Scheme of Teaching and Examination for

4th Semester of 3 Years Diploma in Mechanical Engineering

Duration of Semester **:**   **14 Weeks**
Student Contact Hours   **:**   **36 Hrs**
Total Marks   **:**   **800**
Effective from :   2017 -18 Session

Sl. No.	Name of Subject	Subject Code	Subject	Teaching Scheme			Examination Scheme					
				L	T	P	Hours of Exam	Full Marks of Subject	Final Exam / committee marks	Internal Assessment	Pass Marks Final / Ext. Exam	Pass Marks in Subjects
1.	Manufacturing Technology	MEC402	Theory	3	-	-	3	100	80	20	26	40
2.	Fluid Mechanics & Machine	MEC403	Theory	3	-	-	3	100	80	20	26	40
3.	Thermal Engineering	MEC404	Theory	3	-	-	3	100	80	20	26	40
4.	Theory of Machine	MEC405	Theory	3	-	-	3	100	80	20	26	40
5.	Electrical Engineering	MEC406	Theory	3	-	-	3	100	80	20	26	40
6.	Manufacturing Tech Lab	MEC407	Practical	-	-	2	4	50	40	10	-	20
7.	Fluid Mechanics & Machine Lab	MEC408	Practical	-	-	2	4	50	40	10	-	20
8.	Theory of Machine Lab	MEC409	Practical	-	-	2	4	50	40	10	-	20
9.	Thermal Engineering Lab	MEC410	Practical	-		2	4	50	40	10		20
10.	Electrical Engineering Lab	MEC411	Practical	-	-	2	4	50	40	10	-	20
11	Professional Practice II	401	Sessional	-	-	4	-	50	30	20	-	25
	Total Hours of Teaching per week :			**15**		**14**						

Total Marks :   Theory   :   Practical   :   Sessional   :
      L   :   Lecture,   T   :   Tutorial   P   :   Practical

Note: 1. Period of Class hours should be of 1 hrs duration as per AICTE norms.

2. Remaining Hrs every week has been marked for students for Library and Student Centered Activities.

3. Drawing / Graphics / Practical / Sessional examinations will be held at parent institution.

4. Board will depute examiner for Practical examination.

5. Regarding sessional examination the parent institution will form a three member committee and this committee will examine the sessional records and hold viva of the examinee for 60 % marks allotted to the subject. Marks for remaining 40 % will be provided by the Faculty concerned on the basis of evaluation of each job / work throughout the semester.

Manufacturing Technology

Subject Code : MEC402
Total Theory Hrs 42
F M 100 (80+20)
L   T   P
3

1.   Welding   (07 hrs)

1.1.   Define and classification of various welding processes.
1.2.   Gas& Arc welding-Principle, Equipment, applications and types of Flames.
1.3.   Electrode specifications, current setting & use of flux in welding
1.4   Advance welding process- TIG, MIG, Thermit Welding, Submerge Arc Welding, Plasma Arc Welding, Laser Welding, Ultrasonic Welding, Forge Welding, Explosive Welding & Cold Pressure Welding.
1.5.   Resistance welding-Spot welding, Seam welding, Projection welding
1.6.   Welding defects, non destructive testing.
1.7.   Brazing and soldering: Types, Principles, Applications

2.   Casting   (08 hrs)

2.1   Introduction and history
2.2   Patterns-Material used, types, Patterns allowances, Cores, Core allowances.
2.3   Moulding Sand – Types, characteristics and properties of sand.
2.4   Moulds-Mould materials, Types, Moulding processes
2.5   Process and steps in Sand Moulding
2.6   Mould making
   a.   Runner and Gating System
   b.   Core, Chaplets and Chills.
   c.   Parts of Mould
2.7   Melting practice. Types of furnaces with specific application Cupola furnace, Electric arc furnace.
2.8   Special casting processes. Viz die-casting, centrifugal casting, Investment casting, Continuous casting
2.9   Casting defects and its remedies

3.   Forging   (06 hrs)

3.1   Introduction, Hot & Cold forging.
3.2   Press and hammer (Concept only)
3.3   Explain different forging tools, specification and uses
3.4   Describe various forging processes-Drop forging, Upset forging, stamping, Die forging, press forging.
3.5   Types of dies-Open Die, Closed Die (Single Impression and Multi-impression)
3.6   Closed die Forging operations- Fullering, Edging, Bending, Blocking, Finishing
3.7   Forging defects and their remedies.

4.   Rolling and Extrusion   (04 hrs)

4.1   Principles of rolling and extrusion.

4.2   Hot and cold rolling.

4.3   Introduction to various rolling mills.

4.4   Methods of extrusion–Direct, Indirect, backward & impact Extrusion, Hot & Cold extrusion processes - applications.

5.   Press working   (05 hrs)

5.1   Types of presses and their specifications.

5.2   Die set components. –punch and die shoe, guide pin, bolster plate, stripper, stock guide, feed stock, pilot.

5.3   Punch and die clearances for blanking and piercing, effect of clearance.

5.4   Press working operations- cutting, bending, drawing, punching, blanking, notching, lancing

6.   Lathe   (04 hrs)

6.1   Principle, types and specification of Lathes

6.2   Functions of basic parts and tools.

6.3   Operations–grooving, Turning, parting off, Knurling, facing, Boring, Drilling, threading, step turning, taper turning.

7.   Drilling, Boring & Reaming   (04 hrs)

7.1   **Drilling**

7.1.1   Introduction, classification of drilling machine& their parts

7.1.2   Drilling accessories

7.1.3   Nomenclature of twist drill

7.1.4   Cutting parameters

7.2   **Reaming**

7.2.1   Introduction.

7.2.2   Nomenclature of reaming tool

7.3   **Boring**

7.3.1   Introduction, classification of boring machine and their parts

7.3.2   Counter boring and counter sinking operations

8.   Maintenance & Maintenance Planning   (4 hrs)

8.1   Introduction

8.2   Objective of maintenance

8.3   Types – planned and unplanned maintenance

8.4   Repair cycle and repair complexity.

8.5   Equipment history card, work order.

Manufacturing Technology Lab

Subject Code: MEC402

List of Practical's:-

1. To make one job on Spot welding machine.
2. One simple job on TIG/MIG welding.
3. Making of one simple wooden Pattern on wood turning lathe.
4. Preparation of green sand mould using single piece and multi-piece pattern with core.
5. Preparation of One simple Job (ex- ring) in forging shop.
6. One job on lathe is performing the operations- plain turning, step turning, grooving, knurling, chamfering and thread cutting.
7. One composite job performing the operations-face milling, side and face milling (slotting), drilling /tapping (drilled hole should be perpendicular to slotting operation).
8. One job performing drilling, milling and reaming.
9. Preventive maintenance of welding machine
10. Preventive maintenance of lathe

RECOMMENDED BOOKS:

1. Workshop Technology –Part-I & II, Hazra Choudhury, Media Promoters & Publishers Pvt. Ltd.
2. Workshop Technology, Part – I & II by W.A.S. Chapman, ELBS
3. Manufacturing Technology by P.N. Rao, TMH
4. Workshop Technology Vol. I & II by B.S. Raghubanshi
5. Workshop Technology by Raghubansi, Dhanpat Rai & Sons
6. All about Machine Tools by H. Gerling, New Age International (P) Ltd.
7. Manufacturing Engineering and Technology by S. Kalpakijan, Addison-Wesley Publishing Co.

FLUID MECHANICS & MACHINE

Subject Code: MEC404
Total Contact Hrs: 42
Full Marks: 100 (80+20)

L   T   P
3   2

Contents: Theory

1. Properties of fluid   **2 hrs**
1.1   Introduction, types of fluid, fluid mechanics, classification of fluid mechanics.
1.2   Properties of fluid- Density, Specific gravity, Specific Weight, Specific
Volume, Dynamic Viscosity, Kinematic Viscosity, Surface tension,   Capillarity, Vapor Pressure,
Compressibility.

2. Fluid Pressure & Pressure Measurement   **6 hrs**
2.1   Fluid pressure, Pressure head, Pressure intensity, buoyancy, meta center and meta centric
          height.
2.2   Concept of absolute vacuum,   gauge   pressure, atmospheric pressure, absolute pressure.
2.3   Simple and differential manometers, Burden pressure gauge.
2.4   Total pressure, center of pressure of plane, regular surfaces immersed in liquid. Horizontally,
          vertically and inclined.
                     (Numerical on Manometers, Total Pressure & Centre of pressure)

3.   Fluid Flow   **8 hrs**
3.1   Types of fluid flows
3.2   Continuity equation
3.3   Bernoulli's theorem
3.4   Venture meter–Construction, principle of working, Coefficient of discharge, Derivation for
          discharge through venture meter.
3.5   Orifice meter– Construction, Principle of working, hydraulic coefficients, Derivation for
discharge through Orifice meter
3.6   Weir and Notch- Define & Differentiate between weir and notch. (No Numerical)
3.7   Pitot tube–Construction, Principle of Working.   **(Simple Numerical only)**

4. Flow Through Pipes   **4 hrs**
4.1   Laws of fluid friction (Lamina rand turbulent)
4.2   Darcy's equation and Chezy's equation for frictional losses.
4.3   Minor losses in pipes
4.4   Hydraulic gradient and total gradient line.
4.5   Hydraulic power transmission through pipe.
          (Numerical to estimate major and minorosses)

5. Impact of jet   **3 hrs**
5.1   Impact of jet on fixed vertical, moving vertical flat plates.
5.2   Impact of jet on curved vanes with special reference to turbines & pumps
          (**Simple Numerical son work done and efficiency)**

6.   Hydraulic Turbines   7 hrs

  6.1 Layout and classification of hydro electric power plant.

  6.2 Selection of turbine on the basis of head and discharge available

  6.3 Construction and working principle of Pelt on wheel, Francis and Kaplan turbine.

  6.4 Calculation of Work done, Power, efficiency of turbine.

  6.5 Draft tubes– types and construction, Concept of cavitations in turbines

7. Centrifugal Pumps   6 hrs

7.1   Construction, principle of working and applications.

7.2   Types of casings and impellers.

7.3   Concept of multistage

7.4   Priming and its methods, Cavitations

7.5   Man metric head, Work done, Man metric efficiency, Overall efficiency, NPSH.

7.6   Performance Characteristics of Centrifugal pumps.

7.7   Trouble Shooting.

7.8   Introduction to submersible and jet pump(simple numerical on centrifugal pumps)

8. Reciprocating Pump   6 hrs

8.1   Construction, working principle and applications of single and double acting reciprocating pumps.

8.2   Concept of Slip, Negative slip, Cavitations and separation.

8.3   Use of Air Vessel.

8.4   Indicate or diagram with effect of acceleration head & frictional head.

8. 5   Trouble shooting

(**No Derivations and Numerical on reciprocating pumps**.)

FLUID MECHANICS & MACHINE LAB

SUBJECT CODE: MEC408

List of Practical:

1. Calibration of Bourdon pressure gauge with the help of Dead Weight Pressure gauge.
2. Determine the meta centric height of a floating body.
3. Verification of Bernoulli's Theorem.
4. Determination of Co efficient of Discharge of Venture-meter
5. Determination of Coefficient of discharge, coefficient of Contraction and co-efficient of velocity of orifice meter.
6. Determination of coefficient of discharge through rectangular notch.
7. Determination of coefficient of discharge through triangular notch.
8. To determine minor losses for flow through pipes.
9. Determination of coefficient of friction of flow through pipes.
10. Trial on Pelton/Francis wheel to determine overall efficiency.
11. Trial on centrifugal pump to determine overall efficiency.
12. Trial on reciprocating pump to determine overall efficiency.

RECOMMENDED BOOKS:

1. Hydraulics & Hydraulic Machines by Modi & Seth, Standard Book
2. Hydraulics & Hydraulic Machines by R.K. Bansal
3. Fluid Mechanics by A.K. Jain, Khanna Publishers
4. Hydraulic and Fluid Mechanics by Jagadish Lal, Metropolitan Book
5. Hydraulics, Fluid Mechanics and Fluid Machines by R.S. Khurmi
6. Fluid Mechanics & Hydraulics Machines by R K Rajput
7. Fluid Mechanics & Hydraulics Machines by Domkundwar
8. Hydraulics Machines by JagadishLal

Thermal Engineering

Subject code : MEC404

Teaching and Examination Scheme

L	T	P		Total Theory Hrs 42
3	2			F M 100 (80+20)

Rationale:

Mechanical engineers have to work with various power producing & power absorbing devices like boilers, turbines, compressors, pumps etc. In order to understand the principles, construction & working of these devices, it is essential to understand the concept of energy, work, heat & conversion between them. Hence it is important to study the subject of Thermal Engineering which is a core subject. It includes the study of various sources of energy, basic laws & concept of thermo dynamics, gas laws, properties of steam & generation. Heat transfer forms the basis for different power engineering application. Boilers find application in different process industries. Steam turbine sand condensers are the major component of any steam power plant. Mechanical engineer should understand working and application of these devices.

Objectives:

The Students should be able to:

1. Know various source so energy & their applications.
2. Apply fundamental concepts of thermo dynamics to thermo dynamic systems.
3. Understand various laws of thermo dynamics.
4. Apply various gas laws & ideal gas processes to various thermo dynamic systems.
5. Calculate properties of two phase system by using steam tables/mollier charts.
6. Explain construction & working of boilers, mountings & accessories.

Contents: Theory

Chapter	Name of the Topic	Hours
1.	**Sources of energy** 1.1 Classification of energy sources - Renewable, Non-Renewable 1.2 Fossil fuels, CNG, LPG. 1.3 Solar - Flat plate and concentrating collectors. - Solar Water Heater - Photo voltaic Cell, Solar Distillation. 1.4 Wind, Tidal, Geothermal 1.5 Biogas, Biomass, Bio-diesel 1.6 Hydraulic, Nuclear 1.7 Fuel cell– list of fuel cells	4
2	**Ideal Gases** 2.1 Concept of Ideal gas, Charle's law, Boyle's law, Avogadro's law, equation of state, Characteristic gas constant and universal gas constant. 2.2 Ideal gas processes:- -Isobaric, Isochoric, Isothermal, Adiabatic, Poly tropic, Isentropic with representation of the processes on P-Vand T-S diagram (only simple numericals)	2
3.	**Fundamentals of Thermodynamics** 3.1 Concepts of pure substance, types of systems, properties Of systems, Extensive and Intensive properties .Point function and path function. units of each ,pv=MRT 3.2 Work and Energy -Thermo dynamic definition of work, heat, difference between heat and work, P.E., K.E, Internal Energy, Flow work, concepts of enthalpy, entropy. 3.3 Laws of Thermo dynamic -Zeroth Law, Temperature measurement, principle of energy conservation, irreversibility, Second Law of Thermo dynamics, Kelvin Plank, Claudius statements and their equivalence, Concept of perpetual Motion machine 1 and 2. 3.4 Application of Thermo dynamic laws -Steady Flow Energy equation and its application open system like boiler, engine, nozzle, turbine, compressor & condenser.	10
4.	**Steam and Steam Boiler** 4.1 Generation of steam at constant pressure with representation on various charts such as T-H,T-S,H-S,P-H. Properties of steam and use of steam table, Quality of	8

		Steam and its determination with Separating calorimeter (no numerical). 4.2 Vapour process:- -constant pressure, constant volume, constant an haply, constant entropy (numerical using steam table and Mollier chart), Rankin Cycle 4.3 Steam Boilers:- -Classification of boilers. -Construction and working of -Cochran, Babcock and Wilcox, La-mont and Loeffler boiler. Boiler draught– natural, forced and	
5.		**Steam Turbines and Condensers** 5.1 Steam nozzle:- -Continuity equation, types of nozzles, concept of Mach number, critical pressure, application of steam nozzles.(simple numerical) 5.2 Steam turbine:- -Classification of turbines, Construction and working of Impulse and Reaction turbine. 5.3Compoundingofturbines,Regenerativefeedheating, bleedingofsteam,nozzlecontrolgoverning(withvelocit ydiagrams) (No numerical). 5.4 Steam condenser:- Dalton's law of partial pressure, function and classification of condensers, construction and working of surface condensers. (simple numerical) 5.5 Source so fair leakage, concept of condenser efficiency, vacuum efficiency (no numerical). 5.6 Cooling Towers. -Force draught, natural taught and induced draught.	12
6.		**Heat Transfer** 6.1 Modes of heat transfer:- - Conduction, convection and radiation. 6.2 Conduction by heat transfer - Fourier's law, thermal conductivity, conduction through cylinder, thermal resistance, composite walls, combined conduction and convection (Simple numerical) 6.3 Heat transfer by Radiation:- - Thermal Radiation, Absorptive, Transmissivity, Reflectivity, Emissivity, black and gray bodies, Stefan- Bolts man law. 6.4 Heat Exchangers:- - Shell and tube, plate type, multiphase heat	6
TOTAL			42

Thermal Engineering Lab

Subject code : MEC410

List of Practical's:-

1. Collection of technical data and specification of photovoltaic cell by referring to Manufacturers catalogues.
2. Study of heat transfer and concept of heat exchanges.
3. Study of solar water heating system.
4. Report on visit to wind power generation plant/biogas plant/hydraulic power Plant.
5. Calculation of thermal conductivity of a solid metallic rod.
6. Verification of Stefan -Boltzman's law

7. Study and compare various heat exchangers such as radiators, evaporators, condensers, plate heat exchangers etc.

8. Trace the flue gas path and water-steam circuit with the help of boiler model and write are port.

9. Study of Babcock and Wilcox Boiler/Lancashire Boiler.

10. Determination of change in velocity of steam with steam nozzle.

Recommended Books

Sr. No.	Author	Title	Publication
01	R. K. Rajput	A Course in Thermal Engineering	LaxmiPublication, Delhi
02	P. L. Ballaney	A Course in Thermal Engineering	Khanna Publishers
03	R. S. Khurmi	A text book of Thermal	S Chand& co. ltd.
04	Domkundwar V. M.	A Course in Thermal Engineering	DhanpatRai &Co.
	P. K. Nag	Engineering Thermodynamics	Tata Mc GrawHill
06	R. S. Khurmi	Steam Table &Mollier Diagram	S. Chand & co. Ltd.
07	Yunus A Cengel	Thermodynamics	

Theory of Machine

Subject Code : MEC405

L   T   P   **Total Contact Hrs 42**

3   2   **F M 100 (80+20)**

Contents: Theory

Chapter	Name of the Topic	Hours
1.	**Fundamentals and types of Mechanisms** KinematicsofMachines:- DefinitionofKinematics,Dynamics,Statics,Kinetics,Kinematiclink,KinematicPairanditstypes,constrainedmotionanditstypes,Kinematicchainanditstypes,Mechanism,inversion,machineandstructure. Inversions of Kinematic Chain. • Inversion of four bar chain, coupled wheels of Locomotive & Pantograph. • Inversion of Single Slider Crank chain-Rotary I.C. Engines mechanism, Whit worth quick return mechanism, • Introduction to Inversion of Double Slider Crank Chain-Oldham's Coupling. Common Mechanisms. • Geneva Mechanism. • Ackerman's Steering gear mechanism. (No numericals)	6
2.	**Velocity and Acceleration in Mechanism** 2.1 Concept of relative velocity, angular velocity and Angular acceleration of a point on a link. 2.2 Velocity and acceleration of points and links in mechanisms – relative velocity and instantaneous center method (simple numerical based on analytical method). 2.3 Klein's construction to determine velocity and acceleration of piston of a reciprocating engine.	2

3.	**Cams and Followers** 3.1 • Concept, definition and application of Cams and Followers. • Classification of Cams and Followers. • Different follower motions and their displacement diagrams like uniform velocity, SHM.		6
	3.2 Drawing of profile of radial cam of roller Follower with and without off set with reciprocating motion (Graphical method).		
4.	**Power Transmission** Belt Drives-flat belt, V–belt & its applications, material For flat and V belt, angle of lap, belt length. Slip and creep. Determination of velocity ratio, ratio of tight side and slack side tension, centrifugal tension and initial tension, condition for maximum power transmission (Simple numerical) •Chain Drives–Advantages & Disadvantages, Selection of Chain & Sprocket wheels, methods of lubrication. •Gear Drives–Spur gear terminology, types of gears and gear trains, train value & velocity ratio for compound, reverted and simple epicycles gear train, methods of lubrication, Law of gearing. (simple numerical) •Rope Drives–Types, applications, advantages& Limitations of Steel ropes.		8
5.	**Fly wheel and Governors** • Flywheel-Concept, function and application offly wheel with the help of turning moment diagram for single cylinder 4-Stroke I.C. Engine (No Numerical). Co efficient of fluctuation of energy, coefficient of fluctuation of speed and its significance. • Governors-Types, concept, function and application & Terminology of Governors. (numerical on Watt governor only) • Comparison between Fly wheel and Governor.		6

6.	**Brakes, Dynamometers, Clutches & Bearings** Brakes and Dynamometers • Function of brakes and dynamometer, types of brakes and Dynamometers, comparison between brakes and dynamometer. • Construction and working of i) shoe brake, ii) Band Brake, iii) Internal expanding shoe brake iv) Disc Brake. • Concept of Self Locking & Self energizing brakes. • Numerical problems to find braking force and braking torque for shoe *brake.*onstruction and working of i) Rope Brake Dynamometer, *Introduction to Hydraulic Dynamometer and Eddy current Dynamometer.*		10
	Clutches and Bearing • **Clutches-Uniform pressure and Uniform wear theories.** • **Function of Clutchand its application, Construction and working of Single plate clutch, Introduction to Multi-plate clutch, Centrifugal Clutch, Cone clutch and Diaphragm clutch. (Simple numerical on single plate clutch).** • **Bearings– i) Simple Pivot, ii) Collar Bearing. Torque & power lost in friction (no derivation). Simple numerical**		
7.	**Balancing & Vibrations** • **Concept of balancing. Balancing of single rotating mass. State the causes and effect of unbalance.** • **Concept and terminology used in vibration, causes of vibration sinma chines, and their harm full effect sand remedies.**		2

8.		**Gyroscope (Introduction only)** • **Gyroscopic motion** • **Gyroscopic torque** • **Gyroscopic effects** • **Application of Gyroscope**	2
	Total		42

Theory of Machine Lab

Subject Code : MEC409

List of Practical:

1. To find the ratio of time of cutting stroke to the time of return stroke for quick return mechanism of a shaper machine.
2. Sketch & describe working of bicycle free wheel sprocket mechanism.
3. To find out the height of all types of Governors through Universal Governor Apparatus.
4. Determine the radius of rotation of fly ball for different speed of governor and draw a graph between radiuses of rotation versus speed.
5. Study of different types of CAM and follower through models.
6. Determination of power transmitted by any belt drive using any one dynamometer.
7. Dismantling and assembly of multi-plate clutch of two-wheeler.
8. Balancing of several masses rotating in a single plane by graphical method.
9. Study of gyroscopic model
10. Study of different types of gears, gear trains and drives through models.

RECOMMENDED BOOKS:

1. The Theory of Machines by Thomas Bevan, CBS Publishers & Distributors
2. Theory of Machine by Saha, Jadavani
3. Theory of Machine by P. L. Ballaney
4. Theory of Machine by R.S. Khurmi
5. Theory of Machine by Abdullah Shariff, DhanpatRai& Sons
6. Theory of Machines by SS Ratan
7. Theory of Machine by J E Shigley

Electrical Engineering

Subject : MEC406
Full Marks : 100 (80+20)

L   T   P
3   2

Objectives:
This is a foundation course to understand the basic principles and behavior of electrical circuits, electrical power apparatus and utilization of electrical energy.

1. Electrical EnggFundamentals &Theorems   Module-1 (12 Hours)
Introduction to electrical circuits: Essence of electricity, Electric field, electric current, potential and potential difference, electric power, basic circuit components, ohm's law, Ideal and Practical Sources, Source Conversion, independent and dependent sources, Energy Stored in Inductor and Capacitor, series, parallel and series and parallel circuit.
DC Networks: Laws and Theorems applicable to DC networks (KCL & KVL, Node voltage & Mesh current analysis, Delta-Star & Star-Delta conversion, Superposition principle, Thevenin& Norton theorem),Transients in R-L and R-C circuits with DC excitation, Simple problems.
Introduction to Magnetic Circuits: Introduction to Electromagnetism, B-H curve, Permeability, Reluctance, Solution of magnetic circuits, Hysteresis and Eddy current loss.

2. AC Fundamentals   Module-2 (6 Hours)
Single-Phase AC Circuits: Single-phase EMF Generation, Average and Effective value of periodic ac signals, Peak factor & Form factor, Pharos and Complex representation of sinusoids, Power factor,complex power.
Three-Phase AC Circuits: Comparison between single-phase and three-phase systems, three phase EMF Generation, Line and Phase quantities in star and delta networks,

3.Transformers   Module-3 (8 Hours)
Single-Phase Transformers: Construction and principle of operation, EMF Equation, Transformation ratio, Practical and Ideal transformers, Transformer losses, Brief idea on Transformer Phasor diagram and transformer rating, Auto transformer.
Introduction to 3 phase transformer

4.D C Machines   Module-4 (8 Hours)
D.C. Machines: Principle of operation, construction, classification of DC machines, EMF equation of DC generator, Speed Equation of DC Motor. Series shunt and compound dc motors.

5.AC Machines & Power system   Module – 4 (8 Hours)
Induction Motors: Introduction to Single-phase and Three-phase Induction Motors, Concept of Slip. Synchronous motors and special types of ac motors.

Power Systems: Introduction to generation, transmission and distribution of AC Power, basic idea on grounding, and safety, illumination

Text/reference books:

1. Rizzoni,Principles and Applications of Electrical Engineering., McGrawHill
2. Hughes, "Electrical & Electronic Technology", Ninth Edition Pearson Education.
3. V.D.Toro, "Basic Electrical Engineering", Prentice-Hall of India.
4. B.L.Theraja, A.K.Theraja, "A textbook of Electrical Technology" S.Chand. Ltd.
5. Rajendra Prasad, "Fundamentals of Electrical Engineering", PHI,
6. 6.D P khothari and I J Nagratha "Basic electrical engineering" 2nd ed, TMH.
7. N.N.ParkerSmith,"Problems in Electrical Engineering", CBS Publisher

Electrical Technology Laboratory

Subject Lab : MEC411

List of Experiments:

1. Connection and measurement of power consumption of various lamps.
2. Measurement of armature and field resistance of DC machine.
3. V-I Characteristics of incandescent lamps and time fusing current characteristics of a fuse.
4. Calculation of current, voltage and power in series R-L-C circuit excited by single phase AC supply and calculation of power factor.
5. Study of various parts of DC machine.
6. Study of single phase induction motor and fan motor.
7. Verification of superposition, Thevenin's and Norton's theorem.
8. Study of single phase energy meter.
9. Open circuit and short circuit test of single phase transformer.
10. Study of solar photo voltaic system.

ProfessionalPractices-II

SubjectCode:401

Rationale:

Most of the diploma holders join industries. Due to globalization and competition in the industrial and service sectors the selection for the job is based on campus interviews or competitive tests. While selecting candidates a normal practice adopted is to see general confidence, ability to communicate and their attitude, in addition to basic technological concepts. The purpose of introducing professional practices is to provide opportunity to students to under go activities which will enable them to develop confidence. Industrial visits, expert lectures, seminars on technical topics and group discussion are planned in asemesters othat there will be increased participation of students in learning process.

Objectives:

Studentwillbeableto:

1. Acquireinformationfromdifferentsources
2. Preparenotesfor giventopic
3. Presentgiventopicinaseminar
4. Interactwithpeerstosharethoughts
5. Prepareareportonindustrialvisit,expertlecture

Sl. No.	Activity Heads	Activities	Suggested Hrs
1.	Acquireinformationfromdifferentsources	Topic related to the branch and current area of interest i.e. articles in internet on which research or review is undergoing may be decided for the students group. The group may be restricted to maximum 5 students. Literature survey from Internet , print media and nearby practices may be undertaken. Minimum of 10 to 15 papers may be suggested for reading to get an overview and idea of matters.	12

2.	Preparenotesfor giventopic	Making review or concept to be penned down in form of a article .(the article or review may be of 8 – 10 pages length in digital form of 12 font size in Times New Roman font)	4
3.	Presentgiventopicinaseminar	A seminar or conference or work shop on branch related topic is to be decided and all students in group of 5-6 students may be asked to present their views.	4
4.	Interactwithpeerstosharethoughts	A power point presentation of the article prepared in stage 2 may be presented before the classmates and faculty members.	4
5.	Prepareareportonindustrialvisit,expertlecture	A topic on best practices and product / software development may be assigned to the student group. The group may be asked to prepare a survey, come to opinion making and list out the activities to develop the activities with SWOT analysis.	12