

RATIONALE

It is essential to introduce diploma students in printing technology with the various printed products, so that the student is familiar with elementary knowledge of various kinds of printing processes & printed products, their format, design factors, design elements, typographic element, colour elements, illustrative elements and layout preparation etc.

CONTENTS**1. Printed Products :**

- 1.1 Leaflets, pamphlets
- 1.2 Booklets, catalogues, brochures, manuals, books
- 1.3 Posters and calendars
- 1.4 Magazines, newspapers
- 1.5 Business forms, commercial stationary
- 1.6 Labels, cartoons,
- 1.7 Point of sales displays folders and other forms of direct-mail literatures.
- 1.8 Factors to be consider in print planning- such as purpose, budget, and materials

2. Design Elements :

- 2.1 Identification of design terms
 - 2.1.1 Point, Line, Space
 - 2.1.2 Shape, Mass, Size
 - 2.1.3 Scale, Colour, Tone
 - 2.1.4 Texture, Pattern
 - 2.1.5 Balance and contrast

3. Typographic Element :

- 3.1 Type Fundamentals
- 3.2 Main groups of type face design
- 3.3 Type series
- 3.4 Type facilities
- 3.5 Choosing type face suitable to the subject or product
- 3.6 Relation between type face and printing processes
- 3.7 Type face and paper surfaces
- 3.8 Legibility and readability
- 3.9 Monograms, Trade-marks and logotypes

4. Colour Elements :

- 4.1 Colour theory
- 4.2 Terms used to describe colour
 - 4.2.1 Warm & cold colour
 - 4.2.2 Hue
 - 4.2.3 Brightness
 - 4.2.4 Shade tint
- 4.3 Colour wheel
- 4.4 Relationship between colour
 - 4.4.1 Complimentary
 - 4.4.2 Analogous
 - 4.4.3 Split-complementary colour
- 4.5 Selection of colour for two-or-three or four colour jobs
- 4.6 Choice and effective use of colours

5. Illustrative Elements :

- 5.1 Types of original for illustration reproduction
 - 5.1.1 Continuous tone copy
 - 5.1.2 Line drawing
 - 5.1.3 Black & white colour requirements of artwork
 - 5.1.4 Originals for reproduction
 - 5.1.5 Treatment of photographs
 - 5.1.6 Photochemical transfer materials and their use in black & white photographs
 - 5.1.7 High contrast & low contrast
- 5.2 Improving quality of photographic prints
 - 5.2.1 Masking
 - 5.2.2 Scaling
 - 5.2.3 Cropping of illustration
 - 5.2.4 Reduction and enlargement
 - 5.2.5 Size of reproduction
 - 5.2.6 Care and protection
- 5.3 Airbrush and its use

6. Layout Preparation :

- 6.1 Basic geometric shapes
- 6.2 Disposition of elements
- 6.3 Space
- 6.4 Principles of symmetrical and asymmetrical arrangements
- 6.5 Distinction between geometric and optical centres
- 6.6 Page structures
- 6.7 Arrangement of illustrations and text matter

REFERENCE BOOKS :

- | | |
|---|------------------|
| 1. Art & Print Production | N.N.Sarkar |
| 2. Typographic Design and letter Assembly | B.D.Mahindiratta |
| 3. Introduction to Printing | Herbert Simonn |
| 4. Type | David Gates |
| 5. Hand book on printing technology | NIIR Board |
| 6. Photo-mechanics and binding | Marter Monsen |
| 7. The Lithographer's manual | GATF |
| 8. Advertising & Designing | |

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PRINTING DESIGN

CODE PR 202

L T P
2 2/2 --**RATIONALE**

Every printed product should be designed before it is sent to the printer for executing the work. The print-technician should have a clear perspective of the design principles involved in designing a product, as the designing on the printing process to be decided.

The aim of this subject will be to introduce the study of design as a decision making discipline which controls all the production aspects of the printing techniques. This will cover introduction to varieties of printed product, introduction to type and typography, design organization, visual studies, techniques of copy preparation, layouts and dummy for all kinds of jobs.

The aid is to further examine in detail to design consideration and corporate design planning applied to different types of products, and to allow the students to apply the knowledge gained in his professional carrier.

CONTENTS

1. Principles of Design:

- 1.1 Balance
- 1.2 Optical centre
- 1.3 Harmony
- 1.4 Contrast
- 1.5 Unity
- 1.6 Proportion
- 1.7 Rhythm
- 1.8 Simplicity

2. Basic Design: Visual ingredients

- 2.1 Point
- 2.2 Line
- 2.3 Tone
- 2.4 Shape
- 2.5 Texture
- 2.6 Colour
- 2.7 Scale
- 2.8 Symmetrical and asymmetrical styles

3. Typographic Design and Layout:

- 3.1 Purpose
- 3.2 Suitability
- 3.3 Use of ornaments
- 3.4 Copy Preparation
- 3.5 Copy fitting
- 3.6 Casting off
- 3.7 Page dimensions and margins
- 3.8 White space
- 3.9 Use of Borders, Rules & other decorative materials
- 3.10 Selection of types in relation to the paper, printing process
- 3.11 Psychology of type faces
- 3.12 Designing new type faces
- 3.13 Marking up copy

4. Colour and its importance in Design:

- 4.1 Primary, Secondary & Tertiary colours,
- 4.2 Colour Wheel
- 4.3 Colour scheme
- 4.4 Analogous and complementary colours
- 4.5 Psychology of colour

5. Original Art Works:

- 5.1 Preparation of line originals
- 5.2 Preparation of halftone originals,
- 5.3 Airbrush and its applications
- 5.4 Stages of layout (Visuals, Rough layout, Finishing Layout)
- 5.5 Copy writing
- 5.6 Trade Marks
- 5.7 Dummy preparations.

6. Letter Forms:

- 6.1 Lettering
- 6.2 Development of letter from early Roman inscriptions to present-day-type designs.
- 6.3 The design of Typefaces & Letters for printing
- 6.4 Their suitability for particular printing techniques and paper surface.
- 6.5 Legibility and readability
- 6.6 Optical spacing
- 6.7 Letter-space
- 6.8 Line-space
- 6.9 Text and display types
- 6.9 Drop letters
- 6.10 Initial letters.

7. Design for Reproduction:

- 7.1 Layouts and design suitable for reproduction
- 7.2 Formal and informal layouts
- 7.3 Modern and anesthetic design
- 7.4 Various method of reproduction like direct printing process
- 7.5 Indirect printing process
- 7.6 Die-stamping
- 7.7 Collotype
- 7.8 Mimeograph

8. Application of Photography in Design:

- 8.1 Preparation of finished designs of
 - 8.1.1 Advertising
 - 8.1.2 Magazines,
 - 8.1.3 Book covers
 - 8.1.4 Catalogues
 - 8.1.5 Brochures
- 8.2 Incorporating photographs
- 8.3 Selection of photographs required for these designs
- 8.4 Study of
 - 8.4.1 Textures
 - 8.4.2 Forms
 - 8.4.3 Pattern
 - 8.4.4 Light and shade
 - 8.4.5 Surface finish of paper

9. Design Organization:

- 9.1 Relationship of a design studio with production and sales departments
- 9.2 Control and checking of artwork
- 9.3 The employment of freelance artists, Designers, Photographers.

10. Proof Correction:

- 10.1 Proof reading routines for different kind of work
- 10.2 Reading
- 10.3 Revising
- 10.4 Checking and passing work for machine
- 10.5 Chief points in reading the advertisement and Display materials.

11. Composition:

- 11.1 Display (principle & factor affecting)
- 11.2 Newspaper
- 11.3 Magazine
- 11.4 Book.

REFERENCE BOOKS :

- | | |
|---|------------------|
| 1. Art & Print Production | N.N.Sarkar |
| 2. Typographic Design and letter Assembly | B.D.Mahindiratta |
| 3. Letter Press Printing | Anupam Prakashan |
| 4. Hand book on Printing Technology | NIIR Board |
| 5. Screen Printing | Kailash Takale |
| 6. Offset Printing | Anupam Prakashan |
| 7. Modern Printing Technology | NIIR Board |
| 8. Introduction to Printing | Herbert Simonn |
| 9. Type | David Gates |
| 10. Practical Printing and Binding | Odhams J |
| 11. The Lithographer's manual | GATE |

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PRINTING PROCESSES

CODE PR 203

L T P
1 -- 3**RATIONALE**

It is essential for the diploma students in printing technology to know about various materials being used in printing. Keeping this aspect in mind most of the important materials like metals paper, inks, plastics, rubber, adhesives, photographic materials have been included in the contents of the subject.

CONTENTS**1. History :**

- 1.1 Origin and development from fifteenth century
- 1.2 Definition of Printing
- 1.3 Modern trends in printing.
- 1.4 Planning- such as purpose, budget, materials

2. Classification of Printing processes :

- 2.1 Principle involved in –Relief
- 2.2 Planography
- 2.3 Intaglio
- 2.4 Stencil printing
- 2.5 Dry offset
- 2.6 Commercial suitability
- 2.7 Limitations
- 2.8 Identifying features in the print of these processes
- 2.9 Current development in Pre-press, Press and Finishing process

3. Letter Press Printing :

- 3.1 Types
- 3.2 Function of machines
- 3.3 Basic Impression methods
- 3.4 Applications

4. Lithographic Printing :

- 4.1 Principles
- 4.2 Outline of lithographic reproduction & its applications
- 4.3 Outline of photo lithographic- Reproduction & Principle

5. Offset Printing :

- 5.1 Introduction
- 5.2 Principle & Application.

6. Gravure Printing :

- 6.1 Introduction
- 6.2 Principle & Application.

7. Silk Screen Printing :

- 7.1 Introduction
- 7.2 Principle & Application.

8. Dry Offset :

- 8.1 Introduction
- 8.2 Principle & Application.

9. Flexography :

- 9.1 Introduction
- 9.2 Principle & Application

PRACTICAL**1. Letter press:**

- 1.1 Oiling and cleaning of machine.
- 1.2 Handling, pre make-ready and make-ready light platen machine.
- 1.3 Simple imposition exercises up to 8 pages
- 1.4 Roller setting, ink setting & registering
- 1.5 Pre make-ready of a platen form
- 1.6 Proofing on platen machine

2. Offset Printing :

- 2.1 Handling and care of equipment
- 2.2 Preparation of Plate for receiving image
- 2.3 Proofing

3. Silk screen Printing :

- 3.1 Preparation of silk screen
- 3.2 Image formation on screen by coating and stencil method.
- 3.3 Proofing

4. Gravure Printing:

- 4.1 Visit to local Gravure printing industry

5. Flexography:

- 5.1 Visit to local Flexography printing industry

REFERENCE BOOKS :

- 1. Art & Print Production
- 2. Introduction to Printing
- 3. Letter Press Printing
- 4. Modern Lithography
- 5. Screen Printing
- 6. Flexo & Gravure
- 7. Offset Printing
- 8. Modern Printing Technology

N.N.Sarkar
Herbert Simonn
Anupam Prakashan
Ian Fanx
Kailash Takale
Printing Review, NewDelhi
Anupam Prakashan
NIIR Board

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LETTER ASSEMBLY

CODE PR 204

L T P
2 -- 3**RATIONALE**

Every printed product consists of text portion and illustrations, with the former occupying a predominant portion. Knowledge of text setting method 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 judgment 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 typesetting, typesetting 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 arrears of online integrated system, editing and corrections, electronic page assembly, digital storage and outputs.

CONTENTS

- 1. Type :**
 - 1.1 Dimension of type
 - 1.2 Physical parts
 - 1.3 Faces
 - 1.4 Size range
 - 1.5 Type founding and casting by hand & mechanically
 - 1.6 Type Founts
 - 1.7 Extra sorts
 - 1.8 Layout of the type case for English and Hindi.

- 2. Basic Principles of Typesetting By hand :**
 - 2.1 Setting of text matter- Spacing, Justifying straight matter & Spelling.
 - 2.2 Pronunciation and word division.
 - 2.3 Use of Capital, Small capital, Bold, Italic, Figures, Common abbreviations, Reference marks.
 - 2.4 Distribution of composed matter.
 - 2.5 Introduction to Poem setting, Simple table & Tabular work.

- 3. Composing Room Materials and Equipment :**
 - 3.1 List of Materials & Equipments, their description & applications
 - 3.2 Metal & Wooden furniture
 - 3.3 Locking-up devices & Chases
 - 3.4 Proofing press.

- 4. Composition Room calculation :**
 - 4.1 Weight of type
 - 4.2 Weight of lead
 - 4.3 Resetting in a different type
 - 4.4 Determining type size
 - 4.5 Buying type
 - 4.6 Spacing material
 - 4.7 Poster Type
 - 4.8 Checking and laying new type
 - 4.9 Measurements used in typography
 - 4.10 Em-En relations & application to composed area
 - 4.11 Point System & application to types
 - 4.12 Spacing materials
 - 4.13 Weight spacing materials
 - 4.14 Methods for casting-off copy
 - 4.15 Copy fitting.

5. Proof Reading :

- 5.1 Proof correction marks
- 5.2 Proof reader
- 5.3 Copy holder
- 5.4 Layouts
- 5.5 Requirement of proof reading room

6. Copy Preparation :

- 6.1 Editing
- 6.2 Proof reading
- 6.3 Style of the house
- 6.4 Copy preparation
- 6.5 Normal text
- 6.6 Intricate text
- 6.7 Mathematical and scientific work
- 6.8 Pre-make-ready
- 6.9 Reproduction proof procedures

7. Imposition :

- 7.1 Sheet and half sheet work
- 7.2 Determination of margins
- 7.3 Importance of gripper and lay edge margins
- 7.4 Regular imposition schemes of 4,8,12 and 16 pages
- 7.5 Upright & Landscape
- 7.6 Four and eight page jobs printed in two-up
- 7.7 Inset work
- 7.8 Signatures and collating marks
- 7.9 Folding schemes and their effects on imposition

8. Mechanical Typesetting :

- 8.1 Introduction of Monotype, Monotype metal, Monotype Caster & Super Caster their brief description & application.
- 8.2 Introduction of Linotype, Matrices, Magazines their brief description & application.

9. Personal Hygiene :

- 9.1 Prevention of industrial disease like Dangers of lead poisoning
- 9.2 Handling of Dross
- 9.3 Molten metal

10. Computers in Composition :

- 10.1 Study of computer equipments its function and operations.
- 10.2 Software requirement
- 10.3 Word processing
- 10.4 Electronic scanning
- 10.5 Electronic page make-up
- 10.6 Use of Line Printers
- 10.7 Laser printer
- 10.8 Plotters
- 10.9 CTP

11. Correction and Editing Methods:

- 11.1 Operations
- 11.2 Soft copy correction

- 11.3 Hard copy correction
- 11.4 Devices and equipment

12. Quality Control :

- 12.1 Planning and arrangement
- 12.2 Quality control

PRACTICAL

1. Hand Composition :

- 1.1 Handling & Care of composition room materials and tools.
- 1.2 Drawing of layout of the cases in Hindi and English.
- 1.3 Measure Making
- 1.4 Smoke Proofing
- 1.5 Proofing of composed matter
- 1.6 Proof reading & Correction
- 1.7 Distribution of composed matter

2. Computer Composition :

- 2.1 Handling & Operating of computer equipments
- 2.2 Scanning of Black & White original
- 2.3 Scanning of Colour original
- 2.4 Justification (Left, Right, Center, Justify, Force justify)
- 2.5 Poetry Setting
- 2.6 Tabular Setting
- 2.7 Visiting Card Setting
- 2.8 Letter head Setting
- 2.9 Page Making with Text matter
- 2.10 Page Making with Text & Photo
- 2.11 Export & Import of rtf files
- 2.12 Proofing of script
- 2.13 Online Editing of script

REFERENCE BOOKS :

- | | |
|---|------------------|
| 1. Adhunik Sanyojan Shashtra | Anupam Prakashan |
| 2. Typographic Design and letter Assembly | B.D.Mahindiratta |
| 3. Letter Press Printing | Anupam Prakashan |
| 4. Letter Assembly in Printing | Wooldridge D. |

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LETTER PRESS MACHINING

CODE PR 205

L T P
2 -- 3

RATIONALE

This is technology subject. Technicians working in printing industry are required to deal with different printing machine of various processes. These machines have different operational units. The diploma holders are required to have a good knowledge of these machines. This subject deals with the printing machines of all the processes and their operational units.

CONTENTS

1. Letter Press Machines :

- 1.1 Materials used & Principles of Letterpress machines
- 1.2 Proving press

- 1.3 Platen machines
- 1.4 Automatic platens and vertical job machines
- 2. Work of letterpress printers :**
 - 2.1 Appropriate sequence of operations
 - 2.2 Pre-make-ready & Make-ready its purpose & principles involved
 - 2.3 Choice of appropriate dressing
 - 2.4 Causes and remedies of common difficulties
 - 2.5 Handling & storage of forms
 - 2.6 Use of furniture and quoins
 - 2.7 Various types of mounting bases
- 3. Platen Machine :**
 - 3.1 Adjustments
 - 3.2 Control of inking and impression
 - 3.3 Locking-up Devices- Hand fed & Automatic machines
 - 3.4 Setting of automatic feeders
 - 3.5 Make-ready of all kinds of forms
 - 3.6 Methods of hand feeding
 - 3.7 Safety guards
- 4. Cylinder Machines :**
 - 4.1 Classification
 - 4.2 Relative merits and limitations
 - 4.3 Mechanical and operational features of Feeding, inking, Delivery Systems, Sheet control, Registration.
 - 4.4 Perfecting machine
- 5. Rotary Machines :**
 - 5.1 Classification
 - 5.2 Mechanical and operational feature of rotaries for
 - 5.3 Newspaper
 - 5.4 Magazines
 - 5.5 Books
 - 5.6 Forms
 - 5.7 Stationary
- 6. Automatic Feeders :**
 - 6.1 Principles and Classification
 - 6.2 Mechanical and operational features of models in use
- 7. Make-Ready :**
 - 7.1 Make-ready on cylinder machines regarding text matter, line & halftone blocks, Underlay, Interlay & Overlay making.
 - 7.2 Hand out stand mechanical overlays
- 8. Imposition :**
 - 8.1 Scheme of imposition up to 32 pages (Sheet work & Half sheet work)
- 9. Defects :**
 - 9.1 Analysis of causes and remedies of various defects

10. Miscellaneous Operations :

- 10.1 Creasing
- 10.2 Perforating
- 10.3 Embossing
- 10.4 Thermography
- 10.5 Vignettes and cut outs

11. Letter Press Inks :

- 11.1 Characteristics
- 11.2 Modification
- 11.3 Care and Storage

12. Rollers :

- 12.1 Kinds of rollers
- 12.2 Seasoning
- 12.3 Cleaning and the use of suitable solvents
- 12.4 Care and storage

13. Multicolour Printing :

- 13.1 Colour sequence and its effect & Colour mixing and matching.

PRACTICAL

- 1. Exercises in imposition up to 16 pages (sheet work)
- 2. Exercises in imposition up to 16 pages (half sheet work)
- 3. Exercises in pre-make-ready.
- 4. Handling, make-ready and operation of cylinder machines.
- 5. Printing of text and halftone combination.
- 6. Printing of duo-tones.
- 7. Printing of three or four colour halftone blocks.
- 8. Printing of vignettes and cut out blocks.
- 9. Preparation of overlay.
- 10. Exercises in cutting.
- 11. Exercises in creasing.
- 12. Exercises in perforating.
- 13. Exercises in numbering.
- 14. Exercises in embossing.

REFERENCE BOOKS:

- | | |
|--------------------------------------|----------------------------|
| 1. Printing by Letterpress | Hutchings, E.A.D. |
| 2. Theory and Practice of Press Work | U.S. Govt. Printing office |
| 3. Printing Today | Jon C. Tarr |
| 4. Letterpress Machine Work-I | Radford, R.D. |
| 5. Elementary Platen Press Work | Ralph W. Polk |
| 6. Machine Printing | Durrant, W.R. |
| 7. Composition & Machine work | Hurst, C.A., & Lawrence |
| 8. Letter Press Printing I & II | Misra, C.S. |

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REPRODUCTION PHOTOGRAPHY & TECHNIQUES – I

CODE PR 206

L T P
2 -- 3**RATIONALE**

Photomechanical transfer of images and electronic image generation are the areas of much importance for a student to learn in making printing surfaces. The subject mainly deals with operation and handling of different materials tools equipments and camera etc. used for reproduction photography and technique involved.

CONTENTS**1. Process Photography :**

- 1.1 Principles
- 1.2 Outline the process
- 1.3 Photographic films
- 1.4 Brief introduction of photographic cameras in use
- 1.5 Practice of photography like Exposing, Processing, Printing, Enlarging

2. Process Optics:

- 2.1 Process room equipments
- 2.2 Process cameras its structure and types like Installation, Arc lamps, Process lens, Prism, Straight Line Reversal
- 2.3 Characteristics of line originals
- 2.4 Suitability for reproduction
- 2.5 Stripping

3. Line Photography :

- 3.1 Outline of wet – collodion process
- 3.2 Dry film process (Exposure, Development & after treatments)
- 3.3 Factors governing exposure
- 3.4 Defects of negative
- 3.5 Preparation of line negatives
- 3.6 Positives on dry film. Solution used in paper & film
- 3.7 Developing and their characteristics

4. Miscellaneous Accessories :

- 4.1 Contact screens
- 4.2 Filters, Instruments
- 4.3 Tools
- 4.4 Gray scale

5. Contact Photography :

- 5.1 Application of Contact printing
- 5.2 Basic principle
- 5.3 Advantage and Limitation
- 5.4 Determining correct exposure
- 5.5 Hard and soft dots
- 5.6 Inspection of negatives and positives

6. Light & Colour :

- 6.1 Nature of light
- 6.2 Electromagnetic waves
- 6.3 Light waves

- 6.4 Transmission
- 6.5 Refraction
- 6.6 Absorption
- 6.7 Illumination
- 6.8 Colour temperature
- 6.9 Principle of Colour reproduction
- 6.10 Filter factors, ratio and their application

7. **Photography Films and their Processing :**

- 7.1 Structure of film sensitive emulsion
- 7.2 Exposure and latent image
- 7.3 Development
- 7.4 Types of developers and their components
- 7.5 Factors controlling development
- 7.6 Fixation
- 7.7 Reduction
- 7.8 Intensification
- 7.9 Hardening
- 7.10 Characteristics curve of emulsion
- 7.11 Chemical reversal
- 7.12 Dark and continuous reaction

8. **Optical Equipment :**

- 8.1 Requisites of process lens
- 8.2 Standard lens design
- 8.3 Process cameras their relative advantages and drawback
- 8.4 Process enlarger
- 8.5 Illuminants characteristics
- 8.6 Suitability of different types of illuminants
- 8.7 Use of Fluorescent tubes, Mercury vapour, Xenon lamp, Electronics flash
- 8.8 Light integrating meter

9. **Halftone Reproduction :**

- 9.1 Glass halftone screen
- 9.2 Theories of dot formation
- 9.3 Screen distance (its calculation & correction)
- 9.4 Characteristic of screens & their specialized applications
- 9.5 Screen negative making
- 9.6 Continuous tone negative making
- 9.7 Requirement of halftone negatives for letterpress & lithographic reproduction
- 9.8 System of halftone exposures & Flash exposure
- 9.9 Halftone failure and remedies

10. **Production of Negatives and Positives :**

- 10.1 Types and uses of photographic plates, Films & Papers
- 10.2 Densitometric control
- 10.3 Techniques of negative and positive making
- 10.4 Control of gradation in continuous tone & screen negative \ positives making
- 10.5 Development and after treatment of photographic emulsions
- 10.6 Introduction to equipment used for multi-image preparation of Negatives, Positive
- 10.7 Printing Surfaces & planning of all process
- 10.8 Printing image assembly techniques for Relief, Planographic and Intaglio processes

11. Miscellaneous :

- 11.1 Originals for Black and white halftone reproduction
- 11.2 Line colour work
- 11.3 Preparation of key drawing
- 11.4 Technique of colour separation by opaueing
- 11.5 Tints and tint laying in negatives
- 11.6 Special effects photographs- Montage, Vignettes, Windows, Posterization
- 11.7 Conversion of halftone into line quarter tone & special effect halftones.

Practical

1. Basic exercise in photography.
2. Preparation of contact prints.
3. Preparation of enlargements on bromide paper and films.
4. Focusing the process camera to a given size.
5. Line negative & positive making on dry plates and films.
6. Determining density range of different types of halftone copies.
7. Handling of Densitometer.
8. Determining and setting screen distance for different screen ruling.
9. Determining the effect of different exposures on process films using halftone screen and gray scale.
10. Halftone negative making by single stop exposure system
11. Halftone negative making by multiple stop exposure system
12. Determining filter factors.
13. Application of colour filters.
14. Preparation of contact halftone positives.

REFERENCE BOOKS:

- | | |
|--|--|
| 1. Graphic Arts Photography | Hentzel, Fred Ray Blair |
| 2. Manual of Graphic Reproduction for | Eric Chambers, Litho |
| 3. Lithography | Training Service Ltd. |
| 4. The Handbook of Modern Halftone Photography | Ekald Fred Noemer |
| 5. Perfect Graphic Arts Dexarest | |
| 6. Graphic Reproduction Photography | James Walter Burden, Focal Press, London, 1973 |
| 7. Colour and its Reproduction | Gary G. Field, |
| 8. Basic Photography for the Graphic Arts | Eastman Kodak, Co. N.Y. |
| 9. Halftone Methods for the Graphic Arts | Eastman Kodak, Co. N.Y. |
| 10. Kodak Bulletin for the Graphic arts 38 | Eastman Kodak, Co. N.Y. |
| 11. Contact printing Procedures for the Graphic Arts | Eastman Kodak, Co. N.Y. |
| 12. Basic Colour for the Graphic Arts | Eastman Kodak, Co. N.Y. |
| 13. Line Photography | G.A.T.F |
| 14. Halftone Photography | G.A.T.F |
| 15. Colour Control in Lithography | Kelvin Tritton |

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PHOTO ENGRAVING & PLATE MAKING

CODE PR 207

L T P
1 -- 2**RATIONALE**

It is a technology subject. It gives the knowledge of different printing surface preparation, techniques like photoengraving, offset plates, gravure cylinders and etc. with this information one can control the operation of the equipment production of printing surface etc.

CONTENTS**1. Photo Engraving:**

- 1.1 Conventional line reproduction & Characteristics
- 1.2 Etching technique.

- 1.3 Dichromated colloid images
 - 1.4 Illumination of Exposure conditions
 - 1.5 Photo Engraving Metal like Copper, Zinc, Aluminium
 - 1.6 Development and fixative treatment
 - 1.7 Preparation of Colour Line Plates
 - 1.8 Conventional line etching –Method & Equipments used. Newspaper halftone
 - 1.9 Etching Depth and quality
 - 1.10 Fine-screen halftone on copper
 - 1.11 Deep-etching halftone
 - 1.12 Two and three colour half tone
- 2. Finishing :**
- 2.1 Equipment for printing on metal for etching
 - 2.2 Equipment used for Finishing
- 3. Duplicate Plate making :**
- 3.1 Different types & general uses
 - 3.2 Suitability for work and machines
 - 3.3 Requirements from original
 - 3.4 Requirements of plate equipment and machinery for Stereo-type and electro-types for flat bed and rotary printing.
 - 3.5 The making of rubber and plastic stereo
 - 3.6 Plate moulding, casting, finishing, casting defects
 - 3.7 Stereo metal & its composition
 - 3.8 Electro-typing-preparation of mould, electro-deposition, backing & finishing, Nickel facing
 - 3.9 Modern trends: Rubber & Synthetic plates, mounting & proving, Wrapa round duplicate
- 4. Etching :**
- 4.1 Trough etching
 - 4.2 Still bath etching
 - 4.3 Machine etching
 - 4.4 Powder-less etching
 - 4.5 Tone & colour correction by fine etching
 - 4.6 Halftone etching defects and remedies
 - 4.7 Four way powdering
 - 4.8 Shoulder etching
 - 4.9 Magnesium Etching
 - 4.10 Defects in etching and their prevention
 - 4.11 New development
- 5. Tint laying :**
- 5.1 Line and Halftone combination
- 6. Electronic Engraver :**
- 6.1 Principle and functions
- 7. Printed Circuit Board :**
- 7.1 Making and etching
- 8. Metal Printing :**
- 8.1 Photo resists
 - 8.2 Preparation of line print on zinc

- 8.3 Glue-enamel process
- 8.4 Ink-top albumen process
- 8.5 Synthetic glue process
- 8.6 Cold top Process

PRACTICAL

1. Preparation of solution for etching zinc Plate.
2. Preparation of solution for etching copper plate.
3. Preparation of line print on zinc.
4. Line block making by glue enamel process.
5. Line and Halftone combination.
6. Printing down halftone image on zinc and etching in still bath.
7. Printing down halftone image on copper and etching in still bath.
8. Bevelling and routing.
9. Finishing operations.

REFERENCE BOOKS:

1. Modern Film Planning & Plate Making (II Ed.) A.L. and Roper, K.N. SITA. Gate house.
2. Photo engraving principle & Practice

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CONVERTING OPERATION & PACKAGING

CODE PR 208

L T P
1 2/2 --

RATIONALE

With the tough marketing competitions it has become essential to make the packaging and the printed product attractive. Keeping this thing in mind converting, Operations and packaging subject has been introduced in the Diploma course. Subject content has been selected to give idea about various converting operations and different packing materials. For practical teacher should take the students to various industries, where the work of laminating, varnishing, packaging is done.

CONTENTS

1. Laminating :

- 1.1 Requirements of materials used in laminating
- 1.2 Methods of laminating
- 1.3 Causes of de-lamination warp
- 1.4 Inherent stresses
- 1.5 Adhesion factors
- 1.6 Metal film and laminations

2. Varnishing:

- 2.1 Economic application of varnishing
- 2.2 Lamination imposed by surface to be varnished
- 2.3 The nature of gloss
- 2.4 Purpose of varnish
- 2.5 Effect on colour
- 2.6 Methods of drying
- 2.7 Plate glazing

3. Carton and box Making:

- 3.1 Planning for folding and creasing
- 3.2 Form making

- 3.3 Tools
 - 3.4 Equipment and materials used in die from making
 - 3.5 Grades and type of rules
 - 3.6 Type of dies in use
 - 3.7 Block and one piece die construction
 - 3.8 Ejectors and rule nicking
- 4. Board and Materials used in Box-Making:**
- 4.1 Suitability of different classes of work
 - 4.2 Cutting and creasing make-ready
 - 4.3 Crease fault recognition
 - 4.4 Methods of waste stripping
- 5. Folding, Gluing and Creasing Work:**
- 5.1 Type of machines used
 - 5.2 Windowing
 - 5.3 Waxing
 - 5.4 Side seam gluing
 - 5.5 Stitching machinery
 - 5.6 Corner staying and box covering
- 6. Materials for Finishing:**
- 6.1 Adhesives
 - 6.2 Properties
 - 6.3 Selection and testing
 - 6.4 Varnishes
 - 6.5 Surface laminates
 - 6.6 Cover decorating materials
 - 6.7 Binding materials
 - 6.8 Metal for cutting
 - 6.9 Stamping and embossing
 - 6.10 Ancillary finishing equipment
- 7. Packaging and Dispatch:**
- 7.1 Analysis of packing requirements
 - 7.2 Importance of packing
 - 7.3 Transit and handling hazards
 - 7.4 Packing materials
 - 7.5 Methods and appliances
 - 7.6 Applications of special containers
 - 7.7 Principles of Packaging & designing
 - 7.8 Economic importance
 - 7.9 Advantages and selling aspects

Note:

1. Students should be taken to the industry where packaging work is performed.
2. Student should be taken to the industry where lamination & varnishing work is done.
3. Student should collect various types of cartons, boxes, boards etc. and prepare a record in the form of as file. Also the students make collection of laminated and varnished products. Details of every item should be given along with every collection.

REFERENCE BOOKS :

- | | |
|----------------------------------|-------------------|
| 1. Finishing Process in Printing | Focal Mortin, A.G |
| 2. Hand Book of Packaging Engg | Hanlin, J.F. |
| 3. Fundamentals of Packaging | Pain, F.A |
| 4. Book Binding & Finishing | B.D.Mendiratta |

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NEWS PAPER TECHNOLOGY

CODE PR 209

L T P
2 2/2 --**RATIONALE**

It is a very important subject. It gives the knowledge of newspaper printing. This technology has different operational departments the students are required to have a good knowledge of these departments and printing form his better future in newspaper field.

CONTENTS**1. Newspaper Organisation :**

- 1.1 Editorial
- 1.2 Advertisement
- 1.3 Marketing
- 1.4 Production and Circulation
- 1.5 Use of computers in various departments
- 1.6 Net working in Windows NT in various departments

2. Newspaper Design :

- 2.1 House style of newspaper
- 2.2 Newspaper typography
- 2.3 Page making
- 2.4 Columns

3. Newspaper Production :

- 3.1 Text Setting
- 3.2 Scanning
- 3.3 Page make up systems
- 3.4 Manuals & electronic selection of suitable systems
- 3.5 Processing for pages Colour & B/W
- 3.6 Various types of Plate used in printing
- 3.7 Plate making (colour & b/w)
- 3.8 Computer in Plate making Technique- CTP

4. Newspaper printing machines :

- 4.1 Web-Offset
- 4.2 Web-Flexo
- 4.3 Anilox offset
- 4.4 Different types of presses
- 4.5 Recent developments in newspaper presses & colour printing presses
- 4.6 Trouble shooting

5. Newspaper Materials :

- 5.1 Paper
- 5.2 News print quality
- 5.3 Standardisation
- 5.4 Specification
- 5.5 Inks
- 5.6 Newspaper printing inks
- 5.7 Specification
- 5.8 Types (summer & cold)

6. Quality Control Newspaper Production :

- 6.1 Controlling water ph & conductivity
- 6.2 Controlling print waste
- 6.3 Controlling print waste-inks
- 6.4 Controlling colour density using Densitometer

7. Advance Technique in Newspaper :

- 7.1 Application of telecommunication in newspaper industry
- 7.2 Page making
- 7.3 D.T.P systems
- 7.4 Drawing photographs and others
- 7.5 Facsimile technology
- 7.6 Equipment & Software used in newspapers industry

8. Mailroom operations :

- 8.1 Folding
- 8.2 Insetting
- 8.3 Counting
- 8.4 Binding & dispatch

Note:

- 1. Visit to the newspaper industries (Local)
- 2. Visit to the newspaper industries State capital
- 3. Visit to the newspaper National Capital

REFERENCE BOOKS:

- | | |
|---------------------------|---------------------|
| 1. Newspaper Management | Patrika Publication |
| 2. Electronic composition | Holmes |

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‘C’ PROGRAMMING

CODE PR 210

Same in all branches except AR/CC/CE/CS/ EE /IT

L	T	P
2	--	2

RATIONALE

'C' is computer programming language and also structured programming language. In 'C' programming language we consider various syntax used in programming. By having good knowledge of 'C', students can write modular application and system programs. 'C' can be used in the engineering applications. By acquiring a sound knowledge of 'C' students will be able to understand the concept of all the application areas. This course is specially designed for engineering students of all diploma streams.

CONTENTS**1. Introduction:**

- 1.1 Scope of 'C' Language
- 1.2 Distinction and similarities with other HLLs
- 1.3 Special features and Application areas

2. Elements of 'C':

- 2.1 Character set
- 2.2 Key words
- 2.3 Data types
- 2.4 Constants and Variables
- 2.5 Operators: unary, binary, ternary
- 2.6 Operator precedence

- 3. Console Input-Output:**
 - 3.1 Types of I-O
 - 3.2 Console I-O
 - 3.3 Unformatted console I-O: getchar(), putchar(), gets(), puts(), getch(), getche()
 - 3.4 Formatted I-O: scanf(), printf()

- 4. Control Flow:**
 - 4.1 Statements and blocks
 - 4.2 if
 - 4.3 switch
 - 4.4 Loops: for, while, do-while
 - 4.5 goto and labels
 - 4.6 break, continue, exit
 - 4.7 Nesting control statements

- 5. Arrays:**
 - 5.1 Basic concepts
 - 5.2 Memory representation
 - 5.3 One dimensional array
 - 5.4 Two Dimensional Array

- 6. Functions:**
 - 6.1 Basic concepts
 - 6.2 Declaration and prototypes
 - 6.3 Calling
 - 6.4 Arguments
 - 6.5 Scope rules
 - 6.6 Recursion
 - 6.7 Storage classes types
 - 6.8 Library of functions: math, string, system

- 7. Pointers:**
 - 7.1 Basic concepts
 - 7.2 &, * operator
 - 7.3 Pointer expression: assignment, arithmetic, comparison
 - 7.4 Dynamic memory allocation
 - 7.5 Pointer v/s Arrays

- 8. Structure and Enumerated Data Types:**
 - 8.1 Basic concepts
 - 8.2 Declaration and memory map
 - 8.3 Elements of structures
 - 8.4 Enumerated data types: typedef, enum
 - 8.5 Union

PRACTICALS

1. Problems based on arithmetic expression, fixed mode arithmetic.
2. Problems based on conditional statements and control structures.
3. Problems based on arrays (1-D, 2-D), functions and pointers.
4. Problems based on engineering applications.

REFERENCE BOOKS:

- | | |
|-------------------------|---------------------|
| 1. 'C' Programming | Stephen Kochan |
| 2. Programming with 'C' | Schaum's Series |
| 3. 'C' Programming | V. Balguru Swami |
| 4. 'C' Programming | Kernighan & Ritchie |
| 5. Let us 'C' | Yashwant Kanetkar |

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