B.E. (PTDC) Mechanical Engineering

SEMESTER –IV

BRANCH	SUBJECT TITLE	SUBJECT CODE	Period per week			
			L	T	P	C
B.E. PART TIME MECHANICAL	Machine Design & CAD	PTME-401	3	1	2	6

UNIT-1

Drawing conventions; IS codes, sectional views and sectioning, surface finish and tolerances representation of machine parts such as external and internal threads, slotted heads, square ends, and flat radial ribs, slotted shaft, splined shafts, bearings, springs, gears, Rivet heads and Riveted joints, Welded joints, Drawing of Threaded fasteners .

Assembly Drawing : Assembly Machine Drawing ,Basic concept of assembly drawing ,bill of materials, Assembly drawing of Cotter and Knuckle joints, pedestal and footstep bearings, Engine parts- crosshead and stuffing box, IC engines parts - piston and connecting rods; lathe machine parts-Tool post and Tail Stock.

UNIT-2

CAD : software and hardware required to produce CAD drawings Software: operating systems; CAD software packages e g AutoCAD, AutoCAD/Inventor, Micro station, Catia, Pro/ENGINEER, Solid works; minimum system requirements. Preparing & interpreting CAD drawing, orthographic projections; Commands: absolute/relative/polar coordinates; features eg line types, grids, snaps, circle, text, hatching, dimensioning, layers/levels, colour; viewing e g zoom, pan; inserting other drawings e g symbols, blocks; modifying e g copy, rotate, move, erase, scale, chamfer, fillet Interpret: determine properties of drawn objects e g list, distance, area, volume use CAD software to produce 2D & 3D assembly drawings and views

UNIT-3

3D environment: 3D views e g top, front, side, isometric 3D models: 3D techniques e g addition and subtraction of material, extrude, revolve, sweep, 3D coordinate entry (x, y, z), wire frame drawing, 2D to 3D (thickness, extrusion); surface models; solid

EVALUATION

Evaluation will be continuous an integral part of the class as well through external assessment.

References:

1.Bhatt, ND; Machine Drawing; Charotar Publication
2. K C John ,Machine Drawing , PHI
3. Singh A; Machine Drawing; TMH publication
4. Narayana and Reddy; Machine Drawing; New age, Delhi.
5. Shigley JE et al; Mechanical Engineering Design, TMH

List of Experiments: Assembly Drawing and design problem as per given syllabus

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BRANCH	SUBJECT TITLE	SUBJECT CODE	Period per week			
			L	T	P	C
B.E. PART TIME MECHANICAL	Material & Finance Management	PTME-402	3	1	-	4

UNIT-1

Material : Functions, objectives, planning and control including inventory models with or without storage costs, price break (excluding dynamic and probabilistic considerations). Different classes of inventory. Material Requirement Planning (MRP).

UNIT-2

Financial management: Introduction to standard forms of financial statements, i.e., balance-sheet, profit and loss, and income statement. Fixed and current asset items. Fixed and current liability items. Linkage of two successive balance-sheets through income or profit and loss statement. Funds flow statement. Financial ratios and their implications.

Managerial economics: Concepts, theory of production, marginal productivity and cost. Introduction to theory of firm.

UNIT-3

Quality management: Quality definition, quality planning, quality control and quality management, Total quality management, simple quality control techniques like control charts and acceptance sampling.

UNIT-4

Marketing management consumer behavior, market research, product design and development pricing and promotion.

UNIT-5

Project management: Introduction. Concept of a project, project management concepts, project simulation, cost or project and means of financing, economic evaluation criteria of the project, project implementation, project planning, scheduling and monitoring, project control (PERT, CPM techniques including crashing). Project evaluation.

UNIT-6

Information technology and management. Role of information, management information system and decision support system, Information technology-introduction to e-business, e-commerce and integration tools like enterprise resource planning (ERP).

References:

1- Daft R; The new era of management; Cengage.
2- Bhat Anil, Arya kumar; Management: Principles ,Processes and Practices; Oxford higher edu.
3- Davis & Olson; Management Information System; TMH.
4- Steven Alter; Information systems, Pearson, www.stevenalter.com
5- Kotler P; Marketing management;
6- Khan, Jain; Financial Management;
7- ILO; Work study; ILO.
8- Mohanty SK; Fundamental of Entrepreneurship; PHI.
9- Vollman, Berry et al; Manufacturing planning and control for SCM; TMH.
10- Chase Richard B et al; Operations management; SIE-TMH
11- Adam EE and Ebert RJ; Production and Operations Management Concepts...; PHI Learning.

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SEMESTER –IV

BRANCH	SUBJECT TITLE	SUBJECT CODE	Period per week			
			L	T	P	C
B.E. PART TIME MECHANICAL	Energy Conversion – II (ICE)	PTME-403	3	1	2	6

UNIT-1

Internal Combustion Engine: S.I. and C.I. engines of two and four stroke cycles, real cycle analysis of SI and CI engines, determination of engine dimensions, speed, fuel consumption, output, mean effective pressure, efficiency, factors effecting volumetric efficiency, heat balance, performance characteristics of SI and CI engines, cylinder arrangement, firing order, power balance for multi-cylinder engines .

UNIT-2

Combustion in SI engines: Flame development and propagation ,Pressure-Crank Angle diagram , Stages of Combustion ignition lag, effect of air density, temperature, engine speed, turbulence and ignition timings, physical and chemical aspects , abnormal Combustion , effect of engine and fuel variables on abnormal combustion , pre-ignition, its causes and remedy, salient features of various type combustion chambers.

UNIT-3

Combustion in C.I. Engines: Times base indicator diagrams and their study, various stages of combustion, delay period, diesel knock, knock inhibitors, salient features of various types of combustion chambers.

UNIT-4

I.C. Engine System: Fuels, ignition systems, cooling, exhaust/scavenging and lubrication system. Fuel metering in SI engine: Fuel injection in SI engine (MPFI, TBI,CRDI), Theory of carburetion, Solex Carburetor, simple problems on carburetion. Fuel metering in CI engines: Fuel injection in CI engine, Working Principle of fuel pump & fuel injectors, types of nozzles , simple numerical problems . Cooling & lubrication of SI & CI Engines.

UNIT-5

Supercharging & Turbo charging: Methods of supercharging,& turbo charging Effects of super charging and turbo charging . Engine Modifications for supercharging, supercharging of two stroke engines. Micro processor controlled supercharging.

References:

1. J.B. Heywood. Internal combustion Engines , Wiley
2. Ganeshan V; Internal Combustion engines; TMH
3. Mathur M L & Sharma RP; A. Course in IC engines; DhanpatRai
4. R Yadav , Internal Combustion Engines
5 Halderman JD and Mitchell CD; Automotive Engines theory and servicing; Pearson

List of Experiments:

1. Determination of Valve timing diagram
2. Load test on Petrol Engine
3. Heat Balance of SI engine
4. Heat Balance of CI Engine
5. Study of Battery Ignition system and Electronic Ignition System
6. Study of Diesel fuel pump
7. Study of Diesel fuel injectors 8. Study of Carburetors
9. Study of Fuel Injection system in SI Engine
10. Study of lubricating system in CI Engine

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BRANCH	SUBJECT TITLE	SUBJECT CODE	Period per week			
			L	T	P	C
B.E. PART TIME MECHANICAL	Fluid Mechanics	PTME-404	3	1	2	6

UNIT-1

Fluid Static's : Review of Basic concepts &properties of the fluid . Pressure at a point, pressure variation in static fluid, Absolute and gauge pressure, manometers, Forces on plane and curved surfaces ; buoyant force, Stability of floating and submerged bodies, Relative equilibrium.

UNIT-2

Kinematics of Flow : Types of flow-ideal & real , steady & unsteady, uniform & non-uniform, one, two and three dimensional flow, path lines, streak-lines, streamlines and stream tubes; continuity equation for one and three dimensional flow, rotational & irrotational flow, circulation, stagnation point, separation of flow, sources & sinks, velocity potential, stream function, flow net & its applications , method of drawing flow nets.

UNIT-3

Dynamics of Flow: Euler's equation of motion along a streamline and derivation of Bernoulli's equation, application of Bernoulli's equation, energy correction factor, linear momentum equation for steady flow; momentum correction factor. The moment of momentum equation, forces on fixed and moving vanes and other applications. Fluid Measurements: Velocity measurement (Pitot tube, current meters etc.); flow measurement (orifices, nozzles, mouth pieces, orifice meter, nozzle meter, venturi-meter, weirs and notches).

UNIT-4

Dimensional Analysis : Dimensional analysis, dimensional homogeneity, use of Buckingham-pi theorem, calculation of dimensionless numbers

UNIT-5

Introduction to boundary layer, Boundary layer development on a flat plate and its characteristics - Boundary layer thickness, displacement thickness, momentum thickness, energy thickness. Momentum equation for boundary layer by Von karman, drag on flat plate, boundary layer separation and its control. Aerofoil theory, lift and drag coefficients, streamlined and bluff bodies.

UNIT-6

Flow through Pipes : Reynolds experiment & Reynolds number, laminar & turbulent flow, Introduction to Navier Stokes' Equation, relation between shear & pressure gradient, laminar flow through circular pipes, friction factor, laminar flow between parallel plates, hydrodynamic lubrication. EVALUATION Evaluation will be continuous an integral part of the class as well through external assessment.

References: -

1. Streeter VL, Wylie EB, Bedford KW; Fluid Mechanics; Mc Graw Hills
2 FOX , McDonald Pritchard , Fluid Mechanics Wiley students edition
3. White ; Fluid Mechanics ; Mc Graw Hills
4. Cengal; Fluid Mechanics; Mc Graw Hills
5 R Mohanty; Fluid Mechanics; PHI
6 K L Kumar Fluid Mechanics
7 Fluid Mechanics & hydraulic Machines , Modi & Seth 8 CS Jog , Fluid Mechanics Volume II CAMBRIDGE IISc Series , Third Edition

List of Experiments:

1. To determine the local point pressure with the help of pitot tube.
2. To find out the terminal velocity of a spherical body in water.
3. Calibration of Orifice meter and Venturi meter
4. Determination of Cc, Cv, Cd of Orifices
5. Calibration of Nozzle meter and Mouth Piece.
6. Reynolds experiment for demonstration of stream lines & turbulent flow
7. Determination of meta-centric height 8. Determination of Friction Factor of a pipe.
9. To study the characteristics of a centrifugal pump.
10. Verification of Impulse momentum principle.

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SEMESTER –IV

BRANCH	SUBJECT TITLE	SUBJECT CODE	Period per week			
			L	T	P	C
B.E. PART TIME MECHANICAL	Dot Net	PTME-405	--	--	2	2

UNIT I

Introduction .NET framework, features of .Net framework, architecture and component of .Net, elements of .Net.

UNIT II

Basic Features Of C# Fundamentals, Classes and Objects, Inheritance and Polymorphism, Operator Overloading, Structures. Advanced Features of C# Interfaces, Arrays, Indexers and Collections; Strings and Regular Expressions, Handling Exceptions, Delegates and Events.

UNIT III

Installing ASP.NET framework, overview of the ASP .net framework, overview of CLR, class library, overview of ASP.net control, understanding HTML controls, study of standard controls, validations controls, rich controls. Windows Forms: All about windows form, MDI form, creating windows applications, adding controls to forms, handling Events, and using various Tolls

UNIT IV

Understanding and handling controls events, ADO.NET- Component object model, ODBC, OLEDB, and SQL connected mode, disconnected mode, dataset, data-reader Data base controls: Overview of data access data control, using grid view controls, using details view and frame view controls, ado .net data readers, SQL data source control, object data source control, site map data source.

UNIT V

XML: Introducing XML, Structure, and syntax of XML, document type definition (DTD), XML Schema, Document object model, Presenting and Handling XML. xml data source, using navigation controls, introduction of web parts, using java script, Web Services

References:

1. C# for Programmers by Harvey Deitel, Paul Deitel, Pearson Education
2. Balagurusamy; Programming in C#; TMH
3. Web Commerce Technology Handbook by Daniel Minoli, Emma Minoli , TMH
4. Web Programming by Chris Bates, Wiley
5. XML Bible by Elliotte Rusty Harold ,
6. ASP .Net Complete Reference by McDonald, TMH.
7. ADO .Net Complete Reference by Odey, TMH

List of Experiments/ program (Pl. expands it):

1. Working with call backs and delegates in C#
2. Code access security with C#.
3. Creating a COM+ component with C#.
4. Creating a Windows Service with C#
5. Interacting with a Windows Service with C#
6. Using Reflection in C#
7. Sending Mail and SMTP Mail and C#
8. Perform String Manipulation with the String Builder and String Classes and C#:
9. Using the System .Net Web Client to Retrieve or Upload Data with C#
10. Reading and Writing XML Documents with the XML Text-Reader/-Writer Class and C#
11. Working with Page and forms using ASP .Net.
12. Data Sources access through ADO.Net, 13. Working with Data readers , Transactions
14. Creating Web Application.