

4.1 MATERIALS AND METALLURGY

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RATIONALE

Materials play an important role in the construction and manufacturing of equipment/tools. Right selection of materials add to the economy, working and life of machinery. A diploma holder must be conversant with the properties, uses, availability and costs of materials used for construction/fabrication to enable him to perform his functions confidently. The subject of Materials and Metallurgy has been designed to cover the above aspects.

DETAILED CONTENTS

1. Importance of Materials (4 hrs)

- Classification: Metals and non-metals, Ferrous and non-ferrous metals and their alloys
- Names of common metals, their alloys and non-metals used in Industry
- Properties of metals and alloys
- Physical properties - Appearance, luster, colour, density and melting point
- Mechanical Properties: Strength, stiffness, elasticity, plasticity, toughness, ductility, malleability, brittleness, hardness, fatigue and creep.
- Thermal and electrical conductivity
- Corrosion, causes, effects and prevention.

2. Metallurgical Considerations (6 hrs)

Solidification of metals from liquid to solid state of pure metals, cooling curves of pure metals, dendritic solidification, crystal formation, types of crystal structure. Phase diagram of:

- (i) Solid-state solubility.
- (ii) Partial solubility.
- (iii) Nil solubility i.e. eutectic solution (Binary only). Effects of all alloying elements on engineering materials. Effect of grain size on mechanical properties.

3. Ferrous Metals and Alloys (12 hrs)

- Flow diagram for the production of ferrous metals from their ores, constituents of iron, iron carbon diagram.
- Classification, composition and uses of cast iron and plain carbon steels. IS, BS and SAE Grades
- Effect of alloying elements such as Aluminium, chromium, Nickel, Cobalt, Manganese, Molybdenum, tungsten, Vanadium, Silicon, Sulphur and Phosphorous on steels.
- Composition, properties, grades and uses of special steels such as High speed steel, Stainless steels, Silicon steels, Heat resistant steels, Spring steel.
- Heat Treatment: Iron-carbon diagram, objectives and practical aspects of heat treatment. Brief description and uses with examples of principal heat treatment processes, Annealing, Normalizing, Tempering, Hardening, Carburising, Nitriding and Cyaniding and applications. Examples in heat-treating engineering components time, temperature transformation curve.

4. Non-ferrous Metals and Alloys (12 hrs)

- Copper: Properties and uses
- Composition, properties and uses of copper alloys.
- Brasses: Cartridge brass, Nickel silver.
- Bronzes: Phosphor bronze, Al-bronze, Mn-bronze, and Gun metal.
- Properties and uses of Aluminium.
- Composition, properties and uses of Al-alloys e.g., Duralumin, Yellow metal, Magnalium and Hindalium
- Properties and uses of alloys of lead, tin and magnesium.
- Bearing Metals: Requisite qualities. Composition, properties and uses of white metal bearing, copper based bearing metals. Aluminium based bearing metals. Use of nylon/PTFE for bushes/bearings, bi-metallic and tri-metallic bushes

5. Identification and Examination of Metals and Alloys (1 hr)
- Identification tests - Appearance, sound, filing, weight, magnetic, spark, bend and microstructure. Different types of etchants for preparation of surface structure.
6. Other Important Materials (10 hrs)
- Plastics: Definition, classification of plastics, fibre glass, reinforced plastics. Major applications of various plastics and their uses and grades.
 - Composite materials.
 - Heat insulating materials: Properties and uses of asbestos, glass wool, thermocole, cork, mica.
 - Electrical insulating materials. Properties and uses of china clay, leather, bakelite, ebonite, glass wool, rubber, felt.
 - Sound insulating materials: Cork, fibre boards.
 - Fabrication materials: Wood, plywood, rubber – natural and synthetic, Glass – plate glass, toughened glass, safety glass.
 - Refractory materials: General characteristics and uses of dolomite, ceramics.
 - Protective coating materials: Paints, primers, varnishes, enamels, putti, electroplating materials, rubasil, teflon coating.
 - Sealant and adhesives – Application and availability of sealant and adhesives for industrial user.
7. Selection, specifications and commercial availability of materials (3 hrs)
- Practical considerations for selection of material for different purposes
 - ISO/Bureau of Indian standard specifications for metals, non-metals, various components and materials.

LIST OF PRACTICALS

1. Classification of about 25 specimen of materials/parts in material lab, identify and indicate the type of materials with respect to their properties
2. Study of metallurgical microscope.
3. To prepare microscopic structure for examination and to examine the micro structure of specimens of various metals and alloys.
4. Study of heat treatment furnaces.
5. To study the effects of heat treatments processes on the following materials:
 - (i) Low carbon steel
 - (ii) Mild steel
 - (iii) High Carbon Steel

RECOMMENDED BOOKS

1. Material Science by GBS Narang, Khanna Publishers, New Delhi.
2. Material Science and Metallurgy by RB Choudary, Khanna Publishers, New Delhi.
3. Material Science by RK Rajput; SK Kataria and Sons, Delhi.
4. Materials and Matallurgy by D.S. Nutt. SK Kataria and Sons, Delhi.

4.2 FABRICATION PROCESSES – I

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RATIONALE

A diploma holder is responsible for implementing the standard welding and inspection practices on the shop floor. For this the students should have the knowledge of various welding process, destructive and non-destructive testing codes and practices etc. Hence this subject is offered.

DETAILED CONTENTS

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|---|---|----------|
| 1 | Welding consumables: | (08 hrs) |
| | Classification of electrodes, functions of electrodes coating, types of coating, classification and coding of heavy coated electrodes, welding fluxes, functions of fluxes, roles of flux in gradients, basicity index, classification of fluxes, Characteristics of inert gases used in welding. | |
| 2 | Weldability: | (10 hrs) |
| | Definition of weldability, different aspects of welding, weldability tests, weldability of carbon steel, stainless steel and aluminum. | |
| 3 | Distortion and Residual Stresses: | (06 hrs) |
| | Causes of the development of distortion and residual stresses. Different methods to control distortion and residual stresses in the weldment. | |
| 4 | Welding Inspection: | (12 hrs) |
| | Visual inspection, tensile and bend test of a weldment as per standard practice, principle and procedure of dye penetrant, magnetic particle, ultrasonic and X-ray inspection. | |
| 5 | Codes and Practices: | (04 hrs) |
| | Various Codes and practices related to welding | |
| 6 | Safety and Precautions in Welding | (08 hrs) |
| | Effect and protection from fumes and gases, chromium and nickel in welding fumes. Radiation, noise, electric shocks. Safe storage, handling and use of gas cylinders, Eye and face protection for welding and cutting operations. | |

LIST OF PRACTICALS

1. To prepare the safety instructions for the various fabrication process used in the laboratory.
2. To prepare a single V butt joint by using SMAW process.
3. To prepare a single V butt joint by using MIG process.
4. To prepare a single V butt joint by using TIG process.
5. To prepare a joint by using the spot welding machine.
6. To analyze the effect of welding parameter (voltage, welding speed, current etc.) on the weld bead geometry (penetration, bead width etc.).
7. To prepare a weldment and perform the tensile and band test of the same as per standard practice.
8. To inspect a given weld joint by using dye penetrant test.

INSTRUCTIONAL STRATEGY

1. Case study of fabrication of pressure vessel, heavy pipe lines
2. Industrial visits to a fabrication related industry to get the update of latest developments in the related areas.

RECOMMENDED BOOKS:

1. Welding Engineering by Dr. R.S. Parmar; Khanna Publishers, Delhi
2. Welding Technology by O.P. Khanna; Danpat Rai & Sons, Delhi
3. AWS Welding Hand Books Vol.1 to Vol.5

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	08	16
2	10	20
3	06	12
4	12	26
5	04	10
6	08	16
Total	48	100

4.3 INDUSTRIAL HYDRAULICS AND PNEUMATICS

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RATIONALE

Diploma holders in this course are required to deal with problems of fluid and use of hydraulics and pneumatics in power generation. For this purpose, knowledge and skills about fluid mechanics and machinery, hydraulics and pneumatics systems are required to be imparted for enabling them to perform above functions.

DETAILED CONTENTS

1. Introduction (03 hrs)

Fluid, types of fluid; properties of fluid viz mass density, weight density (specific weight), specific volume, capillarity, specific gravity, viscosity, surface tension, kinematic viscosity and dynamic viscosity and their units.
2. Pressure and its Measurement (06 hrs)
 - 2.1 Pressure (Atmospheric Pressure, gauge pressure, absolute pressure)
 - 2.2 Pressure measuring devices: peizometer tube manometers - simple U-tube, differential single column, inverted U-tube, micromanometer
 - 2.3 Bourdon pressure gauge, Diaphragm pressure gauge, dead weight pressure gauge
3. Flow of Fluids (07 hrs)

Types of fluid flow – steady and unsteady, uniform and non-uniform, laminar and turbulent; rate of flow and their units; continuity equation of flow; potential energy of a flowing fluid; total head; Bernoulli's theorem (statement and proof) and its applications. Discharge measurement with the help of venturi-meter, orifice meter, pitot-tube, limitations of Bernoulli's theorem.
4. Flow through Pipes (10 hrs)
 - 4.1 Definition of pipe flow, wetted perimeter, hydraulic mean depth, hydraulic gradient; loss of head due to friction; Chezy's equation and Darcy's equation of head loss (without proof), Reynold's number and its effect on pipe friction; siphon, Nozzle - definition, velocity of liquid flowing through the nozzle, power developed. Water hammer, anchor block, syphon, surge tank.

- 4.2 Loss of head in pipes due to sudden enlargement, sudden contraction, obstruction on flow path, change of direction and pipe fittings (without proof)
5. Hydraulic Machines (05 hrs)
- Description, operation and application of hydraulic machines – hydraulic ram, hydraulic jack, hydraulic brake, hydraulic accumulator, hydraulic door closer, hydraulic press, selection of specification of above machines for different applications
6. Water Turbines and Pumps (14 hrs)
- 6.1 Concept of a turbine, types of turbines –impulse and reaction type (concept only), difference between them. Construction and working of pelton wheel, Francis turbine, Propeller and Kaplan turbines. Unit speed, unit power, unit discharge, specific speed of turbines, selection of turbines based on specific speed.
- 6.2 Concept of hydraulic pump, single acting reciprocating pump (construction and operation only), vane, screw and gear pumps.
- 6.3 Construction, working and operation of centrifugal pump. Performance, efficiencies and specifications of a centrifugal pump. Trouble shooting and problems in centrifugal pumps and remedial measures, pitting, cavitation, priming.
7. Introduction to Oil Power Hydraulics and Pneumatics (03 hrs)
- 7.1 Introduction to oil power hydraulics and pneumatic system
- 7.2 Statement of Pascal law and its applications
- 7.3 Industrial applications of oil power hydraulics and pneumatic system
8. Components of Hydraulic Systems (08 hrs)
- 8.1 Basic components of hydraulic system, function of each component in a hydraulic circuit.
- 8.2 Oil reservoirs, couplings, motors and pumps – definition and functions of the parts,; capacity of oil reservoirs – hydraulic oil and hydraulic fire resistant fluids.
- 8.3 Filters- definition and purpose, classification, location of filter, filter efficiency.
- 8.4 Seals and packing- factors affecting selection of seals, classification of seals, sealing materials.

9. Components of Pneumatic Systems (08 hrs)
- 9.1 Basic components – function of each component
 - 9.2 Air compressors – type, working, capacity of air tank, power required to drive compressor, regulation of compressed air.
 - 9.3 Air cylinder – types, function, single acting, double acting, rotating, non-rotating, piston type, diaphragm type, tandem cylinder, double ended cylinder, duplex cylinder.
 - 9.4 Air filter, regulator and lubricator – their necessity in pneumatic circuit.
 - 9.5 Installation, maintenance and application of air cylinders.

LIST OF PRACTICALS

1. Measurement of pressure head by employing.
 - i) Piezometer tube
 - ii) Single and double column manometer
2. To find out the value of coefficient of discharge for a venturimeter.
3. Measurement of flow by using venturimeter.
4. Verification of Bernoulli's theorem.
5. To find coefficient of friction for a pipe (Darcy's friction).
6. To study hydraulic circuit of an automobile brake and hydraulic ram.
7. Study the working of a Pelton wheel and Francis turbine.
8. To study a single stage centrifugal pump for constructional details and its operation to find out its normal head and discharge.
9. To draw the characteristic curves for a single stage centrifugal pump.
 - i) Head Vs Discharge
 - ii) Power Vs Discharge
 - iii) Efficiency Vs Discharge

RECOMMENDED BOOKS

1. Fluid Mechanics by KL Kumar; S Chand and Co Ltd., Ram Nagar, New Delhi.
2. Hydraulics and Fluid Mechanics Machine by RS Khurmi ; S.Chand & Co. Ltd., New Delhi.

3. Hydraulics and Hydraulic Machinery by Dr. Jagadish Lal; Metropolitan Book Company Ltd., Delhi.
4. Fluid Power and Tribology by Anil Agarwal & M.L. Bhatia, Scientific Publishers(India) , Jodhpur
5. Hydraulic and Pneumatic Power and Control Design, Performance and Application by Yeaple, McGraw Hill, New York..
6. Pneumatic Controls by Festo Didactic; Bangalore.
7. Pneumatics Control: An Introduction to the Principles by Werner Deppert and Kurt Stoll; Vogel – Verlag.

4.4 WORKSHOP TECHNOLOGY-II

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RATIONALE

Diploma holders are responsible for supervising production processes to achieve production targets and for optimal utilization of resources. For this purpose, knowledge about various machining processes, modern machining methods, processing of plastic, CNC machining, tool, jigs and fixtures is required to be imparted. Hence the subject of workshop technology.

DETAILED CONTENTS

1. Milling (15 hrs)

- Specification and working principle of milling machine
- Classification, brief description and applications of milling machines
- Details of column and knee type milling machine
- Milling machine accessories and attachment – Arbors, adaptors, collets, vices, circular table, indexing head and tail stock, vertical milling attachment, spiral milling attachment, slotting attachment and rack milling attachment.
- Milling methods - up milling and down milling
- Identification of different milling cutters and work mandrels
- Work holding devices
- Milling operations – face milling, angular milling, form milling, straddle milling and gang milling.
- Cutting speed and feed, depth of cut.
- Indexing on dividing heads, plain and universal dividing heads.
- Indexing methods: direct, Plain or simple, compound differential and angular indexing.
- Cutting fluids used in milling.

2. Grinding (10 hrs)

- Purpose of grinding
- Specifications of grinding wheel – Abrasive, Grade, structure, Bond
- Common wheel shapes and types of wheel – built up wheels, mounted wheels and diamond wheels. Specification of grinding wheels as per BIS.
- Truing, dressing, balancing and mounting of wheel.
- Grinding methods – Surface grinding, cylindrical grinding and centreless grinding.
- Grinding machine – Cylindrical grinder, surface grinder, internal grinder, centreless grinder, tool and cutter grinder.

- Selection of grinding wheel
 - Cutting fluids used in grinding.
3. Shaping, Planing and Slotting (8 hrs)
- Working principle of shaper, planer and slotter.
 - Quick return mechanism applied to shaper, slotter and planer machine.
 - Specification of shaper, planer and slotting machine.
 - Speeds, feeds and depth of cut.
4. Broaching (5 hrs)
- Introduction
 - Types of broaching machines – Single ram and duplex ram horizontal type, vertical type pull up, pull down, push down.
 - Elements of broach tool, broach teeth details – nomenclature, types, tool material.
5. Metal Forming Process (10 hrs)
- Press Working
 - a) Press working – Types of presses, type of dies, selection of press die, die material
 - b) Press Operations-Shearing, piercing, trimming, punching, notching, shaving, gearing, embossing, stamping
 - Forging
 - a) Open die forging, closed die forging
 - b) Cold and hot forging
 - Rolling
 - a) Elementary theory of rolling
 - b) Types of rolling mills
 - c) Rolling defects and remedies
 - Extrusion and Drawing
 - a) Type of extrusion- Hot and Cold, Direct and indirect
 - b) Pipe drawing, tube drawing

RECOMMENDED BOOKS

1. Workshop Technology by B.S. Raghuwanshi; Dhanpat Rai and Sons, Delhi.
2. Workshop Technology Vol. I, II, III by Chapman; Standard Publishers Distributors, New Delhi.
3. Workshop Technology by R.C Jindal; Ishan Publications, Ambala city.
4. Production Engineering and Science by Pandey and Singh; Standard Publishers Distributors, New Delhi.
5. Workshop Practice by R.K. Singal, S K Kataria and Sons, New Delhi.
6. A Text Book of Production Engineering by P.C. Sharma; S. Chand and Company Ltd., New Delhi.

4.5 MACHINE DESIGN AND DRAWING

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RATIONALE

A diploma holder in this course is required to assist in the design and development of prototype and other equipments. For this, it is essential, that he is made conversant with the principles related to design of components and application of these principles for designing and prepare drawing of the same and hence this subject.

DETAILED CONTENT

1. Introduction (14 hrs)

- Design - Definition, types of designs necessity of design.
- Comparison of designed and undersigned work.
- Design procedure.
- Practical examples related with design procedure.
- Characteristics of a good designer.
- Characteristics of environment required for a designer.
- Design terminology: stress, strain, factor of safety, factors affecting factor of safety, stress concentration, methods to reduce stress concentration, fatigue, endurance limit.,
- General design considerations.
- Codes and standards.

2. Design of keys and shafts. (14 hrs)

Design of keys: Types of keys, materials of keys, and functions of keys.
Design of keys.

Design of shafts: Types of shaft, type of loading on shafts, shaft materials, Effect of keyway on shaft strength, Design of shafts under various loading.

3. Design of Joints (14 hrs)

- Types of joints: Temporary and permanent, utility of joints.
- Permanent joints.
- Welded joints.
- Types of welded joints, strength of parallel and transverse fillet welds.
- Strength of combined parallel and transverse welds.
- Axially loaded welded joints.

- Riveted joints: rivet materials, rivet heads, leak proofing of riveted joints – caulking and fullering.
 - Different modes of rivet joint failure.
 - Design of riveted joints: lap, butt, diamond (Lozenzo).
 - Design of boiler joints i.e. circumferential and longitudinal boiler joints.
4. **Design of Couplings** (14 hrs)
- Necessity of a coupling, advantages of a coupling and types of couplings, design of flanged couplings.
5. **Assembly Drawing of the following** (18 hrs)
- Tool post.
 - Bench-vice.
 - Safety valve.
6. **Cams** (12 hrs)
- Cam profile nomenclature.
 - Types of followers.
 - Motions of followers.
 - To draw cams with different followers with different motions.
7. **Gears** (10 hrs)
- Types of gears.
 - Nomenclature of gears.
 - Conventional representation of gears.
 - Draw profile of spur gear.

RECOMMENDED BOOKS

1. Machine Design by Pandya and Shah.
2. Machine Design by Sharma and Aggarwal; Katson Publishing House, Ludhiana.
3. Machine Design by R.S. Khurmi & J.K. Gupta; Eurasia Publishing House (Pvt.) Ltd.
4. Design of Machine elements by V.B. Bhandari; Tata Mc Graw Hill; Delhi.
5. Engineering Design by George Dieter; Tata Mc Graw Hill; Delhi.
6. Mechanical Engineering Design by Joseph Edward Shigley, Mc Graw Hill.
7. Machine Design by Sadhu Singh.
8. Machine Design by G.R. Nagpal.
9. Machine Design Data Book.

4.6 WORKSHOP PRACTICE - II

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RATIONALE

Diploma holders are responsible for supervising production processes to achieve production targets and for optimal utilization of resources. For this purpose, skills in various machining processes, modern machining methods, processing of plastic, CNC machining, tool, jigs and fixtures is required to be imparted. Hence the subject of workshop practice.

LIST OF PRACTICALS

1. Produce a rectangular block by face milling and prepare a slot on one face with a slotting cutter / side and face cutter.
2. Gear manufacturing by some indexing device on a milling machine & gear hobber. Inspection of gear
3. Job on grinding using
 - Surface grinding
 - Cylindrical grinding
 - Centreless grinding
4. Milling cutter grinding on tool and cutter grinder.
5. Prepare a V-block to ± 0.2 mm accuracy on shaper machine.
6. Exercise on key way cutting and spline cutting.
7. Preparation of job through eccentric turning.
8. Practice of taper turning.
9. Exercise on EDM for preparation of electrodes(male and female).

Note: The workshop Superintendent will finalize the specific drawings of all the jobs in the beginning of semester in consultation with staff

4.7 COMPUTER APPLICATIONS IN FABRICATION TECHNOLOGY

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RATIONALE

Today age is computer age. Most of our daily activities are being influenced by the use of computers. While in areas like science and technology, improvements cannot be achieved without computers. It has become necessary for each and everyone of us to have a basic knowledge of application of computers. PowerPoint is a feature packed presentation programme whereas access is database management systems. Programming is backbone for preparing various technological projects, which can be achieved by C⁺⁺ language – most versatile one in today's scenario. This subject is being offered to acquaint the students about MS PowerPoint, MS Access and Programming using C⁺⁺ language.

DETAILED CONTENT

1. Computer Application Overview (3 hrs)
 - Commercial and business data processing applications
 - Engineering computation

2. MS PowerPoint (15 hrs)
 - 2.1 Introduction
 - Elements of power point package- templates, wizards, views, color schemes
 - Starting PowerPoint
 - Exploring PowerPoint menus
 - Starting a new slide
 - Adding title, text and art
 - Moving text area and resizing text box
 - Starting a slide show
 - Saving a presentation
 - Printing slides
 - Inserting and deleting slides
 - Closing a presentation
 - Exercise for making a presentation and slide show

2.2 Views

- PowerPoint views – slide view, outline view, slide sorter view, notes view, slide show view, slide setup
- Zoom in, zoom out
- Exercises on various views of presentation

2.3 Formatting and Enhancing text

- Formatting
- Changing format with a new layout
- Alignment of text and text spacing
- Enhancing text formatting – use of bullets, changing text font and size
- Selecting text style and color
- Applying design template
- Closing and applying the transition
- Spell checking
- To set header and footer
- Exercise on formatting text and applying design template.

2.4 Slide with graphs

- Creating a graph
- Adding graphic objects
- Adding clipart pictures
- Adding movies and sounds
- Adding multimedia to presentation
- Inserting excel worksheet or word table
- Exercise on inserting graphs, tables, movies and clipart.

3 MS - Access

(16 hrs)

3.1 Introduction to Microsoft access

- Components of access

3.2 Table creating

- Starting access, creating tables, tool bars and views of tables
- Editing the design and contents of the table
- Creating relationship between tables
- Adding OLE objects to a table
- Use of import and export facility
- Exercise on table creating

- 3.3 Query Handling
- Creating a new query, use of criteria, expressions and operation
 - Editing a query, print a query
 - Exercise on creating and editing query
- 3.4 Form designing
- Introduction, creating a form, modify a form design, designing a form using design view.
 - Sub – forms, printing the forms, exercise on form designing.
- 3.5 Report designing
- Creating a report, managing the different controls of the records, saving and printing the report, use of graphs in reports
 - Exercise on report designing
- 4 Programming fundamentals (6 hrs)
- Algorithm, pseudo language, flow charts: advantages and disadvantages
 - Decision table – type, advantages and disadvantages
 - Structured programming: structuring the control flow, modular programming
 - Exercise on making algorithm and flow charts.
- 5 C++ programming (24 hrs)
- 5.1 Fundamentals
- Introduction, oop, character set, C++ tokens, keywords, identifiers, constants, basic data type, declaration of variables, defining symbolic constants, assignment statement, comments in a programme, structure of C++ programme, output using COUT, output using CIN, manipulators.
- 5.2 Operators and Expressions
- Arithmetic operators, relational operators, logical operators, shorthand assignment operator, increment and decrement operators, conditional operators, bit wise operators, precedence in C++ operators, casting of data, standard mathematical functions.
- 5.3 Control structures
- IF statements, IF---ELSE statements, nested IF statements, switch statements, Go To statements, repetitive structures, while statements, do statement, for loop, break statement, continue statement, nested loops.
- 5.4 Programs
- Write a program to check if a number is even or odd.
 - Write a program to find the smallest of 3 numbers.
 - Write a program to find largest of 4 numbers

- Write a program to find the roots of quadratic equation.
 - Write a program to find the sum of the first N natural numbers using a for - do loops.
 - Write a program that reads in N numbers and finds the smallest number among them.
 - Write a program to find the sum of squares of the digits of a number.
6. Demonstration of CNC machine.

RECOMMENDED BOOKS

1. MS Office 2000 for everyone by Sanjay Saxena; Vikas Publishing House Pvt. Ltd.
2. MS Office 2000 by Steve Hill; BPB Publications.
3. Programming in C++ by B. Subharamanayam.
4. Programming in C by Abdul Khader; Ajanata Publications

INDUSTRIAL TRAINING

Industrial Training aims at exposing the students to field practices, size and scale of operation and work culture at practical sites. For this purpose, students at the end of fourth semester are required to be sent for a period of 4 weeks to industry.

Each student is supposed to study the material and technology used at site and prepares a detailed report of the observation of process seen by him/her. These students should be supervised and guided by respective subject teachers. Each teacher may guide a group of four to five students.

The teacher along with field supervisors will conduct performance assessment of students. The components of evaluation will include the following.

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| a) Punctuality and regularity | 15% |
| b) Initiative in learning new things | 15% |
| c) Relationship with workers | 15% |
| d) Industrial training report | 55% |