Course Name : Diploma in Mechanical Engineering
Course Code : DME
Semester : Fifth
Subject Title : Theory of Machines
Subject Code : 134ME51

Teaching Scheme			Paper Hours	Examination Scheme											Total Marks
L	T	P		Theory		Test	Total		Pract		Oral		Termwork		
				Max	Min		Max	Min	Max	Min	Max	Min	Max	Min	
3	-	2	3	80	32	20	100	40	-	-	25	10	25	10	150

RATIONALE:

A diploma engineer should have sound knowledge of fundamentals of machines and mechanisms. This subject imparts the facts, concepts, principles, procedure, kinematics and dynamics involved in different machine elements and mechanisms like lever, gear, cam, follower, belt, flywheel, brake, dynamometer, clutch, etc.

It will deal with geometry of mechanisms as well as forces acting and transmitted by machine parts. This will involve the knowledge of velocities and accelerations of links, different power drives and power transmission devices.
Detail knowledge of above-mentioned aspects with deep insight to the practical applications develops a professional confidence in them to become successful Engineer.

Objectives:

- To understand concepts and facts of fundamentals of machines and mechanisms.
- To understand the applications of various machine components.

Syllabus

Part I:- Theory

No.	Contents	L	M
	SECTION - I		
1	**Velocity and Acceleration Analysis** Velocity and acceleration analysis of simple mechanisms (with maximum six links), by relative velocity and relative acceleration method. Instantaneous center method for velocity analysis (Coriolis component to be excluded)	8	18
2	**Balancing**: Balancing of single and multiple rotating masses in the same and different transverse planes, static and dynamic balancing, Reaction forces at shaft support during rotation of unbalanced mass system.	6	14

3	**Cams and followers:** Types of cams, types of followers, cam terminology, cam profiles for following follower motions: constant velocity, S.H.M., constant acceleration & cycloidal motions.	6	14
4	**Rope and Belt Drive, chain drives**: Determination of belt length, velocity ratio, effect of centrifugal tension on power transmission, condition for maximum power to be transmitted, initial tension, determination of width of belt, belt materials, Chain drives and its comparison with belt drives.	6	14
	SECTION - II		
5	**Basic Definitions:** Link, types of links, degree of freedom, kinematic pair, kinematic chain, mechanism, study inversions of four bar mechanism, study of pentograph and mini drafter mechanism etc.	2	6
6	**Flywheel and governors:** Function and application of governors and flywheels, comparison between flywheel and governor, governor terminology.	2	4
7	**Brakes and Dynamometers:** Types of brakes, Internal and external type, single and double shoe brakes, types of band brakes, Determination of braking torque, working of dynamometers etc.	4	10
8	**Gears and gear trains**: Gear terminology, law of gearing, types of gears and gear trains, their selection for different applications. Working of a gearbox, Determination of speed ratios in simple and compound gear trains, reverted and epicyclic gear trains.	6	14
9	**Friction in Bearings and Clutches:** Power lost in flat, collared and conical pivot bearings, uniform wear and uniform pressure assumptions, Power transmitting capacity of single and multi-plate clutches, cone clutch.	6	14
10	**Vibrations:** Vibrations terminology: period, frequency, amplitude, cycle etc. Mathematical treatment only of single degree of freedom undamped free longitudinal vibrations like spring – mass system, simple pendulum etc.	2	4
	Total	48	80*(110)
	* Question no. 5 – section II, will be for 16 marks containing objective questions from entire syllabus. Marks total exceeds 80 due to about 25% optional questions		

TERM WORK: Numerical problems covering the following topics.

1. Friction in bearings and clutches
2. Rope and belt drives
3. Brakes and dynamometers
4. Vibrations
5. Gears and gear trains

Part II:-Practicals

Graphical work on following topics:

1. Velocity and acceleration analysis of mechanisms, relative velocity and acceleration of mechanisms.
2. Velocity analysis of mechanisms by instantaneous center method.
3. Types of cam profiles.
4. Balancing of rotating masses.
5. Demonstration of the following items available in the laboratory.
   i. various types of clutches
   ii. Various types of cams
   iii. Various types of governors
   iv. Various types of gears
   v. Static and dynamic balancing machine
   vi. Inversions of four bar mechanisms, single slider crank and double slider crank mechanism .

TextBooks:

1. Theory of machines ,R.S.Khurmi&J,K,Gupta ,S.Chand Publications 33 rd Edition 2009
2. Theory of machines,S.S.Rattan ,McGraw-Hill Publications 38 th Edition 2003

ReferenceBooks:

1. Theory of machinesB.L.Singhal, McGraw-Hill Publications, 2nd Edition2003
2. Theory of machines, B.K.SarkarMcGraw-Hill Publications1st edition 200

Course Name : Diploma in Mechanical Engineering
Course Code : DME
Semester : Fifth
Subject Title : Thermal Power Engineering
Subject Code : 134ME52

Teaching Scheme			Paper Hours	Examination Scheme											Total Marks
L	T	P		Theory		Test	Total		Pract		Oral		Termwork		
				Max	Min		Max	Min	Max	Min	Max	Min	Max	Min	
3	-	2	3	80	32	20	100	40	25	10	-	-	25	10	150

Rationale:

This subject is designed to enhance the basic knowledge about the principles and laws of thermodynamics and it's applications. The subject contains the topics of I. C. Engines, Gas Turbines and Steam power plants which are very important power units. It introduces the theoretical frame work, various systems and constructional details of the I. C.Engines, Gas Turbines and Steam power plants from the operation and maintenance point of view.

Objectives:

- To understand the working of different types of I.C.Engines and their applications
- To understand the working of different systems used in I.C. Engines
- To understand the working of different types of gas turbines and their applications.
- To understand the working of Steam power plants and the components involved viz. Nozzles, Turbines and Condensers.

Syllabus

Part I:- Theory

No.	Contents	L	M
	Section - I		
1	**Air standard Cycles:** Carnot cycle, Otto cycle, Diesel and Dual cycle, Derivations of air Standard Efficiencies.Numerical problems.	**4**	**8**
2	**I. C. Engines** 2.1 Classification and applications of I. C. Engines. Working of SI and CI Engines, study of 4-stroke and 2-stroke cycles. Ideal and actual P-V diagrams, valve timing diagrams. 2.2 Constructional details of I. C. Engines.	**5**	**6**
3.	**I.C.Engine Systems** 2.4 Fuel supply systems in S. I. engines, Carburation and carburettor, fuel injection in S. I. engine 2.5 Fuel supply systems in C. I. engines. Fuel injection systems.	**5**	**8**

	2.6 Cooling, lubrication and ignition systems. 2.7 Governing of I. C. engines. 2.8 I. C. engine fuels, fuel ratings. 2.9 Super charging and turbo charging 2.10 Pollution due to I. C. Engines.		
4.	**I.C. Engine Performance** I.C. Engine performance and Testing: Break power, Indicated power, frictional power, Mechanical, Brake thermal, Indicated thermal and Volumetric efficiencies, specific fuel consumption, heat balance sheet, dynamometers, characteristics of S. I. and C. I. engines	**6**	**10**
5.	**I.C.Engine Maintenance** Preventive and Breakdown Maintenance of Engines. Troubleshooting	**2**	**4**
6	**Gas Turbines:** Introduction to gas turbines, basic cycles, merits and demerits w.r.t. I. C. Engines. Turbojet, Turboprop, Ramjet engines.(No Numerical problems)	**2**	**4**
Section - II			
7	**Steam Power Cycles:** Carnot cycle, Rankine cycle, Reheat and regeneration cycles.(Numerical problems on Rankine Cycle only)	**7**	**12**
8	**Steam Generators** Classification, Water tube and Fire tube boilers,Cochran and Babcock Wilcox Boilers, Package Boiler, High Pressure Boiler, Benson Boiler Application of steam in Power generation and Process heating.	**4**	**6**
9	**Steam Nozzles:** Convergent, Convergent-Divergent Nozzles, velocity of steam at exit, nozzle efficiency.	**5**	**8**
10	**Steam Turbine:** Impulse and reaction turbines, Compounding of Steam turbines, velocity diagrams, determination of power and axial thrust. (single stage only)	**5**	**10**
11	**Steam Condensers:** Classification, Necessity of steam condensers in power plants, vaccum efficiency, study of surface condensers. (No Numerical Problems)	**3**	**4**
		48	**80**

Part II :- Practicals:

1. Identification of components of 4-stroke and 2 stroke cycle engines
2. Performance test on S. I. Engine
3. Performance test on C. I. Engine
4. Identification of components of Engine cooling and lubrication systems.
5. Identification of components of Engine fuel supply systems.
6. Identification of components of Engine Ignition systems.
7. Engine maintenance – assembly, disassembling of I.C. engines
8. Study of Cochran, Babcock Wilcox with the use of cut section models.
9. Identification of components of Steam Power Plant and Layout.
10. Visit to Thermal Power Station / Engine Maintenance/ Engine manufacturing Shop

Text Books:

1. Thermal Engineering by R.K.Rajput, Laxmi Publicashions (P) Ltd ,9th Edition 2013

References Books:

1. A text Book of Thermal Engineering – R.S.Khurmi & J.K.Gupta-S.Chand Publications- Revised Edition-2012
2. Internal combustion Engines- Mathur & Sharma-Dhanpatrai publications-2010
3. Internal combustion Engines- V.Ganeshan-Tata McGraw Hills publications-2nd Edition -2005

Course Name : Diploma in Mechanical Engineering
Course Code : DME
Semester : Fifth
Subject Title : Metrology & Quality Control
Subject Code : 134ME 53

Teaching Scheme			Paper Hours	Examination Scheme											Total Marks
L	T	P		Theory		Test	Total		Pract		Oral		Termwork		
				Max	Min		Max	Min	Max	Min	Max	Min	Max	Min	
3	-	2	3	80	32	20	100	40	-	-	25	10	25	10	150

Rationale:

1. The course is designed to provide the basic knowledge of science of measurement and skills required to use various measuring instruments and gauges to verify the dimensional accuracies and surface finish of measured components. The course also provide the knowledge of the basic methods of Quality Control and Inspection in modern manufacturing organization.

Objectives:

To understand Measurement system analysis , sources of variation in measurements , four test of measurements system analysis.

- Bias
- Linearity
- Repeatability and reproducibility
- Stability test

Syllabus

Part I:- Theory

Section – I			
Metrology			
		L	**M**
1.	**Introduction :** Explain briefly simple measuring instruments such as dial indicator, Calipers and micrometer etc. slip gauges, their different grades.Indian standards on slip gauges, ringing of slip gauges manufacturing and calibration of slip gauge , requirements of interchangeable manufacture	**3**	**6**
2.	**Standard measurements:** Line and standard, wavelength standard, calibration of working standard by direct comparison and by interferometry	**2**	**5**
3.	**Study of Interferometry:** Elementary treatment to principle of interference, interferometry applied to flatness testing.	**2**	**5**

4.	**Limits, Fits and Gauges :** Allowance and tolerance: requirement of interchangeable manufacture, selective assembly, limits and fits, IS system of limits and fits, hole basis system and shaft basis system. **<u>Gauges</u>:** Types of gauges, plane plug gauge, plane ring gauges and snap gauges, adjustable type gap gauges, combined limit gauges, position gauge. **<u>Gauge Design</u>:** Taylors principle wear allowance considerations, gauge markers tolerance, bonus tolerances based on maximum material conditions and least material conditions	**6**	**15**
5.	**Comparators:** Study of comparators such as Johnson's Mikrokator, sigma comparator free flow air gauges, solar pneumatic gauge .Principle of operation of electrical and electronic comparator. Free flow air gauges, solar pneumatic gauge.	**3**	**8**
6.	**Introduction to straightness, flatness, squareness and parallelism testing**	**2**	**6**
7.	**Introduction to Surface Textures:** Meaning of surface texture, terminology of surface texture, analysis of surface traces – R.M.S. value, C.L.A. value, mean line, lay, study of tomlinson surface meter.	**2**	**5**
Section – II			
8.	**Angular measurements:** Instruments-bevel protractor, sine bar, angle gauges, spirit level, clinometer	**3**	**5**
9.	**Metrology of screw threads:** Screw thread terminology, thread errors, thread measurements-major diameter, minor diameter, effective diameter measurements-micrometer methods, two wire and three wire method(floating carriage micrometer) , internal threads-effective diameter measurements	**4**	**7**
10.	**Gear measurements:** Gear technology, error in gears, gear measurements, measurements of tooth thickness by Gear tooth verniar caliper, Constant chord method, Base tangent method.	**4**	**8**
Quality Control			
		L	**M**
1.	**Introduction :** Quality, Quality control, Statistical quality control (SQC), Statistical	**2**	**4**

	concepts used in SQC, Cost consideration in quality control.Quality characteristics, variables and `attributes. Variation and types. Factors affecting variation.		
2.	**Process control:** **a. Control charts for variables** Mean (X) and range(R) charts. Control chart technique. Process in state of control and out of control. Process capability, specification limits and conditions for process in control. Concept of 6σ. Capability index. Calculation of rejections when process is not in control. b. **Control charts for attributes** Defect and defective, control charts for defectives such as fraction defectives (P chart), number defective(nP chart) and percent defective (100P chart). Control charts for defects such as count of defect (C chart) and defects per unit (U chart).	**8**	**16**
3.	**Acceptance sampling:** Concept of sampling, acceptance sampling, Single, double and multiple sampling plans, Sequential sampling. Operating characteristic (OC) curve and probability of acceptance in single, double and multiple plans. Producer and consumer risk. AQL, RQL, ATI, AOQ, AOQL and ASN. Type-I and type-II errors. Type-A and type-B OC curves. Design of single sampling plan. introduction to IS -2500.	**5**	**10**
Part I :- Practicals			
1.	Use of slip gauges and accessories .		
2.	plug gauge checking using 'floating carriage micrometer '.		
3.	Measurement of angle using Clinometer.		
4.	Use of Sigma Comparator.		
5.	Auto Collimator.		
6.	Gear Measurements.		
Part II :- Assignments (Quality Control) :			
1.	Assignment On Control Charts.		
2.	Acceptance Sampling Procedures .		
(D) Seminar presentation on allotted topics			
1.			

Text Books

1. "R.K.Jain", "Engineering Metrology", "Khanna Publishers", Edition 20 th, Reprint 2011.
2. Statistical Quality Control by Mahajan

Books For Reference :

1. "I .C. Gupta", "Engineering Metrology", " Dhanpat Rai Publications (P). Ltd. 7 th Revised Edition, Reprint 2013.
2. Statistical Quality Control –Grant & Livenworth
3. Quality Control- National Productivity Council
4. "Shot bolt ","Metrology" ;
5. "S.K. Singh", "Industrial Instrumentation and Control", "TMH, Edition 1987.
6. Process Control-Oakland

Course Name : Diploma in Mechanical Engineering
Course Code : DME
Semester : Fifth
Subject Title : Fluid Power Engineering
Subject Code : 134ME54

Teaching & Examination Scheme

Teaching Scheme			Paper Hours	Examination Scheme											Total Marks
L	T	P		Theory		Test	Total		PR		OR		TW		
				Max	Min		Max	Min	Max	Min	Max	Min	Max	Min	
3	-	2	3	80	32	20	100	40	-	-	25	10	25	10	150

Rationale:

Oil Hydraulic systems & pneumatic systems are widely used in all fields of engineering asclean source of motive power. Low cost automation systems with the use of pneumatics have become popular as manufacturing aids.

Diploma engineers come across such systems in all segments of industries.

Hence the subject will give the students basic skills and knowledge, which will be directly needed in the industrial environment.

Objectives:

The student will be able to.

1) Identify various components of hydraulic & pneumatic systems.

2) Know the working principle of various components used for hydraulic & pneumatic systems.

3) Select appropriate components required for simple hydraulic and pneumatic circuits.

4) List probable causes of faults or defects in the components of hydraulic & pneumaticcircuits.

Syllabus

Sr. No	Contents	L	M
	Section- I		
1	**Introduction to oil hydraulic systems** 1.1 Practical applications of hydraulic systems. 1.2 General layout of oil hydraulic systems. 1.3 Merits and limitations of oil hydraulic systems	03	04
2	**Components of Hydraulic systems** 2.1 **Pumps** – Vane pump, gear pump, Gerotor pump, screw pump, piston pump 2.2 **Valves** – Construction, working and symbols of Pressure control valves – pressure relief valve, pressure reducing, pressure unloading Direction control valves – Poppet valve, spool valve, 3/2, 4/2 D.C. valves, Sequence valves. Flow control valves – pressure compensated, non pressure compensated flow control valve. 2.3 **Actuators**- Construction, working and symbols of Rotary Actuators - Hydraulic motors Linear Actuators – Cylinders - single acting, double acting. 2.4 **Accessories** – Pipes, Hoses, fittings, Oil filters, Seals and gaskets, Accumulators. (Types, construction, working principle and symbols of all components)	16	08 08 06 06
3	**Hydraulic Circuits** 3.1 Meter in, Meter out circuits 3.2 Bleed off circuit 3.3 Sequencing circuit 3.4 Hydraulic circuits for Milling machine, Shaper machine, Motion synchronization circuit	05	08
	Section- II		
4	**Introduction to pneumatic Systems** 4.1 Applications of pneumatic system 4.2 General layout of pneumatic system 4.3 Merits and limitations of pneumatic systems	04	06

5	**Components of pneumatic system** 5.1 **Compressor–** Reciprocating & Rotary compressors. 5.2 **Control Valves** – Pressure regulating valves, Flow Control valves, Direction Control Valves. 5.3 **Actuators** – Rotary - Air motors, Types, construction, working principle Linear- Cylinders- Types, construction &working principle 5.4 **Accessories** – Pipes, Hoses, Fittings, FRL unit (Types, construction, working principle and symbols of all components)	16	06 08 08 06
6	**Pneumatic Circuits** Speed control circuits. Sequencing circuits.	04	06
	Total	**48**	**80**

List of Practical:

1) Demonstration of meter in and meter out circuit.

2) Demonstration of sequencing circuit.

3) Demonstration of hydraulic circuit for shaper machine.

4) Demonstration of pneumatic circuit for speed control of double acting cylinders.

5) Demonstration of pneumatic circuit for speed control of pneumatic motor.

6) Study of trouble shooting procedures of various hydraulic and pneumatic circuits.

7) Selection of circuit components for simple hydraulic and pneumatic circuits

Books:

Sr. No.	Author	Title	Publisher
01	Pippenger Hicks	Industrial Hydraulics	McGraw Hill International
02	Majumdar S.R	Oil Hydraulic system- Principle and maintenance	Tata McGraw Hill
03	Majumdar S.R	Pneumatics Systems Principles and Maintenance	Tata McGraw Hill
04	Stewart	Hydraulics and Pneumatics	Taraporewala Publication

Course Name : Diploma in Mechanical Engineering
Course Code : DME
Semester : Fifth
Subject Title : Computer Programming
Subject Code : 134ME55

Teaching & Examination Scheme

Teaching Scheme			Paper Hours	Examination Scheme											Total Marks
L	T	P		Theory		Test	Total		Pract		Oral		Termwork		
				Max	Min		Max	Min	Max	Min	Max	Min	Max	Min	
2	-	2	-	-	-	-	-	-	25	10	-	-	25	10	50

Rationale: Students are already familiar with computer system and programming fundamentals. This subject will extend their knowledge in programming. Programming starts with structured approach, hence topics relevant to it are included. Many of other application software use object oriented programming approach, hence it is introduced in syllabus.
Objective: At the end of this course students will be able to understand

- Control Structures
- Functions, arrays, structures.
- Objects and Classes.

As used in C ++ programming.

Syllabus

Part I -Theory

Sr. No	Contents	L
1.0	Fundamentals of C++ and control structures	02
2.0	Control structures: Conditional operator, nested if else switch statements, nested loops, break and continue	08
3.0	Functions: Returning and non returning functions, sending arguments by value and by reference. Recursive functions, storage class.	04
4.0	Arrays: Single and two dimensional arrays, sending array to function, strings. Operations on arrays, matrix and strings.	08
5.0	Structures: Declaration and definition, sending structure to function, array of structures and operations on it.	04
6.0	Introduction to objects and classes: Concepts of object and class, constructors, function and constructor overloading, sending object as argument to function and returning object from function. Static members and friend functions. Binary operator overloading.	06
	Total	**32**

Part II- Practicals

1. Programs on nested if-else and switch statements.
2. Programs on single loop using break.
3. Programs on nested loops.
4. Programs on various types of functions.

5. Data manipulation (array operations).
6. Matrix operations (only square matrix).
7. Operations on strings.
8. Addition of two structure variable using function.
9. Merit list using structures.
10. Statistical operations using object and class.
11. Addition of two objects and returning object.
12. Operations on complex numbers using operator overloading.

Term work:
Students shall submit journal containing term work, at least 10 practicals, 4 assignments based on syllabus.
Learning Resources:

Text Books:
1) Object Oriented Programming using C++, by Balguruswamy, Tata McGraw-Hill Publishing Company, Second Edition, 2002
2) Let us „C++" , by Yashwant Kanetkar, BPB Publications, First edition, 1999, Reprint 2005.
Reference Books:
1) Object Oriented Programming in C++, By Robert Lafore, Techmedia Publisher, Fourth edition, 2002.

Course Name : Diploma in Mechanical Engineering
Course Code : DME
Semester : Fifth
Subject Title : Project
Subject Code : 134ME56

Teaching Scheme			Paper Hours	Examination Scheme											Total Marks
L	T	P		Theory		Test	Total		Pract		Oral		Termwork		
				Max	Min		Max	Min	Max	Min	Max	Min	Max	Min	
-	-	3	-	-	-	-	-	-	-	-	25	10	25	10	50

RATIONALE:

The student is introduced to various aspects of mechanical engineering at this stage. The project gives him an opportunity to get some hands on practical experience on different subjects covered so far. This provides a practical experience to the student about the different theoretical topics which are studied at length during the course so far. The selection of project topics will be based on following guidelines.
The student can choose a single project for the entire third year or can take up one independent project in each of the two semesters.

Objectives:

- To develop the skills and ability to work in small groups.
- To apply the concepts of various engineering subjects to real life problems.

COURSE CONTENT:

Students will choose a **project topic** (any one) of their choice from the following three categories.

(1) Manufacturing Type Project:

- To select any assembly you have studied during 'IV LME –Machine Drawing' subject eg. screw jack, drill jig etc.
- Preparation of manufacturing drawings and detail drawings of any assembly studied Machine drawing subject eg. screw jack etc assigning suitable tolerances at required places.
- Getting these components made from institute's workshop or outside under own guidance, supervision and observation.
- Assemblying the components and form the required assembly.

Note:

1. Student may select any other assembly outside text book.
2. The assembly should contain min 5 to max 10 components; excluding std parts like nut-bolts.
3. The overall size of the assembly should be within min $4inch^3$ to max $1ft^3$ approx.

4. The components may be made out of steel, wood or any other durable material. The project model need to be a working model at least to the level of demonstration.
5. A group of min 2 to max 4 students can be formed per project.

(2) Thesis Type Project:

- Selecting a topic, an assembly, a unit, a device, a component etc. which can be examined from technical perspective. Eg. fan, gearbox, Oil seals, bearings, screw jacks, locks, cutting tools, pipe joints, welding methods, threaded fasteners, couplings, belts, chains, domestic mixers, refrigerators, ergonomics, lubrication, wear, friction etc.
- Collecting information related to the selected subject from the point of view of its working, design features, specifications, manufacturers, manufacturing methods, suppliers, costing, design types, feature comparison, science-technique-principal involved therein, related statistical data, failure studies, origin, history involved etc. whichever is applicable.

Note:

1. The student may need to visit places to collect data, observe manufacturing processes, collect information from different sources like library books, internet, manufacturers, associated people etc.
2. Max 2 students can form a group for thesis project.

(3) Special Purpose Project:

- To select ANY TECHNICAL TOPIC of your choice, but essentially covering manufacturing activity. Only write-up is not permitted.

Note:

1. The topic will be finalized only after discussing the scope with concerned staff.
2. The aspects covered in two other types above; should be mainly applicable to the selected topic.

TREM WORK:

A consolidated report on the project work (complete or incomplete) will be prepared at the end of each semester. The extent of written work will vary, depending on the related manufacturing work (if any) that is involved with the projec

Course Name : Diploma in Mechanical Engineering
Course Code : DME
Semester : Fifth
Subject Title : Student Center Activity/Test

Teaching Scheme			Paper Hours	Examination Scheme											Total Marks
L	T	P		Theory		Test	Total		PR		OR		TW		
				Max	Min		Max	Min	Max	Min	Max	Min	Max	Min	
-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-

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 attitude, in addition to basic technological concepts.

The purpose of introducing professional practices is to provide opportunity to students to undergo activities which will enable them to develop confidence. Expert lectures, E-learning sources, E-library, Internet, seminars on technical topics and group discussion are planned in a semester so that there will be increased participation of students in learning process.

Objectives:

The Student will be able to:

1. Acquire information from different sources
2. Prepare notes for given topic
3. Present given topic in a seminar
4. Interact with peers to share thoughts
5. Take the advantages of E-learning sources