ergonomics : Objectives, Human factors in engg., Man machine system, Display design, design controls. Principles of motion economy, work place design.

UNIT-IV **[9 Hrs.]**

Plant Layout :- Objectives, principle, Types of plant layout, Material handling, objectives, principles and selection of material handling equipments, Unit load concept, material flow pattern.

UNIT-V **[9 Hrs.]**

Maintenance :- Objectives, Types of maintenance, preventive, predictive, break down maintenance. Reliability and maintainability analysis. Failure data analysis, reliability, MTBT, MTTR, Batch tub curve, series, parallel and stand by system.

BOOKS RECOMMENDED:

1.	Work Study	-	By ILO
2.	Motion & Time Study	-	By Bames
3.	Ergonomics	-	By Murell
4.	Production Planning & Control	-	By Jain & Agrawal
5.	Industrial Engineering & Project Management	-	By Martand & Telsang
6.	Reliability Engineering	-	By Balguruswami
7.	Plant Layout & Material Handling	-	By James Apple.

ME703: I.C. ENGINE AND GAS TURBINES (Theory)

CREDITS: 03

Teaching Scheme
Lectures: 3 Hours/Week
Tutorial: 1 Hour/Week

Examination Scheme
Duration of Paper: 03 Hours
University Assessment: 80 Marks
College Assessment: 20 Marks

UNIT – I **[9 Hrs.]**

Engines types & their operations, Introduction, Engine classification. Engine operating cycles. Engine components. Engine friction, lubrication, & cooling, lubrication systems.

Automobile Fuels. Rating of engine fuels, I. C. Engine fuels - Petrol, diesel, CNG, LPG, Alcohols, Vegetable oils fuel supply systems.

S. I. Engine, Carburetors, Modern carburetor, S.P.F.I., MPFI, Direct injection.

C.I. Engines : Fuel injection pump, Reciprocating, rotary, fuel injector, High pressure D.I. systems, fuel distribution systems. CROI.

UNIT – II **[9 Hrs.]**

S. I. Engines. Charge motion within the cylinder swirl, squish, combustion stages, flame propagation. Cyclic variations in combustion, ignition fundamentals, conventional ignition system, abnormal combustion, knock and surface ignition, knock fundamentals, turbo-charging, supercharging and scavenging in engines.
C.I. Engines. Combustion in direct and indirect injection, fuel spray behavior, combustion in C.I. Engines, ignition delay, auto ignition, factors affecting delay. Effects of fuel properties. Abnormal combustion, supercharging & turbo charging in engines.

UNIT – III **[9 Hrs.]**

Measurement of Power, IP, BP, Speed fuel and air combustion, calculation of indicated and brake thermal efficiency, volumetric efficiency, mechanical efficiency, percentage of excess of air heat balance sheet, performance characteristics and factors influencing the performance of I.C. Engines.

UNIT- IV **[9 Hrs.]**

Rotary Compressors
Principle, operation, parts, indicator diagram, work done, Roots efficiency, Vanes efficiency (No analytical treatment expected)

Centrifugal Compressor :- Principle, Operation, parts, velocity diagram, static & total head quantities, work done by impeller, isentropic efficiency of compressor, slip factor, pressure coefficient, power input factor.

Axial Flow Compressor :- Principle, operation, parts, velocity diagram, work done, degree of reaction, stage efficiency, compressor characteristics, surging & chocking, Polytropic efficiency.

UNIT- V **[9 Hrs.]**

Gas Turbine :-
Ideal cycles, isentropic & small stage efficiency, application of gas turbine, pressure losses, effect of inter-cooling, reheat & regeneration, Fuel-air ratio, combustion efficiency, performance calculation, open cycle & closed cycle gas turbine plants, co-generations & combined power cycles.

Jet Propulsion :- Principles & working of turbojet, turboprop, Ramjet & pulse jet, simple turbojet cycle. Thrust power, propulsive power. Thermal efficiency, propulsive efficiency, overall efficiency.

TEXT BOOKS

1. Internal Combustion Engine, Fundamentals	-	John B. Heywood.
2. Internal Combustion Engines & Air Pollution	-	Edward F. Obert.

REFERENCE BOOKS

1. Internal Combustion Engines	-	N. Ganesan
2. Internal Combustion Engines	-	V. M. Domkundwar
3. Internal Combustion Engines	-	M. C. Mathur, R. D. Sharma.
4. Internal Combustion Engines	-	R.K.Rjput

ME704: AUTOMATION IN PRODUCTION (Theory)

CREDITS: 03

Teaching Scheme
Lectures: 3 Hours/Week
Tutorial: 1 Hour/Week

Examination Scheme
Duration of Paper: 03 Hours
University Assessment: 80 Marks
College Assessment: 20 Marks

UNIT- I **[9 Hrs.]**

Automation - Definition, types, reasons for automating. functions in manufacturing. Organization and information processing in manufacturing.

Automated Flow Lines :- Methods of work part transport, Transfer mechanisms, Buffer storage, Analysis of flow lines. General terminology and analysis of transfer lines without storage, partial automation, automated flow lines with storage buffers, manual assembly lines. Line balancing problem, Methods of line balancing. Automated Assembly systems - Types, parts delivery system.

UNIT – II **[9 Hrs.]**

Numerical Control Production Systems - Basic concepts, coordinate system and machine motion - Types of NC systems - Point to point, straight cut & continuous path. Machine control unit & other components. Tape & tape readers.
NC part programming - Punched tape & tape formats, NC words, methods of part programming, manual part programming. Introduction to APT (Programming not expected), Direct numerical control. Computer Numerical Control. Adaptive control. Applications & economics of NC.

UNIT – III **[9 Hrs.]**

Industrial Robotics - Introduction, Robot anotomy, Robot control systems, accuracy and repeatability and other specifications, end effectors, sensors, introduction to robot programming, safety monitoring.
Robot Applications - Characteristics of robot applications, work cell layout, robot applications in material handling, processing, assembly and inspection.

Computer aided manufacturing - Manufacturing planning, manufacturing control, Computer integrated manufacturing.

Flexible manufacturing systems - Components, Types of systems, FMS layout configuration computer functions, data files, system reports, FMS benefits.

Computer aided process planning :- Retrieval CAPP systems, generative CAPP systems, benefits of CAPP. Shop floor control.

UNIT – IV **[9 Hrs.]**

Automated material handling & storage – Introduction to Material Handling equipments, Automated Guided vehicle Systems.

Types :- Driverless trains, AGVS pallet trucks, AGVS unit-load carriers, Vehicle guidance & Routing, Traffic control & safety, System management, Analysis of AGVS systems, AGVS applications.

Automated Storage & Retrieval System -
Types :- Unit load AS / RS, mini load AS / RS, man on board AS/RS, automated item retrieval system, deep lane AS/RS - Basic components & special features of AS/Rs, Carrousel storage systems, work in process storage, quantitative analysis.

UNIT – V **[9 Hrs.]**

Automated Inspection:- Automated inspection principles & methods - 100% automated inspection, off-line & on-line inspection, distributed inspection & final inspection, Sensor technologies for automated inspection, coordinate measuring machines- construction, operation & benefits, Machine vision image acquisition, image processing & analysis, interpretation, machine vision applications.

Group Technology :- Part families, parts classification & coding, Opitz classification systems, production flow analysis, Machine cell design - composite part concept, types of cell design, best machine arrangement, benefits of group technology.

TEXT BOOKS:

1. Automation, Production Systems & CIMS - M. P. Groover - PHI
2. CAD / CAM - Zimmers & Groover - PHI

REFERENCE BOOKS :

1. Numerical Control & Computer Aided Manufacturing - Kundra, Rao & Tewari - TMH
2. Computer Control of Manufacturing Systems - Yoram Koren - McGraw Hill.

ME705: DESIGN OF MECHANICAL DRIVES (Theory)

CREDITS: 03

Teaching Scheme
Lectures: 3 Hours/Week
Tutorial: 1 Hour/Week

Examination Scheme
Duration of Paper: 04 Hours
University Assessment: 80 Marks
College Assessment: 20 Marks

UNIT – I ` **[12 Hrs.]**

Coupling: - Types of shaft coupling, design of rigid flange coupling, flexible bush coupling

Flywheel: - Coefficient of fluctuation of energy and coefficient of fluctuation of speed, energy stored in flywheel, stresses in flywheel, design of flywheel.

Bearings :- Surface finish, friction, wear, lubrication, oil seals, design of journal bearings for radial and thrust loads, selection of ball & roller bearings for radial and thrust loads. Failures of anti friction bearing, design of hydrostatic pocket type thrust bearing such as circular step thrust bearing, bearing housing.

UNIT – II **[12 Hrs.]**

Flat belt drive :- Types of belts & belt material, analysis of belt tension, condition for transmitting maximum power, design of flat belt & flat belt pulley.

V Belt drive :- Types of V-belt, analysis of V-belt tension, design of V-belt & pulley.

Roller Chain drive :- Velocity ratio, length of chain, chordal action, selection of chain, dimensions of tooth profile & sprocket.

UNIT – III **[12 Hrs.]**

Spur & Helical Gear drive :- Review of kinematics of gear & terminology, interference, tooth profiles, formative number of teeth etc., Buckingham equation, design of spur gear drive, helical gear drive.

Worm Gear Drive :- Types & proportion of worm & worm gear, force analysis, beam strength of worm gear teeth, dynamic tooth load, wear load, thermal rating of worm gear, design of worm & worm gear.

Bevel Gear drive:- Types of bevel gear, proportions of bevel gear, force analysis of bevel gear drive, design of bevel gear drive.

UNIT – IV **[12 Hrs.]**

Kinematics of friction drives such as brakes & clutches.

Design of friction clutches:- Design of single plate, multiple plate, cone & centrifugal clutch.

Design of brake: **-**Design of Shoe brake, band brake & internal expanding brake.

Introduction to haulage system, Design of wire rope, sheave and drum.

Types of motor like AC, DC, their characteristics, controls & selection of motors.

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TEXT BOOKS:

1. Mechanical Design of Machines - Maleev, Hartman
2. Machine Design - P. H. Black
3. Mechanical Engineering Design - Shigley
4. Design of Machine elements - V. B. Bhandari
5. Design Data Book - B.D.Shiwalkar
6. Design Data Book - PSG
7. Machine Design - R.S.Khurmi
8. Machine Design - Pandey & Shah

REFERENCE BOOKS:

1. Hand Book of Machine Design - Shigley & Mischke.

ME706: I.C. ENGINE AND GAS TURBINES (Laboratory)

CREDITS: 02

Teaching Scheme
Practical: 3 Hours/Week

Examination Scheme
University Assessment: 25 Marks
College Assessment: 25 Marks

LIST OF PRACTICALS:

Minimum Eight experiments out of following should be performed.

1. Trial on reciprocating air compressor.
2. Assembling & disassembling the internal combustion engine.
3. Study of carburetors like Solex, Carter, Zenith & S.U. carburetor.
4. Performance testing of single cylinder internal combustion engine (diesel).
5. Trial on Multi cylinder petrol engine.
6. Morse test on Multi-cylinder petrol engine.
7. Heat balance on Multi-cylinder diesel engine.
8. Study of gas turbines
9. Trial on Steam Turbine
10. Performance testing of computerized multi cylinder Diesel Engine.
11. Performance testing of computerized multi cylinder Petrol Engine.

A Journal/Report on practicals conducted shall be submitted by each student. University Practical examination shall be on viva-voce of 10 marks and practical performance or objective test of 15 marks.

ME707: AUTOMATION IN PRODUCTION (Laboratory)

CREDITS: 02

Teaching Scheme
Practical: 3 Hours/Week

Examination Scheme
University Assessment: 25 Marks
College Assessment: 25 Marks

LIST OF PRACTICALS:

Minimum Eight experiments out of following should be performed.

1. Performance. Simulation on CNC Lathe.
2. Performance, Simulation of CNC Milling Machine.
3. Manual Part Programming
4. Study of Automated Storage & Retrieval system
5. Study of Robot configurations.
6. Study of Group Technology.
7. Study of Flexible Manufacturing System.
8. Study of Automated Guided Vehicle System
9. Study of Machine Vision System.
10. Study of Computer Aided Process Planning System.

A Journal/Report on practicals conducted shall be submitted by each student. University Practical examination shall be on viva-voce of 10 marks and practical performance or objective test of 15 marks.

ME708: DESIGN OF MECHANICAL DRIVES (Laboratory)

CREDITS: 02

Teaching Scheme
Practical: 3 Hours/Week

Examination Scheme
University Assessment: 25 Marks
College Assessment: 25 Marks

LIST OF PRACTICALS:

(A) Minimum Six to Eight designs out of following shall be carried out.

1. Design of Rigid flange coupling drive / Design of Flexible bush pin coupling drive
2. Design of Flat belt drive / Design of V-Belt drive
3. Design of Chain drive
4. Design of Journal Bearing
5. Design of Spur / Helical gear drive
6. Design of Bevel gear drive / Design of Worm gear drive
7. Design of Single / Multiple plate clutch
8. Design of Cone clutch drive / Design of Centrifugal clutch drive
9. Design of Flywheel
10. Design of Wire Rope, Sheave & Drum

(B) Student shall submit one assembly design report along with the drawing for assembly / sub-assembly for any mechanical system consisting of not less than four machine element included in the syllabus.

A Journal/Report shall be submitted by each student. University Practical examination shall be on viva-voce of 10 marks and objective test of 15 marks.

ME709: PROJECT SEMINAR

CREDITS: 02

Teaching Scheme
Practical: 3 Hours/Week

Examination Scheme
College Assessment: 50 Marks

It is expected to select project topic as per the guidelines of the project to be undertaken in the 8th semester. Also it is expected to carry out the literature survey for the project work, to finalize the methodology and schedule of the project. Each student of the concerned project batch shall work on project topic under the Project guide and shall present a seminar using audio-visual aids of about 15 minutes duration. Seminar delivery shall be followed by question-answer session. A report shall be submitted.