

6.1 EMPLOYABILITY SKILLS – II

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RATIONALE

The present day world requires professionals who are not only well qualified and competent but also possess good communication skills. Our diploma students not only need to possess subject related knowledge but also soft skills to get good jobs or to rise steadily at their work place. The objective of this subject to prepare students for employability in job market and survive in cut throat competition among professionals.

DETAILED CONTENTS

1. Oral Practice
 - i) Mock interview (05 hrs)
 - ii) Preparing for meeting (05 hrs)
 - iii) Group discussion (05 hrs)
 - iv) Seminar presentation (05 hrs)
 - v) Making a presentation (12 hrs)
 - a) Elements of good presentation
 - b) Structure and tools of presentation
 - c) Paper reading
 - d) Power point presentation

6.2 ENTREPRENEURSHIP DEVELOPMENT AND MANAGEMENT

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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 (14 hrs)
 - 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, organisation: NSIC, NRDC, DC, MSME, SIDBI, NABARD, Commercial Banks, SFC's TCO, KVIB, DIC, Technology Business Incubators (TBI) and Science and Technology Entrepreneur Parks
2. Market Survey and Opportunity Identification (10 hrs)
 - Scanning of the 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 (8 hrs)
 - 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 (04 hrs)
- 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 (03 hrs)
- 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, Douglas, McGregor)
6. Management Scope in Different Areas (06 hrs)
- 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 (03 hrs)
- 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. Soft Skills for Interpersonal Communication by S.Balasubramaniam; Published by Orient BlackSwan, New Delhi
2. Generic skill Development Manual, MSBTE, Mumbai.
3. Lifelong learning, Policy Brief (www.oecd.org)
4. Lifelong learning in Global Knowledge Economy, Challenge for Developing Countries – World Bank Publication
5. Towards Knowledge Society, UNESCO Paris Publication

6. Your Personal Pinnacle of Success by DD Sharma, Sultan Chand and Sons, New Delhi
7. Human Learning, Ormrod
8. A Handbook of Entrepreneurship, Edited by BS Rathore and Dr JS Saini; Aapga Publications, Panchkula (Haryana)
9. Entrepreneurship Development by CB Gupta and P Srinivasan, Sultan Chand and Sons, New Delhi
10. Handbook of Small Scale Industry by PM Bhandari

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	14	28
2	10	20
3	08	16
4	04	10
5	03	06
6	06	14
7	03	06
Total	48	100

6.3 BASICS OF AUTOMOBILE ENGINEERING

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RATIONALE

These days, automobile has become a necessity instead of luxury. The diploma holders in this course are required to supervise production and repair and maintenance of vehicles. For this purpose, knowledge and skills are required to be imparted to them regarding automobile industry as a whole. This subject aims at developing required knowledge and skills in this area.

DETAILED CONTENTS

1. Introduction (04 hrs)
 - 1.1 Automobile and its development
 - 1.2 Various types of automobiles manufactured in India.
 - 1.3 Layout of chassis

2. Power System (06 hrs)
 - 2.1 Fuel systems for petrol and diesel engines including multi point fuel injection (MPFI), common rail direct injection (CRDI), Fuel injectors and nozzles.
 - 2.2 Comparison of MPFI with carburetor system.
 - 2.3 Concept of double overhead cam, single overhead cam, Twin cam 16 valve technology in 4 cylinder engine.

3. Transmission System (08 hrs)
 - 3.1 Clutch - Function, Constructional details of single plate and multiplate friction clutches, Centrifugal and semi centrifugal clutch, Hydraulic clutch
 - 3.2 Gear Box - Function, Concept of sliding mesh, constant mesh and synchromesh gear box, Torque converter and overdrive,
 - 3.3 Types of drives – Front wheel, Rear wheel, Four Wheel.
 - 3.4 Function of Propeller shaft, Universal joint, Differential and Different types of Rear axles and Front Axles.
 - 3.5 Wheels and Tyres - Types of wheels, Types and specifications of tyres used in Indian vehicles, Wheel balancing

4. Steering System (08 hrs)

Function and principle of Ackerman and Davis steering mechanism, types of steering gear boxes – Worm and nut, worm and wheel, worm and roller, rack and opinion, Power steering system and alignment of wheels – Toe in, toe out, camber, caster, kingpin inclination.

5. Braking system (06 hrs)
- Constructional details and working of mechanical, hydraulic brake. Concept of air and vacuum brake, brake adjustment, Introduction to Anti lock brake system and its working.
6. Suspension System (08 hrs)
- Function, Types, Working of coil spring, leaf spring. Concept of Air suspension and Shock absorber.
7. Auto Electrical System: (08 hrs)
- 7.1 Constructional details of lead acid cell battery. Maintenance of batteries, checking of batteries for voltage and specific gravity, Magneto and Battery coil ignition system.
- 7.2 Concept of Dynamo
- 7.3 Alternator - Construction and working, Charging of battery by Alternator and Regulator.

INSTRUCTIONAL STRATEGY

1. Use computer based learning aids for effective teaching-learning
2. Expose the students to real life problems
3. Plan assignments so as to promote problem solving abilities and develop continued learning skills

RECOMMENDED BOOKS

1. Automobile Engineering by GBS Narang; Khanna Publishers, Delhi.
2. Automobile Engineering by Dr. Kirpal Singh; Standard Publishers and Distributors, Delhi.
3. Automotive Mechanics, by W.Crouse and Anglin; Tata McGraw Hill, Delhi.

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	04	12
2	06	12
3	08	16
4	08	16
5	06	12
6	08	16
7	08	16
Total	48	100

6.4 BASICS OF INSPECTION AND QUALITY CONTROL

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RATIONALE

Diploma holders in this course required to measure and inspect for ensuring quality of product. For this purpose, knowledge and skills about standards of measurement, limits, fits and tolerances, types of inspection and various measuring instruments, SQC & quality standards are necessary. Hence this subject.

DETAILED CONTENT

1. Inspection (09 hrs)
 - Introduction, units of measurement, standards for measurement and interchangeability.
 - International, national and company standard, line and wavelength standards.
 - Planning of inspection: what to inspect? When to inspect? Who should inspect? Where to inspect?
 - Types of inspection: remedial, preventive and operative inspection, incoming, in-process and final inspection.
 - Study of factors influencing the quality of manufacture.

2. Measurement and Gauging (22 hrs)
 - Basic principles used in measurement and gauging, mechanical, optical, electrical and electronic.
 - Study of various measuring instruments like: calipers, micrometers, dial indicators, surface plate, straight edge, try square, protectors, sine bar, clinometer, comparators – mechanical, electrical and pneumatic. Slip gauges, tool room microscope, profile projector.
Limit gauges: plug, ring, snap, taper, thread, height, depth, form, feeler, wire and their applications for linear, angular, surface, thread and gear measurements, gauge tolerances.
 - Geometrical parameters and errors - Errors & their effect on quality, concept of errors, measurement of geometrical parameter such as straightness, flatness and parallelism.

- Study of procedure for alignment tests on lathes, drilling and milling machines.
 - Testing and maintenance of measuring instruments.
3. Statistical Quality Control (16 hrs)
- Basic statistical concepts, empirical distribution and histograms, frequency, mean, mode, standard deviation, normal distribution, binomial and Poisson, Simple- examples.
 - Introduction to control charts, namely X, R, P and C charts and their applications.
 - Sampling plans, selection of sample size, method of taking samples, frequency of samples.
 - Inspection plan format and test reports
4. Modern Quality Concepts (09 hrs)
- Concept of total quality management (TQM)
 - National and International Codes.
 - ISO-9000, concept and its evolution and implications.
 - Introduction to Kaizen – Its Implications,
 - 5S in Industries
5. Instrumentation (08 hrs)
- Measurement of mechanical quantities such as displacement, vibration, frequency, pressure temperature by electro mechanical transducers of resistance, capacitance & inductance type.

INSTRUCTIONAL STRATEGY

Teacher should arrange industrial visits to demonstrate some of the inspection and quality control operations being followed there.

RECOMMENDED BOOKS

1. Statistical Quality Control by M.Mahajan: Dhanpat Rai and Sons, Delhi
2. Engineering Metrology by RK Jain
3. Engineering Metrology by RK Rajput; SK Kataria and Sons
4. Production Planning Control and Management by KC Jain & Aggarwal; Khanna Publishers, New Delhi.

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	09	14
2	22	34
3	16	24
4	09	14
5	08	14
Total	64	100

6.5 INDUSTRIAL ENGINEERING

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RATIONALE

A diploma holder in this course will have to conduct time and motion study to improve the methods/system. For this, knowledge and related skills in method study and work measurement are essential. In addition, knowledge of ergonomics is required. Hence this subject.

DETAILED CONTENTS

1. Productivity (06 hrs)
Introduction to productivity, factors affecting productivity, Measurement of productivity, causes of low productivity and methods to improve productivity.
2. Work Study (14 hrs)
Definition and scope of work study; Areas of application of work study in industry; Inter-relation between method study and work measurement; Human aspects of work study; Reactions of management and labour to work study; Role of work study in improving productivity.
3. Method Study (08 hrs)
Objectives and procedure for Method analysis; Information collection and recording techniques. Processing aids; critical examination; development, installation and maintenance of improved methods.
4. Motion Analysis (06 hrs)
Principles of Motion analysis; Micromotion and Memomotion study; Therbligs and SIMO charts; Normal work area and design of work places; Basic parameters and principles of work design.
5. Work Measurement (10 hrs)
Objectives; work measurement techniques, stop watch time study; principle, equipment used and procedure; systems of performance rating; calculation of basic times; various allowances; calculation of standard time, work sampling, standard data and its usage.

6. Wages and Incentive Schemes (08 hrs)

Introduction to wages, Wage payment for direct and indirect labour, wage payment plans and incentives, various incentive plans, incentives for indirect labour.

7. Ergonomic (12 hrs)

Introduction, ergonomics as a link between engineering science and human science, guidelines for location of display devices, control devices, role of environmental conditions such as noise, heat, light, and ventilation etc. on human performance.

LIST OF PRACTICALS

1. Stop watch time study on any machine like lathe, drilling machine or milling machine
2. Method improvement - Assembly of bolt, nut and 3 washers
3. Determination of standard time for assembly of electrical switch
4. Preparation of flow process chart
5. Preparation of SIMO chart
6. Preparation of flow diagram

INSTRUCTIONAL STRATEGY

1. Teacher should use models and encourage students to develop some other suitable model.
2. The teacher should observe and redress the difficulties faced by students in performing the work while working on ergonomically good and poorly designed workstation.

RECOMMENDED BOOKS

1. Work Study and Ergonomics by S Dalela and Sourabh
2. Industrial Engineering and Management by O.P. Khanna Dhanpat Rai and Sons, Delhi.
3. Industrial Engineering and Management by M. Mahajan; Dhanpat Rai and Sons, New Delhi.
4. Introduction to Work Study, ILO Publication

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	06	10
2	14	22
3	08	12
4	06	10
5	10	16
6	08	12
7	12	18
Total	64	100

6.6 CNC MACHINES AND AUTOMATION

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RATIONALE

Diploma holders are required to supervise and handle specialized machines and equipment like CNC machines. For this purpose, knowledge and skills about NC machines, part programming in NC machines and tooling for CNC machines are required to be imparted for enabling them to perform above functions. This subject aims at development of knowledge and skills about CNC machines, tools, equipment and use of high tech machines for increased productivity and quality.

DETAILED CONTENTS

1. Introduction (06 hrs)
Introduction to NC, CNC & DNC, their advantages, disadvantages and applications. Basic components of CNC machines, Machine Control Unit, input devices, selection of components to be machined on CNC machines, Axis identification
2. Construction and Tooling (06 hrs)
Design features, specification of CNC machines, use of slideways, balls, rollers and coatings, motor and leadscrew, swarf removal, safety and guarding devices, various cutting tools for CNC machines, Concept of CNC tool holder, different pallet systems and automatic tool changer system, management of a tool room.
3. System Devices (12 hrs)
Control System; Open Loop and Closed Loop System, Concept of Actuators, Transducers and Sensors, Tachometer, LVDT, opto-interrupters, potentiometers for linear and angular position, encoder and decoder and axis drives
4. Part Programming (08 hrs)
Introduction to Part programming, Basic concepts of part programming, NC words, part programming formats, simple programming for rational components, part programming using canned cycles, subroutines and do loops, tool off sets, cutter radius compensation and tool wear compensation.
5. Problems in CNC Machines (04 hrs)
Common problems in CNC machines related to mechanical, electrical and pneumatic, electronic components. Study of common problems and remedies, use of on-time fault finding diagnosis tools in CNC machines.

6. Automation and NC system (06 hrs)
Concept of automation, emerging trends in automation, automatic assembly. Overview of FMS, Group technology, CAD/CAM and CIM.
7. Robot Technology (06 hrs)
Introduction to robot technology, basic robot motion and its applications

LIST OF PRACTICALS

1. Study of constructional detail of CNC lathe.
2. Study of constructional detail of CNC milling machine.
3. Study the constructional details and working of Automatic tool changer and Multiple pallets
4. Develop a part programme for following lathe operations and make the job on CNC lathe.
 - Plain turning and facing operation
 - Taper turning operation
 - Circular interpolation.
5. Develop a part programme for the following milling operation and make the job on CNC milling
 - Plain milling
 - Slot milling
 - Contouring
 - Pocket milling
6. Preparation of work instructions for machine operator
7. Preparation of preventive maintenance schedule for CNC machine.
8. Demonstration through industrial visit for awareness of actual working of FMS in production.

INSTRUCTIONAL STRATEGY

This is highly practice-based course. Efforts should be made to develop programming skills amongst the students. During practice work, it should be ensured that students get opportunity to individually perform practical tasks.

RECOMMENDED BOOKS

1. CNC Machines – Programming and Applications by M Adithan and BS Pabla; New Age International (P) Ltd., Delhi.
2. CNC Machines by M.S. Sehrawat and J.S. Narang; Dhanpat Rai and Co., New Delhi.
3. Computer Aided Manufacturing by Rao, Kundra and Tiwari; Tata Mc Graw Hill, New Delhi.
4. CNC Machine by Bharaj; Satya Publications, New Delhi.

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	06	12
2	06	12
3	12	26
4	08	18
5	04	08
6	06	12
7	06	12
Total	48	100

6.7 PLCS AND MICROPROCESSOR

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RATIONALE

A diploma holder when employed in automated industrial process controls or in automated power station will be required to know the basics of Programmable Logic Controllers, their working and their programming. In industry, many manufacturing processes demand a sequence of operation, which are to be performed repetitively. Early automation systems were mechanical in design, timing and sequencing being effected by gears and cams. Slowly these design concepts were replaced by electrical drives which were controlled by relays and now by programmable logic controllers (PLCs). A PLC is a solid state device, designed to operate in noisy industrial environments and can perform all logic functions. PLCs are widely used in all industries for efficient control operations. A diploma holder in industry is called upon to design , modify and troubleshoot such control circuits. Looking at the industrial applications of PLCs in the modern industry, this subject finds its usefulness in the present curriculum.

Microcontrollers have also assumed great significance in the field of electronics and comma goods industry, and thus considered to be an important field of engineering. This subject aims to expose the students to both of these and give them adequate knowledge of these topics.

DETAILED CONTENTS

1. Introduction to PLC (06 hrs)
What is PLC, concept of PLC, Building blocks of PLC, Functions of various blocks, limitations of relays. Advantages of PLCs over electromagnetic relays. Different programming languages, PLC manufacturer etc.
.
2. Working of PLC (08 hrs)
 - Basic operation and principles of PLC
 - Architectural details processor
 - Memory structures, I/O structure
 - Programming terminal, power supply
3. Instruction Set (08 hrs)
 - Basic instructions like latch, master control self holding relays.
 - Timer instruction like retentive timers, resetting of timers.
 - Counter instructions like up counter, down counter, resetting of counters.
 - Arithmetic Instructions (ADD,SUB,DIV,MUL etc.)

- MOV instruction
 - RTC(Real Time Clock Function)
 - Comparison instructions like equal, not equal, greater, greater than equal, less than, less than equal
4. Ladder Diagram Programming (06 hrs)
- Programming based on basic instructions, timer, counter, sequencer, and comparison instructions using ladder program.
5. Applications of PLCs (04 hrs)
- Assembly
 - Packaging
 - Process controls
 - Car parking
 - Doorbell operation
 - Traffic light control
 - Microwave Oven
 - Washing machine
 - Motor in forward and reverse direction
 - Star-Delta, DOL Starters
 - Paint Industry
 - Filling of Bottles
 - Room Automation
6. Micro Controller Series (MCS)-51 Over View (10 hrs)
- Pin details
 - I/o Port structure
 - Memory Organisation
 - Special function registers
7. Instruction Set Addressing Modes (06 hrs)
- Timer operation
 - Serial Port operation
 - Interrupts
8. Assembly language programming (06 hrs)
- Assemblers and Compilers
 - Assembler Directives
9. Design and Interface (04 hrs)
- Examples like: keypad interface, 7- segment interface, LCD, stepper motor. A/D, D/A, RTC interface.

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| 10. | Introduction of PIC Micro controllers | (04 hrs) |
| 11. | Application of Micro controllers | (02 hrs) |

LIST OF PRACTICALS

PLCs

1. Components/sub-components of a PLC, Learning functions of different modules of a PLC system
2. Practical steps in programming a PLC (a) using a Hand held programmer (b) using computer interface
3. Introduction to step 5 programming language, ladder diagram concepts, instruction list syntax
4. Basic logic operations, AND, OR, NOT functions
5. Logic control systems with time response as applied to clamping operation
6. Sequence control system e.g. in lifting a device for packaging and counting
7. Use of PLC for an application(teacher may decide)

Micro Controllers

1. Familiarization with a study of Architecture of 8085 kit, basic sub systems and input output connectors, functions keys on micro controllers kit
2. Familiarization of Micro Controllers (8051) kit
3. Testing of general input/output on Micro controller board
4. Development of Electrical , Instrumentation applications using 8051 micro-controller

INSTRUCTIONAL STRATEGY

Introduce the subject and make the students familiar with applications of PLCs and Microcontrollers. The inputs shall start with theoretical inputs to architecture, instruction set, assembly language programming, Small projects may be identified, be designed and implemented. PLC ladder diagram and programming should be supplemented with visits to industry. More emphasis may be given to practical work.

RECOMMENDED BOOKS

- 1) Programmable Logic Controller by Job Dan Otter; P.H. International, Inc, USA
- 2) Introduction to PLCs by Gary Dunning. McGraw Hill

- 3) Module on PLCs and their Applications by Rajesh Kumar, NITTTR Chandigarh
- 4) Programmable Logic Controller and Microcontrollers by Gurpreet Kaur and SK Sahdev by Uneek Publications, Jalandhar
- 5) Module on “Allen Bradlag PIC (SLC 500), Institution set-1, by Rajesh Kumar, NITTTR, Chandigarh
- 6) Module on “PLC Applications based on SLC 5/03” By Rajesh Kumar, NITTTR Chandigarh
- 7) The 8051 Micro controller by 1 Scot Mackenzie, Prentice Hall International, London
- 8) The 8051 Micro controllers Architecture, programming and Applications by Ayala; Penram International
- 9) Process Control Instrumentation Technology by Johnson, Curits; EE Edition, Prentice Hall of India, New Delhi
- 10) Microcontrollers by Ayala
- 11) Microcontrollers by Mazidi
- 12) Microcontrollers by Neil Makanzie
- 13) Microcontrollers by Deshmukh

SUGGESTED DISTRIBUTION OF MARKS

Topic	Time Allotted (hrs)	Marks Allocation (%)
1.	6	10
2.	8	15
3.	8	10
4.	6	10
5.	4	5
6.	10	15
7.	6	10
8.	6	10
9.	4	5
10	4	5
11	2	5
Total	64	100

6.8 PROJECT WORK

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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. The students should identify the project 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 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
Total marks		100	100	80	60	40	20

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

	Range of maximum marks	Overall grade
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 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.