Rationale:
A technical diploma holder is engaged generally as first line supervisor. He forms a bridge between workers and management. He has to understand the language of the modern management and communicate with the workers in their language. This subject will help accomplishing the task in stipulated time, develop attitude towards cost effectiveness, selection of most effective alternative methods. This course will also help the student to tackle different numerical methods and computational techniques for problem solving in research organization as a programmer.

Objective:
The course enables students to:
- Managerial skill based on mathematical footing
- The ability to find approximate solutions and/or answers to the problems where analytical methods become more complex.
- To choose correct numerical techniques for a given problem.

S.No. | Topics | Periods
--- | --- | ---
01 | GROUP –A (Numerical Methods & Computational Techniques) | (20)
02 | GROUP-B (Statistical Techniques) | (20)
03 | GROUP-C (Management Techniques) | (20)

Total: (60)

CONTENTS:

**GROUP-A**

**NUMERICAL METHODS & COMPUTATIONAL TECHNIQUES**

01.01 Introduction to Numerical methods: Approximation and errors (Truncation & Round off). Floating, point presentation of numbers, arithmetic operations with normalized floating point.


01.03 Solution of Linear Simultaneous Equations: Gaussian Elimination method and Gauss-Jordan method.


01.05 Numerical Differentiation & Integration: Newton’s forward and backward differentiation formula. Trapezoidal Rule and Simpson’s 1/3 rule for numerical integration.

01.06 Numerical solution of 1st order ordinary differential equations: Taylor’s Series. Euler’s method. Modified Euler’s method Runge-Kutta methods.

**GROUP-B**

**STATISTICAL TECHNIQUES**

02.01 Introduction to statistics: Measure of central tendencies: measures of dispersions: standard deviation and variance for discrete and grouped data: assumed mean and step deviation methods.


02.03 Probability Distribution: Introduction to Arithmetic Mean and Standard Deviation of a probability distribution. Important probability distribution – Binomial distribution. Poisson’s distribution and normal distribution. Their means and variance.

02.04 Sampling Distribution: Sampling Distribution of Mean and Standard Deviation.

02.05 Quality Control: P-Chart and R-Chart.

**GROUP-C**

**MANAGEMENT TECHNIQUES**

03.01 Linear Models

03.01.01 Introduction to Operations Research (O.R) Steps of O.R.

03.01.02 Linear Programming Problems: Step in information of a LPP. Mathematical Modelling and Solution Procedure.

03.01.03 Solution by Simplex Method: Basic Feasible Solution (Degenerator and Non-degenerator) Procedure including Big-M Method. Example.

03.01.04 Transportation problem: Introduction and Solution Procedure-
(i) Finding the initial basic feasible solution by N-W Corner Rule and Vogel’s Approximation Method.
(ii) Finding the Optimal Solution by U-V Method.

03.01.05 Assignment Problem: Introduction and Solution Procedure–Fundamental theory underlying Hungarian Method.

03.02 Network Analysis. CPM & PERT: Introduction.

03.02.01 Basic concepts – Activities. Nodes. Edges. Networking of a project. Various times calculations. CPM to determine the optimal project schedule.

03.02.02 PERT- Definition, difference between CPM & PERT. Pessimistic times, optimistic times. Most likely times of various activities, probability of meeting the schedule time, standard deviation of the schedule time.


Books Recommended: **Text Books**


**SCHEME OF EXAMINATION FOR FINAL EXAMINATION**

<table>
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<tr>
<th>Theory</th>
<th>No of Period in one session : 60</th>
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Rationale:
The subject forms an important part of Engineering curricula for developing the concepts required in the design of various structures. The subject deals with the basic concept of mechanic of body and the behaviour of material used in practice and in structures under varying load conditions. The first part of the subject deals with the applied mechanics science. Which describe the condition of body in rest or motion under the action of forces. In its preview come variety of general and specialized engineering disciplines concerned with analysis of structures and machines and the mechanism of their parts.

In the Second part, the principles of strength of materials is introduced in which the student will learn to distinguish between different types of stress and strain and also the qualitative assessment of stress and strains in material element under the action of internal forces.

Objective:
Knowledge Workers will be able to:
- Analyze and understand the physical behaviour of members of engineering structures.
- Acquire knowledge of various elements of structures.
- Utilise the basic principles.
- Develop skill to tackle field problem.
- Solve the problems by the application of basic principles.
- Judge the suitability of materials in design process.

S.No. | Topics | PART-A | Periods
--- | --- | --- | ---
01 | Introduction | (02) |
02 | Vector Methods | (02) |
03 | Introduction to system of forces and equilibrium | (06) |
04 | Friction | (04) |
05 | Kinematics and kinetics of a particle | (03) |
06 | Kinematics and kinetics of rigid body | (04) |
07 | Impulse and Momentum | (02) |
08 | Work, Energy and Power | (04) |
**Total:** | **PART-A:** | **(27)** |

**PART-B**

01 | Simple stress and strains | (05) |
02 | Elastic constants | (03) |
03 | Center of Gravity (Centroid) | (05) |
04 | Moment of Inertia | (05) |
05 | Shearing force and bending moments | (05) |
**Total:** | **PART-B:** | **(23)** |

**CONTENTS:**

**PART-A**

**TOPIC: 01 – INTRODUCTION:**
Idealisation of mechanics; Concept of rigid body; External forces (Body forces & surface forces) Law of Mechanics.

**TOPIC: 02 VECTOR METHODS:**
Equality and equivalence of vectors; Free and Bound vector; Moment of a force about a point and a line; Couple and moment of a couple; couple moment as free vector. Wrench.

**TOPIC: 03 – INTRODUCTION TO SYSTEM OF FORCES AND EQUILIBRIUM:**
Statically equivalent force system; simplest equivalent of a system of forces; force analysis, free body diagram, equation of equilibrium.

**TOPIC: 04 – FRICTION:**
Types of Friction (Static, Dynamic, Sliding, Rolling, Fluid) Rope & Belt Friction etc.

**TOPIC: 05 – KINEMATICS AND KINETICS OF A PARTICLE:**
Rectilinear and curvilinear translations; normal and tangential component of acceleration; radial and transverse component of acceleration.

**TOPIC: 06 – KINEMATICS AND KINETICS OF RIGID BODY:**
Angular Velocity and angular acceleration; Effective forces on a rigid body. D’ Alembert’s principle.

**TOPIC: 07 – IMPULSE AND MOMENTUM:**
Linear impulse and linear momentum, angular impulse and angular momentum.

**TOPIC: 08 – WORK, ENERGY AND POWER:**
Work done by forces and couples, potential and kinetic energy, work-energy; conservation of energy; concept of power and efficiency.

**PART-B**

**TOPIC: 01 – SIMPLE STRESSES & STRAIN:**
01.01 Definition of various terms and their units (S.I. Units)
01.03 Stress & strain in varying sectional bar & composite bar. Stress & strain due to temperature variation in homogeneous and composite bars.
01.04 Shrinking on hoop’s stresses.

**TOPIC: 02 – ELASTIC STRESSES & STRAIN:**
[03]
02.01 Linear strain and lateral strain, poisson’s ratio, volumetric strain
02.02 Change in volume due to axial, biaxial & triaxial loading. Bulk modulus.
02.03 Shear stress and strain, modulus of rigidity.
02.04 Various relations between modulus of elasticity, modulus of rigidity & bulk modulus.
02.05 Simple shear. Complementary shear stress, stress on oblique section.

**TOPIC: 03 – CENTER OF GRAVITY (CENTROID):**
03.01 Definition of center of gravity & centroid.
03.02 Determination of C.G of various sections symmetrical and unsymmetrical sections.
03.03 Determination of C.G. of perforated sections. C.G. of semi circle, quadrant circle.

**TOPIC: 04 – MOMENT OF INERTIA:**
04.01 Definition of M.I.; radius of gyration, second moment of area.
04.02 Parallel axis theorem & perpendicular axis theorem.
04.03 Derivation of M.I. of regular area-rectangular, triangular circular about centroidal axis.
04.04 M.I. of built up section, symmetrical and unsymmetrical about centroidal axis, modulus of sections.

**TOPIC: 05 – SHEARING FORCE & BENDING MOMENT:**
05.01 Types of beams and types of supports, types of loading.
05.02 Concept and definitions of shear force and bending moment, sign convention.
05.03 Shear force and bending moment diagrams for cantilever, simply supported beam, over hanging beam for various types of loading & couples, point of contraflexure.
05.04 Relation between B.M, S.F. and rate of loading.

**Books Recommended:**

**Text Books**

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**SCHEME OF EXAMINATION FOR FINAL EXAMINATION**

F.M. : 80
Computers play a vital role in present day life, more so, in the professional life of technician engineers. In order to enable the students use the computers effectively in problem solving, this course offers the modern programming language C along with exposition to various engineering applications of computers.

**Objective:**
The objectives of this course are to make the students able to:
- Develop efficient algorithms for solving a problem.
- Use the various constructs of a programming language viz. conditional, iteration and recursion.
- Implement the algorithms in “C” language.
- Use simple data structures like arrays, stacks and linked list solving problems.
- Handling File in “C”.

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<tr>
<td>01</td>
<td>Introduction to Programming</td>
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<td>02</td>
<td>Algorithm for Problem Solving</td>
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<tr>
<td>03</td>
<td>Introduction to ‘C’ Language</td>
<td>(06)</td>
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<td>04</td>
<td>Condition and Loops</td>
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<td>Functions</td>
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<td>07</td>
<td>Structures and Unions</td>
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<td>08</td>
<td>Pointers</td>
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<td>09</td>
<td>Self Referential Structures and Linked Lists</td>
<td>(03)</td>
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<tr>
<td>10</td>
<td>File Processing</td>
<td>(03)</td>
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**Total:** (50)

**CONTENTS:**

**TOPIC: 01 – INTRODUCTION TO PROGRAMMING:**

**TOPIC: 02 – ALGORITHM FOR PROBLEM SOLVING:**
Exchanging values of two variables, summation of a set of numbers. Decimal Base to Binary Base conversion. Reversing digits of an integer, GCD (Greatest Common Division) of two numbers. Test whether a number is prime. Organize numbers in ascending order. Find square root of a number, factorial computation, Fibonacci sequence. Evaluate 'sin x' as sum of a series. Compute sine Series. Check whether a given number is Palindrome or not. Find Square root of a quadratic equation. Generate LCM & GCD. Reverse order of elements of an array. Find largest number in an array. Print elements of upper triangular matrix, multiplication of two matrices, Evaluate a Polynomial.

**TOPIC: 03 – INTRODUCTION TO ‘C’ LANGUAGE:**
03.01 Character set, Variable and Identifiers, Built-in Data Types, Variable Definition, Declaration, C Key Words-Rules & Guidelines for Naming Variables.
03.02 Arithmetic operators and Expressions, Constants and Literals, Precedence & Order of Evaluation.
03.03 Simple assignment statement. Basic input/output statement.
03.04 Simple ‘C’ programs.

**TOPIC: 04 – CONDITIONAL STATEMENTS AND LOOPS:**
04.01 Decision making within a program
04.02 Conditions, Relational Operators, Logical Perator.
04.03 If statement, it-else statement.
04.04 Loop statements
04.05 Break, Continue, Switch, Goto and Labels.

**TOPIC: 05 – ARRAYS:**
What is an Array?, Declaring an Array, Initializing an Array. One dimensional arrays. Array manipulation: Searching, Insertion, Deletion of an element from an array; Finding the largest/smallest element in array; Two dimensional arrays, Addition/Multiplication of two matrices, Transpose of a square matrix; Null terminated strings as array of characters, Representation sparse matrices.

**TOPIC: 06 – FUNCTIONS:**
Top-down approach of problem solving. Modular programming and functions, Definition of Functions Recursion, Standard Library of C functions, Prototype of a function: Formal parameter list, Return Type, Function call, Block structure, Passing arguments to a Function: call by reference; call by value, Recursive Functions, arrays as function arguments.

**TOPIC: 07 – STRUCTURES AND UNIONS:**

**TOPIC: 08 – POINTERS:**
Concept of Pointers, Address operators, pointer type declaration, pointer assignment, pointer initialization pointer arithmetic, Indirection Operator, Pointers to Pointers, functions and pointers, Arrays and Pointers, pointer arrays.
TOPIC: 09 – SELF REFERENTIAL STRUCTURES AND LINKED LISTS:
Creation of a singly linked list, Traversing a linked list, Insertion into a link list, Deletion from a linked list.

TOPIC: 10 – FILE PROCESSING:
Concept of Files, File operation in various modes and closing of a file, Reading from file, Writing onto a file.

Book Recommended:


SCHEME OF EXAMINATION FOR FINAL EXAMINATION

F.M. : 80
Rationale & Objective:

Every printed product consists of text portion and illustrations, with the former occupying a mechanical portion knowledge of text setting methods and equipment used for setting text, which is broadly termed Letter Assembly, therefore very essential.

The aim of this subject is to study letter assembly as an important part of print-production techniques, to enable the students to make judgement about the aspect of printing, particularly in relation to the requirements of designing the printed products.

This will cover development of typesetting methods, preparation for type setting inputs and outputs, page assembly, proofing imposition and planning. The aim is to further develop the student’s understanding and knowledge of letter assembly equipment, particularly in the areas of on-line integrated system, image generation system, editing and corrections, electronic page assembly, digital storage and outputs.

S.No. | Topics | Periods
--- | --- | ---
01 | Introduction | (06)
02 | Preparation for Typesetting | (09)
03 | Letter Assembly System | (06)
04 | Typesetting Routines | (06)
05 | Introduction to Phototypesetting | (09)
06 | Typesetting Input | (06)
07 | Photo-typesetting Output | (06)
08 | Page Assembling and Proofing | (06)
09 | Imposition and Planning | (06)

CONTENTS:

**TOPIC: 01 – INTRODUCTION:**

01.01 Historical development of Typesetting from Gutenberg to present.
01.02 Review of various systems and their relationship with current production methods.

**TOPIC: 02 – PREPARATION FOR TYPESETTING:**

02.01 Typographical unit of measurement. Angle-American point system.
02.02 Units of set, measurement of length;
02.03 Preparation of copy, house style.
02.04 Proof-reading.
02.05 Casting-off and copy fitting.

**TOPIC: 03 – LETTER ASSEMBLY SYSTEM:**

03.01 Handsetting, Mechanical typesetting, typewriter composition phototypesetting, computerized typesetting.
03.02 Display composition by various system.
03.03 Editing, correction and page-make up in all the systems.

**TOPIC: 04 – TYPESETTING Routines:**

04.01 Different kinds of setting poetry; table, tabular, mathematical, scientific work, etc.
04.02 Methodical approach for each kind of job, tools, accessories, and precision aids, used in the letter assembly departments and their purposes.

**TOPIC: 05 – INTRODUCTION TO PHOTOTYPESETTING:**

05.01 Development from the earliest to the present.
05.02 Principles of first to present generations photo-typesetting machines, their performance and usage.

**TOPIC: 06 – TYPESetting INPUT:**

06.01 Counting and non-counting keyboard, keyboard layout and ergonomics.

**TOPIC: 07 – PHOTO-TYPESetting OUTPUT:**

07.01 Application of various photo-typesetter, scopes, and limitation.
07.02 Processing of photo-typesetting output.

**TOPIC: 08 – PAGe ASSEMBLING AND PROOFING:**

08.01 Make-up of photo-typesetting products for book, magazine, newspaper, and general printing.
08.02 Equipment and materials used.
08.03 Photo headline setting and transfer lettering systems for display composition.
08.04 Proofing Techniques-matrix printer, diazzo, electrostatic, diffusion transfer, photographic.

**TOPIC: 09 – IMPOSITION AND PLANNING:**

09.01 Page shapes, margins, and size in relation to paper size.
09.02 Rules for Imposition upto 32 pages.
09.03 Accommodation of press and Finishing requirements, sheet work and halfsheet work, grip edge, signature and register marks.

**SCHEME OF EXAMINATION FOR FINAL EXAMINATION**

| F.M. | 80 |
Rationale & Objective:
The student will learn the scientific approach to the different printing materials. He will also learn about the testing of material for quality control. The subject will make the student to learn about the chemical reactions involved in the various stages of Reproduction Photography, Surface Preparation, Presswork etc.

CONTENTS:

**TOPIC: 01 – MATERIAL USED FOR IMAGE CARRIERS:**

01.01 Relief process, Type metal alloys, original plates; Zinc & Copper for Blocks, Photopolymer plates, Duplicate plates; Stereo and Electro..

01.02 Planography: Zinc, aluminium, anodized aluminium, bi-metallic and tri-metallic plates, presensitised plates, photopolymer plates.

01.03. Intaglio: Metals used for gravure cylinders and plating.

01.04 Materials used for other processes, e.g. Flexography, Screen, Dry offset.

**TOPIC: 02 – PHOTOGRAPHIC MATERIALS:**

02.01 Basic ingredients of emulsion and their functions.

02.02 Emulsion process, control of sensitometric qualities and sensitometric properties, emulsion structure.

02.03 Developer’s constituents and their functions.

02.04 Chemicals for after-treatment.

02.05 Introduction to non-silver material.

**TOPIC: 03 – POLYMERS:**

03.01 Monomers and Polymers.

03.02 Homopolymers and Copolymers.

03.03 Types of polymerisation reactions: Addition polymerisation and condensation polymerisation.

03.04 Types of polymers: Plastics, Rubber and Fibres.

03.05 Composition and characteristic properties of the polymers printing Ink resin and vehicles, adhesives, film base, cellulose and gelatin.

**TOPIC: 04 – COLLOIDS**

04.01 Characteristics.

04.02 Methods of preparation and properties.

Application in printing industry.

**TOPIC: 05 – SUBSTRATES:**

05.01 Fibrous and non-fibrous raw materials used in paper and board manufacture.

05.02 Surface treatment related to ultimate use.

05.03 Varieties of papers and boards: Characteristics, Classifications, identification selection of choice for different classes of print jobs and printing processes.

05.04 Other substrates: Metal foil, plastic, cellophane, etc.

SCHEME OF EXAMINATION FOR FINAL EXAMINATION

F.M. : 80
Rationale & Objective:
It is a core subject of printing technology. It is essential for students to learn about the basics of various printing processes. Process photography, techniques of printing surface preparation and printing machines.

CONTENTS:
1. Printing Industry- historical background and structure.
2. Principles Involved and characteristics of different printing process-their suitability and limitations.
3. Introduction to Relief surface and Planographic surface.
4. Introduction to equipments and tools used for all printing processes.
5. Introduction to process photography: types of process cameras-their constructions and functioning-making negatives and positives.
6. Introduction to Surface Preparation (Overview only)

SCHEME OF EXAMINATION FOR FINAL EXAMINATION

F.M. : 80
## CONTENTS:

### TOPIC: 01 – VARIOUS KINDS OF PRINTED PRODUCTS, THEIR FORMAT, AND DESIGN FACTORS:

01.01 Leaflets, pamphlets, booklets, catalogues, brochures, manuals, books.
01.02 Magazines and Newspapers.
01.03 Business forms and commercial stationary.
01.04 Labels, cartons, point-of-sale displays, etc.
01.05 Factors to be considered in print planning, such as purpose, budget, materials etc.

### TOPIC: 02 – DESIGN AND TYPOGRAPHIC ELEMENTS:

02.01 Identification of design terms; point, line, space, shape, mass, size and scale, colour, tone, texture, pattern, balance and contrast.
02.02 Typographic Elements.
02.03 Type fundamentals, main groups of type face designs, type series, type families.
02.04 Choosing type face suitable to the subject or product, relation between type face and printing processes, type face and paper surfaces.
02.05 Legibility and readability.
02.06 Monograms, trade-marks and logotypes.

### TOPIC: 03 – COLOUR ELEMENTS:

03.01 Colour theory. Terms used to describe colour: warm and cold colours, hue, shade, tint.
03.02 Colour wheel. Term to describe their relationships, between colours, complementary colour, split-complementary colours, selection of colours for two or three or four colours jobs. Attributes and emotional appeal of colour.
03.03 Choose and effective use of colours, colour harmony, colour contrast and colour values.

### TOPIC: 04 – ILLUSTRATIVE ELEMENT

04.01 Types of originals for illustration and re-production: continuous tone copy, line drawings, black and white and colour.
04.02 Requirements of art work and originals for reproduction, treatment of photographs, photomechanical transfer materials and their use.
04.03 Black and white photographs; high contrast and low contrast; improving quality of photographic proofs; masking, scaling, cropping of illustration, reduction and enlargements; size of reproduction; care and protection; air brush and its use.

### TOPIC: 05 – LAYOUT PREPARATION:

05.01 Materials, equipment and techniques used in the preparation of layout and art work.
05.02 Basic geometric shapes, disposition of elements and space; principles of symmetrical and asymmetrical arrangements; distinction between geometric and optical centres.
05.03 Preparation of the layouts, analysis of briefs, stages and house styles.
05.04 Methods of producing different forms of layout.
05.05 Page structures, arrangement of illustration and text matter.
05.06 Dummy preparation.

### TOPIC: 06 – TYPOGRAPHY:

06.01 Methods of preparing a design in its various stages, for different classes of work book, display, news, magazines and other kinds, typographic specifications for different classes of work.
06.02 Copy preparation for different classes of work in relation to typesetting systems, artworks preparation for different printing processes paper etc.
06.03 Materials and tools used in preparation of layouts and art work.

### TOPIC: 07 – PLANNING FOR PRODUCTION:

07.01 Selection and colour limitation of production processes, jobs selections, consideration of available methods of composition method possibilities and limitations of Bindings and ancillary processes as they affect design.
07.02 Technical influences and the selection and specification of ink, paper and other materials in relation to job specifications and the different production processes decided.
07.03 Casting-off copy, principles of copy-fitting, copy fitting tables.
07.04 Preparation of page : layouts for different parts of the book and preparation of dummies.
TOPIC: 08 – DISPLAY COMPOSITION:

08.01 Principles of display, factors affecting display setting, effective use of white space. Line shape and size of space, the type face combinations, suitability, use of initials, the techniques of layouts arrangements to guide the eye-dividing an area-use of grid preparation of dummy of different kinds of jobs.

SCHEME OF EXAMINATION FOR FINAL EXAMINATION

F.M. : 80
Potomechanics, transfer of image and electronic image generation of the photography and their importance for a student to learn, in making tinting for the job and mainly deals with operation and handling of different equipments, machinery etc, used for reproduction photography.

S.No. | Topics |
---|---|
01 | Function of graphic reproduction |
02 | Optical system |
03 | Cameras |
04 | Illuminants |
05 | Emulsion for graphic reproduction photography |
06 | Line and Halftone photography |
07 | Contact Processing |
08 | Processing |

**Periods**
- (08)
- (08)
- (08)
- (08)
- (07)
- (07)
- (07)
- (07)

**CONTENTS:**

**TOPIC: 01 – FUNCTION OF GRAPHIC REPRODUCTION:**
Functions of graphic reproduction. Definitions of graphic reproduction photography; Originals for graphic reproduction classification of originals, line originals, Half Tone, Continuous tone, full colour originals, requirements of originals, scaling the originals.

**TOPIC: 02 – OPTICAL SYSTEM**
02.01 Lenses. Lens aberrations, process lens, optical reversal, straight line reversal, lens aperture, diaphragm, its functions depth of focus, depth of field, waterhouse etc.

**TOPIC: 03 – CAMERAS**
03.01 Different types of process cameras and accessories, e.g. horizontal, dark room, vertical, vertical enlarger-types camera, roll-film cameras, Computerised Camera evaluation of modern cameras.

**TOPIC: 04–ILLUMINANTS**
04.01 Classification, requirements, colour temperature, comparative study of different illuminants, carbon arc lamps open and enclosed, incandescent lamps, tungsten, halogen lamps, pulsed xenon lamps, lens flap, units of illumination, inverse square law, relative intensity exposure calculations.

**TOPIC: 05–EMULSIONS FOR GRAPHIC REPRODUCTION PHOTOGRAPHY**
05.01 Ingredients, brief description of manufacture of emulsions, types of emulsions, emulsion structure, Requirement of emulsions, emulsion structure, Requirements of emulsion. Study of sensiometric waves-characteristic and gama curves. Latent image Theory: Reciprocity failure, intermittency effect, cavalier effect, etc.

**TOPIC: 06–LINE AND HALFTONE PHOTOGRAPHY:**
06.01 Basic Line exposure, magnification factor, line photography from black and white, and colour line originals, evaluation of line negatives. Brief study of halftone screens, manufacture, halftone theories, screen distance calculations, inverse system. Various ratio system-calculations. Halftone exposure-single and multiple exposure system, flash no-screen exposure priciples of dot formation, evaluation of halftone, negative & positives.

**TOPIC: 07 – CONTACT PROCESSING**
07.01 Application of Contact printing, determining the correct exposure dots, soft dots, spreads and chokes for multi-colour printing inspection of negatives and positives.

**TOPIC: 08–PROCESSING:**
08.01 Developers, Ingredients and their function. Different developers, thier suitability, factors affecting of development, method of development, automatic processor, stop bath, fixing bath, thier functions.

**SCHEME OF EXAMINATION FOR FINAL EXAMINATION**

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F.M. : 80
Rationale & Objective:
This is a core subject. After printing is complete, the printed sheets are required to be put in a proper shape such as books, magazine, registers, etc. For this, knowledge of various methods and techniques of binding and finishing is very essential. A diploma holder is required to supervise the binding and finishing section in a press.

S.No.  Topics                                                                 Periods
01    Warehouse Operations.                                                    (08)
02    Securing Operations.                                                     (08)
03    Forwarding Operations.                                                   (08)
04    Binding Techniques                                                       (08)
05    Preparation and Attaching Boards.                                         (08)
06    Covering Operations.                                                     (05)
07    Finishing.                                                               (05)

CONTENTS:

TOPIC: 01 – WAREHOUSE OPERATIONS.                                            [08]
01.01 Printed paper warehouse and white paper warehouse, storing temperature, humidity, materials handing, safety.
01.02 Paper buying, stocking, storage and issue.
01.03 International paper sizes, and I.S.I. paper sizes, advantages, grammes per square metre GSM), method of substances specification; old imperial sizes and subdivisions of paper.

TOPIC: 02 – SECURING OPERATIONS:                                             [08]
02.01 Use of thread, tape, cord, wire-stitching, looping, gluing, pasting, covering, pamphlet, work.
02.02 Different kinds of sewing, cord sewing and tape sewing, hand sewing and machine sewing, two-on and all-along sewing, over casting for looseleaf works, suitability for different styles of binding.
02.03 End papers: single, made –end paper, reinforced, cloth-joint, leather-joint, silk-fly leaf and leather –flyleaf. Zigzag end papers, their object.

TOPIC: 03 – FORWARDING OPERATIONS.                                           [08]
03.01 In board and out –board forwarding, different kinds of binding and styles, publishers, library, miscellaneous and deluxe extra leather, stationery binding- characteristics.
03.02 Gluing the back; founding and backing objects, care and precautions, reducing swelling in the back, flat backs, back lining.

TOPIC: 04 – BINDING TECHNIQUES                                                [08]
04.01 Adhesive binding, thermoplastic, unsewn, threadless and perfect binding.

TOPIC: 05 – PREPARATION AND ATTACHING BOARDS                                  [08]
05.01 Dimensional variation of boards, lining, cutting to size, warping of boards, prevention, attaching boards, lacing-in-split-board work.

TOPIC: 06 – COVERING OPERATION:                                               [05]
06.01 Different kinds of covering materials, selecting leather as other materials, measuring and cutting to size and shape, applying adhesive and turning it, pressing, setting the groove or joints, settings the head, setting the band, polishing pressing and pasting down.

TOPIC: 07 – FINISHING                                                         [05]
07.01 Decorating the cover of the book with the finishing tools, blind blocking, gold blocking and sliding hand tools, fillets pallets, rules. Lottering, type holder, brass type, marking for tooling and lettering; heating, testing and pressing, cleaning, inlaying, lacing and bands open up and pressing.
07.02 Edge decoration, colouring, spraying marbling, guilding, gauffereing or tooling the edges, head bands, handmade and machine-made head bands.

SCHEME OF EXAMINATION FOR FINAL EXAMINATION                                 F.M. : 80
## PRESS WORK

<table>
<thead>
<tr>
<th>Subject Code</th>
<th>Theory</th>
<th>No of Period in one session : 50</th>
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### Rationale & Objective:
The subject deals with the Printing Techniques; Relief printing process, Planographic Printing Process and Silk Screen. Intaglio Printing; Knowledge of this subject is very essential for diploma Holder.

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Topics</th>
<th>Period</th>
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<tbody>
<tr>
<td>01</td>
<td>Relief Printing</td>
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<td>02</td>
<td>Planographic Printing</td>
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<tr>
<td>03</td>
<td>Screen Printing</td>
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<tr>
<td>04</td>
<td>Intaglio Printing</td>
<td>(10)</td>
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<tr>
<td>05</td>
<td>Flexography Printing</td>
<td>(10)</td>
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</tbody>
</table>

### CONTENTS:

**TOPIC: 01 – RELIEF PRINTING:**

01.01 Letter press planten machine, kinds-purpose sizes of machine, Different kinds of inking systems-Markeready systems.
01.02 Letterpress cylinder machine single revolution, perfecting machine sizes-speeds-suitability inking systems, make ready, Feeding and delivery systems.
01.03 Web-fed printing machine and their characteristics.

**TOPIC: 02 – PLANOGRAPHIC PRINTING:**

02.01 Offset machine(sheet-fed), kinds of presses-sizes-speeds suitability, single, two and multi-colour and perfecting machine.
02.02 Different Kinds of feeding system and its control(ramp controls)
02.03 Plate cylinder, Blanket cylinder, impression cylinder. Packing of these cylinder-their purposes.
02.04 Inking systems-Dempening Systems-drying system-different kinds of delivery systems.

**TOPIC: 03 – SCREEN PRINTING:**

03.01 Screen printing machine and printing tables, its flatbod machine their accessories-suitability.

**TOPIC: 04 – INTAGLIO PRINTING**

04.01 Intaglio: sheet fed matchine kinds-sizes and suitability.

**TOPIC: 05 – FLAXOGRAPHY PRINTING**

05.01 Flexography-sheet fed machine, web fed, kinds-sizes and suitability.

### SCHEME OF EXAMINATION FOR FINAL EXAMINATION

| F.M. : 80 |
Rationale & Objectives:
The Engineering Mechanics Laboratory is a subject which will help technician to understand the application of theory that he has studied in practice by performing experiments and verifying results. Besides the above the objective of the curriculum with effective skill will be developed in them to observe experimental data, and to analyses the results. These topics of this curriculum will certainly build their confidence in performing the utilization of principle of mechanics in Civil Engineering works.

CONTENTS:
Eight experiments to be performed in the laboratory:

1. Determination of elongation of wire under external load.
2. Tensile Test on mild steel specimen.
3. Tensile Test on high tensile specimen.
4. Compression Test on metal.
5. Compression Test on bricks.
7. Determination of reaction at the support of beam.
8. Determination of bending moment of a simply supported beam.
9. Determination of reaction at the support of roof truss.
10. Determination of deflection of beams.
12. Determination of bending moment of a over hanging beam.
13. Verification of Polygon Law of forces.
14. Verification of Triangle Law of forces.
15. To find moment of inertia of fly wheel.
16. Compression Test on metal.
17. Tensile Test on M.S.specimen.
18. Determination of co-efficient of friction on inclined plane.

Books Recommended:

Text Books

COMPUTER PROGRAMMING THROUGH ‘C’ Lab.

<table>
<thead>
<tr>
<th>Subject Code</th>
<th>Practical</th>
<th>No of Periods Per Week</th>
<th>No of Period in one session : 60</th>
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CONTENTS:

List of Practicals:
1. Programming exercise on executing a C program.
2. Programming exercise on editing C program.
3. Programming exercise on defining variables and assigning values to variable.
4. Programming exercise on arithmetic and relational operations.
5. Programming exercise on arithmetic expressions and their evaluation
6. Programming on infix, postfix, transformation using stack.
7. Programs on insertion, deletion on link list.

Books Recommended:


SCHEME OF EXAMINATION FOR FINAL EXAMINATION

F.M. : 40
PRINTER’S PROCESS – I Lab.

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<th>Subject Code</th>
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1. Letter Assembly: Lay of case, use of tools and equipments, use of spacing materials, setting straight matter, setting techniques, proofing.
3. Surface Preparation:
   (a) Use of equipments and accessories for platemaking, graining, counter-etching, preparing coating, solution, coating plate for albumen process and;
   (b) Equipments and tools used for making a line block.

SCHEME OF EXAMINATION FOR FINAL EXAMINATION

F.M. : 40
1. Collection and study of all varieties of printed materials.
2. Classification of types faces: Block letters, Old face Transitional, Modern and Decorative types.
3. Identification of different display faces: method.
4. Layout procedure: Interpretation of copy and layout, preparing composing room layouts rough and finished layouts.
5. Tools of the layout man; care and handling.
7. Lettering for layouts techniques.
8. Layout for simple title pages, letterheads, visiting cards envelopes, greeting cards, invitations, certificates, advertisements and folders.
10. Study of various kinds of originals used in the printed materials.
12. Practicing layout and dummies for various, class of work: book, display, news, magazines, and other kinds of job work.
13. Practicing the techniques of copy preparation.

SCHEME OF EXAMINATION FOR FINAL EXAMINATION

F.M. : 40
1. Typesetting Routines
   Setting various kinds of work-text/poetry, table and tabular and display work by handsetting, mechanical composition and photo-typesetting.

2. Make up of pages
   Procedure for making-up for different kinds of text pages which includes various components, such as, headlines and folio, footnotes, let-in-notes, let-in-notes, labels. Illustration with legends etc Make –up of preliminary and supplementary pages of books.

3. Display Composition
   Setting up of display job as per the layouts, using suitable typesetting system for different kinds of display jobs.

4. Practical work with different, proofing techniques

5. Imposition
   Imposition upto 32 pages for upright and Landscape pages, half sheet and sheet work.

6. Practising for keyboard operation for phototypesetting.

SCHEME OF EXAMINATION FOR FINAL EXAMINATION

F.M. : 40
# REPRODUCTION & PHOTOGRAPHY-I

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<th>No of Periods Per Week</th>
<th>Full Marks</th>
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<td>Annual Exam. : 40</td>
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<td>Internal Exam. : 10</td>
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</table>

1. Introduction to different equipment, study of different working parts c.t.c
2. Preparation of processing chemicals.
3. Making line negatives to different methods.
4. Line negatives from coloured line originals.
5. After treatments - reducers, Intensifiers - chemicals reversal
6. Halftone negative making.
7. Calculation of screen distance, principle of dot formation Use of Ration and inverse system.
8. Use of gray scale:
   Contrast Control by different methods. Practice on different contacts.
9. Use of Densitometers.
10. Study of density, range, contrast, game characteristics curve.

**SCHEME OF EXAMINATION FOR FINAL EXAMINATION**

F.M. : 40
**BINDING & FINISHING - I**

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1. Study of tools and machinery, their uses and care in handling.
3. Folding, counting and jogging.
4. Side and saddle Odd and even number stitching.
5. Endpapers.
6. Styles of binding: Quarter-bound cut-flush (library sewing). Quarter-bound turned in (library sewing) Quarter-bound turned in (Sawn-in Sewing)
8. Tear-off pad.
9. One letter Index book, Styles of binding Quarer-bound turned-in with squares (Flexible sewing), Quarter-bound turned –in with squares (Two-on sewing), case binding (Overcast sewing), Publishers binding (Library sewing).
10. Half-bound (conventional method); Calico and marble with gilding, spine preparing and spine decorating with ink. Photo-album with colour strings.
12. Rebinding-Case binding.
13. Writing pad with gift cameras.

**SCHEME OF EXAMINATION FOR FINAL EXAMINATION**

**F.M. : 40**
Subject Code

17218

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<th>Practical</th>
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No of Period in one session : 50

Annual Exam. : 40

Internal Exam. : 10

2. Opacity test.
3. Drying and Bleeding tests.
4. Emulsification tests.
5. Test for end use requirements of Ink and Papers.

SCHEME OF EXAMINATION FOR FINAL EXAMINATION

F.M. : 40
# REPRODUCTION & PHOTOGRAPHY - I

<table>
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<td><strong>No. of Periods Per Week</strong></td>
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**Contents:**

1. Preparation of Line & Half Tone Negative.
2. Preventive maintenance of Croceess Camera.
3. Scaling of different types of origionals.
4. Factor Controlling of exposure & development.
5. Basic Ingredient of Developers.
Subject Code
17220

No of Periods Per Week
L  T  P/S  Annual Exam.
0  0  2  : 30

No of Period in one session : 50
Full Marks : 50
Internal Exam. : 20

S.No.  Topics
01  Letter Press.
02  Offset

CONTENTS:

TOPIC: 01 – LETTER PRESS:
01.01 Automatic platens and cylinder machine makeready operations for text, line and halftone, setting of feeding, inking and delivery units, levelling the impression.
01.02 Simple imposition schemes.
01.03 Printing fruits and their remedies for sheet-fed presses.
01.04 Mounting and locking dences.

TOPIC: 02 – OFFSET:
02.01 Adjustment of automatic feeders.
02.02 Mounting of plate on cylinder, fitting or offset blanket, preparing it for printing.
02.03 Preparation of fountain solution, dampening rollers.
02.04 Adjustment of inking and dampening rollers, ink fountain setting.
02.05 Colour mixing and matching.
02.06 Make-ready and printing of line and halftone, one-and-two colour work.
02.07 Ink roller wash up, cleaning storing plates.