

## 6.1 ENTREPRENEURSHIP DEVELOPMENT AND MANAGEMENT

L T P

Periods per week 5 - -

### RATIONALE

In the present day scenario, it has become imperative to impart entrepreneurship and management concepts to students so that a significant percentage of them can be directed towards setting up and managing their own small enterprises. This subject focuses on imparting the necessary competencies and skills of enterprise set up and its management.

### DETAILED CONTENTS

#### SECTION – A ENTREPRENEURSHIP

1. **Introduction** (23 periods)
  - Concept /Meaning and its need
  - Qualities and functions of entrepreneur and barriers in entrepreneurship
  - Sole proprietorship and partnership forms of business organisations
  - Schemes of assistance by entrepreneurial support agencies at National, State, District level: NSIC, NRDC, DC:MSME, SIDBI, NABARD, Commercial Banks, SFC's TCO, KVIB, DIC, Technology Business Incubator (TBI) and Science and Technology Entrepreneur Parks (STEP)
2. **Market Survey and Opportunity Identification** (17 periods)
  - Scanning of business environment
  - Salient features of National and State industrial policies and resultant business opportunities
  - Types and conduct of market survey
  - Assessment of demand and supply in potential areas of growth
  - Identifying business opportunity
  - Considerations in product selection
3. **Project report Preparation** (14 periods)
  - Preliminary project report
  - Detailed project report including technical, economic and market feasibility
  - Common errors in project report preparations
  - Exercises on preparation of project report

#### SECTION –B MANAGEMENT

4. **Introduction to Management** (06 periods)
  - Definitions and importance of management
  - Functions of management: Importance and Process of planning, organising, staffing, directing and controlling
  - Principles of management (Henri Fayol, F.W. Taylor)
  - Concept and structure of an organisation
  - Types of industrial organisations
    - a) Line organisation
    - b) Line and staff organisation
    - c) Functional Organisation

- 5. Leadership and Motivation** (05 periods)
- a) Leadership
- Definition and Need
  - Qualities and functions of a leader
  - Manager Vs leader
  - Types of leadership
- b) Motivation
- Definitions and characteristics
  - Factors affecting motivation
  - Theories of motivation (Maslow, Herzberg, McGregor)
- 6. Management Scope in Different Areas** (10 periods)
- a) Human Resource Management
- Introduction and objective
  - Introduction to Man power planning, recruitment and selection
  - Introduction to performance appraisal methods
- b) Material and Store Management
- Introduction functions, and objectives
  - ABC Analysis and EOQ
- c) Marketing and sales
- Introduction, importance, and its functions
  - Physical distribution
  - Introduction to promotion mix
  - Sales promotion
- d) Financial Management
- Introductions, importance and its functions
  - Elementary knowledge of income tax, sales tax, excise duty, custom duty and VAT
- 7. Miscellaneous Topics** (05 periods)
- a) Customer Relation Management (CRM)
- Definition and need
  - Types of CRM
- b) Total Quality Management (TQM)
- Statistical process control
  - Total employees Involvement
  - Just in time (JIT)
- c) Intellectual Property Right (IPR)
- Introductions, definition and its importance
  - Infringement related to patents, copy right, trade mark

**Note:** In addition, different activities like conduct of entrepreneurship awareness camp extension lecturers by outside experts, interactions sessions with entrepreneurs and industrial visits may also be organised.

## INSTRUCTIONAL STRATEGY

Some of the topics may be taught using question/answer, assignment or seminar method. The teacher will discuss stories and case studies with students, which in turn will develop appropriate managerial and entrepreneurial qualities in the students. In addition, expert lecturers may also be arranged from outside experts and students may be taken to nearby industrial organisations on visit. Approach extracted reading and handouts may be provided.

## RECOMMENDED BOOKS

1. A Handbook of Entrepreneurship, Edited by BS Rathore and Dr JS Saini; Aapga Publications, Panchkula (Haryana)
2. Entrepreneurship Development published by Tata McGraw Hill Publishing Company Ltd., New Delhi
3. Entrepreneurship Development in India by CB Gupta and P Srinivasan; Sultan Chand and Sons, New Delhi
4. Entrepreneurship Development - Small Business Enterprises by Poornima M Charantimath; Pearson Education, New Delhi
5. Entrepreneurship : New Venture Creation by David H Holt; Prentice Hall of India Pvt. Ltd., New Delhi
6. Handbook of Small Scale Industry by PM Bhandari
7. Principles and Practice of Management by L M Prasad; Sultan Chand & Sons, New Delhi.

## SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Pds)	Marks Allotted (%)
1	23	30
2	17	20
3	14	15
4	6	10
5	5	05
6	10	15
7	5	05
<b>Total</b>	<b>80</b>	<b>100</b>

## 6.2 MOTOR VEHICLE ACT AND TRANSPORT MANAGEMENT

**L T P**  
**Periods per week 4 - -**

### RATIONALE

A diploma holder in Automobile Engineering is supposed to have knowledge about significance of vehicle accident, accidental vehicle claim procedure from insurance company and about Motor Vehicle Act. Therefore, it is essential to teach Motor Vehicle Act features and appropriate practices covering Motor Vehicle Act. Further, knowledge of transport management systems and techniques would also be an asset to him.

### DETAILED CONTENTS

- 1. Garage location, layout and types, and change work procedure and records (10 periods)**
  - Location of garage/selection of site of garage
  - Layout of garage
  - Types of garage
  - Inspection of faulty vehicle
  - Estimation of repair
  - Job control system
  - Work – order or job card
  - Testing and test reports
  - Costing and billing
  
- 2. Garage Stores (10 periods)**
  - Definition
  - Purpose of store keeping
  - Function of store keeping
  - Location of store
  - Layout of store
  - Advantage of good store – keeping and recording
  - Procurement of store
  - Prevention of pilferage of store
  - Bin card
  - Store organisation
  
- 3. Insurance of Vehicle (10 periods)**
  - Meaning and necessity of vehicle insurance
  - Types of vehicle insurance
  - Duties of surveyor
  - Duties of driver in case of accident and injury to a person
  - Relation between surveyor and insurance cooperation
  - Procedure to get accidental claim and compensation
  
- 4. Driving and Highway code (16 periods)**
  - Principle of driving
  - Driving procedure
  - Driving precautions
  - Driving in abnormal conditions, like hilly area, night, fog, heavy traffic and rain

- Emergency Driving situations
- Driving License - purpose, importance and requirements
- Different types of driving license
- Procedure to get driving license
- Highway code – types with sketches with colour code

## 5. **Transport Management**

**(10 periods)**

- History of transport with special reference to road transport in India
- Modes of Road transport
- Organization- Service station and its functions, General layout of modern service station, Spare parts section and dealership service section, Accounts and books, Different types of cards and their use in maintaining service station records
- Structure of fleet organization
- State transport - optimum utilization of fleet
- Roadworthiness requirement
- Maintenance of logbook, History sheet, Causes, and prevention of Road Accident, Analysis of Accident, Economy of replacement

## 6. **Motor Vehicle Act**

**(08 periods)**

- Definitions
- Salient features of motor vehicle act
- Licensing of drivers and conductors of motor vehicles
- Registration of old and new vehicles
- Transfer of vehicle – local and state to state
- Traffic offences, penalties procedure
- Fitness of vehicle – meaning and purpose, provision in the act
- Vehicle permit – different types
- Imposition of penalties of violation of rules
- Different documents required for registration of vehicle, for driving license, and for transfer of vehicle

### **INSTRUCTIONAL STRATEGY**

Teacher should lay emphasis on basic principles and practices covering Motor Vehicle Act and fleet management. Visits should be organized to service stations for understanding of topics.

### **RECOMMENDED BOOKS**

1. Automobile Engineering Vol. I by Dr. Kirpal Singh, Standard Publisher Distributors, Delhi.
2. Transport Management Vol. III & IV by Central Institute of Road Transport, Pune.
3. Motor Vehicle Act of India (with Latest Amendment).
4. Motor Vehicle Act with Rules by B.S. Kohli.
5. Motor Transportation: Principles and Practices by WJ Hudson and James; Ronald Press Company, New York.
6. Transport in Modern India by KP Bhatnagar, Satish Bahadur, DN Aggarwal and SC Gupta.
7. Central Motor Vehicle Rules.

### SUGGESTED DISTRIBUTION OF MARKS

<b>Topic No.</b>	<b>Time allotted (Period)</b>	<b>Marks Allotted (%)</b>
1	10	15
2	10	15
3	10	15
4	16	25
5	10	15
6	8	15
<b>Total</b>	<b>64</b>	<b>100</b>

## 6.3 DESIGN OF AUTOMOTIVE PARTS

**L T P**  
**4 - 2 - 0**

### RATIONALE

This is the second course for the students of Mechanical (Automobile Engg). Understanding of basic design principles of components like cylinder liner, piston, crank shaft, connecting rod, simple mechanisms, etc are essential for diploma holders in Automobile Engineering, hence this subject.

### DETAILED CONTENTS

- 1. Introduction (02 periods)**  
Review of the working principle of automobiles, Design consideration, design procedure
- 2. Designing of I C Engine Parts (20 periods)**
  - i) Design of **cylinder** Stress analyses thin cylinder and design formulation Cylinder materials Design of cylinder bore, stroke, cylinder head, cylinder flange, studs, cylinder liners
  - (ii) Design of Piston Type and function of piston, Piston material Design of piston head, crown, piston rings, piston pin
  - (iii) Design of connecting rod Function of connecting rod, types of connecting rods Design requirements of connecting rod Design and drawing of connecting rod
  - (iv) Design of crank shafts Crank shaft material Design of side and centre crank shaft
  - (v) Design of cam shaft
  - (vi) Design of Valves
  - (vii) Design of rocker arms
- 2. Design of power transmission systems (20 periods)**
  - (i) Design of flat belts, V belts Design of pulleys Design of chain drives
  - (ii) Manufacturing methods of gear Gear tooth profiles Types of gear drives, selection of gear drives Design of spur gears
- 3. Design of brakes (10 periods)**
  - Different types of braking systems
  - Braking materials
  - Design of simple shoe and band brake
- 4. Design of clutches (10 periods)**
  - Types of clutches
  - Friction clutch
  - Disc and plate clutch
  - Cone clutch centrifugal clutch
- 5. Design of flywheels (10 periods)**
  - Function of flywheel
  - Stresses in flywheel
  - Design of flywheel

## 6. Selection of rolling contact bearing

(10 periods)

Types of rolling contact bearing, their nomenclature Selection of bearing from SKF or TATA bearing of simple kind like ball, roller under axial and or thrust loading

### INSTRUCTIONAL STRATEGY

Teacher should lay emphasis on conceptual understanding and design aspects of various parts/components. Various models should be demonstrated in the class to explain mechanism

### RECOMMENDED BOOKS

1. Machine Design- Fundamentals and Practices, by P C Gope, PHI Learning Pvt Limited, New Delhi. 2012
2. A Text Book of Machine Design by RS Khurmi & JKGupta, Eurasia Publishing House, Pvt. Ltd., New Delhi
3. Introduction to Machine Design by VB Bhandari, TMH, Delhi
4. Theory of Machines by PL Ballaney, Khanna Publishers, New Delhi
5. Theory of Machines by DR Malhotra & HC Gupta, Satya Prakashan, Delhi

### SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time allotted (Hrs)	Marks Allotted (%)
1	2	05
2	20	25
3	20	25
4	10	15
5	10	15
6	10	15
<b>Total</b>	<b>72</b>	<b>100</b>



## 6.4 MECHANICS OF VEHICLE

L T P  
Periods per week 4 - -

### RATIONALE

Various types of motions, power transmission, forces acting on moving vehicle, vehicle braking, balancing and vibration in rotating body are some of the concepts which are essential for diploma holders in Automobile Engineering. Hence the subject is introduced in the syllabus.

### DETAILED CONTENTS

- 1. Simple Mechanism (10 periods)**
  - Definition of link, kinematic pair, kinematic chain, Mechanism, inversions and machines
  - Simple examples of mechanism with:-
  - Lower pairs, Four bar chain, Slider crank chain, Double slider crank chain, Higher pairs
  
- 2. Motion and Turning Moment (10 periods)**
  - Displacement, velocity and acceleration of piston
  - Angular velocity and angular acceleration of connecting rod
  - Calculations of piston effort and crank effort at different angles
  - Fly wheel - its types, weight and moment of inertia
  - Fluctuation of energy for fly wheel
  - Turning moment diagrams with reference to internal combustion engines.
  - Analysis of Hooke's Joint
  
- 3. Power Transmission (08 periods)**
  - Flat belt, V-belt and chain drives.
  - Ratio of tension of two sides of the belt with and without centrifugal tension.
  - Horse power transmitted and condition for maximum horse power transmitted.
  - Velocity ratios transmitted by
  - Belts
  - Simple, compound and epicyclic gear box
  
- 4. Vehicle in Motion (10 periods)**
  - Air, grade, and rolling resistances
  - Tractive effort, traction, Inertia load, Draw bar pull and power required to proper a vehicle
  - Calculations of acceleration and tractive effort required in case of front wheel drive, rear wheel drive and four wheel drive
  - Centrifugal force and its effect on vehicle stability on banked and unbanked road
  
- 5. Vehicle Control (10 periods)**
  - Braking friction and limits of braking
  - Retardation and Braking force, calculations in case of front wheel, rear wheel and all wheel braking
  - Weight transfer during braking
  - Stopping distance and stopping time
  - Davis and Ackermann Steering Mechanism, Correct Steering angle

- 6. Balancing (10 periods)**
- Concepts of static and dynamic balancing, working of static and dynamic machine
  - Balancing of rotating masses-single rotating mass by a single mass rotating in the same plane and by two masses rotating in different planes, balancing of several masses rotating in the same plane. Balancing of several masses rotating in different planes
- 7. Vibration (06 periods)**
- Introduction, Types of vibrating motion, Types of free vibrations, Natural Frequency of Free longitudinal Vibrations, Natural frequency of free, Transverse vibrations
  - Causes of vibration in rotating bodies, damping of vibrations, Free damped vibrations (Vacuum Damping)

**INSTRUCTIONAL STATREGY**

1. Models should be shown
2. Practical demonstrations should be organized

**RECOMMENDED BOOKS**

1. Theory of Machines by R.S. Khurmi
2. Automobile Engineering Vol-I, II, Dr. Kirpal Singh, Standard Publishers and Distributor, New Delhi
3. Theory of Machines by D.R. Malhotra; Satya Parkashan
4. Theory of Machines by PL Balaney; Khanna Publishers, Delhi
5. Mechanics of Vehicles by W. Steed; Kafe books Limited, London

**SUGGESTED DISTRIBUTION OF MARK**

<b>Topic No.</b>	<b>Time Allotted (Period)</b>	<b>Marks Allotted (%)</b>
1	10	15
2	10	15
3	10	15
4	10	15
5	08	15
6	10	15
7	06	10
<b>Total</b>	<b>64</b>	<b>100</b>

## 6.5 OVERHAULING PRACTICE LAB

**L T P**  
**Periods per week - - 9**

### RATIONALE

Automobile overhauling and troubleshooting forms the main job of a diploma holder in automobile engineering. The competencies in knowing the faults and reconditioning of various components and accessories of automobile will go a long way in instilling confidence for a diploma holder. The practice in above areas has thus been included in the curriculum.

### DETAILED CONTENTS

1. Diagnosing the engine for overhauling
2. Removal of engine from vehicle
3. Dismantling of engine
4. Overhauling of petrol engine
5. Overhauling of diesel engine
6. Decarbonising of engine blocks, combustion chamber, piston crown and valve parts.
7. Surfacing of cylinder heads, cylinder blocks and manifolds on cylinder head refacing machine
8. Replacing of piston and piston rings – removal and refitting
9. Practice on cylinder boring machine
10. Practice in fitting cylinder liners- sleeving and desleeving
11. Testing and aligning of connecting rod
12. Overhauling of valves and valve mechanism
13. Overhauling of gear box
14. Overhauling of differential and propeller shaft
15. Overhauling of wheels and axles
16. Overhauling of brakes
17. Overhauling of clutch

### RECOMMENDED BOOKS

1. Automobile Engineering by Dr. Kirpal Singh; Standard Publisher, Delhi.
2. Automobile Engineering by Sh. R.B. Gupta; Satya Prakashan, New Delhi.
3. Maintenance and Repair of Motor Vehicle by H.O. Geneva; Dialogue, R-686, New Rajinder Nagar, New Delhi.
4. Automotive Mechanics by William H. Crouse, Tata McGraw Hill, Delhi.
5. Auto Mechanics: Theory & Service by W.J.deKryger et al.

## 6.6 PROJECT WORK

**L T P**  
**Periods per week - - 06**

Project work aims at developing skills in the students whereby they apply the totality of knowledge and skills gained through the course in the solution of particular problem or undertaking a project. The students have various aptitudes and strengths. Project work, therefore, should match the strengths of students. For this purpose, students should be asked to identify the type of project work, they would like to execute. It is also essential that the faculty of the respective department may have a brainstorming session to identify suitable project assignments. The project assignment can be individual assignment or a group assignment. There should not be more than 3 students if the project work is given for a group. The students should identify or given project assignment at least two to three months in advance. The project work identified in collaboration with industry may be preferred.

Each teacher is expected to guide the project work of 5-6 students.

- Projects related to repair and maintenance of automobiles
- Projects related to increasing productivity
- Projects related to quality assurance
- Projects related to estimation and economics of production
- Projects connected with repair and maintenance of plant and equipment
- Projects related to identification of raw material thereby reducing the wastage
- Any other related problems of interest of host industry

A suggestive criteria for assessing student performance by the external (personnel from industry) and internal (teacher) examiner is given in table below:

Sr. No.	Performance criteria	Max. marks	Rating Scale				
			Excellent	Very good	Good	Satis-factory	Poor
1.	Selection of project assignment	10	10	8	6	4	2
2.	Planning and execution of considerations	10	10	8	6	4	2
3.	Quality of performance	20	20	16	12	8	4
4.	Providing solution of the problems or production of final product	20	20	16	12	8	4
5.	Sense of responsibility	10	10	8	6	4	2
6.	Self expression/ communication skills	5	5	4	3	2	1
7.	Interpersonal skills/human relations	5	5	4	3	2	1
8.	Report writing skills	10	10	8	6	4	2
9.	Viva voce	10	10	8	6	4	2
<b>Total marks</b>		<b>100</b>	<b>100</b>	<b>80</b>	<b>60</b>	<b>40</b>	<b>20</b>

The overall grading of the practical training shall be made as per following table

	<b>Range of maximum marks</b>	<b>Overall grade</b>
i)	More than 80	<i>Excellent</i>
ii)	65-80	Very good
iii)	50-64	Good
iv)	41-49	Fair
v)	Less than 40	Poor

In order to qualify for the diploma, students must get “Overall Good grade” failing which the students may be given one more chance of undergoing 8 -10 weeks of project oriented/project work professional training in the same industry and re-evaluated before being disqualified and declared “not eligible to receive diploma”. It is also important to note that the students must get more than six “goods” or above “good” grade in different performance criteria items in order to get “Overall Good” grade.

### **Important Notes**

1. This criteria must be followed by the internal and external examiner and they should see the daily, weekly and monthly reports while awarding marks as per the above criteria.
2. The criteria for evaluation of the students have been worked out for 100 maximum marks. The internal and external examiners will evaluate students separately and give marks as per the study and evaluation scheme of examination.
3. The external examiner, preferably, a person from industry/organization, who has been associated with the project-oriented professional training of the students, should evaluate the students performance as per the above criteria.
4. It is also proposed that two students or two projects which are rated best be given merit certificate at the time of annual day of the institute. It would be better if specific nearby industries are approached for instituting such awards.

The teachers are free to evolve another criteria of assessment, depending upon the type of project work.

It is proposed that the institute may organize an annual exhibition of the project work done by the students and invite leading Industrial organizations in such an exhibition. It is also proposed that two students or two projects which are rated best be given merit certificate at the time of annual day of the institute. It would be better if specific industries are approached for instituting such awards.

## 6.7 POWER PLANT ENGINEERING

L T P  
5 - 2

### RATIONALE

A diploma holder in mechanical engineering is supposed to manage the power generating plant. In Uttaranchal state, hydropower potential is supposed to be very large. Therefore, he must have relevant knowledge and skills about various power plants e.g. steam power plant, nuclear power plant, hydro power plant, diesel engine power plant and gas turbine power plant. Hence this subject is offered.

### DETAILED CONTENTS

#### 1. Introduction

(08 Periods)

Sources of energy fuels, flowing stream of water, solar rays, wind, terrestrial heat, ocean tides and waves Concept of power station, central and industrial power station, captive power station, classification of power station with respect to prime mover steam, IC engine, gas turbine and hydro power station, scope in Uttaranchal state

#### 2. Steam Power Plant

(20 Periods)

2.1 Parameters of power cycle- thermal efficiency, work ratio, specific steam Consumption Rankine cycle flow diagram, representation on thermodynamic planes, thermal efficiency, effect on change of condenser pressure, boiler pressure, degree of super heat on thermal efficiency Reheat cycle, simple regenerative cycle, (No numerical)

#### 2.2 Steam prime movers

Concept of a prime mover, steam turbine- advantages as a prime mover, principle elements of a steam turbine and functions –nozzles, blades, rotor, shaft, casing, shaft seals, diaphragm, bearings, steam control, oil system Governing of steam turbines- classification of steam turbines Starting and stopping procedures for turbines, precautions during running Performance of steam turbine, Thermal efficiency, efficiency ratio, mechanical efficiency, steam rate

#### 2.3 Steam Condensing Equipment

Functions of condensers, classification, surface condenser components and their functions Condenser auxiliaries- hot well, condensate pump, vacuum pump, air ejector, circulating pump, atmospheric relief valve Requirement of a good condensing system Cooling towers- purpose and types

#### 2.4 Steam power station control

Effect of load variation of various parameters, types of control systems-area and centralized, basic components of a control system, compressed air and electrical control systems, controls and instruments in a modern central station control room Working of feed water control system and steam temperature control system Records maintained in a steam power station and their purpose

### 3. Nuclear Power Plant

(18 Periods)

Equivalence between mass and energy- Atomic structure of matter, atomic nomenclature, nuclear reactions- fission, fusion, mass defect, binding energy, chain reaction, methods of control of rate of fusion reaction, types of nuclear materials, fissile and fertile materials Nuclear reactors- elements and functions of different elements, classification on the basis of different criteria Nuclear power stations employing boiling water rent reactor, candu type reactor-system components, advantages and dis advantages Comparison of nuclear power station with a steam power station Health hazards, safety precautions

### 4. Diesel Engine Power Plant

(08 Periods)

Advantages and disadvantages of diesel engine. Essential elements of diesel power plant. Fuel injection system performance, testing of diesel engine power plant

### 5. Gas Turbine Power Plant

(08 Periods)

Brayton cycle- schematic diagram, thermal efficiency. Advantages of gas turbines over diesel engines. Classification of gas turbines, advantages and disadvantages methods of improving thermal efficiency, Important parts and their functions, Essential auxiliaries and controls for gas turbine power point. Fuel for gas turbines

### 6. Hydro Power

(18 Periods)

Advantages, basic elements, dams, head works, water turbines, classification of water turbines, speed and pressure control, plant auxiliaries, plant operation, potential in Uttranchal state, detailed working

### INSTRUCTIONAL STRATEGY

Treatment of the subject will be subjected to analysis and examples. One visit to Power plant station is compulsory.

### List of Practical

- 1- The student will visit to different power plant station and prepare a report. The Evaluation of internal and external marks will be based on report as well as viva-voice.

### RECOMMENDED BOOKS

1. A course in Power Plant Engineering by S. Domkundwar & Arora; Dhanpat Rai and sons
2. Power Plant Engineering by G.B.S Narang
3. Power plant engineering by G.R. Nagpal; S.K. Khanna Publishers, Delhi

### SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time allotted (Period)	Marks Allotted (%)
1	08	10
2	20	30
3	18	20
4	08	10
5	08	10
6	18	20
<b>Total</b>	<b>80</b>	<b>100</b>

## 6.8 EMPLOYABLE SKILLS

L T P  
Periods per week - - 4

### RATIONALE

Diploma holders are required to not only possess subject related knowledge but also soft skills to get good jobs and to rise steadily at their workshop. This subject is included to develop employability skills amongst the students

### DETAILED CONTENTS

1. Industrial Scenario Engineering Education and expectations of competences from an engineer by employer **(04 periods)**
2. Personality types, characteristic and features for a successful engineer **(04 periods)**
3. Professional Engineer desirable values and ethics and their development. Relation between engineering profession, society and environment **(04 periods)**
4. **Managing project** **(16 periods)**
  - Leadership
  - Motivation
  - Time management
  - Resource management
  - Computer Software
  - Interpersonal relationship
  - Engineer economics and fundamentals
5. **Effective Communication** **(08 periods)**
  - Listening
  - Speaking
  - Writing
  - Presentation Technique/Seminar
  - Group discussion
6. **Preparing for Employment** **(08 periods)**
  - Searching for job/job hunting
  - Resume Writing
  - Interview technique in personal interview telephonic interview, panel interview, group interview, video conference
7. **Managing Self** **(06 periods)**
  - Managers body, mind, emotion and spirit
  - Stress Management
  - Conflict resolution
8. **Continuing professional development** **(04 periods)**
  - Organising learning and knowledge
  - Use of computer for organising knowledge resource
9. **Creativity, Innovation and Intellectual property right** **(06 periods)**
  - Concept and need in present time for an engineer
10. Basic rules, laws and norms to be adhered by engineers during their working **(04 periods)**



