Scheme of Teaching and Examination for
V Semester DIPLOMA in MECHANICAL ENGINEERING

THEORY

Sl. No.	SUBJECTS	SUBJECT CODE	TEACHING SCHEME		EXAMINATION - SCHEME					
			Periods per Week	Periods in one Session (Year)	Hours of Exam.	Terminal Exam. (A) Marks	Final Exam. (B) Marks	Total Marks (A+B)	Pass Marks Final Exam.	Pass Marks in the Subject
1.	Production & Costing	25501	06	60	03	20	80	100	26	36
2.	Energy Conversion-II	25502	06	50	03	20	80	100	26	36
3.	Mechanics of Structure	25503	06	50	03	20	80	100	26	36
4.	Installation & Maintenance	25504	06	50	03	20	80	100	26	36
5.	Automobile Engineering	25505	06	60	03	20	80	100	26	36
		Total :-	**30**					**500**		

PRACTICAL

Sl. No.	SUBJECTS	SUBJECT CODE	TEACHING SCHEME		EXAMINATION – SCHEME					
			Periods per Week	Periods in one Session (Year)	Hours of Exam.	Marks Internal Exam. (A)	Marks External Exam. (B)	Total Marks (A+B)	Pass Marks Final Exam.	Pass Marks in the Subject
6.	Workshop Practice	25506	12	150	06	10	40	50	16	21
		Total :-	**12**					**50**		

SESSIONAL

Sl. No.	SUBJECTS	SUBJECT CODE	TEACHING SCHEME		EXAMINATION - SCHEME			
			Periods per Week	Periods in One Session (Year)	Marks of Internal Examiner (X)	Marks of External Examiner (Y)	Total Marks (X+Y)	Pass Marks in the Subject
7.	Workshop Practice	25507	--	--	40	60	100	50
8.	In plant Training & Visit to Work	25508	4 Weeks Continuous		40	60	100	50
		Total :-					**200**	

Total Periods per Week	**42**	**Total Marks**	**750**

PRODUCTION & COSTING

Subject Code 25501	Theory			No of Period in one session : 60		
	No. of Periods Per Week			Full Marks	:	100
	L	T	P/S	Annual Exam.	:	80
	06	-	-	Internal Exam.	:	20

Rationale :

Every industrial unit may it be public or private sector stands for service to humanity. In the same course they either have to manage things on no-profit no loss basic or for handsome profit. In all cases the technician engaged in the job must be well conversant with need of the market and the purchasing capacity of the consumers. Again these two factors must have collaboration with the feasibility and economy with which the production should be affected. Therefore, the technician engaged in such works must have sound knowledge of production, planning market survey, cost and quality control sale promotion etc. Introduction of this subject will enable student learning about all relevant topics giving knowledge as said above. This course will also fulfil the one the measure activities of a technician i.e. cost consciousness. It is expected from a technician to perform every activity in an economical way.

Objective:

After covering the courses a student will be able to :-

- Learn all the elements of production, planning and control to develop the skill.
- Plan a work schedule and complete the work in given time.
- Develop basic concept & knowledge of market research.
- Define and understand the elements involved in workstudy and apply it towards product economy.
- Define and understand jobs evaluation and their ment ralings.
- Understand different terms associated with work sampling and its application towards quality control.
- Understand the distribution channels, advertisement.
- Develop skill of sales.
- Develop knowledge of foreign trade.
- Break cost into elements for cost analysis.
- Correspondence promotion.
- Knowledge of depreciation and skill for calculation of Cost of depreciation.
- Estimate & Calculate different matching time.
- Develop skill to find the cost of a product & fix up selling price.

S.No.	Topics	Periods
	Part-A	
01	Production, Planning & Control.	(10)
02	Sales Forecasting.	(08)
03	Job evaluation & Merit Rating.	(06)
04	Time & Motion Study.	(05)
05	Salesmanship.	(04)

Part-B

06	Elements of Cost.	(06)
07	Depreciation.	(05)
08	Estimation of Machining time.	(06)
09	Costing for Metal forming and Fabrication Process.	(10)
	Total :	**(60)**

CONTENTS:

PART-A

PART-B

TOPIC: 08 – ESTIMATION OF MACHINING TIME: [06]

08.01 Cutting speed, feed and depth of cut for different machining operations.

08.02 Concept of unit time, Cycle time and total time.

08.03 Calculation of Machining time for different machining operation.

TOPIC: 09 – COSTING FOR METAL FORMING AND FABRICATION PROCESS: [10]

09.01 Concepts of different types of welding & Welded joints.

09.02 Calculation of welding time & welding cost.

09.03 Concepts of forging and forging operation, estimation of forgoing cost.

Books Recommended:

1.	Production & Costing, Khanna Publisher, Delhi-6	-	G. S. B. Narang & V. Kumar
2.	Mechanical Production & Costing, Khanna Publisher, Delhi-6	-	T. R. Banga & S. C. Sharma
3.	Industrial Engg. & Management, Dhanpat Rai & Sons	-	O. P. Khanna
4.	Mechanical Engg. Estimating & Costing, Tata McGraw Hill, Avenue Road Madras-600034	-	T.T.T.I., Madras
5.	Production & Costing.	-	Dadan & Karmendra
6.	Time and Motion Study.	-	Dalela
7.	Production Process, Oxford University Press.	-	T.T.T.I., Madras

ENERGY CONVERSION - II

Subject Code 25502	Theory			No of Period in one session : 50		
	No. of Periods Per Week			Full Marks	:	100
	L	T	P/S	Annual Exam.	:	80
	06	-	-	Internal Exam.	:	20

Rationale :

Water and heat management are back bone of any developing country. These managements cover the full utility of water and heat. It should be basis on environmental safety and pollution free management.

Objective:

Student should able to:-

(A) Analyse the capability of water and heat power in the form of energy.
(B) Use of hydraulic machines and steam engines, and I. C. engines.
(C) Use of these machines as prime movers.

S.No.	Topics	Periods
01	Water Turbines.	(10)
02	Water Pumps.	(05)
03	I. C. Engines.	(14)
04	Steam Condenser & Steam Nozzles.	(06)
05	Steam Engines & Turbines.	(08)
06	Compressors.	(07)
	Total :	**(50)**

CONTENTS:

TOPIC: 01 – WATER TURBINES: [10]

01.01 Pelton turbine: Construction and working principle with velocity triangles, work done.

01.02 Design Consideration of Pelton turbine.

01.03 Radial flow Reaction Turbine : Main parts of radial flow reaction turbine, Inward and outward reaction turbine, velocity triangle, work done.

01.04 Francis Turbine: Construction and working principle with velocity triangle work done.

01.05 Kaplan Turbine: Construction and working principle with velocity triangle work done.

01.06 Draft Tubes : Types of draft tube, draft tube theory, efficiency of draft tube.

TOPIC: 02 – WATER PUMPS: [05]

02.01 Centrifugal Pumps : Main parts of centrifugal pump and working principle, Cavitation.

02.02 Definitions of heads and efficiencies of centrifugal pump.

02.03 Minimum speed for stating of centrifugal pump.

02.04 Multistage of centrifugal pump.

02.05 Reciprocating Pump : Working principle, discharge, work done, power required to drive the pump, slip indicator, diagram and air vessels.

TOPIC: 03 –I. C. ENGINES: **[14]**

03.01 I. C. Engines.

03.01.01 Definition and classification of I. C. Engines.

03.01.02 Working of Petrol Engine.

03.01.03 Working of Diesel Engines.

03.01.04 Comparison between two-stroke and four-stroke engine.

03.01.05 Comparison between Petrol and Diesel Engine.

03.01.06 Testing and performance of I. C. Engine.

03.01.07 Value setting Diagram of I. C. Engine.

03.02 Fuel and combustion in I. C. Engine.

03.02.01 Flame propagation.

03.02.02 Pre-Ignition.

03.02.03 Ignition delay.

03.02.04 Detonation and Knocking.

03.02.05 Factors affecting detonation.

03.02.06 Octane and Cetane value of petrol and diesel fuels.

03.03 Carburation.

03.03.01 Concept of Carburation.

03.03.02 Air fuel ratio.

03.03.03 Working of simple carburetor and its limitations.

03.03.04 Zenith carburetor.

03.04 Ignition system of Petrol Engine.

03.04.01 Introduction and types of Ignition System.

03.04.02 Brief description of a Battery coil ignition system.

03.04.03 Brief description of a magneto ignition system.

03.05 Fuel Injection system of a Diesel Engine.

03.05.01 Introduction.

03.05.02 Components of fuel injection system.

03.05.03 Description and working of fuel injection pump.

03.05.04 Description and working of injector.

03.05.05 Description and working of Fuel filter.

TOPIC: 04 – STEAM CONDENSER & STEAM NOZZLES: **[06]**

04.01 Advantages of condenser.

04.02 Classification of condenser.

04.03 Jet, Parallel flow, counter flow and surface condenser.

04.04 Vacuum and condenser efficiencies.

04.05 Types of steam nozzles.

04.06 Flow through nozzles, nozzle efficiencies.

04.07 Condition of minimum discharge, critical pressure ration.

TOPIC: 05 – STEAM ENGINES & TURBINES: **[08]**

05.01 Classification of steam engines and working principle.

05.02 Mean Effective Pressure, indicator diagram, diagram factor, power developed by steam engine.

05.03 Steam Impulse and Reaction turbines with velocity diagram.

05.04 Combined velocity diagram of steam turbine.

05.05 Delaval and curtis turbine.

05.06 Effect of friction on combined velocity triangle.

05.07 Velocity and pressure Compounding of steam turbine.

05.08 Calculation of work done and power.

TOPIC: 06 – COMPRESSORS: **[07]**

06.01 Rotary air compressor : Root blower, Vane blower and Centrifugal compressor (Only working principle).

06.02 Calculation of work done for centrifugal compressor.

06.03 Reciprocating Compressor-Construction details.

06.04 Work input for reciprocating compressor during various processes in single and double stage.

06.05 Intercooling, Perfect intercooling and different types of efficiencies.

Books Recommended:

1. Hydraulic Machine - Dr. J. Lal
2. Fluid Mechanics and Machines - Dr. R. K. Bansal
3. Fluid Mechanics and Machines - R. S. Khurmi
4. Thermal Engineering, Khanna Publishers. - P. L. Ballancy
5. Thermal Engineering - R. S. Khurmi
6. Heat Engine - Karmchandami
7. A Text Book of Mechanical Technology Thermal Engine, S. Chand & Co, Ltd. - R. S. Khurmi
8. Saral Ushma Engine, - S. L. Tak & R. Shamu
9. Refrigeration and Air Conditioning, Dhanpat Rai & Sons. - S. Domkumdwar
10. Hydraulics and Hydraulic Machines. - J. Lal.
11. Solar Energy. - S. P. Sukhatme.

Reference Books :

1. Thermodynamics Applied to Heat Engine, Pitman Asia Edition. - E. H. Lewiff.
2. A Course in Thermodynamics and Heat Engines (Thermal Engineering), Dhanpat Rai & Sons. - Domkundwon, Kothanda Raman Khajuria and Arora
3. Refrigeration and Air Conditioning, S. Chand & Co. - V. K. Jain.
4. Hydraulics and Hydraulic Machines, Madhyon Prodogy Hindi Granth Academy. - K. K. Keshari.
5. Solar Energy, S. Chand & Co. - M. P. Agrwal.
6. Refrigeration and Air-conditioning in the light of latest development, ISGT. - T.T.T.I., Madras
7. Hydraulic Machinery. -

MECHANICS OF STRUCTURE

Subject Code 25503	Theory			No of Period in one session : 50		
	No. of Periods Per Week			Full Marks	:	100
	L	T	P/S	Annual Exam.	:	80
	06	-	-	Internal Exam.	:	20

Rationale:

The subject form an important part of Mechanical Engineering and deals with the basic concept of the behaviour of material used in machine parts and in practice in different structures. In fact, this subject may be considered as the key of the engineering subjects dealing materials.

Objective:

The student will be able to :

(i) Understand the various properties of materials used.

(ii) Understand & analyze the effect of various forces acting on the component of machine and resistance offered by these components.

(iii) Judge the suitability of a particular material in the design.

S.No.	Topics	Periods
01	Principal Stresses and Strain.	(07)
02	Strain Energy.	(04)
03	Slope & Deflection of Beam.	(07)
04	Torsion of Shaft.	(06)
05	Spring.	(04)
06	Columns and Struts.	(06)
07	Stresses in Beam.	(05)
08	Combined Direct Bending Stresses.	(06)
09	Thin Cylinders and Spheres.	(05)
	Total :	**(50)**

CONTENTS:

TOPIC: 01 – PRINCIPAL STRESSES AND STRAIN: [07]

01.01 Normal and Tangential stresses on oblique planes, resultant stress.

01.02 Principal planes and principal stresses & strain.
(Analytical and graphical solution) (Simple problems)

01.03 Theory of elastic failure. (Simple problems)

TOPIC: 02 – STRAIN ENERGY: [04]

02.01 Definition and concept of strain energy, Different types of loading.

02.02 Stresses developed due to gradual, sudden and impact load. (Simple problems)

TOPIC: 03 – SLOPE & DEFLECTION OF BEAM: [07]

03.01 Relation between slope, deflection and radius of curvature.

03.02 Slope and deflection calculation for cantilevers & simply supported beam subjected to concentrated and uniformly distributed load.

03.03 Macaulay's Method and its application for determining slopes and deflections.

TOPIC: 04 – TORSION OF SHAFT: **[06]**

04.01 Theory of pure torsion, Moment of Resistance, Torsional Equation, Assumption in the theory of pure torsion, Polar modulus, Torsional rigidity. (Simple Problems)

04.02 Power Transmitted by a shaft. (Simple Problems)

TOPIC: 05 – SPRING: **[04]**

05.01 Close Coiled Helical Springs, Determination of deflection, angle of twist and stiffness under axial loading and twisting. (Simple Problems)

05.02 Leaf springs, Determination of Central deflection, number of leaves and proof load on elliptical section of spring. (Simple Problems)

TOPIC: 06 – COLUMNS AND STRUTS: **[06]**

06.01 Concept of columns, Euler's Analysis for various end conditions of long column. Limitation of Euler's formula, Equivalent lengths of columns.

06.02 Buckling load, Crushing load, Slenderness Ratio.

06.03 Ranking formula for column.

TOPIC: 07 – STRESSES IN BEAM: **[06]**

07.01 Theory of Simple Bending, Position of neutral axis, Moment of resistance, General bending equation of a beam subjected to pure bending. (Simple Problems).

TOPIC: 08 – COMBINED DIRECT BENDING STRESSES: **[06]**

08.01 Concept of Direct and Eccentric load.

08.02 Symmetrical Column Sections (Rectangular & Circular) with Eccentric loading about one axis, Stress distribution.

08.03 Core or Kernel of sections. (Simple Problems)

08.04 Columns and Chimney subjected to horizontal wind pressure.

TOPIC: 09 – THIN CYLINDERS AND SPHERES: **[05]**

09.01 Failure of a cylindrical shell due to an internal pressure, Circumferential and longitudinal stress.

09.02 Changes in dimensions, Changes in Volume due to internal pressure. (Simple Problems)

Books Recommended:

1. Strength of Materials - S. Ramamrutham
2. Strength of Materials - Surendra Singh
3. Strength of Materials - Ryder
4. Strength of Materials (M. K. S. & S.I. Units) - R. S. Khurmi

INSTALLATION & MAINTENANCE

Subject Code	Theory			No of Period in one session : 50		
	No. of Periods Per Week			Full Marks	:	100
	L	T	P/S	Annual Exam.	:	80

25504	**06**	**-**	**-**	**Internal Exam.**	**:**	**20**

Rationale :

A mechanical engineering diploma holder is in demand as maintenance supervisor. In the capacity of a supervisor he has to take the problem of installation and commissioning of machines. He is responsible for the maintenance and up keep of the machine and equipments under his charge. He is expected to plan maintenance schedule and keep machines in operating condition. He has to take on the spot decision about replacement, restoration and recovery of machine parts.

The subject has been designed to develop sufficient knowledge which will help in developing & skill and attitude in students so that when engaged in any industry he may be able to discharge his duties with confidence.

Objective:

A student after successful completion of the subject will be able to :-

- Understand the problem in installation of machine and equipment.
- Organise the maintenance activities.
- Develop the knowledge of methods of determining wear.
- Select repair methods of worn parts and their sequence.
- Understand the common defects and their repair resonation and/or removal in machine parts.
- Ensure a non interrupted production-flow

S.No.	**Topics**	**Periods**
01	Maintenance & Maintenance Planning.	(07)
02	Generalised procedure of Installation.	(08)
03	Maintenance and Repair of Guide Surfaces.	(05)
04	Corrosion-its Control and Chemical Cleaning.	(06)
05	Lubrication and Lubricants.	(05)
06	Pumps and Air Compressors.	(06)
07	Material Handling.	(04)
08	Seals, Packings and Gaskets.	(04)
09	Miscellaneous Maintenance.	(05)
	Total :	**(50)**

CONTENTS:

TOPIC: 06 – PUMPS AND AIR COMPRESSORS: **[06]**

06.01 Introduction to basic elements of Centrifugal and reciprocating pumps.

06.02 Pumping units, Connection of pumps with suction lines and discharge lines, Direction or rotation of pump.

06.03 Different types of Troubles with Centrifugal pumps and their causes.

06.04 Air Compressor : Types of Compressor, selection of Compressor, Site selection and storing of Compressor, fitting and positioning of important accessories and Components.

TOPIC: 07 – MATERIAL HANDLING: **[04]**

07.01 Methods of Material Handling.

07.02 Lifting and lowering devices-Block and tackle, Elevator, pillar Crane, overhead crane.

07.03 Transporting Devices : Wheel barrow, hand truck, lift truck, Crane truck, Conveyors-belt, elevating, Roller screw, pipe line and Cable Conveyor.

TOPIC: 08 – SEALS, PACKINGS AND GASKETS: **[04]**

08.01 Introduction.

08.02 Classification of Seals-Static and Dynamic.

08.03 Applications of labyrinth seal, Gasket seals on fixed joints on reciprocating parts.

TOPIC: 09 – MISCELLANEOUS MAINTENANCE: **[05]**

09.01 Pipe Materials and Pipe fitting.

09.02 Major Causes of faults-Leakages, Swaying of pipes, Water hammer, Corrosion.

09.03 Dust Collectors/Separators-Types of dust separators, Mechanical and Electrostatic precipitators.

Books Recommended:

1. Installation, Servicing and Maintenance, S. Chand & Sons Co. Ltd. - S. N. Bhattacharya
2. Industrial Maintenance, S. Chand & Sons Co. Ltd. - H. P. Garg
3. General Mechanical Engg., McGraw Hill (T.T.T.I., Chandigarh). -
4. Maintenance Management, I. S. T. E., Mysore. -
5. Installation & Maintenance, Rup Prakashan. - B. K. Mishra.

AUTOMOBILE ENGINEERING

Subject Code 25505	Theory			No of Period in one session : 60		
	No. of Periods Per Week			Full Marks	:	100
	L	T	P/S	Annual Exam.	:	80
	06	-	-	Internal Exam.	:	20

Rationale:

Automobile engineering though a specialised subject is a branch of Mechanical Engineering. In India there are few places where a separate diploma course in automobile engineering is existing. To cater to the choice of aspiring young engineers and meet the growing need of automobile industry, it is desirable to teach the subject in the curriculum of mechanical engineering diploma course. Hence the subject is need-based of industry and the individual technician. It will also provide the basic theoretical background for those who would like to start on automobile service enterprise after completing the Diploma.

Objective:

The student will be able to:-

- Know about an automobile.
- List the main components of automobile vehicles.
- Classify automobile vehicles.
- Sketch different types of automobile chasis.
- Describe function of various chasis component.
- List the various operating systems.
- Explain I. C. Engine as power unit.
- Understand the meaning of 'scavenging'.
- Know the necessity of engine cooling.
- Classify the cooling system.
- Know firing order.
- Draw value timing diagrams.
- Know the various engine rotatings.
- List the various engine rotatings.
- Know about engine lubrication.
- Understand the Ignition system, fuel Injection system.
- Hydraulic system, breaking system, lighting system.

S.No.	Topics	Periods
01	Introduction.	(03)
02	Auto Engines.	(04)
03	Valves and Ports.	(03)
04	Cooling System.	(04)
05	Lubrication.	(05)
06	Fuel Supply System.	(04)
07	Carburetor.	(05)
08	Transmission System.	(06)
09	Front Axle & Steering.	(04)
10	Frame & Suspension.	(04)
11	Brakes.	(03)
12	Intake & Exhaust System.	(03)
13	Electrical System.	(06)
14	Miscellaneous.	(06)
	Total :	**(60)**

CONTENTS:

08.07 WHEEL & TYRES

08.07.01 Wheel- function and requirements.

08.07.02 Type of wheel tyres, desirable properties, Tubeless tyre, redial ply tyre.

08.07.03 Tyre materials, factors affecting tyre life.

08.07.04 Tubes- function and construction, valve pin, Air pressure for different vehicles & their measurement.

TOPIC: 09 – FRONT AXLE & STEERING: [04]

09.01 Function of axle, axle load, function of king-pin, stub axle assembly, steering principle toe-in and toe-out, principle of caster and its effects, camber effect, steering gears-types & working, power steering.

TOPIC: 10 – FRAME & SUSPENSION: [04]

10.01 Frame- Necessity and construction.

10.02 Classification of suspension system, their types-Telescopic shock absorber, Air suspension, independent suspension.

TOPIC: 11 – BRAKES: [03]

11.01 Concept and requirement of brakes.

11.02 Classification of brakes- working of mechanical, hydraulic, Vacuum/Air assisted brakes.

11.03 Bleeding of brakes, brake adjustment, material for brake lining with requirement.

TOPIC: 12 – INTAKE & EXHAUST SYSTEM: [03]

12.01 Intake manifold in S. I. and C. I. engines.

12.02 Exhaust manifold, different types of muffler and tailpiece.

12.03 Supercharger, Turbo charger in C. I. engine.

TOPIC: 13 – ELECTRICAL SYSTEM: [06]

13.01 Concept of ignition, working of condenser, Ignition coil, distributor, C. B. point, principle of firing order.

13.02 Construction and function of storage battery and its maintenance.

13.03 Battery charging and testing.

13.04 Starter motor, Bendix drive- brief description.

13.05 Need and function of magneto system.

13.06 Need and function of Dynamo, Alternator, cut-out, control of voltage and current.

13.07 Different lighting and signaling points, horn, audio equipments, Wiper.

13.08 Brief idea of Air conditioning.

TOPIC: 14 – MISCELLANEOUS: [06]

14.01 Spark plug cleaning and gap setting.

14.02 Measurement of lubricant level in engine sump, gear box and differential.

14.03 Cleaning of air filter, float chamber jets etc.

14.04 Use of grease gun, location of grease nipples.

14.05 Description of short-circuited spark plug, faulty float pin, lightening of fan belt.

14.06 Break down maintenance of vehicles & their components.

14.07 Analysis of exhaust gases. Certification of Bharat Stage I, Bharat Stage II and Bharat Stage III.

Books Recommended:

1.	Automobile Engineering Vol. I & II, Standard Publishers, Nai Sarak, New Delhi.	-	Dr. Kirpal Singh
2.	Automobile Engineering, Satya Prakashan Publishers.	-	R. S. Gupta
3.	Automobile Mechanics	-	Joseph Heitner
4.	Automobile Engineering, Standard Publishers, Nai Sarak, New Delhi.	-	R. P. Sharma
5.	Internal Combustion Engines	-	A. C. Roa and S. B. Beohar

WORKSHOP PRACTICE

Subject Code 25506	Practical			No of Period in one session : 150		
	No. of Periods Per Week			Full Marks	:	50
	L	T	P/S	Annual Exam.	:	40
	12	-	-	Internal Exam.	:	10

Rationale :

The workshop practice is a subject which gives ample opportunity to the students to work and achieve proficiency in skill and brings attitudinal change among them towards the work with hand constant practice on different machine will no doubt generate sufficient confidence in the students.

It will help them in developing into a quality technician. Through the contents of the courses the students will be learning highly skilled operation on machines. They will be encouraged to maintain, overhaul the machines they use besides the domestic and mechanical appliances.

Objective:

The students will be able to develop skill to :-

- Prepare jobs involving higher skill on lathes, milling machines, shapers and grinders.
- Prepare job of fitting involving close tolerances.
- Prepare jobs with help of gas welding and cutting equipments.
- Handle measuring instruments and gauges for precision measurements.
- Overhaul maintain & repair Workshop machines.
- Overhaul maintain & repair domestic appliances.
- Overhaul maintain & repair mechanical devices.

S.No.	Topics	No. of jobs	Periods	Remarks
	Section A			
	Workshop Practice			
01	Machine shop work	05	(45)	
02	Advance fitting work.	01	(12)	
03	Welding shop work.	01	(12)	
04	Press Work	01	(09)	
05	Buffing / Anodizing / Frostering.	01	(09)	
	Section B			
	Maintenance (Sessional only)			
01	Workshop Machine	01	(15)	
02	House hold appliances.	01	(12)	
03	Mechanical Devices	01	(06)	
04	Automobile Vehicles.	03	(30)	
		Total :	**(150)**	

CONTENTS:

SECTION A

WORKSHOP PRACTICE

TOPIC: 01 – MACHINE SHOP WORK: **[45]**

01.01 Study and use of precision measuring. tools and gauge.

01.02 Grinding: -

(i) Mathing Turning Tool.
(ii) Parting tool.

01.03 A job involving work on C. N. C.

(Computersied numerical control) lathe or a job on automatic lathe if C. N. C. lathe is not available)

01.04 A job involving eccetric turning.

01.05 A job involving drilling, boring, internal threading on centre lathe.

01.06 Milling-Gear cutting, Tee Slot cutting.

01.07 Shaper- V-block, key way on shaft.

TOPIC: 02 –ADVANCE FITTING: **[12]**

02.01 Male-female Joint.

02.02 Lap Joint.

02.03 Hexagonal Nut (Threading by tap).

TOPIC: 03 –WELDING SHOP WORK: **[12]**

03.01 Making M. S. Flat grill 1’ × 1’.

TOPIC: 04 – PRESS WORK: **[09]**

04.01 Making Trey.

04.02 Making Saucer.

TOPIC: 05 –BUFFING / ANODIZING / FROSTERING : **[09]**

SECTION B

MAINTENANCE

TOPIC: 01 – WORKSHOP MACHINE: **[15]**

01.01 Lathe.

01.01.01 Dismantling, cleaning, oiling and greasing of Lathes.

01.02 Shaper.

01.02.01 Dismantling, cleaning, oiling and / or Greasing of shapers.

01.03 Planer.

01.03.01 Dismanting, clearing, oiling and / or Greasing of Planer machines.

01.04 Milling Machines.

01.04.01 Dismanting, clearing, oiling and / or Greasing of milling machines.

TOPIC: 02 – HOUSE HOLD APPLIANCES : **[12]**

02.01	Dismanting, clearing, repair (if required) of the following :
02.01.01	Pressure cooker.
02.01.02	Geyser, Coolers.
02.01.03	Gas stoves.
02.01.04	Pressure Stoves.
02.01.05	Mixer, Grinder and Juicer.
02.01.06	Washing Machines.
02.01.07	Vacuum Cleaner.

TOPIC: 03 – MECHANICAL DEVICES: **[06]**

03.01	Dismanting, clearing, oiling and / or Greasing.
03.01.01	Hydraulic door closer.
03.01.02	Rolling shutters.
03.01.03	Hand pumps.
03.01.04	Electrically operated sirens.
03.01.05	Electrically operated lift.
03.01.06	M/Clocks, Locks, E/fans, Water pipe fitings.

TOPIC: 04 – AUTOMOBILE VEHICLES: **[30]**

01.01	Learn the use of tools and equipments.
01.02	Dismantling of engine components, inspection, rectification of fault and Assembly.
01.03	Finding faults in Automobile chasis and rectify them.
01.04	Inspection of wear pattern of tyre, Rectification of faults in related components and repair of tyre and tubes.
01.05	Finding starting trouble due to defects in feed line and rectify them. Find out starting trouble due to electrical faults and rectify them.
01.06	Finding defects in cooling system, lubricating system, transmission line and rectify them.

WORKSHOP PRACTICE

Subject Code 25507	Sessional			No of Period in one session :		
	No. of Periods Per Week			Full Marks	:	100
	L	T	P/S	Annual Exam.	:	60
	-	-	-	Internal Exam.	:	40

Rationale :

The workshop practice is a subject which gives ample opportunity to the students to work and achieve proficiency in skill and brings attitudinal change among them towards the work with hand constant practice on different machine will no doubt generate sufficient confidence in the students.

It will help them in developing into a quality technician. Through the contents of the courses the students will be learning highly skilled operation on machines. They will be encouraged to maintain, overhaul the machines they use besides the domestic and mechanical appliances.

Objective:

The students will be able to develop skill to :-

- Prepare jobs involving higher skill on lathes, milling machines, shapers and grinders.
- Prepare job of fitting involving close tolerances.
- Prepare jobs with help of gas welding and cutting equipments.
- Handle measuring instruments and gauges for precision measurements.
- Overhaul maintain & repair Workshop machines.
- Overhaul maintain & repair domestic appliances.
- Overhaul maintain & repair mechanical devices.

S.No.	Topics	No. of jobs
	Section A	
	Workshop Practice	
01	Machine shop work	05
02	Advance fitting work.	01
03	Welding shop work.	01
04	Press Work	01
05	Buffing / Anodizing / Frostering.	01
	Section B	
	Maintenance (Sessional only)	
01	Workshop Machine	01
02	House hold appliances.	01
03	Mechanical Devices	01
04	Automobile Vehicles.	03

CONTENTS:

SECTION A

WORKSHOP PRACTICE

TOPIC: 01 – MACHINE SHOP WORK:

01.01 Study and use of precision measuring. tools and gauge.

01.02 Grinding: -

(iii) Mathing Turning Tool.
(iv) Parting tool.

01.03 A job involving work on C. N. C.

(Computersied numerical control) lathe or a job on automatic lathe if C. N. C. lathe is not available)

01.04 A job involving eccetric turning.

01.05 A job involving drilling, boring, internal threading on centre lathe.

01.06 Milling-Gear cutting, Tee Slot cutting.

01.07 Shaper- V-block, key way on shaft.

TOPIC: 02 –ADVANCE FITTING:

02.01 Male-female Joint.

02.02 Lap Joint.

02.03 Hexagonal Nut (Threading by tap).

TOPIC: 03 –WELDING SHOP WORK:

03.01 Making M. S. Flat grill 1' × 1'.

TOPIC: 04 – PRESS WORK:

04.01 Making Trey.

04.02 Making Saucer.

TOPIC: 05 –BUFFING / ANODIZING / FROSTERING :

SECTION B

MAINTENANCE

TOPIC: 01 – WORKSHOP MACHINE:

01.01 Lathe.

01.01.01 Dismantling, cleaning, oiling and greasing of Lathes.

01.02 Shaper.

01.02.01 Dismantling, cleaning, oiling and / or Greasing of shapers.

01.03 Planer.

01.03.01 Dismanting, clearing, oiling and / or Greasing of Planer machines.

01.04 Milling Machines.

01.04.01 Dismanting, clearing, oiling and / or Greasing of milling machines.

TOPIC: 02 – HOUSE HOLD APPLIANCES :

02.01	Dismanting, clearing, repair (if required) of the following :
02.01.01	Pressure cooker.
02.01.02	Geyser, Coolers.
02.01.03	Gas stoves.
02.01.04	Pressure Stoves.
02.01.05	Mixer, Grinder and Juicer.
02.01.06	Washing Machines.
02.01.07	Vacuum Cleaner.

TOPIC: 03 – MECHANICAL DEVICES:

03.01	Dismanting, clearing, oiling and / or Greasing.
03.01.01	Hydraulic door closer.
03.01.02	Rolling shutters.
03.01.03	Hand pumps.
03.01.04	Electrically operated sirens.
03.01.05	Electrically operated lift.
03.01.06	M/Clocks, Locks, E/fans, Water pipe fitings.

TOPIC: 04 – AUTOMOBILE VEHICLES:

01.01	Learn the use of tools and equipments.
01.02	Dismantling of engine components, inspection, rectification of fault and Assembly.
01.03	Finding faults in Automobile chasis and rectify them.
01.04	Inspection of wear pattern of tyre, Rectification of faults in related components and repair of tyre and tubes.
01.05	Finding starting trouble due to defects in feed line and rectify them. Find out starting trouble due to electrical faults and rectify them.
01.06	Finding defects in cooling system, lubricating system, transmission line and rectify them.

IN PLANT TRAINING & VISIT TO WORK

Subject Code 25508	Theory			No of Period in one session :		
	No. of Periods Per Week			Full Marks	:	100
	L	T	P/S	Annual Exam.	:	60
	4 Weeks Continuous			Internal Exam.	:	40

Rationale:

A student is required to develop a skill to synthesise his knowledge, skill and attitudes gained while joining through different course. It is desirable to expose the students to the world of work to be familiar with the real life situations and understand the problem there in. The "In plant training and visit to work" is being introduced for the final year diploma technicians for Mechanical Engineering with the above objective in view. This course will help the students to observe how the technical, managerial, quality control, safety and other principle are being applied in real life situation. He will be able to observe how his supervisor performs day-to-day work and coordinate shop floor activities. The course will, no doubt, be a of great help in developing skills required for a diploma holder technician, and will also help in bringing attitudinal change in him.

Objective:

A student will be able to:

- Understand the working of the machines, tools and equipments more clearly.
- Write specifications of the machines, tools, equipments.
- Learn to maintain office records.
- Know the process of planning, implementation and monitoring.
- Learn the skill for shop floor co-ordination.
- Know the skill of office management and inventory Control.
- Understand the process of production.
- Know the skill of quality control.
- Know the skill of maintenance management.
- Know the skill of production control.
- Acquire the skill of man/machine loading.
- Know the organizational set-up and plant layout.
- Locate the plants and industries related to Mechanical Engineering-State and Nation wise.
- Find out Characteristics, Functions, and activities of those industries.
- Know the source of raw materials and markets for the industries.
- Find out opportunities and method of recruitment.
- Find out the special characteristics of the industries.
- Observe the special purpose production machines, which the student may not have seen in the institution, in production.
- Learn the special testing machine / equipments which have not been provided in institution.

CONTENTS

Visit to Works

Visit to works of following industries (any four):

- Automobile Industry.
- Engineering Industry (both heavy and medium).
- Steel Plant.
- Thermal Power Plant.
- Hydel Power Stations.
- Cement Factory.
- Computer Manufacturing Unit.
- Financial Institution.
- Refrigeration Plant.

REPORT WRITING:

Industrial Tour

S.No.	Topics
01	Introduction.
02	Name and types of Industries visited :- - Their specific characteristics
03	Working of different industries:- - Location - Lay-out - Raw materials used - Products - Organizational Structure - Special Machine - Special Tools
04	Conclusions - Observations - Typical Characteristics - Area of Weakness - Suggestions.