CURRICULUM FOR THREE YEAR
(SIX SEMESTER)
DIPLOMA COURSE IN

PRINTING TECHNOLOGY

Effective from Session

UNDER DEVELOPMENT

Semester System

Prepared By

Curriculum Development Cell

INSTITUTE OF RESEARCH DEVELOPMENT
& TRAINING, U.P., KANPUR

APPROVED BY

BOARD OF TECHNICAL EDUCATION
U.P. LUCKNOW,
CORRECTED AS SYLLABUS COMMITTEE OF:
B.T.E. MEETING HELD ON 10.06.2015

Corrected and Approved By B.T.E. Meeting On Dated 10.06.2015

STUDY AND EVALUATION SCHEME FOR
DIPLOMA COURSE IN PRINTING TECHNOLOGY (SIX SEMESTER)
(To Be Effective From)

I Semester

Curriculum						SUBJECT	Scheme of Examination								
Periods Per Week							Theory			Practical			Grand Total
Lec.	Tutorial	Draw		Lab	Work Shop	Total		Examination Dur.	Examination Marks	Sess. Marks	Total Marks	Examination Dur.	Examination Marks	Sess. Marks	Total Marks	
5	-	-		3	-	8	1.1 Professional Communication	2.5	50	20	70	3	20	10	30	100
3	1	-		-	-	4	1.2 Applied Mathematics-I(A)	2.5	50	20	70	-	-	-	-	70
3	1	-		-	-	4	1.3 Applied Physics-I	2.5	50	20	70	-	--	--	--	70
6	-	-		4	-	10	1.4 Applied Chemistry	2.5	50	20	70	3	40	20	60	130
4	-	-		4	-	8	1.5 Graphics Design & Topography	2.5	50	25	75	3	50	25	75	150
6	-	-		6	-	12	1.6 Printing Processes-I	2.5	50	25	75	3	50	25	75	150
27	2	-		17	-	46	<---------TOTAL---------->	--	300	130	430		160	80	240	670
Games/NCC/Social and Cultural Activities + Discipline (15 + 10)																25
TOTAL																695

II Semester

3	1	-		-	-	4	2.1 Applied Mathematics-I(B)	2.5	50	20	70	-	-	-	-	70
3	1	-		4	-	8	2.2 Applied Physics-II	2.5	50	20	70	3	40	20	60	130
6	-	-		-	-	6	2.3 Basic Accountancy	2.5	50	50	100	-	--	--	--	100
6	-	-		6	-	12	2.4 Printing Processes-II	2.5	50	25	75	3	50	25	75	150
-	-	4		-	-	4	2.5 Engineering Drawing	3.0	50	20	70	-	-	-	-	70
18	2	4		10	-	34	<---------TOTAL---------->	--	250	135	385		90	45	135	520
Games/NCC/Social and Cultural Activities + Discipline (15 + 10)																25
TOTAL																545

NOTE:- (1) Each period will be 50 minutes duration.
(2) Each session will be of 16 weeks.
(3) Effective teaching will be at least 14 weeks.
(4) Remaining periods will be utilised for revision etc.

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III Semester

Curriculum							Scheme of Examination								
Periods Per Week						S U B J E C T	Theory			Practical			Grand Total
Lec.	Tutorial	Draw	Lab	Work Shop	Total		Examination Dur.	Marks	Sess. Marks	Total Marks	Examination Dur.	Marks	Sess. Marks	Total Marks	
3	-	-	2	-	5	3.1 Basic Engineering-I	2.5	50	25	75	3	50	25	75	150
3	-	-	2	-	5	3.2 Graphics Reprodoction	2.5	50	25	75	3	50	25	75	150
3	-	-	2	-	5	3.3 Printing Science	2.5	50	25	75	3	50	25	75	150
4	-	-	4	-	8	3.4 Printing Design-I	2.5	50	25	75	3	50	25	75	150
4	-	-	4	-	8	3.6 Binding & Packaging-I	2.5	50	25	75	3	50	25	75	150
3	-	-	-	-	3	3.7 Entrepreneurship Dev.	2.5	50	50	100	-	-	--	--	100
20	-	-	14	-	34	<---------TOTAL---------->	--	300	175	475		250	125	375	850
						Games/NCC/Social and Cultural Activities + Discipline (15 + 10)									25
													TOTAL		875

IV Semester

3	-	-	2	-	5	4.1 Basic Engineering-II	2.5	50	25	75	3	50	25	75	150
4	-	-	4	-	8	4.2 Computer Application	2.5	50	25	75	3	50	25	75	150
4	-	-	2	-	6	4.3 Text & Image Setting-I	2.5	50	25	75	3	50	25	75	150
3	-	-	2	-	5	4.4 Process Planning & Film Assembly	2.5	50	25	75	3	50	25	75	150
3	-	-	2	-	5	4.5 Reproduction Technology	2.5	50	25	75	3	50	25	75	150
3	-	-	2	-	5	4.6 Image Carrier Technology-I	2.5	50	25	75	3	50	25	75	150
20	-	-	14	-	34	<---------TOTAL---------->	--	300	150	450		300	150	450	900
						Games/NCC/Social and Cultural Activities + Discipline (15 + 10)									25
													TOTAL		925

NOTE:- (1) Each period will be 50 minutes duration.
(2) Each session will be of 16 weeks.
(3) Effective teaching will be at least 14 weeks.
(4) Remaining periods will be utilised for revision etc.

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V Semester

Curriculum						SUBJECT	Scheme of Examination								
Periods Per Week							Theory			Practical					Grand Total
Lec.	Tutorial	Draw	Lab	Work Shop	Total		Examination Dur.	Sess. Marks	Total Marks	Examination Dur.	Sess. Marks	Total Marks			
3	-	-	-	-	3	5.1 Business Management	2.5	50	50	100	-	--	--	--	100
4	-	-	4	-	8	5.2 Printing Design-II	2.5	50	25	75	3	50	25	75	150
4	-	-	2	-	6	5.3 Text & Image Setting-II	2.5	50	25	75	3	50	25	75	150
3	-	-	2	-	5	5.4 Planning and Colour Seperation Technology	2.5	50	25	75	3	50	25	75	150
3	-	-	2	-	5	5.5 Image Carrier Technology-II	2.5	50	25	75	3	50	25	75	150
4	-	-	4	-	8	5.6 Press Technology-I	2.5	50	25	75	3	50	25	75	150
21	-	-	14	-	35	<---------TOTAL---------->	--	300	175	475		250	125	375	850
Games/NCC/Social and Cultural Activities + Discipline (15 + 10)															25
TOTAL															875

VI Semester

4	-	-	-	-	4	6.1 Environmental Education * and Disaster Management	2.5	50	--	--	-	--	--	--	--
4	-	-	4	-	8	6.2 Press Technology-II	2.5	50	25	75	3	50	25	75	150
4	-	-	4	-	8	6.3 Binding & Packaging-II	2.5	50	25	75	3	50	25	75	150
3	-	-	-	-	3	6.4 Printing Costing & Estami.	2.5	75	25	100	-	--	--	--	100
4	-	-	4	-	8	6.5 Book Desing & Print Production.	2.5	50	25	75	3	100	25	125	200
-	-	-	4	-	4	6.6 Project.	---	--	--	--	3	100	50	150	150
-	-	-	-	-	-	Industrial Training(4 week)	---	--	--	--	-	100	40	140	140
19	-	-	16	-	35	<---------TOTAL---------->	--	225	100	325		400	165	565	890
Games/NCC/Social and Cultural Activity + Discipline (15 + 10)															25
Aggregate															915
30% of I & II Semester															342
70% of III & IV Semester															1260
100% of V & VI Semester															1790
Grand Total															3392

NOTE:-
(1) Each period will be 50 minutes duration.
(2) Each session will be of 16 weeks.
(3) Effective teaching will be at least 14 weeks.
(4) Remaining periods will be utilised for revision etc.
(5) Field visit and extension lectures at institute level as per
(6) (*) It is compulsory to appear & to pass in examination, But marks will not be included for division and percentage of obtained marks.

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C O N T E N T S

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Salient Features of the Course.

Title	Diploma Course in Printing Technology
Entry Qualification	Passed High School With 35% Marks
Duration of Course	3 years (SIX SEMESTERS)
Intake	75
Examination pattern	Semester System
Industrial Training	The Students will be placed in the industry for 4 weeks for Industrial Exposure during the last semester of the programme.

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List of experts who contributed in revising the curriculum in the workshops held on 29.01.15

1.	Shri Mohd. Imran Ahmadd	Lectruer N.R.I.P.T., Allahabad
2.	Shri Rajeev Kumar Singh	Instructor N.R.I.P.T., Allahabad
3.	Shri S. K. Vishwakarma	Lecturer N.R.I.P.T., Allahabad
4.	Shri C. P. Maurya	Lecturer N.R.I.P.T., Allahabad
5.	Shri Veer Bhadhur Singh	Sr. Manajar Danik Jagran, Noida
6.	Shri Govind Bhargava	M.D., Star Press, Kanpur
7.	Shri Ravi Kumar Srivastava	Production Head, Mail Today, Noida
8.	Shri Equeran Ahamad	Assistant Manager, Survey of India,Delhi
9.	Shri Pankaj Yadav	Professor,I.R.D.T.,Knp.

List of experts who contributed in semester system of the curriculum in the workshops held on 06.05.15

1.	Shri Mohd. Imran Ahmadd	Lectruer N.R.I.P.T., Allahabad
2.	Shri Rajeev Kumar Singh	Instructor N.R.I.P.T., Allahabad
3.	Shri S. K. Vishwakarma	Lecturer N.R.I.P.T., Allahabad
4.	Shri C. P. Maurya	Lecturer N.R.I.P.T., Allahabad
5.	Shri Pankaj Yadav	Survey of India,Delhi Professor,I.R.D.T.,Knp.

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I J O B O P P O R T U N I T I E S

1. Small Scale Industries. 10%

As Supervisor in Offset, Gravure, Flexo

and Screen Printing Establishments.

2. Self-Employment 06%

As owner of a printing press as a whole,

Or

Owner of a specialised unit, such as,

(i) Typesetting

(ii) Process camera work for production of Negatives, positives, and colour separations

(iii) Plate-making for offset printing process

(iv) Binding and other finishing work

Or

Owner of a Screen Printing Unit.

3. Medium and Large Scale Industries 65%

Supervisor or Operator of sophisticated machines like phototypesetters, colour scanners, computerised cameras, multicolour offset printing machines and web-offset machines, etc. Marketing and Sales Executive of print products.

4. Other Avenues of Employment 19%

Print Production Executives in public sector undertakings, advertising agencies, financial institutions , publishers, technical institutions.

Note.

The figures indicate the average of employed

technicians who pass out with a Diploma in

Printing Technology.

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II J O B A C T I V I T I E S

1. Type setting

    1.1 Hand composing and mechanical composition
    1.2 Phototypesetting including editing and page make-up.
    1.3 Desk-Top Publishing (DTP)

2. Reproduction Technology

    2.1 Process camera operation
    2.2 Processing the camera outputs.
    2.3 Line and half-tone photography
    2.4 Manual colour separation
    2.5 Electronic colour separation

3. Surface Preparation

    3.1 Preparing the surfaces for different printing processes

4. Press work

    4.1 Preparing printing machines of presswork
    4.2 Selection and use of substrates and ink
    4.3 Operation of printing machines
    4.4 Handling running-on problems

5. Binding and Finishing

    5.1 Warehousing functions
    5.2 Conversion of printed materials into finished jobs
    5.3 Other finishing operations
    5.4 Re-binding

6. Supervision and Management

    6.1 Planning, supervising, managing resources and factors of production
    6.2 Advertising and marketing
    6.3 Exercising quality control

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III ACTIVITY ANALYSIS

1. TYPESETTING

ACTIVITY	KNOWLEDGE	SKILL
1.1 Hand composition and Mechanical Composition	a) Types, type measurement, casting-off,typographic design b) Proof Correction c) Methods of typesetting,page make-up and imporition schemes d) Operation and maintenance of machines	a) Practice in setting of different sizes and different measures for text, tabular, and display jobs. b) Correction of errors in proofs at various stages. c) Practice in making up of pages, imposing and locking up of pages d) Handling of machines.
1.2 Phototypesetting including editing and page make-up.	a) Keyboard, operation, phototyp- esetting systems, editing b) Types type measurement, casting-off, typographic design and proof-correction. c) Computer processing d) Processing of film/paper outputs	a)Operation of keyboards in English and one/two required languages. b) Practice in setting types of different measures for text, tabular and display jobs, and correction of error in proofs at various stages. c) Page make-up.
1.3 Desk Top Publishing	a) Disk Operating System(DOS) b) Word Processing c) Page make up and graphic software d) Soft-fonts and down loading fonts e) Printers and their outputs f) Optical Character Reader (OCR) and table top Scanner	a) Operation of keyboards in English and one/two required languages. Practice in setting types of different sizes and different measures for text, tabular, and display jobs, and correction of errors in proofs at various stages. Page make-up. b) Operation of different printers and scanners

REPRODUCTION PHOTOGRAPHY

ACTIVITY	KNOWLEDGE	SKILL
2.1 Process camera operation	a) Types of process cameras, accessories and illuminants b) Types of originals and their selection. c) Optical system d) Latent image theory	a) Handling and maintenance of process camer and illuminants b) Focussing and sizing of the copy. c) Making of line and half-tone negatives.
2.2 Processing the camera outputs	a) Types of films and chemicals b) Manual and automatic processing c) Systematic working	a) Preparation and handling of chemicals b) Handling c) Use of densitometers, etc.,
2.3 Line and half tone photography	a) Theory of half-tone b) Continuous tone originals c) Types of half tone screening	a) Making half-tone negatives and positives. b) Setting screens.
2.4 Manual colour seperation	a) Colour theories, filters, screen angles and illuminants b) Colour separation methods c) Masking and colour correction	a) Handling and maintenace of process camers Focussing and sizing of the copy. Making half-tone negatives and positives. b) Making colour separation negatives, using cameras and positives by contact printer and enlarger.

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2.5 Electronic Colour separation	a) Input scanning b) Processing c) Output, and colour theories, filters screen angles.	a) Loading the originals, setting and operating the scanner. b) Processing the outputs

Surface Preparation

ACTIVITY	KNOWLEDGE	SKILL
3.1. Preparing the surface fir printing	a) Types of printing surfaces b) Stripping c) Chemical used for surface preparation d) Image formation for different printing processes e) finishing the Surface.	a) Preparation of printing surfaces, e.g. block plates, screens etc. b) Imposition schemes and film planning c) Preparing different solution d) i. Practice in graining, coating, exposing, developing, etching, lacquering, etc. Practice in desensitising for storage of plates ii. Practice in gravure screen and cylinder preparation. iii. Practice in prepartion of flexographic surface. e) Practice in finishing operations

4. Presswork

ACTIVITY	KNOWLEDGE	SKILL
4.1 Preparing printing machines for presswork	a) types, functions, and construction of printing machines b) Method of obtaining impression c) Making ready of the forme and machnies d) Various units of printing	a) Setting the various of the press for starting printing. b)Fixing the printing surfaces. c) Positioning the image, setting up of impressior and correct ink supply, and colour mixing and matching.
4.2 Selection and use of Substractes and inks	a) Kinds, sizes and weights of substrates and type of inks b) Suitability of ink and substrates, etc.	a) Care in handling of paper and ink
4.3 Operation of printing Machines	a) types, functions and construction of printing machines. b) Method of obtaining impression c) Various units of printing	a) Handling and controlling point of the machines.
4.4 Handling running on problems	a) Mechines faults and printability faults and their remedies	a) Rectification of machines faults

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5. Binding and Finishing

ACTIVITY	KNOWLEDGE	SKILL
5.1 Warechousing functions	a) Handling, storage and care of binding materials b) Paper size and subdivisions and binding materials.	a) Practice in pre-forwarding operations. b) Making calculation and counting mateials
5.2 Conversion of printed material into finished job	a) Machines and equipments required, securing and wrapper b) Adhesives	a) Operation of binding machines, stitching sewing and perfect binding b) Preparation of adhesives
5.3 Other finishing operations	a) Laminations, different decorations including gold blocking, edge decoration,	a) Use of machines, equipment and tools for decoration and finishing.
5.4 Re-binding.	a) Differnt reparing methods.	a) Practice in pre-forwarding operations ii. making calculation and counting materials iii. Operation of binding machines, stitching, sewing and perfect binding. iv. Preparation of adhesives. v. Use of machines, equipment and tools for decoration and finishing vi. Pulling to pieces, repairing demaged folios.

6. Supervision and management

ACTIVITY	KNOWLEDGE	SKILL
6.1 Planning, supervising, managing resources and factors of production	a) Human behaviour b) Related laws and theories of economics c) Technical knowledge of printing and production	a) Communication skills, leadership, innovation Enterpreneurship.
6.2 Advertising and marketing	a) Market potential b) Casting adn estimating	
6.3 Exercing quality control	a) Norms and standards of print materials	a) Assessing the quality of printed products b) Forecasting for finished jobs.

IV C o u r s e O b j e c t i v e s

At the end of the course, the students should be able to

4.01 Understand the physical principles involved in various printing processes, printing machinery and printing materials.

4.02 Understand the chemical properties of various printing materials and chemical reactions involved in printing processes.

4.03 Select suitable materials for a printing job

4.04 Supervise and handle manually operated and electronic typesetting and composing room calculations.

4.05 Supervise and handle process photography and plate making in respect of

Process photography for letter press, flexo, gravure and other processes.

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Letterpress and flexo plate-making
Retouching, stripping and layout.
Offset plate-making
Gravure plate-making
Screen printing

4.06 Supervise electronic equipments photography.

4.07 Supervise, handle machine room operations connected with

Letterpress and flexo printing
Offset printing
Gravure printing
Web-fed Press: Letterpress/ Offset.
Screen printing.

4.08 Supervise, handle finisihing operations connected with

Book, magzine and publicity materials.
Stationery items and other work.

4.09 Detect the faults in printing machines (preventive maintenance . minor repairs.)

4.10 Manage and control production, which involves.

Selecting the porecess and the methodology of production

Estimating and Costing.
Planning and Scheduling
Allocating work to sectional heads.
Directing and motivating workers to achive targets.
Maintaining production records.
Indenting materials required for the job.
Exercising control over production and quality.
Acting as a link between labour and management.
Ensuring safety of labour and plant.
rendering technical advice on choice of materials and processes.

4.11 Apply scientific method to problem solving situations in printing processes, machines and management.

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V Abstract of Curriculum Areas

The subjects identified in the previous section can be grouped into different curriuclum areas as follows.

1. Printing Science and Materials (Physics, Chemistry, Printing Science, Paper and ink).
2. Lettering, type design, typography and layout.
3. Typesetting, make-up imposition and proof reading.
4. Photographic reproduction technology (Process photography and materials, retouching, stripping and layout.
5. Letterpress and gravure platemaking (Letterpress, platemaking gravure and flexographic)
6. Lithographic platemaking
7. Letterpress printing
8. Lithographic printing (offset printing techniques)
9. Rotary letterpress and web off set (web offset and web letterpress printing techniques)
10. Gravure, flexographic and silk screen printing techniques.
11. Binding and finishing.
12. Engineering principles (Mechnical Engineering, Electrical Technology, Drawing, Electronics)
13. Printing Management (Estimating and Costing, Production Management, Industrial Management, Productivity Techniques, Material Management and Quality control.
14. Printing machinery maintenance.
15. Industrial training
16. Project work.

In addition to the foundation courses in the above areas each student will select one elective subject either in the area of printing technology or in printing machinery maintenance for an in- depth study.

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I Semester

1.1 PROFESSIONAL COMMUNICATION

[Common to All Engineering/Non Engineering Courses]

L	T	P
5	-	3

Rationale:

Communication forms an important activity of diploma holder. It is essential that he/she should be in a position to communicate in writing and orally with superiors,equals and subordinates. This subject aims at providing working knowledge of languages like Hindi and English so as to train the students in the art of communication. It is suggested that maximum attention should be given in developing Communication abilities in the students while imparting instructions by giving maximum emphasis on practice.

Sr.No.	Units	Coverage time L	T	P
1.	Introduction to communication methods meaning,channels & media written and verbal.	5	-	-
2.	Development of comprehension of English & Hindi through study of text material& language exercises.	10	-	-
3.	Development of expression through			
	A. Letters(English & Hindi)	10	-	-
	B. Report writing (English) Note making and minutes writing	10	-	-
4.	Paragraph writing, Essey writing, Proposal writing	10	-	-
5.	Composition	10	-	-
6.	Remecial Grammer & Vocabulary Building	15	-	-
		70	-	42

1. PART I : COMMUNICATION IN ENGLISH (40 Marks)

1.1 Concept of communication, importance of effective communication, types of communucation, formal, informal, verbal and nonverbal, spoken and written. Techniques of communication, Listening, reading, writting and speaking, Barriers in communication, Modern tools of communication- Fax, e-mail, Telephone, telegram, etc.

1.2 Technical communication Vs. General Communication : Development of comprehension and knowledge of English through the study of text material and language exercises based on the prescribed text book of English.

1.3 Development of expression through:

1.3.1 Paragraph writing, Essay writing, Proposal writing.

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1.3.2 Business and personal correspondence (Letters) :
Kinds of letters:-
Official, demi-offical, unofficial , for reply or in reply, quotation, tender and order giving letters. Application for a job, Resume.

1.3.3 Report writing and Note making and minutes writing.

1.4 Functional Grammer : Study of sentences and parts of speech (word class), Preposition, Verb, Articles, Abbreviations.

1.5 Vocabulary Building : Homophones, One word substitution, Idioms and Phrases.

1.6 Composition on narrative, descriptive, imaginative, argumentative, discussion and factual topics.

2. PART II : COMMUNICATION IN HINDI (10 Marks)

2.1 Development of comprehension and knowledge of Hindi usage through rapid reading and language exercises based on prescribed text material developed by IRDT.

2.2 Development of expression through ;

Letter writing in Hindi:
Kinds of letters:-
Official, demi-offical, unofficial , for reply or in reply, quotation, tender and order giving letters, Application for a job, Press release in Hindi, Report writing.

Note: Paper should be in two parts, part I - English and part II Hindi.

REFERENCE BOOKS

1. Bookshelf worksheet of Professional Communication, New Delhi : Bookshelf 2008

2. Functional Skills in language and literature by R. P. Singh, New Delhi : Oxford University Press.

3. Oxford Engilsh Hindi English Dictionary, New Delhi : Oxford 2008

LANGUAGE LAB PRACTICE

For the practice/exercise the following is suggested :-

1.A. Phonetic transcription
B. Stress and intonation :
(At least 10 word for writting and 10 word for pronunciation)

2. ASSIGNMENT : (Written Communication)

Two assignment of approximately 400 word each decided by the teacher concerned.

THE FOLLOWING MODEL IS PROPOSED :

1. a picture/photograph
2. an opening sentence or phrase

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3. a newspaper/magzine clipping or report
4. factual writting which should be informative or argumentative.

(The students may refer to "Bookshelf worksheet" for technical communication)

3. Oral Conversation:

1. Short speeches/declamation : Bid farewell, Felicitate somebody, Celebrate a public event, Offer condolences
2. Debate on current problems/topics
3. MockInterview : Preparation, Unfolding of personality and Expressing ideas effectively
4. Group discussion on current topics/problems
5. Role Play/ general conversation : Making polite enquiries at Railway Station, Post Office, Banks and other Public places, Replying to such enquiries, enquiring about various goods sold in the market and discussing their prices. Complaining about service at Hotel, restaurant, Offering apologies in reply to such complaints, complain to a company about a defective product you have brought, reply to such complaints.
6. Presentation skill, Use of OHP and LCD.
7. Through drilling of model words involving different phonetic symbols (Vowels, Consonants, Difthongs).

4. Aural :

Listening to conversation/talk/reading of short passage and then writting down the relevant or main points in the specified number of words and answering the given questions

The assignments/project work are to be evaluated by the internal/ external examiner. The distribution of 30 marks e.g.

10 marks for assignment (Given by subject teacher as sessional marks)
10 marks for conversation and viva-voce
10 marks for phonetic transcription

STRUCTURE OF THE PAPER OF PROFESSIONAL COMMUNICATION

Distribution of Marks

Theory Paper : 50 Marks
Sessional : 20 Marks
Pratices : 30 Marks

Q1. Question based on the topics of the prescribed syllabus will be set for testing candidates ability to understand the content, explain words and phrases, making sentence of given words and ability to summarise will be included. All questions will have to be answered.

A.	from English Text Book	10 Marks
B.	from Hindi Text Book	5 Marks

Q2. Candidates will be required to write one letter (English) and one letter in (Hindi) from a choice of two -

A.	English Letters	5 Marks
B.	Hindi Letters	5 Marks

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Q3. Report Writting on given outlines 5 Marks

Q4. There will be a number of short answer questions to test the candidates knowledge of functional grammer, structure and usage of the language. All the items in this question will be compulsory. The grammar questions has four parts -

(Total Part: A For 5 Marks, B For 3 Marks, C For 3 Marks and D For 4 Marks)

A. This part of the question has to do with the transformation of sentences. English uses several patterns of sentence formation and the same meaning can be expresed by several patterns e.g. Active to Passive voice and vice versa, Direct to Indirect and vice versa, Reframing sentences by changing part of speech e.g Noune to Adjective, Interchanging degree of comparison.

Interchanging Moods - Affirmative to Negative, Assertive to Interrogative or to exclamatory

B. The second part usually requires blanks in a sentence to be filled in with a suitable preposition and articles.

C. The third part is usually an exercise on tenses.

D. The fourth part concerns with one word substitution and abbrevation, uses of idioms and Phrases, Homophones.

Q5. COMPOSITION : (About 300 Words) (5 marks)

Candidates will be required to select one composition topic from a choice of five. The choice will normally include narrative descriptive, argumentative, discussion and factual topics. The main ceteria by which the composition will be marked are as follows

A. the quality of the language employed, the range and appropriateness of vocabulary and sentence structure the correctness of grammatical construction, punctuation and spelling.

B. The degrees to which candidate have been successfully in organising both the composition as a whole and the individual paragraphs.

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1.2 APPLIED MATHEMATICS I(A)

[Common to All Engineering Courses]

L	T	P
3	2/2	-

Rationale:

The study of mathematics is an important requirement for the understanding and development of any branch of engineering. The purpose of teaching mathematics to diploma engineering students is to impart them basic knowledge of mathematics which is needed for full understanding and study of engineering subjects.

S.N.	Units	Coverage L	Time T	P
1.	Algebra- I	8	3	-
2.	Algebra- II	8	3	-
3.	Trignometry	6	2	-
4.	Differential Calculus-I	10	3	-
5.	Differential Calculus-II	10	3	-
		42	14	-

DETAILED CONTENTS:

1. ALGEBRA-I : (10 Marks)

1.1 Series : AP and GP; Sum, nth term, Mean

1.2 Binomial theorem for positive, negative and fractional index (without proof). Application of Binomial theorem.

1.3 Determinants : Elementary properties of determinant of order 2 and 3, Multiplication system of algebraic equation, Consistency of equation, Crammer's rule

2. ALGEBRA-II:(10 Marks)

2.1 Vector algebra : Dot and Cross product, Scaler and vector triple product.

2.2 Complex number.

Complex numbers, Representation, Modulus and amplitud Demoivre theorem, its application in solving algebraic equations, Mod. function and its properties..

3. TRIGONOMETRY :(8 Marks)

3.1 Relation between sides and angles of a triangle : Statement of various formulae showing relation ship between sides and angle of a triangle.

3.2 Inverse circular functions : Simple case only

4. DIFFERENTIAL CALCULUS - I : (12 Marks)

4.1 Functions, limits, continuity, - functions and their graphs, range and domain, elementary methods of finding limits (right and left), elementary test for continuity and differentiability.

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4.2 Methods of finding derivative, - Function of a function, Logaritimic differentiation, Differentiation of implicit functions.

5. DIFFERENTIAL CALCULUS -II :(10 Marks)

5.1 Higher order derivatives, Leibnitz theorem.

5.2 Special functions (Exponential, Logarithmic, Inverse circular and function), Definition, Graphs, range and Domain and Derivations of each of these functions.

5.3 Application - Finding Tangants, Normal, Points of Maxima/Minima, Increasing/Decreasing functions, Rate, Measure, velocity, Acceleration, Errors and approximation.

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1.3 APPLIED PHYSICS-I

[Common to All Engineering Courses]

L	T	P
3	2/2	-

Rationale:

Engineering physics is a foundation Course. Its purpose is to develop proper understanding of physical phenomenon and scientific temper in the students. While teaching the subject,teachers should make maximum use of demonstrations to make the subject interesting to the students.

TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Topics	L	T	P
1.	Units & Dimensions	3	1	-
2.	Errors in Measurement	3	1	-
3.	Circular Motion	4	1	-
4.	Motion of Planets	4	1	-
5.	Dynamics of rigid body (Rotational Motion)	5	1	-
6.	Fluid Mechanics and Friction	4	1	-
7.	Friction	4	1	-
8.	Harmonic Motion	5	2	-
9.	Heat & Thermodynamics	6	4	-
10.	Acoustics	4	1	-
		42	14	-

DETAILED CONTENTS:

1. Units and Dimensions (4 Marks)

S.I. Units & Dimensions of physical quantities, Dimensional formula and dimensional equation. Principle of homogenity of dimensions and applications of homogenity principle to:

i) Checking the correctness of physical equations,

ii) Deriving relations among various physical quantities,

iii) Conversion of numerical values of physical quantities from one system of units into another. Limitations of dimensional analysis.

2. ERRORS AND MEASUREMENT (4 Marks)

Errors in measuremnts, accuracy and precision, random and systematic errors, estimation of probable errors in the results of measurement(Combination of erros in addition, substraction, multipication and powers). Significant figures, and order of accuracy in respect to instruments,

3. Circular Motion (5 Marks)

Central forces. Uniform Circular motion (Horizental and Vertical cases),angular velocity,angular acceleration and centripetal acceleration.Relationship between linear and angular velocity and acceleration. Centripetal and

centrifugal forces. Practical applications of centripetal forces. Principle of centrifuge.

4. MOTION OF PLANETS AND SATELLITES :(5 Marks)

Gravitational force, Acceleration due to gravity and its variation w.r. to height and depth from earth, Kapler's Law, Escope and orbital velocity, Time period of satellite, Geo-stationary, Polar satellites (Concept Only)

5. Dynamics of Rigid Body (Rotational Motion) (6 Marks)

Rigid body,Rotational motion, Moment of inertia,Theorems(Perpendicular and Parallel axis) of moment of inertia (Statement). Expression of M.I. of regular bodies (Lamina, Sphere, Disc, Cylindercal),Concept of Radius of gyration, angular momentum, Conservation of angular momentum, Torque, Rotational kinetic energy. Rolling of sphere on the slant plane . Concept of Fly wheel.

6. Fluid Mechanics :(5 Marks)

Surface tension, Capillary action and determination of surface tension from capilary rise method, Equation of continuity (A1V1=A2V2), Bernoulli's theorem, and its application stream line and Turbulent flow, Reynold's number.

7. Friction :(4 Marks)

Introduction, Physical significance of friction, Advantage and disadvantage of friction and its role in every day life. Coefficients of static and dynamic friction and their measurements. viscosity, coeff. of viscosity, & its determination by stoke's method.

8. Harmonic Motion (6 Marks)

Periodic Motion , characterstics of simple harmonic motion; equation of S.H.M. and determination of velocity and acceleration. Graphical representation. Spring-mass system. Simple pendulum. Derivation of its periodic time. Energy conservation in S.H.M.. Concept of phase, phase difference, Definition of free, forced, undamped and damped vibrations, Resonance and its sharpness, Q-factor.

9. Heat & Thermodynamics: (6 Marks)

Modes of heat transfer (Conduction, Convection and Radiation), coefficient of thermal conductivity Isothermal and adiabatic process. Zeroth First, Second Law of Thermodynamics and Carnot cycle, Heat Engine (Concept Only).

10. Acoustics (5 Marks)
Definition of pitch, loudness, quality and intensity of sound waves. Echo, reverberation and reverberation time. Sabine's formula without Derivation. Control of reverberation time (problems on reverberation time). Accoustics of building defects and remedy.

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1.4 APPLIED CHEMISTRY

[Common to All Engineering Courses]

L	T	P
6	-	4

Rationale:

Engineering Chemistry has profound and deep relationship with the industrial and environmental technology. This curriculum intends to impart technical knowledge alongwith productive practice to the students of the diploma engineering. The teachers are expected to guide the students in the classroom and the laboratories according to the curriculum by demonstrations and by showing relevant materials and equipments to inculcate interests in learning among students.

TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Topics	L	T	P
1.	Atomic Structure	4	-	-
2	Chemical Bonding	6	-	-
3.	Classification of Elements	4	-	-
4.	Electro Chemistry-I	7	-	-
5.	Electro Chemistry-II	8	-	-
6.	Chemical Kinetics	4	-	-
7.	Catalysis	4	-	-
8.	Solid State	4	-	-
9.	Fuels	4	-	-
10.	Water Treatment	6	-	-
11.	Colloidal State	4	-	-
12.	Lubricants	4	-	-
13.	Hydrocarbons	7	-	-
14.	Organic Reactions & Mechanism	8	-	-
15	Polymers	4	-	-
16	Synethetic Materials	6	-	-
		84	-	56

DETAILED CONTENTS:

1. ATOMIC STRUCTURE :(3 MARKS)

Basic concept of atomic structure, Matter wave concept, Quantum number, Haisenberg's Uncertainty Principle, Shaples of orbitals.

2. CHEMICAL BONDING :(4 MARKS)

Covalent bond, Ionic & Co-ordinate, Hydrogen bonding, Valence bond theory, Hybridisation, VSEPR theory, Molecular orbital theory.

3. CLASSIFICATION OF ELEMENTS :(3 MARKS)

Modern classification of elements (s,p,d and f blcok elements), Periodic properties : Ionisation potential electro negativity, Electron affinity.

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4. ELECTRO CHEMISTRY-I:(3 MARKS)

Arrhenius Theory of electrolytic dissociation, Transport number, Electrolytic conductance, Ostwald dilution law. Concept of Acid and bases : Bronsted, Arrhenius and Lewis theory. Concept of pH and numericals. Buffer solutions, Indicators, Solubility product, Common ion effect with their application,

5. ELECTRO CHEMISTRY-II:(3 MARKS)

Redox reactions, Electrode potential(Nernst Equation), Electro-chemical cell (Galvanic and Electrolytic). EMF of a cell and free energy change. Standard electrode potential, Electro chemical series and its application. Chemical and Electrochemical theory of corrosion, Galvenic Series. Prevention of corrosion by various method.

6. CHEMICAL KINETICS :(3 MARKS)

Law of mass action, order and molecularity of rection. Activation energy, rate constants, Ist order reactions and 2nd order reactions.

7. CATALYSIS :(2 MARKS)

Definition Characteristics of catalytic reactions, Catalytic promotors and poison , Autocatalysis and Negative catalysis, Theory of catalysis, Application.

8. SOLID STATE :(2 MARKS)

Types of solids (Amorphous and Crystalline), Classification (Molecular, Ionic, Covalent, Metallic), Band theory of solids (Conductors, Semiconductors and Insulators), types of Crystals, FCC, BCC, Crystal imperfection.

9. FUELS :(3 MARKS)

Definition, its classification, high & low Calorific value.Determination of calorific value of solid and liquid fuels by Bomb calorimeter.

Liquid fuel - Petroleum and its refining, distillate of petroleum (Kerosene oil, Disel and Petrol), Benzol and Power alchol. Knocking, Anti-knocking agents, Octane number and Cetane number.

Cracking and its type, Gasoling from hydrogenation of coal (Bergius process and Fischer tropsch's process)

Gaseous Fuel - Coal gas, Oil gas, Water gas, Producer gas, Bio gas, LPG and CNG.

Numerical Problems based on topics

10. WATER TREATMENT :(3 MARKS)

Hardness of water, Its limits and determination of hardness of water by EDTA method. Softening methods (Only Sods lime, Zeolote and Ion exchange resin process). Disadvantage of hard water in different industries, scale and sludge formation, Corrosion, Caustic embritlement, primming and

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foarming in biolers.

Disinfecting of Water By Chloramine-T, Ozone and Chlorine. Advantage and disadvantage of chlorinational, Industrial waste and sewage, Municipality waste water treatment, Definition of BOD and COD. Numerical Problems based on topics.

11. COLLOIDAL STATE OF MATTER :(3 MARKS)

Concept of collidal and its types, Different system of colloids, Dispersed phase and dispersion medium.
Methods of preparation of colloidal solutions, Dialysis and electrodialysis. Properties of colloidal solution with special reference to absorption, Brownian Movement, tyndal effect, Electro phoresis and coagulation. relative stability of hydrophillic and hydrophobie colloids. Protection and protective colloids. Emulsion, Types, preparation,properties and uses. Application of colloids chemistry in different industries.

12. LUBRICANTS :(3 MARKS)

Definition, classification, Necessasity and various kinds of lubricants. Function and mechanism of action of lubricants and examples. Properties of lubricants, Importance of additive compunds in lubricants, Synthetic lubricants and cutting fluids. Industrial application, its function in bearing.

13. HYDROCARBONS:(4 MARKS)

A. Classification and IUPAC nomeuclature of organic compounds hamologous series (Functional Group)

B. Preparation, properties and uses of Ethane, Ethene, Ethyne (Acetylene), Benzene and Toluene.

14. ORGANIC REACTIONS & MECHANISM:(4 MARKS)

1. Fundamental auspects -

   A. Electrophiles and nucleophiles, Reaction Intermediates, Free radical, Carbocation, Carbanion
   B. Inductive effect, Mesomeric effect, Electromeric effect.

2.A. Mechanism of addition reaction (Markonicove's Rule, Cyanohydrin and Peroxide effect),

B. Mechanism of Substitution reactions; (Nucleophillic) hydrolysis of alkyle halide, electrophillic substitution halogenation, Sulphonation, Niration and friedel-Craft reaction.

C. Mechanism of Elimination reaction - Dehydration of primary alcohol, Dehyrohalogenation of primary alkyl halide.

15. POLYMERS :(3 MARKS)

1. Polymers and their classification. Average degree of polymerisation, Average molecular weight, Free radical polymerisation (Mechanisms)

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2. Thermosetting and Thermoplastic resen -

   A. Addition polymers and their industrial application- Polystyrene, PVA, PVC, PAN, PMMA, Buna-S, Buna-N, Teflon.

   B. Condensation polymer and their industrial application : Nylon 6, Nylon 6,6, Bakelite, Melamine formaldehyde, Urea formaldehyde, Terylene or Decron, Polyurethanes.

3. General concept of Bio polymers, Biodegradable polymers and inorganic polymers(Silicon)

16. SYNETHETIC MATERIALS :(4 MARKS)

A. Introduction - Fats and Oils
B. Saponification of fats and oils , Manufacturing of soap.
C. Synthetic detergents, types of detergents and its manufacturing.
3. EXPLOSIVES: TNT, RDX, Dynamite.
4. Paint and Varnish

LIST OF PRACTICALS

1. To analyse inorganic mixture for two acid and basic radicals from following radicals

   A. Basic Radicals :

   NH_4^+, Pb^{++}, Cu^{++}, Bi^{+++}, Cd^{++}, As^{+++}, Sb^{+++},

   Sn^{++}, Al^{+++}, Fe^{+++}, Cr^{+++}, Mn^{++}, Zn^{++}, Co^{++}

   Ni^{++}, Ba^{++}, Sr^{++}, Ca^{++}, Mg^{++}

   B. Acid Radicals :

   CO_3^{--}, S^{--}, SO_3^{--}, CH_3COO^-, NO_2^-,

   No_3^- , Cl^-, $Br\_$, I^- , So_4^{--}

2. To determine the percentage of available Chlorine in the supplied sample of Bleaching powder.

3. To determine the total hardness of water sample in terms of $CaCo_3$ by EDTA titration method using Eriochroma black-T indicator.

4. To determine the strength of given HCl solution by titration against NaOH solution using Phenolphthalium as indicator.

5. To determine the Chloride content in supplied water sample by using Mohr's methods.

6. Determination of temporary hard ness of water sample by O-Hener's method.

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1.5 GRAPHIC DESIGN & TYPOGRAPHY

Rationale :

Printing production is based on proper designing and typographic planning. Introduction of Graphic Design & Typography subject is essential to impart basic knowledge and skills in graphic design principles, layouts, typographic principles and methods etc. This subject is essential as prerequisite for studying printing Design and Letter Assembly subjects in the Diploma Curriculum.

1. Printed products,

1.1 Introduction to format and design factors for printed products, photography and illustrations.

1.2 Embellishment: Leaflets, pamphlets, Booklets, Folders, Catalogues, Brochures, Manuals , Books, Magazines and Newspapers, Business-forms and commercial stationery; lables, cartons, point of-sale display materials etc.

2. Visual Ingredients, Graphic Design Principles and Layout :

2.1 Graphic design principles:Balance, geometrical and optical centres, white space , optical space, harmony, contrast, unity, proportion, rhythm, emphasis, simplicity, etc.

2.2 Visual ingredients : Point, line, shape, mass, size and scale, colour, tone , texture, pattern, etc.

2.3 Layouts: Purpose and function, stages of latest layout techniques.

3. Typography :

3.1 Introduction to printing type and composing techniques.

3.2 Selecting type face suitable to the subject or purpose. Relationship between type face and printing processes, between type face and paper surfaces. Legibility and readability.

3.3 Monograms, trade marks and logotypes.

4. Typesetting Techniques :

4.1 Typesetting materials, tools and equipment required, principles of setting text, display, tables and tabular setting by latest software.

4.2 Different methods of typesetting: Introduction to hand setting and machanical setting, photo, digital setting *By various software).

4.3 Proof reading: Proof reader and Copy holder, proof reading marks, kinds of proofs, proof reading procedure. Correcction and page make up.

PRACTICALS

(1) GRAPHIC DESIGN (15 MARKS)

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1. Collection of Specimens of printed products and their study.

2. Collection of specimens of type faces related to main groups of type design.

3. Layout preparation for simple title pages of the book, text pages, letterheads, visiting cards, invitation cards, envelopes, greeting cards, certificates, pamphlets and leaflets.

(2) TYPOGRAPHY (25 MARKS)

1. Drawing of lay of the type cases for Hindi and English.

2. Create headlines and captions (Reading line, Multiline, Leading type size and colour).

3. Letterhead setting in English and Hindi.

4. Visiting card, invitation card setting in English and Hindi. Proofing proof reading and correcting typeset matter.

Note :-

The students shall be required to produce at the time of Internal and External Examination a portfolio of specimens of prescribed practical work duly signed by him and his teacher.

REFERENCE BOOKS

1. Art & Production , N.N. Sarkar, Sagar Publication, New Delhi.
2. A Hand Book of Typography, Kailas, Anupam prakashan, Allahabad.
3. Theory & Practical of composition, A.C. Goel, Saroj Prakashan ,Allahabad.
4. Adhunik Sanyojan shastra, C.S. Misra, Anupam prakashan, Allahabad.
5. Compossing & Typography Today, B.D. Mendiratta, Printek Publication, New Delhi.
6. Exploring Typography : By Tova Rabinowitz - Publisher : Thomson Delmar Learning ; U.K.

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1.6 PRINTING PROCESSES-I

Rationale:

This is a core subject of printing technology. It is essential for students to learn about the basics of various printing processes, and printing machines.

1. Introduction To Printing Technology :

1.1 History, Ingredients of Printing (image carriers, printing inks, Printing substrates).

1.2 Different printing Processes and their Modern uses

1.3 Suitability and limitations of each printing process for various jobs and purposes.

1.4 Outline of printing production process with basic ideas of Current practices in the ares of prepress in press and postpress operations.

1.5 Introduction to house keeping.

2. Letterpress Printing Technology :

2.1 Introduction to Machine room equipments and materials.

2.2 Classification, functions and uses of letterpress machines,

2.3 Introduction to basic mechanical and operational feature of letter press platen machine, Impression and ink transfer methods. Impression and ink transfer methods in letterpress machines.

2.4 Introduction to Premake-ready and Make-ready operations

2.5 Introduciton to Running defects, their causes and remedies.

3. Flexography Printing Techniques :

3.1 Introduction to Flexographic Printing and its uses in Printing Industry

3.2 Basic principle of flexographic printing.

3.3 Types of substrates used in flexographic printing.

LIST OF PRACTICALS

1. Introduction to the printing process department.
2. Demonstration and proper use of various tools and equipments.
3. Sample collection of various printed materials.
4. Simple imposition exercise up to 8 pages upright and oblong.
5. Locking up of the matter and dressing, picking of impression surface.
6. Handling, make-ready and operation of printing machines.
7. Printing and proffing of various small jobs.
8. Sample collection of various printing papers/substrates.
9. Demonstration of flexography printing.

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REFERENCE BOOKS

1. Letter press printing part I-II, C.S. Misra, Anupam Prakashan, Allahabad.

2. Akshar Mudran Shastra, C.S. Misra, Anupam Prakashan, Allahabad.

3. Printing Processes, V.S. Krishnamurthy, Chennai.

4. What the printer should know about ink- Dr. Nelson Ra Eldced- GATF Press.

5. What the printer should know about paper - Lawrance A Wilson - GATF Press

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II Semester

2.1 APPLIED MATHEMATICS I (B)

[Common to All Engineering Courses]

L	T	P
3	2/2	-

Rationale:

The study of mathematics is an important requirement for the understanding and development of any branch of engineering. The purpose of teaching mathematics to diploma engineering students is to impart them basic knowledge of mathematics which is needed for full understanding and study of engineering subjects.

S.N.	Units	Coverage Time L	T	P
1.	Integral Calculus-I	12	4	-
2.	Integral Calculus-II	12	4	-
3.	Coordinate Geometry (2 Dimensional)	10	3	-
4.	Coordinate Geometry (3 Dimensional)	8	3	-
		42	14	-

DETAILED CONTENTS:

1. INTEGRAL CALCULUS - I : (14 Marks)

Methods of Indefinite Integration :-

1.1 Integration by substitution.

1.2 Integration by rational function.

1.3 Integration by partial fraction.

1.4 Integration by parts.

2. INTEGRAL CALCULUS -II :(14 Marks)

2.1 Meaning and properties of definite integrals, Evaluation of definite integrals. Integration of special function.

2.2 Application : Finding areas bounded by simple curves, Length of simple curves, Volume of solids of revolution, centre of mean of plane areas.

2.3 Simposns 1/3rd and Simposns3/8th rule and Trapezoidal Rule : their application in simple cases.

3. CO-ORDINATE GEOMETRY (2 DIMENSION):(14 Marks)

3.1 CIRCLE :

Equation of circle in standard form. Centre - Radius form, Diameter form, Two intercept form.

3.2 Standard form and simple properties

Parabola x2=4ay, y2=4ax,

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Ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$

Hyperbola $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$

4. CO-ORDINATE GEOMETRY (3 DIMENSION):(8 Marks)

4.1 Straight lines and planes in space -

Distance between two points in space, direction cosine and direction ratios, Finding equation of a straight line and Plane (Different Forms),

4.2 Sphere $x^2 + y^2 + z^2 + 2gx + 2fy + 2wz = d$ (Radius, Centre and General Equation)

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2.2 APPLIED PHYSICS-II

[Common to All Engineering Courses]

L	T	P
3	2/2	4

Rationale:

Engineering physics is a foundation Course. Its purpose is to develop proper understanding of physical phenomenon and scientific temper in the students. While teaching the subject,teachers should make maximum use of demonstrations to make the subject interesting to the students.

TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Topics	L	T	P
1.	Optics	4	1	-
2.	Introduction To Fiber Optics	4	1	-
3.	Laser & its Application	4	1	-
4.	Electrostatics	4	1	-
5.	D.C. Circuits	4	1	-
6.	Magnetic Materials & Their Properties	4	1	-
7.	Semi Conductor Physics	4	1	-
8.	Introduction Diode & Transistors	4	2	-
9.	Introduction To Digital Electronics	4	2	-
10.	Non-conventional energy sources	6	3	-
		42	14	56

1. Optics (4 Marks)

Nature of light, Laws of Reflection and Refraction, Snell's Law, Interference (Constructive and Deotructive), Diffraction and Polarization (Concept Only), Law of Mallus and Polaroids.

2. Introduction To Fibre Optics :(5 Marks)

Critical angle, Total internal reflection, Principle of fibre optics, Optical fibre, Pulse dispersion in step-index fibres, Graded index fibre, Single mode fibre, Optical sensor.

3. Lasers and its Applications (4 Marks)

Absorbtion and Emission of energy by atom, Spontaneous and Stimulated Emission, Poluation inversion, Main component of laser and types of laser- Ruby Laser, He-Ne laser and their applications. Introduction to MASER.

4. Electrostatics :(4 Marks)

Coutomb's Law, Electric field, Electric potential, Potential energy, Capacator, Energy of a charged capacitor, Effect of dielectric on capacators.

5. D.C. Circuits (5 Marks)

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Ohm's Law, Kirchoff's Law and their simple application, Principle of Wheat Stone bridge and application of this principle in measurement of resistance (Meter bridge and Post Office Box); Carey Foster's bridge, potentiometer.

6. Magnetic Materials and Their Properties: (5 Marks)

Dia, Para and Ferro-magnetism, Ferrites, Magnatic Hysteresis Curve and its utility. Basic idea of super conductivity, Meissner's effect.

7. Semiconductor Physics (4 Marks)

Concept of Energy bands in soldis, classification of solids into conductors, insulators and semiconductors on the basis of energy band structure. Intrinsic and extrinsic semi conductors, Electrons and holes as charge carriers in semiconductors, P-type and N-type semiconductors.

8. Junction Diode and Transister : (6 Marks)

Majority and Minority charge carriers,P-N junction formation, barrier voltage, Forward and reverse biasing of a junction diode, P-N junction device characteristics, Formation of transistor, transistor-action, Base, emitter and collector currents and their relationship LED's.

9. Introduction To Digital Electronics : (6 Marks)

Concept of binary numbers, Interconversion from binary to decimal and decimal to binary. Concepts of Gates (AND, NOT, OR).

10. Non-conventional energy sources: (7 Marks)

(a) Wind energy : Introduction, scope and significance, measurement of wind velocty by anemometer, general principle of wind mill.

(b) Solar energy: Solar radiation and potentiality of solar radiation in India, uses of solar energy: Solar Cooker, solar water heater, solar photovoltaic cells, solar energy collector.

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PHYSICS LAB

Note: Any 4 experiments are to be performed.

1. Determination of coefficient of friction on a horizontal plane.

2. Determination of 'g' by plotting a graph T2 verses l and using the formula g=4n2/Slope of the graph line

3. Determine the force connstant of combinationof springs incase of 1. Series 2. Parallel.

4. To verify the series and parallel combination of Resistances with the help of meter bridge.

5. To determine the velocity of sound with the help of resonance tube.

6. Determination of viscosity coefficient of a lubricant by Stoke's law.

7. Determination of E1/E2 of cells by potentio meter.

8. Determination of specific resistance by Carry Foster bridge.

9. Determination of resitivity by P.O.Box.

10. Verification of Kirchoff's Law.

11. To draw Characteristics of p-n Junction diode.

12. To measure instantaneous and average wind velocity by indicating cup type anemometer/hand held anemometer.

NOTE :

Students should be asked to plot a graph in experiments (where possible) and graph should be used for calculation of results. Results should be given in significant figures only.

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2.3 BASIC ACCOUNTANCY

Rationale :

All productive activities in an industry are motivated by profit. An accountant analyses the financial aspect of a business to give a correct picture as to whether it is running on profit or at a loss, as well as how that profit has been made or that loss sustained. People in printing management should be able to do this evaluation with a view to enahancing the profit or eliminating the loss of an organisation.

DETAILED CONTENT

1. Accountancy: Definition- object of accountancy- double entry system - explanation of terms - first principles of double entry.

2. Journal: Rules of journalising - division of accounts - the importance of ledger - balancing personal accounts cash accounts, goods accounts, closing of real accounts closing of normal account, capital account , drawing account.

3. Sub division of journals: the cash book, bank reconciliation statement, journal proper and its objects, rectification of errors. Brief descriptions of profit and loss accounts and balance sheet.

Reference Books

1. Batliboi, Double Entry Book Keeping.

2. Basic Accounting, Goel, Himalaya Publishing House Mumbai.

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2.4 PRINTING PROCESSES-II

Rationale :

It is a core subject of printing technology. It is essential for students to learn about the basics of various printing processes, and printing machines.

1. Introduction:

Lithographic Printing

1.1 Origin and development of lithography.

1.2 Characterstics, suitability and limitations of lithography.

1.3 Principles of lithography and their application to image formation.

1.4 Image carriers for Lithographic Printing.

1.5 Lithographic presses: Kinds, basic mechanical features and uses.

1.6 Offset Printing machine room materials and accessories.

1.7 Pre make ready and make ready operations for printing Single colour text and line illustrations on sheetfed offset machines.

1.8 Running defects, causes and their remedies.

2. Gravure Printing

2.1 Gravure Image Carriers use in industry

2.2 Basic mechanical and operational features of various gravure printing machines: uses, advantages and limitations of gravure printing press. (Packaging Press, Label Press, Publication Press).

2.3 Outline of Gravure Printing Process.

3. Screen Printing

3.1 Manual and Photomechanical Image Carriers for Screen Printing.

3.2 Screen Printing inks - Types, Properties.

3.3 Screen Printing Machines, Hand Printing Tables, Container Screen Printing, Flat Bed Hinged Frame (Automatic), Rotary Screen Printing, Carousal Printing Machine.

3.4 Outline of Screen Printing Process.

4. Digital Printing :

4.1 Basic knowledge of digital printing

4.2 Use of digital printing

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PRACTICAL

1. Handling and maintenance of sheet Fed Offset Machine.
2. Pre-makeready (Pre-press operations) & Makeready on sheet fed offset machine.
3. Printing half sheet work (4 pages) text jobs on sheetfed offset machine.
4. Printing sheet work (8 pages) text jobs on sheetfed machine.
5. Printing single colour line illustration jobs on sheetfed machine.
6. Printing two-colour registration jobs on sheetfed machine.
7. Sample collection of printed materials
8. Sample collection of paper/substrate.

Note :-

The student shall be required to produce at the time of internal and external examination a portfolio of specimen verified by his teacher.

REFERENCE BOOKS

1. Technology of offset printing, C.S. Misra, Anupam prakashan, Allahabad.
2. Offset Mudran Shastra, C.S. Misra, Anupam prakashan, Allahabad.
3. Commercial Screen Printing, Bhamare, Adorn Publication Naupada, Thane.
4. Complete Screen Printing, K.K. Agrawal, Dehati Pustak Bhandar, Delhi.
5. Machine Printing, Focal Press, London.
6. Vyavsayik Screen Printing, Bhamare, Adorn Publication Naupada, Thane.
7. Screen Process Printing -By John Stephens, Blue Print, An imprint of Hapman and Hall, London
8. Modern Gravure Technology - By Harry B. Smith, Pira International, U.K.

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2.5 ENGINEERING DRAWING

Rationale :

Engineering Drawing is one of the most important modes of communication used by Engineers and Technicians. Technicians being middle level supervisors in between Engineers on one side and Craftsmen on the other side, they should be well versed with reading and interpreting the Engineering Drawings. Though the printing technicions may not be required to prepare instrument perfect drawings, they should be congversant with the systems and conventions followed as per proficiency in free hand sketching which will help them solving day to day problems.

Detailed Contents Practicals

1. Introduction

1.1. Scope of the subject: Paper sizes and layout as per Indian Standards, Instruments used for drawing.

1.2 Scale of drawing reduced and enlarged scale drawings.

2. Free hand lettering

2.1 Designation of letters, Size of letters as per Indian Standards, Types and conventions of lines as per indian Standards.

2.2 Practice in lettering single stroke letters and numerals.

3. Dimensioning as per Indian Standards.

3.1 Need for dimensioning, Conventions of dimensioning: Aligned dimensioning and unidirectional demensioning.

3.2 Chain dimensioning, Parallel dimensioning, Progressing dimensioning, Dimensioning from datum.

4. Orthographic Projection

4.1 Definition, Principal planes H.P. and V.P.

4.2 Minimum munber of views required to describe an object.

4.3 Method of obtaining the views.

5. First angle and Third angle Projections.

5.1 Relative position of viewer object and plane in first angle and third angle projection, Placements of views in first angle and third angle projections.

5.2 Free hand sketching of the objects given in three dimensions.

5.3 Identification of the angle of projection used in a drawing, Supplying missing lines in the given views.

5.4 Drawing of views for some real objects from Printing Technology.

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6. Sectioning

6.1 Need for sectioning, Types of sectioning: Half, full and revolved sections, Choosing the correct sectional plane.

6.2 Drawing sectional view, Conventional representation of materials in section as per Indian Standards.

7. Pictorial Drawing.

7.1 Need for pictorial drawing, Types of pictorial drawing: Isometric drawing, cabinet drawing and cavalier drawing.

7.2 Prepare pictorial drawing of simple components.

8. Free hand Sketching.

8.1 Free-hand sketching of the pictorial view when three views are given.

8.2 Free-hand sketching of Isometric view of simple components.

9. Interpretation of Engineering Drawing.

9.1 Detailed drawing, Assembly drawing, Production drawing.

9.2 Making simple sketches from working drawings, Identity the system of projection used.

9.3 The system of dimensioning used, Compute the unknown dimension from given dimension.

9.4 Visualise the components when the orthographic views are given, Visualise the internal details from sectional views.

10. Conventions

10.1 Conventional representation of the following as per ISI External & Internal threads , Springs (Spiral,Leaf, Helical), nut & bolts, gear, splined shaft, bearing, straight & diamond knurling, ratchet & pinion, square & hexagonal on shaft welded & rivetted joints, welded symbol & conventions.

11 Machine Elements

11.1 Thread profiles- BSW , Acme ,square ,metric & V threads along with their angles & projections

11.2 Keys- sketching isometric views & orthographic views of parallel & taper sunk key, Gib head key, round key or pin , wood ruff key

11.3 Free hand sketching of following saft coupling-(a) Muff coupling (b) Flanged coupling (c) Universal coupling.

11.4 Lockingdevices.

12 Free Hand Sketching

12.1 Driving mechanism of offset printing machine : (a) Printing Unit (b) Inking Unit (c) Dampening Unit (d) Feeding Unit (e)

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Delivery Unit

12.2 Line Diagram of speed control of horizontal whirler.

12.3 Driving mechanism of flat bed machine.

12.4 Driving mechanism of traddle machine.(a) Parallel approach
(b) Swing type

Reference Books

ls 696/1972 of Indian Standard Institution.

TTTI, Madras, Technicial Drawing, Nachimuthu Polytechnic, Poliachi 642003, 1975.

Bharath Heavy Electricals Ltd. Engineering Drawing Practice, 1986.

K.S. Rangaswami, G.L. Sinha & D.N. Sarbadhikari, Engineering Drawing, N.C.E.R.T., 1967.

Joseph J. Almon, Visualised Basic Mechanical Drawing, Bruce Publishing Co., 1961.

Pick up & Parker, Engineering Drawing with worked Examples, Hutchinson Technical Education

Frederick E. Gieseeke, Alva Mitchell, /Henry Cecil Spencer, Technical Drawing, Macmillan Company New York, 1958.

W. Abbott, Technical Drawing, E.L.B.S., 1964

Richard Marritt, Engineering Drawing for Students, Methuen & Co., Ltd., London. 1965.

Thomus E. french and Charles J. Vierck, A Manual of Engineering Drawing for Students and Draftsmen, McGraw Hill Book Company, 1960.

Warren J. Luzadder, Fundamentals of Engineering Drawing, Prentice Hall, 1962.

NOTE :-

The subject should not be treated conventionally where the students are always drawing instrument perfected drawings. Instead most of the time the students will be required to complete structured and graded exercises as worksheets (as given in reference 2)

Other Resources.
1. Charts.
2. Models: Quadrant box, viewing box, components
3. Sectioned models
4. Transparencies
5. Chalk borad- drawing instruments for use on the chalk board.

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III Semester

3.1 BASIC ENGINEERING-I

Rationale:

Modern printing equipments and machines incorporate all the engineering disciplines, like electrical, mechanical, electronics and computers. The print technician who has to handle some of the high-tech equipments in supervising the work of the operation of these machines, should be fully aware of the principles of these engineering disciplines. He should also be able to identify the problems and faults likely to occur during the operation of these printing machines.

Hence, the technicans working in the printing industry are required to know the electrical, electronics and mechanical engineering devices inputs.

Detailed Contents

(A) THEORY:

1. Mechanical Engineering :

1.1 Mechanical components: Links, nuts , bolts, screw, studs, key, rivets, pin, cotters, levers, shafts, couplings, clutches, brakes, belts bearings, pulleys, gears, cams, chains, spokets.

1.2 Measuring devices: calipers, verniers, screw gauges, micrometers, feeler gauges, dial gauges, Durometers

1.3 Manufacturing processes: Soldering, welding, rivetting processes, metal forming processes, foundry, forging and forming. Metal shaping processes, machining processes.

1.4 Lubricant and lubricating devices: Viscosity, types of lubricants, principles, characteristics, and applications. Lubrication system.

1.5 Maintenance: Preventive maintenance break down maintenance equipment and machines required for maintenance shop. Maintenance contracts, periodical maintnance.

2. Hydraulics and Pneumatics :

2.1 Hydraulics: Principles, hydraulics in printing.

2.2 Pneumatics: basic principles of compressors. Vacuum pumps. 1.1 Introduction to basic principles.

3. MACHINE DRAWING

3.1 Interpretation of engineering drawing.

3.2 Making of simple sketches from which working drawing can

be prepared by a draughtsman.

4. ELECTRICAL SYSTEMS

4.1 Electrical Terms and definitions: electric current and voltage, ohm's law, resistance law ,conductor, resistor and insulator. Horse power, watt, KWh and their relationship with current, voltage and resistance. D.C. and A.C.,KVA, KW and KVA powers. power factor, its magnitude, nature significance.

4.2 Electrical sources (cell, battery and supply): Electrical loads (resistance capacitance and inductance) and their behaviour in D.C. supply. Electrical circuit and concept of open circuit, closed circuit and short circuit. series, parallel and series-parallel connection of cells, resistors and capacitors, their purpose and equivalent valves.

PRACTICALS

1. Study of various mechanical components, nuts, bolts, hubs, screws, couplings. pulleys, bearings, brakes and clutches

2. To Study the operation and use various measuring devices : calipers, micrometers, screw gauge, feeler gauges and dial gauges.

3. To study soldering, welding and rivetting processes. Relationship of viscosity and temperature.

4. To use Redwood Viscometer and finding viscosity and the relationship of viscosity and temperature.

5. To Study of equipment and machines for maintenance shop.

6. To study and learn Hardware Testing.

7. To Study air compressors.

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3.2 GRAPHIC REPRODUCTION

Rationale

Graphic Reproduction is an important area of Printing Technology. It is essential to impart basic knowledge and skills in process photography, photomechanical processes for preparting surfaces for different printing processes, etc. This subject is essential as prerequisite for studying Reproduction Photography and Printing Surfaces in the Diploma Curriculum.

DETAILED CONTENT

1. Introduction and outline of Gaphic Reproduction :

1.1 Introduction, functions and outline of graphic reproduction.

1.2 Originals for reproduction: Classification (Line, Halfftone, continuous Tone), characteristics and requirements.

1.3 Introduction to reproduction photography and photomechanical processes.

2. Equipment and Accessories:

2.1 Process Camera; basic parts, kinds and functions, Process lens, Lateral reversal, illuminate, light integrator.

3. Photographic Film Emulsions:

3.1 Introduction to photographic film and emulsions; types of photographic emulsions and their uses in reproduction photography.

4. Contact Photography:

4.1 Equipment and accessories in contact photography

4.2 Preparation of positives from line negative and Vice-Varsa.

5. Line Photography :

5.1 Handling of Camera; Exposure and factorol governing exposure time.

5.2 Development, Fixing and after treatments.

5.3 Defects in the negative and their remedies.

6. Application of Processed Film :

6.1 Introduction to Photomechanical image carriers for different printing processes.

6.2 Process of surface platemaking for planographic printing; equipment and materials used.

6.3 Use of Process film in duplicating processes.

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LIST OF PRACTICAL

1. Preparation of negatives / positives by contact photography.
2. Handling of Process Camera for line negative making.
3. Line negative making in same size.
4. Line negative making in reduced /enlarged size.
5. Retouching and correction of faulty line negatives.
6. Line block making on zinc.

REFERENCE BOOKS

1. Line Photography, Davis Robinson, AIFMP, New Delhi.
2. Halftone Photography, Erwin Jaffe, AIFMP, New Delhi.

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3.3 PRINTING SCIENCE

Rationale:

The Student will learn the scientific approach to the different printing materials. He will also learn about the testing of materials for quality control. The subject will make the student to learn about the chemical reactions invloved in the various stages of Reproduction Photography, Surface Preparation, Press work etc.

DETAILED CONTENTENT

1. Materials used for Image Carriers :

1.1 Relief Process: Type metal alloys. Original plates:Zinc and copper for blocks; photopolymer plates, Duplicate plates: stereo and electro.

1.2 Planography: Zinc, aluminium, anodized aluminium, bimetallic and trimetallic plates, presentsitised plates, photopolymer plates, paper based plates.

1.3 Intaglio: Metals used for gravure cylinders and plating.

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

2. Photographic Materials :

2.1 Basic ingredients of emulsion and their functions.

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

2.3 Developer's constituents and their functions.

2.4 Chemicals for after treatment.

2.5 Introduction to non silver material.

3. Polymers :

3.1 Monomers and Polymers.

3.2 Homopolymers and Copolymers.

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

3.4 Types of Polymers: Plastics, rubber and Fibres.

3.5 Composition and characteristic properties of the ploymers: Printing ink resin and vechicles, adhesives, film base, cellulose and gelatin.

4. Colloids :

4.1 Characteristics.

4.2 Methods of preparation and properties.
4.3 Application in printing industry.

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5. Substrates :

5.1 Fibrous and non finrous raw materials used in paper and board manufacture.

5.2 Surface treatment related to ultimate use.

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

5.4 Dimensional stability of paper: Effect of humidity on paper.

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

6. Printing Inks :

6.1 Constituents of printing ink, general characteristics and requirements of printing inks for various printing processes.

6.2 Basic drying methods and their suitability for printing processes.

6.3 Three and four colour process inks for letterpress and lithography.

6.4 Different inks, e.g. heat set, quick set inks, fugitive, metallic inks, etc., their suitability to different applications.

6.5 Flexo and Gravure inks.

7. Print Finishing Materials :

7.1 Securing material - threads, tapes, cords, wires, etc. Adhesives, classes and chracteristics.

7.2 Covering materials : Woven and non woven

7.3 Finishing material, gold leaf; too; colouring material

7.4 Materials used for varnishing and lamination.

8. Testing of Materials

LIST OF PRACTICALS

1. Ink Tests, acid value test, tone and undertone tests.

2. Opacity test.

3. Drying and bleeding tests.

4. Emulsification tests.

5. Printability tests for papers.
6. Print quality tests for papers.

7. Mass, ink tests, stone and undertone tests.

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8. Tests for end requirements.

References Books

1. Printing inks and papers, C.S. Misra, Anupam Prakashan, Allahabad.

2. Mudran Syahiyan Tatha Kagaj, C.S. Misra, Anupam Prakashan, Allahabad.

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3.4 PRINTING DESIGN - I

Rationale

Every printed product is designed before it is printed. The print technician should have a clear perspective of the design principles involved in designing a printed product. The objective of this subject will be to introduce the study of design as a decision making discipline which controls all the aspects of the printing production.

Detailed Contents.

1. Illustrative Elements :

1.1 Types of originals for illustration and their reproduction: Line and continuous tone copies in colour and black and white.

1.2 Requirements of Art work or originals for reproduction; treatment of photographs, photomechanical transfer materials and their uses

1.3 Black and white photopgraphs: high contrast and medium contrast.

1.4 Improving quality of photographic prints; Masking; Scaling; Cropping, retouching, use of air-brush.

2. Colour Elements :

2.1 Colour theory; terms used to describe colour; warm and cold colours; hue shade; tint.

2.2 Colour wheel; terms used to describe relationship between colours monochromatic, complementary, analogul, split-complimentary.

2.3 Selection of colours for two or three or four colour jobs.

2.4 Attributes and emotional appeal for colours.

2.5 Choice and effective use of colours; colour harmony, colour contrast, and colour values.

3. Layout Preparation :

3.1 Materials, tools, equipment and techniques used in the preparation of layout and art work.

3.2 Basic geometric shapes, disposition of elements and space; principles of symmetrical and asymmetrical arrangements; distinction between geometric and optical centres.

3.3 Preparation of the layout, analysis of briefs, stages and house style.

3.4 Methods of producing different forms of layout.

3.5 Page structures, arrangement of illustrations and text matter.

3.6 Dummy: its uses and preparation.

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4. Typographic Design :

4.1 Methods of preparing a design and its various stages, for different classes of work.

4.2 Typogrphic specifications for different classes of work.

4.3 Art work preparation for different classes of work in relation to different printing processes, paper and ink, etc.

PRACTICAL

1. Interpretation of copy and preparation of rough and finished layouts for typegraphic setting.
2. Lettering for layouts.
3. Designing of monograms and trade marks with the help of appropriate computer software.
4. Designing of recto and verso pages of book.
5. Designing of pages for poetry and children's books.
6. Designing of book covers and jackets.
7. Designing of lables.
8. Designing of single and two colour posters.
9. Designing of single and two colour leaflets upto 6 pages.
10. Preparation of dummies for books, leaflets and display materials.
11. Colour mixing in two, three and four colour combination.

Note -

The students shall be required to produce at the time of Internal and External Examination portfolio of specimens of prescribed practical work duly signed by him and verified by his teacher.

REFERENCE BOOKS

1. Walkar, Magazine Design, Buleprint, London.
2. Marting Duglas, Books Design, Buleprint, London.
3. Warford, H. S. Design for Print Production, Focal Press,London.
4. Marguand, E. Graphic Design Presentation, VNR, USA.
5. Silver G., Graphic Layout & Design , VNR, USA.
6. HartBurt, A Publication Design: A guide to Pageout.
7. HartBurt, A Publication Design: A guide to Pageout Typography, Format & Style,VNR, USA.
8. Art & Production, N.N. Sarkar, Sagar Publication, Janpath, New Delhi.
9. Exploring Typography By TOVA Rabinwitz Publisher, Thomson-Delmar Learning; UK.

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3.5 BINDING & PACKAGING-I

Rationale :

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, register, etc. For this, knowledge of various methods and techniques of binding and finishing is very essential.

Detailed Contents

1. Warehouse and Binding Operations:

1.1 Printed paper warehouse and unprinted paper warehouse, storing, temperature, humidity, materials handling, safety.

1.2 International paper sizes, Conventional paper sizes, and sub-divisions of paper.

1.3 Book Binding : styles of book binding, basic equipments used in binding.

1.4 Binding Operations: Jogging, folding gathering, collating, stiching, sewing, cutting and trimming operations, machines in use. Treatment of plates and maps, tipping and guarding.

2. Securing Operations :

2.1 Use of thread, tape, cord, wire-stitching, looping, gluing, pasting , covering.

2.2 Different kinds of sewing, cord sewing and tape sewing, hand sewing and machine sewing, two on through and all along sewing, over casting for looseleaf works, suitability for different styles of binding.

2.3 End papers: single, made end paper, cloth-joint, leather-joint, fly leaf, zigzag end papers, their objectives.

3. Forwarding Operations:

3.1 In board and out board forwarding, different kinds of binding and styles, publishers, library, miscellaneous and deluxe extra leather, stationery binding- characteristics.

3.2 Gluing the back, rounding and backing, objects, care and precautions, reducing swell in the back, flat backs, back lining.

4. Adhesive binding, thermoplastic, unsewn, threadless and perfect binding.

5. Preparation and Attaching Boards :

5.1 Dimensional variation of boards, lining. cutting to size, warping of boards, prevention, attaching boards, laching-in.

6. Covering Operations :

6.1 Different kinds of covering materials, selecting leather of

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other materials, measuring and cutting to size and shape, applying adhesive and turning-in, pressing, setting the groove or joints, setting the head, setting the band, polishing, pressing and pasting down.

7. Finishing :

7.1 Miscellaneous Operations : Cutting, Creasing, Numbering, Perforating, Embossing, Thermography, etc.

7.2 Decorating the cover of the book with the finishing tools, blind blocking, gold blocking, and sliding hand tools, fillets, gallets, rules and mitre, Lettering, type holder, brass type, marking for tooling and lettering, heating, testing and pressing, cleaning, inlaying, lacing and bands open-up and pressing.

7.3 Edge decoration, colouring, spraying, marbling, guilding, gauffering or tooling the edges, head bands, Book mark, Bode mark, hand made and machine made head bands.

LIST OF PRACTICALS

1. Study of tools and machinery, their uses and care in handing.

2. Materials and supplies essential for a book binding department.

3. Folding, counting and jogging.

4. Side and saddle - Odd and even number stitching.

5. End papers.

6. Styles of binding: Quarter- bound cut flush (Library sewing), Quarter bound, turned in (Library Sewing), Quarter-bound turned in (Sawn-in-sewing)

7. Manifold book (Carbon duplicate book)

8. Tear-off pad.

9. Oneletter index book Styles of binding Quarter-bound turned-in with squares (Flexible sewing), Quarter-bound truned-in with squares (Two-on sewing), Case binding (Overcast sewing), Publisher binding (Library sewing).

10. Half-bound (conventional method): Calico and marble with gilding, spine preparing and spine decorating with ink, leather paring and gilding the spine, phot- album with colour strings.

11. Account book binding: half-bound (modern style) leather and calico, and gilding, file-making or loose-leaf binding with screws.

12. Rebinding-Case Binding.

13. Writing pad with gild corners

14. Exercise on sewing machine, exercise on stitching, looping

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and cutting machine.

15. Finishing processes: Operation of ruling machine, operation of blocking machine, numbering machines: hand numbering and type-high numbering machine, operations care and maintenance. Planning a job for hand numbering, finishing leather, calico cover with gold foil embossing, hand tooling and blind tooling methods, bronzing varnishing and other surface treatments.

References Books.

1. Martin, A.G., Finishing Process in Printing, Focal, 1972.

2. Johnson, A.W., Manual of Book Binding, Thames and Hudson.

3. Alex J. Vaughan, Modern Book binding

4. Learance Twon, Bookbinding by Hand.

5. Doeglas Cockerell, Bookbinding and the Care of Books.

6. Hanlon, J.F., Handbook of Packaging Engg. McGran Hill.

7. Pain, F.A., Fundamentals of Packaging, 1981.

8. What the printer should know about paper-by Lawrence A. Wilson.

9. Introduction to printing and finishing- by Hugh M. Spiers.

10. Folding in practice - by Alfred Furler

11. Printing and Die Cutting - by Vanessa Bailey.

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3.6 ENTREPRENEURSHIP DEVELOPMENT

Rationale:

In the face of rising unemployment and introduction of Capital- intensive techniques of production in printing industries, the student of Printing Technology (Diploma Course) should have a basic theoretical training on self-employment. The Governments - both Central and the States do also endorse this idea as their activites in providing bank loans and other assistance to these aspirant self-employed technologists have increased.

This subject, is therefore, very essential in the curriculum of diploma course in printing technology. This will enable the students to plan for the establishment, to know about the inventory control, production possibility, quality control, purchase mechanism, sales mechanism and such others so that he can successfully drive through the break-neck competitions in this field of printing.

DETAILED CONTENT

1. Entrepreneurship:

   Definition, responsibilities, project report on feasibility, studies for small scale industries, proposal for bank loan for establishing a press and its extension, obtaining licenses, Enlistments as a Supplier.

2. Location and layout of a press, choice of site , facotrs influencing product and process layout - plan , layout criteria for a good layout, good materials handling system.

3. Materials Management:

   Purchase: importance, functions, methods and procedure, control - stock levels, re-ordering and economic ordering quantity.

4. Cost of Product:

   Significance, prime cost and supplemented variability of all costs in the long-run, marginal cost and A.C. and M.C. consists of V.C. only. Opportunity cost, SRC adn LRC, TR, AR.

5. Sales and marketing with special reference to printing/printed materials.

6. Quality Control:

   From receipt of order to delivery of products.

7. Communication:

   Meaning, purpose, formal and informal methods of communication.

8. The conduct of meeting, writing of reports and letters.

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REFERENCE BOOKS

1. Rathore & Saini, Entrepreneurship Development Training Materials, TTTI, Chandigarh.

2. Rao, TV Development Entrepreneurship A Handbook TV Rao and Udai Praeek Learning Systems New Delhi.

3. Srivastava, Sb, A Practical Guide to Industrial Development Sultan Chand & Sons, New Delhi.

4. Parth, SM, How to Finance Small Business Entreprises, Mac Millan, Delhi.

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IV Semester

4.1 BASIC ENGINEERING-II

Rationale :

Modern printing equipments and machines incorporate all the engineering disciplines, like electrical, mechanical, electronics and computers. The print technician who has to handle some of the high-tech equipments in supervising the work of the operation of these machines, should be fully aware of the principles of these engineering disciplines.

He should also be able to identify the problems and faults likely to occur during the operation of these printing machines. Hence, the technicans working in the printing industry are required to know the electrical, electronics and mechanical engineering devices inputs.

Detailed Contents

1. ELECTRICAL ENGINEERING

1.1 A. C. Circuits :

Single phase supply its frequency,instantanious value, RMS value and form factor. behaviours of pure resistance, inductance and capacitance in A.C. supply. Impedance, current power factor and power in single phase RLC series and parallel circuits.

1.2 Three Phase Supply:

Star and delta conversions. Line current, line voltage, phase current, phase voltage and power relations in star and delta connections.

1.3 Energy Conversion Principles:

Conversions of electrical energy into heat and light. heater, bulb and tubelight and their current, voltage and power.

1.4 Magnetic field of a current carrying conductor and right hand thumb rule. Magnetic field of a solinoid and helix rule. Magnetic circuit, MMF, Flux, reluctance,magnetising force, magnetic saturation. Electromagnet and its polarity . electron magnetic force, its magnitude and direction by fleming's left hand rule. Electromagnetic induction, dynamically induced e.m.f., fleming's right hand rule and lenz's law. Self and mutually induced e.m.f. and self and mutual inductances. Concepts of single phase and three phase generation.

1.5 Electrical machines in printing: Basic construction, working, e.m.f. equation and concept of step up and step down transformer, operation of a transformer, tapped transformer, auto transformer, and voltage stabilisers. current, voltage and KVA rating of transformer,

1.6 Basic construction, working characteristics and

applications of squirrel cage and Slip-ring type three phase induction motors and Capacitor type single phase induction motors, shaded pole motors and universal motors. speed control of single phase and three phase motors.

1.7 Main parts (contactor, push button stations, over load relay and time relay) of a starter with their purpose in the starter circuit. Circuit connection with motor and working of DOL, star-delta, auto transformer and motor resistance starters.

1.8 Electrical wiring and maintenance: Type of wiring, concept of wiring circuits and wiring, Introduction to main switch, D.B., switch board, wiring accessories, fuse and earthing. Wiring tools, testing of installation. I.E. Rules for wiring installations and Safety precautions.

1.9 Common faults, trouble shooting and prevenyive maintenance of wiring installation, electrical equipments and machines used in printing.

2. ELECTRONIC ENGINEERING:

2.1 Semi Conductor Devices :

P-type and N-type Semi conductors and P-N junction diode, Zener diode, BJT and JFET transistors. MOS device SCR and Photo devices.

2.2 Electronic Circuit Operations :

Rectification and half wave and full wave rectifiers, Zener voltage regulator, amplification, ocillation, modulation and detection progress and their purpose.Basic logic gates and basic flip flops.

2.3 Electronic In Printing :

Application of electronics in Press control, speed control, colour registration, web control, safety and measuring devices.

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LIST OF PRACTICALS

1. To Measure voltage at various currents in DC circuits to find resistance and also to verify Ohm's Law.

2. To Measure current, voltage and power in single phase AC circuit and to find power factor of the circuit.

3. To connect three phase load in star and also in delta and measure line and phase currents and voltages in each case.

4. To fix single phase energy meter, main switch/MCB and D.B. on a wooden board, to make their connections to supply a load and to take the observations of energy meter or energy consumption.

5. To do wiring of a lamp, a tube light, a fan and a five ampere socket controlled at one switch board.

6. To study DOL starter, to connect it with squirrel cage induction motor and to study its operations.

7. To connect star-delta starter with three phase induction motor, start and run the motor and also to reverse the direction of rotation.

8. To Study the operation of a tapped transformer, single phase and three phase auto-transformer for voltage control at load terminals and also study the operation of voltage stabilisers.

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4.2 COMPUTER APPLICATION

Rationale:

Computers are being used for design and information processing in all branches of engineering. An exposure to fundamentals of computer programming is very essential for all diploma holders. this subject has been included to introduce students in the use and application of computers in engineering.

DETAILED CONTENTS

1. COMPONENTS OF THE COMPUTER :

   Block diagram of computer, Types of monitors and other peripherals, Input and Output devices, Types of software, System software, Application software.

2. OPERATING SYSTEM :

i. What is operating system, Multiprogramming, Time Sharing and Multi tasking.

ii. Command of DOS, UNIX, LINUX, Windows environment menus of dialogue boxes, Concept of ICON, Function of Programming, Documnet

3. GRAPHICS :

   MS Office, Page Maker, Coral Draw, Adobe Photoshop, Quark Express, Adobe Indesign

4. MS WORD PROCESSING:

   File : Open, Close, Save and Find File, Print and Page Setup
   Edit : Cut, Copy, Find, Replace
   Insert: Page Insert, Page No., Symbole
   Font : Paragraph, Tabs, Boder & Shading, Change Case
   Tools : Spelling, Mail Merge
   Table : Insert Table, Delete Cells, Merge Cell, Sort Text

5. DATABASE :

   Making datafile useing MS-ACCESS using various operation, Indexing, Generating, Reports, Printing Files and Other activity.

6. INTRODUCTION TO INTERNET :

   What is Internet, How to send and receive E-Mail and see different types of web sides.

7. ROLE OF COMPUTER IN PRINTING :

   Application at different stages such as type setting, Plate making, finishing process, H/w and S/w meant for printing industry

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LIST OF PRACTICALS

1. Creating, Editing, Modifying database file, Label, Report, Format & Query.

2. Use All commonds of DOS.

3. Use & Practice all the features and utilities of MS Word and Practice on Hindi Key Fonts, Making Marriage Card, Bio Data, visting card, Letter Head setting, etc. .

4. Selection of command using Windows.

5. Practice on MS-ACCESS.

7. Graphics

   A. Page Maker
   B. Coral Draw

8. Practice on DOS/UNIX/LINUX/Windows.

9. Practices on E-Mail & Websites.

10. Practice of scanning of Photographs and Other things.

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4.3 TEXT & IMAGE SETTING-I

Rationale

Every printed product consists of text portion and illustrations, with the former occupying a predominent portion. Knowledge of text setting methods and equipment used for setting text, which is broadly termed 'Letter Assembly' is 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 method, preparation for typesetting, typesetting inputs and outputs, pageassembly, proofing, imposition and planning.

The aim is to further develop the students understanding and knowledge of letter assembly equipment, particularly in the areas of on line intergrated system, image generation system, editing and corrections, electronic page assembly, digital storage and outputs.

Detailed Contents

1. Brief Introduction To Typesetting Systems :

1.1 Introduction to Mechanical typesetting - Merits & Limitations.

1.2 Phototype setting Systems - Application, Merits & Limitations.

1.3 Digital type setting Systems - Merits & Limitations.

2. Typographic Measurement System :

2.1 Units of Measurement, Point system, Units.

2.2 Computerized Measurement by different latest system.

3. Typesetting Routines.

3.1 Typesetting for commerical jobs ie books, magazines, newspapers and general etc.

3.2 Display setting.

3.3 Types of Proof and proof reading.

3.4 Editing, Correction and make-up for books, magazines, newspapers, general etc.

4. Digital type setting system :

4.1 Role & functions of computer in type setting.

4.2 Hardware, software its requirement for inputting and outputting.

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4.3 Desk Top Publishing (DTP) System advantages & limitations

4.4 Various latest DTP software and their applicaiton.

4.5 Editing correcting and make-up, proffing.

LIST OF PRACTICAL

1. Hand Composition (15 marks):

1.1 Display work as per layout

1.2 Demonstration on Mechanical Typesetting Machines.

1.3 Make-up of pages.

1.4 Proof reading - Different Techniques.

1.5 Proofing on Amoniya Paper with amoniya printing role.

2. Desk Top Publishing and Strike on System (35 marks):

2.1 Study of DTP Configuration.

2.2 Practice on DTP key board.

2.3 Setting text matters: Measure, Grid, Columns, Margins, Interlinear, Font selection on DTP system.

2.4 Corrections: on screen corrections.

2.5 Create : Title page, visting cards, letter head, envelop, invitation card, greeting card, bill/vouchers, banners and posters

2.6 Care & handling of D.T.P. system.

2.7 Setting of Daisy wheel and test matter on Electronic Typewriter.

2.8 Aquiring of data/image for digital printing.

REFERENCE BOOKS

1. Health, L. G. Introductory Phototypesetting, GATF,1981.
2. N. Edward Berg, The New Era of Electronic Composition, GATF.
3. Encyclopedia of Contemporary Type Setting ,GATF,1997.
4. N. Edward Nerg, Electronic Composition, A guide to the revolution in Type Setting, GATF, 1975
5. Joost List, Electronic Publishing, Vroom Helm,1987.
6. Kirty Wilson_ Davies, Desk Top Publishing, Blue Print, 1987.
7. Desk Top Publishing, Book, Peter Worlock, 1988.
8. Desk Top Publishing By Ron Strutt and Kirty Wilson Devis.
9. Fundamentals of copy and Layout (Third Edition): National Text Book Company, Illinois, USA

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4.4 PROCESS PLANNING AND FILM ASSEMBLY

Rationale

With the introduction of electronic and phototypesetting a bulk of text work is now printed by offset. Process planning & film Assembly Play a key role in Offset Printing Production. Introduction of Processes Planning and Film Assembly as an independent subject in the Diploma Curriculum is essential.

DETAILED CONTENT

1. Layout & Planning for Film Assembly :

1.1 Importance of planning and planning considerations.

1.2 Layout and planning information the layout factors- related to paper, machine, plate size, Plate Clamp allowance, paper grip allowance, arrangement of individual images of varying sizes, areas of critical register, ink distribution over the sheet.

1.3 Planning for rapid press makeready: Plate-cylinder guide marks standard distance, fitting the plate to the press, gripper and plate clamp allownance.

1.4 Preparing the layout :Sheet base and centre reference lines on the layout, placing the aids (register marks, colour quides, star-tergets, etc.,) within the layout; complicated layouts - strait cut, die-cut and punched finishing and as per work specifications.

1.5 Planning imposing schemes: The imposition, imposition terms heads, food, fore-edges, backs, gutters, tails, folios, perfecting, imposing rules upright and oblong.

1.6 Methods of printing book-work: Sheet - Work, work and turn, work and tumble, back marging allowance for sewing, saddle stitching, side stitching, perfect binding, etc., book- work margins.

1.7 Planning equipment, tools and materials.

1.8 Image quality control aids and devices.

2. Methods of Planning :

2.1 Direct ruling to the plate.

2.2 Considerations and methods of manila/ paper template with projected lines, metal keys, Golden rod Key, hinged printing down flats, Burn and red keys on film, adhesive and transfer systems.

3. Image Register Systems :

3.1 Register pins; punched- hole methods.

3.2 Page layout scheme including bleeds, trimns and folds.

3.3 Step & repeat.

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4. Negative/ Postive film Assembly :

4.1 Inspection of films for assembly

4.2 Attching negatives to masking materials

4.3 Positive film assembly Opaquing and checking the flat.

4.4 Attaching tints on line negatives.

4.5 Film Assembly for multi colour printing.

LIST OF PRACTICALS

1. Film Assembly for Single- Colour Printing :

1.1 Preparation of Complimentary flats with negatives/ Positives using pin- bar for: burring images, surprint reverse, Screen tints, Silhouting, halftones and drop out mask work.

1.2 Manual stepping of negatives/ Positive for plate exposure.

1.3 Method of duplicating film on daylight film.

2. Film Assembly for multi- Colour printing :

2.1 Preparation of flats with negatives/ Positives using register pin bar for flat colour work.

2.2 Multi colour film assembly using register pins.

2.3 Screen tints.

Refernece Books

1. Peck, H.L., Stripping: The Assembly of Film Images, Graphic Art Technical Foundation, U.S.A., 1989.

2. Gatehouse and Roper, film Assemnbly and Platemaking, Graphic Arts Technical Foundations U.S.A., 1982

3. Jorgensen and Field, Test Images for Printing, Grapic Arts Technical Foundation, U.S.A., 1989.

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4.5 REPRODUCTION TECHNOLOGY

Rationale

Photomechanical transfer of images and electronic image generation are the areas of graphic reproduction in printing technology, A through Knowledge of reproduction photography is essential for the student to learn the process of Image carrier preparation for printing. The subject mainly deals with operation and handling of different equipment, machinery etc. for reproduction photography.

DETAILED CONTENT

1. Originals for Reproduction :

1.1 Require ments of original reproduction.

1.2 Classification of originals, their characteristics and suitability for reproduction.

1.3 Copy preparation for reproduction : Scaling, cropping.

2. Equipments and Accessories :

2.1 Process lens: Introduction, structure and requirements, care and handling. lens aperture, diaphragm- their functions.

2.2 Lateral reversal: Optical and straight line reversal.

2.3 Illuminants used for reproduction photography requirements kinds of modern illuminants- their merits and limitations. units of illumination, relative intensity and expouser calculations.

2.4 Process cameras: kinds of modern process cameras and accessories- their merits and limitations.

2.5 Darkroom accessories and their uses.

2.6 Halftone screen - kinds and uses.

2.7 Light integrater, auto film/paper processor and their control devices.

3. Photographic Films and Processing Chemicals :

3.1 Structure of a photographic film, Ingredients used in photographic film manufacture, outline of film manufacture, kinds of photographic films used for reproduction photography- their characteristics and uses.

3.2 Characterstics curve and gama curve of photographic film and effect.

3.3 Latent Image Theory, reciprocity failure, intermittence effect.

3.4 Processing chemicals : developer, kinds, ingredients used in developers and their functions, stop bath, fixer, reducer and intensifiers.

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4. Line Negative Making :

4.1 Basic line exposure, factorgoverning expouser.

4.2 Camera Procedures for line negative making from black & white colour lines originals.

4.3 Dark room procedures for processing an exposed film for line negative making; development and factors governing development; stop bath; fixing and after treatments.

4.4 Evaluation of line negatives.

4.5 Defects in line negative and their remedies.

5. Contact Photography :

5.1 Application of contact photography in reproduction.

5.2 Contact Photography : determining the correct exposure, hard and soft dots, Spreads and Chokes.

6. Halftone Reproduction :

6.1 Introduction to densitometry: Optical density and its measurement; use of densitometers, Colorimeter and Spectrophoto meter.

6.2 Screens: Cross line and contact screen; grey scale, Selection of screeing.

6.3 Theories of Halftone dot formation; screen distance.

6.4 Halftone negative making ; requirements of Halftone negative for diffrent printing processes.

6.5 Halftone exposure systems; flash exposure.

6.6 Camera Procedures and dark room processing for Halftone negative making.

6.7 Evaluation of Halftone negatives; Halftone failure and remedies.

LIST OF PRACTICALS

1. Introduction to different equipments, study of different working parts, etc.

2. Preparation of precessing 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. Calculation of screen distance, principle of dot formation Use of V ratio and inverse system

7. Use of gray scale. Contrast control by different methods Practice on different contacts.

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8. Use of densitometers.

9. Study of density, range contrast, gama, characterstic curve.

Reference Books

1. Hentzel, Fred Ray Blair and Tom Destree, Graphic Arts Photography: Colour, GATF.

2. Eric Chambers, Manual of Graphic reproduction for Lithography, Litho Training Services Ltd., London and Manchester, 1979.

3. Ekald Fred Noemer, The Handbook of Modern Halftone Photography, Perfect Graphic Arts, Demarest.

4. James Walter Burden, Graphic Reporoduction Photography, Focal Press, London, 1973.

5. Gray G.Field, Colour and its Reproduction, GATF, 1988.

6. Halftone Methods for the Graphic Arts, Graphics Materials Divison, Eastman Kodak, Co., N.Y.

7. William, P. Spence & David G. Requist, Graphic Reproduction, Benett Publishing, illinois Co., Raymond N.Blair the Lithographiers Manual, GATF.

8. Line Photography, AIFMP, New Delhi.

9. Halftone Photographic AIFMP, New Delhi.

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4.6 IMAGE CARRIERS TECHNOLOGY-I

Rationale :

It is a technology subject. It gives the knowledge of different printing surface preparation, techniques like photo engraving, offset plates, gravure cylinders etc. With this information one can control the operation of the equipments / production of printing surfaces, etc.

Detailed Contents

1. Introduction :

1.1 Introduction to Image Carrier for different printing processes.

1.2 Details of Image Carrier for Flexo, gravure, offset, silk screen and digital process, its suitability and limitations.

2. Photo Engraving :

2.1 Metallic and non metallic image carrier for photoengraving.

2.2 Photo resists: Kinds, characteristics, requirements, dark and continuing reactions.

2.3 Photographic intermediates (Negative/ Positives): Kinds, characteristics, and requirements.

3. Electroplating For Gravure Cylinder Making Process

4. Off Set Plate Making :

4.1 Introduction to Offset plate processes. Materials for offset plates-merits, limitation and suitability.

4.2 Offset Platemaking, materials equipment and accessories.

4.3 Plate Grains, Graining and anodizing.

4.4 Introduction to various plate making process (surface, deepetch, wipe on, PS Plate, Paper Plate, etc.

4.5 Removal and addition work on plate.
4.6 Plate troubles and their remedies.

5. Introduction to CTP, Types of CTP and its working.

LIST OF PRACTICALS

1. Use of different photo resists for image forming on metal

2. Preparing relief plates line work

3. Preparing Deepetch plates (2 Nos.).

4. Preparing stereo plate.

5. Preparing Surface plate process (4 Nos.).

6. Preparing paper plates for table top offset machines.

7. Preparing Wipe on plate (2 Nos.)

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REFERENCE BOOKS

1. GATEHOUSE & ROPER, FILM ASSEMBLEY & PLAT MAKING, GATF,USA.

2. OFFSET PLAT MAKING, GATF, USA.

3. MERTLE & OTHERS, PHOTOMECHANICS & PRINTING, VNR, USA.

4. KARCH & BUBER, GRAPHIC ARTS PROCEDURES, AMERICAN TECHNICAL SOCIETY, CHICAGO, USA.

5. OFFSET PLATE MAKING(DEEP-ETCH), AIFMP, NEW DELHI.

6. OFFSET PLATE MAKING(ALBUMIN PROCESS), AIFMP, NEW DELHI.

7. FORMULARY, AIFMP, NEW DELHI.

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V SEMESTER

5.1 BUSINESS MANAGEMENT

Rationale :

The existence of profit of a business is no more a chance phenomenon. It is a scientifically calculated management activity. Therefore, it is essential that in the curriculum for Diploma Course in Printing Technology the subject should be included as Basic subject. Supevisors are called Front line Managers in the sense that they are the persons directly in touch with the workers.

The study of management will enable the students to apply usefully the knowledge of industrial relations, legislations relating to industries printing and publication, management functions, personnel management and many other important and relevant activities in their professional lives.

DETAILED CONTENT

1. Introduction :

1.1 Economy and its effect on society.

1.2 Indian Economy - under developed economy and Developing stage.

1.3 Status of Printing industry in India.

1.4 Production: Meaning and factors of production.

2. Business Organisation :

2.1 Forms of business organisation and their formation.

2.2 Propriety, Partnership, Private and public limited companies co-operatives and public sector.

3. Management :

3.1 Definition, difference with administration.

3.2 Histroy and growth of scientific management.

3.3 General management functions - planning, organising, co-ordinating, motivating, directing and controlling.

3.4 Structure of an organisation- sales and marketing, prodution and admininstration, responsibilities.

3.5 Departmental management- management organisation and responsibilites, leadership delegation and authority.

3.6 Production organisation - production planning and control system.

3.7 Factories organisation: Product Planning & control system

3.8 Factories Act & Industrial laws.

3.9 Salesmanship & advertising.

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4. Productivity :

4.1 Principles of method study, principles of work measurement.

4.2 Principles of job evaluation.

4.3 Principles of time study, incentive payment scheme.

5. Personnel Management:

5.1 Elements of personnel management: industrial psychology behaviour and attitude.

5.2 Employment: job specification, selection, tests and interview, induction and training, general welfare amenities.

5.3 Handling grievances, ensuring uniformity of decision.

5.4 Discipline, correcting the workers, employee counselling, absenteism, labour turn over.

5.5 Joint consultation, works committee.

5.6 Trade Unionism.

6 Press Laws :

6.1 Copyright Act, Imprint & other laws.

6.2 Registration Act.

REFERENCE BOOKS

1. Aswathapa, K. Factory Organisation & Management, Himalaya Publishing House, Mumbai.

2. Shekher, S. A., Modern Business Organisation & Management, Himalaya Publishing House, Mumbai.

3. Shukla, M.C., Business Organisation & Management, S. Chand & Co., New Delhi.

4. Spriegal R. William, Industrial Management, S. Chand & Co., New Delhi.

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5.2 PRINTING DESIGN-II

Rationale :

Every printed product is designed before it is printed. The print technician should have a clear perspective of the design principles involved in designing a printed product.The objective of this subject will be to introduce the study of design as a decision making discipline which controls all the aspects of the printing production.

DETAILED CONTENT

1. Planning for production :

1.1 Selection and Coordination of production processes within the economic terms and jobs specifications.

1.2 The possibilities and limitations of binding, finishing and ancilliary processees as they affect design.

1.3 Technical influences and the selection of the specification of ink, paper, cloth, and other materials in relation to job specifications and to different production processes decided.

2. Book Design :

2.1 Parts of a Book.

2.2 Format and page design to suit different classes of books, book jacket and binding styles.

2.3 Illustrations Their suitability, positions, captions and legends.

2.4 Casting off copy. Principles of copy fitting, copy fitting tables.

2.5 Margins: Importance of margins, determining margins to suit various styles of binding.

2.6 Preparation of page layouts for different parts of the book and dummies.

3. Display Design :

3.1 Principles of display. Factors affecting display setting.

3.2 The effective use of white space. The shape and the size of the space.

3.3 Type face combinations and their suitabilities.

3.4 Use of borders, rules and other decorative materials. Use of initials.

3.5 Grids: use of grid.

4. Newspaper Design.

4.1 Newspaper format ; Parts of a newspaper.

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4.2 Principles of newspaper design.

4.3 Treatment and arrangements of body matter and headings.

5. Magazine Design :

5.1 Parts of a magazine and their arrangements for Cover page, contents pages and sequences.

6. Design for Packaging :

6.1 Introduction to packaging, Kinds of printed packages, Introduction to Packages, designing economic importance, advantages, selling aspects.

7. Design Organisation :

7.1 Quality Control of art work.

7.2 Necessity of free lance artists, designers, and photographers.

7.3 The advertising agency: Its functions, procedures and services.

8. Degital Designing :

Software used in digital desiging of printed products

LIST OF PRACTICALS

1. Preparation of layouts and Dummies for the book.

2. Designing of leaflets, booklets, brochures.

3. Designing layout for sale display materials

4. Preparation of layout and paste ups for advertisement in newspapers and magazines.

5. Designing of newspaper pages.

6. Desinging of magazine pages.

7. Preparation of Dummies for the production of newspaper and magazine.

8. Designing for packaging

9. Copy preparation for text and illustrations.

Note :-

The students shall be required to produce at the time of internal and external examination a portfolio of specimens of prescribed practical work duly signed by him and verified by his teacher.

REFERENCE BOOKS

1. Walkar, Magazine Design, Blue print, London.

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2. Marting Duglas, Books Design, Blue print, London.

3. Wakford, H. S. Design for Print Production, Focal Press,London.

4. Marguand, E. Graphic Design Presentation, VNR, USA.

5. Silver G., Graphic Layout & Design , VNR, USA.

6. HartBurt, A Publication Design: A guide to Pageout.

7. HartBurt, A Publication Design: A guide to Pageout Typography, Format & Style,VNR, USA.

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5.3 TEXT & IMAGE SETTING-II

Rationale

Every printed product consists of text portion and illustrations, with the former occupying a predominent portion. Knowledge of text setting methods and equipment used for setting text, which is broadly termed 'Letter Assembly' is 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 method, preparation for typesetting, typesetting inputs and outputs, pageassembly, proofing, imposition and planning.

The aim is to further develop the students understanding and knowledge of letter assembly equipment, particularly in the areas of on line intergrated system, image generation system, editing and corrections, electronic page assembly, digital storage and outputs.

DETAILED CONTENTS

1. Image Setting Systems:

1.1 Classification of image setting systems.

1.2 Suitability & limitations of different image setting systems.

1.3 Basic components of modern image setter and their functions

2. Image Setting Configuration :

2.1 Input devices - work station, high end scanners, Digital Pen, FTP.

2.2 Software for text and image Setting- Type setting and page making, Illustration processing, Colour seperation and correction.

2.3 Output Devices- Image Setter, large formate inkjet printer, film processor.

2.4 Storage systems- Latest auto backup devices.

3. Digital Imaging :

3.1 Basics of image editing, page assembling and imposition.

3.2 Imposition and workflow software.

3.3 Raster image processor (RIP).

3.4 File extension for digital imaging e.g. TIFF, EPS, JPEG, Bitmap

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4. Production Routine :

4.1 Steps in text processing.

4.2 Scanning Operations for illustration processing.

4.3 Output, Quality control.

LIST OF PRACTICALS

1. Setting of text, table and tabular setting on Desk Top Publishing system.
2 Setting of display matter.
3. Editing and correction of Desk Top Publishing system.
4. Page make-up of text matter by various word processing software.
5. Setting of text, table and tabular matter on various software.
6. Illustration editing and correction on various image editing software.
7. Output of practical performed.
8. Full sheet output and imposition through software.

REFERENCE BOOKS

1. Health, L. G. Introductory Phototypesetting, GATF,1981.
2. N. Edward Berg, The New Era of Electronic Composition, GATF.
3. Encyclopedia of Contemporary Type Setting ,GATF,1997.
4. N. Edward Nerg, Electronic Composition, A guide to the revolution in Type Setting, GATF, 1975
5. Joost List, Electronic Publishing, Vroom Helm,1987.
6. Kirty Wilson_ Davies, Desk Top Publishing, Blue Print, 1987.
7. Desk Top Publishing, Book, Peter Worlock, 1988.
8. James felici & Ted Nace Desktop Publishing Skill, Addition Wesley Publishing Company, 1987.
9. Gatehouse Roper, film Assembly and Platemaking, GATF 1982.
10. Digital image-A Practical Guide - by Adele Drobler, Greenberg and seth.

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5.4 PLANNING AND COLOUR SEPERATION TECHNOLOGY

Rationale :

Photo-mechanical transfer of images and electronic image generation are the areas of graphic reproduction in printing technology, A through Knowledge of reproduction photography is essential for the student to learn the process of Image carrier preparation for printing. The course mainly deals with operation and handling of different equipment, machinery etc. for reproduction photography.

DETAILS CONTENTS

1. Light and Colour :

1.1 Electromagnetic waves, visual appreciation.

1.2 Properties of colour, colour perception.

1.3 Additive & subtractive principles of colour synthesis.

2. Equipments and Materials :

2.1 Camera essentials.

2.2 Filters, filter factor, filter ratio.

2.3 Halftone screen, special purpose, screens screen angles.

3. Quality Control Aids

3.1 Copy preparation and evaluation.
3.2 Tone and colour control.
3.3 Grey scale, register marks, register punch, Colour Patches.

4. Colour Separation :

4.1 Principles of colour reproduction.
4.2 Methods of colour separation: direct colour separation and indirect colour separation.

4.3 Exposure control system.

4.4 Evaluation of colour separations.

5. Colour Correction :

5.1 Basic principles of colour correction
5.2 Colour correction methods: manual colour correction, photographic colour correction, single overlay, two overlay, high light, premask, camera back masking, quality control mask, under colour removal.

6. Electronic Colour Scanner :

6.1 Principle of scanning, Principles of colour.

6.2 Electronic colour scanner : Working principle and functions of a colour scanner.

6.3 Electronic colour separation: scanner programming, scanner

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operation and evaluation of separations through scanner.

7. Miscellaneous Camera Techniques :

7.1 Duotone negative making.

7.2 Rescreening of halftone prints.

7.3 Preparation of halftone tints.

7.4 Line & halftone combination work.

7.5 Dropout negative-making.

8. Proofing :

8.1 After treatment of negative.

8.2 Prepress proofing, needs for prepress proofing.

LIST OF PRACTICALS

1. Rescreening from printing halftones.
2. Line and halftone Conbination negative making.
3. Screen tint preparation from contact screen.
4. Preparation of spreads and chokes for multicolour printing.
5. Manual retouching exercises.
6. Direct/Indirect separation from reflection copy.

Reference Books

1. Hentzel, Fred Ray Blair and Tom Destree, Graphic Arts Photography: Black and White, GATF,U.S.A.
2. Eric Chambers, Manual of Graphic reproduction for Lithography, Litho Training Services Ltd., London and Manchester, 1979.
3. Ekald Fred Noemer, The Handbook of Modern Halftone Photography, Perfect Graphic Arts, Demarest.
4. Hames Walter Burden, Graphic Reporoduction Photography, Focal Press, London, 1973.
5. Gray G.Field, Colour and its Reproduction, GATF, 1988.
6. William, P. Spence & David G. Requist, Graphic Reproduction, Benett Publishing, illinois Co., GATF.

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5.5 IMAGE CARRIERS TECHNOLOGY-II

Rationale :

It is a technology subject. It gives the knowledge of different printing surface preparation, techniques like photo engraving, offset plates, gravure cylinders etc. With this information one can control the operation of the equipments and production of printing surfaces, etc.

DETAILS CONTENT

1. Relief Plate Making Processes :

1.1 Relief plates for letterpress, flexography and letterset , merits, limitations, suitability, materials, equipment and methods.

1.2 Precosting, Postcosting for elexography plated.

2. Offset Plate Processes :

2.1 P.S. Plate Process

2.2 Multi-metal plate process.

2.3 Photopolymer plates.

2.4 Paper Plate

2.5 Letterset Plates

2.6 Quality control aids; The Star Target, dot Gain scale, Senstivity guide, colour control bar, green bar, plate punching, Reflection Denistometer, Trouble Shooting.

3. C.T.P.: computer to Plate systems.

3.1 Types of CTP and Plate

3.2 Details working process of CTP.

4. Gravure Surface Preparation :

4.1 Conventional Processes of Gravure Cylinder preparation.

4.2 Electronic and laser beam engraving- Principles, equipment, materials and methods.

4.3 P.S. Photopolymer plates for gravure cylinders(Introductory).

5. Screen Preparation :

5.1 Screen fabrics: Kinds, Characteristics and suitability.

5.2 Screen preparation materials, accessories and methods.

5.3 Modern techniques of screen preparation.

LIST OF PRACTICAL

1. Preparation of negative and positive working PS plates.

2. Preparation of photopolymer relief plates(Demonstration).

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3. Flexographic Platemaking (Demonstration)

4. Gravure Cylinder making (Demonstration)

5. Electronic Engraving (Demonstration)

6. Polymer plates for Offset (Demonstration)

7. Preparation of image carrier for screen printing by different Prosses

8. Use of Pre-registration Devices.

REFERENCE BOOKS

1. GATEHOUSE & ROPER, FILM ASSEMBLEY & PLATE MAKING, GATF,USA.

2. OFFSET PLATE MAKING, GATF, USA.

3. MERTLE & OTHERS, PHOTOMECHANICS & PRINTING, VNR, USA.

4. KARCH & BUBER, GRAPHIC ARTS PROCEDURES, AMERICAN TECHNICAL SOCIETY, CHICAGO, USA.

5. MACHINE PRINTING, FOCAL PRESS, LONDON.

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5.6 PRESS TECHNOLOGY-I

Rationale :

This is a technology subject. Technicians working in printing industry are required to deal with different printing machines 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.

Detailed Contents

1. Letter Press Printing Machine:

1.1 Letterpress cylinder Machines: Classification, relative merits and limitations, Mechanical and Operational features. Automatic feeding, inking and delivery systems.

1.2 Pre-make ready and Make-ready operations involving text matter, line and halftone blocks underlay, interlay & overlay.

1.3 Principle of Imposition Schemes upto 16 pages halfsheet work and sheet work.

1.4 Running defects : Analysis of causes and their remedies.

1.5 Introduction to Label Printing.

2. Floxgraphy Printing :

2.1 Types of image carriers, their suitability and uses.

2.2 Flexography printing machine, Types of machine.

2.3 Flexography printing mahcine operations and suitability.

2.4 Different types of inking system.

2.5 Types of ink and chamical used in flexography printing.

3. Digital Printing :

3.1 Introduction to digital printing, Toner based digital printing and Non toner based printing.

3.2 Digital Printing Fundamentals - Pixel image, Digital image.CCD and CMOS. Introduction to various software used in digital printing.

3.3 Selection of technology for digital printing - Variable data printing, print on demand, Different types of card printing (ATM, Credit Card, RFIF), MICR printing and various types of inkjet printing.

LIST OF PRACTICALS

1. Introduction, handling, Make-ready and operation of letter-press machines.

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2. Imposition scheme up to 16 pages Upright and oblong.

3. Colour printing and proofing of various jobs.

4. Practice of cutting, creasing, perforating, numbering, embossing and thermography

5. Colour mixing and matching.

6. Capturing images with digital camera.

7. Digitizing originals with high-end flatbed scanners.

8. Colour printing and proofing of job on digital printers.

9. Sample collection of various printing papers/substractes.

10. Sample collection of various printed materials

11. Demonstration of flexography printing.

REFERENCE BOOKS

1. Letter Press Printing I-II, C.S. Misra Anupam Prakashan Allahabad.

2. Akshar Mudran Shastra, C.S. Misra Anupam Prakashan,Allahabad.

3. Durrant, W.R., Machine Printing, Focal Press, London.

4. Hutchings, E.D., Printing By Letterpress, Heinemann, London.

5. Lithographers Manual, GATF, USA.

6. Faux, I., Lithography,GATF,USA.

7. Offset Press Operating, GATF, USA.

8. Flexography; Principles & Practice, Flexographic Technical Association, USA.

9. Digital colour printing technology - by Biswanath Charkaravarthy

10. Introduction to Prepress - by Hugh M. Speirs.

11. Scanning Primer - by Richard M. Adams II

12. Understanding Digital Colour - by Phol Green

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VI Semester

6.1 ENVIRONMENTAL EDUCATION & DISASTER MANAGEMENT

L	T	P
4	-	-

RATIONALE:

A diplima student must have the knowledge of different types of pollution caused due to industrialisation and construction activities, so as he may help in balancing of eco-system and control pollution by providing controlling measures. They should be also aware of the environmental laws for effectively controlling the pollution of environment. The topics are to be taught in light of legislation Para-3.

TOPIC WISE DISTRIBUTION OF PERIODS:

SL. NO.	TOPIC	L	T	P
1.	Introduction	6		
2.	Pollution	4		
2.1	Water Pollution	8		
2.2	Air Pollution	8		
2.3	Noise Pollution	4		
2.4	Radio Active Pollution	6		
2.5	Solid Waste Management	6		
3.	Legislations	4		
4.	Environmental Impact Assessment	4		
5.	Disaster Management	6		
	TOTAL	56	-	-

DETAILED CONTENTS

1. INTRODUCTION :

- Basics of ecology, Ecosystem, Biodiversity Human activities and its effect on ecology and eco system, different development i.e. irrigration, urbanization, road development and other engineering activities and their effects on ecology and eco system, Mining and deforestation and their effects.

- Lowering of water level , Urbanization.

- Biodegradation and Biodegradibility, composting, bio remediation, Microbes .Use of biopesticidies and biofungicides.

- Global warning concerns, Ozone layer depletion, Green house effect, Acid rain,etc.

2. POLLUTION :

Sources of pollution, natural and man made, their effects on living environments and related legislation.

2.1 WATER POLLUTION :

- Factors contributing water pollution and their effect.

- Domestic waste water and industrial waste water. Heavy metals, microbes and leaching metal.

- Physical, Chemical and Biological Characteristics of waste water.

- Indian Standards for qulity of drinking water.

- Indian Standards for quality of treated waste water.

- Treatment methods of effluent (domestic waste water and industrial/ mining waste water), its reuse/safe disposal.

2.2 AIR POLLUTION :

Definition of Air pollution, types of air pollutants i.e. SPM, NOX, SOX, GO, CO2, NH3, F, CL, causes and its effects on the environment.

- Monitoring and control of air pollutants, Control measures techniques. Introductory Idea of control equipment in industries i.e.

A. Settling chambers
B. Cyclones
C. Scrubbers (Dry and Wet)
D. Multi Clones
E. Electro Static Precipitations
F. Bog Fillers.

- Ambient air qulaity measurement and their standards.

- Process and domestic emission control

- Vehicular Pollution and Its control with special emphasis of Euro-I, Euro-II, Euro-III and Euro IV.

2.3 NOISE POLLUTION :

Sources of noise pollution, its effect and control.

2.4 RADISACTIVE POLLUTION :

Sources and its effect on human, animal, plant and material, means to control and preventive measures.

2.5 SOLID WASTE MANAGEMENT :

Municipal solid waste, Biomedical waste, Industrial and Hazardous waste, Plastic waste and its management.

3. LEGISLATION :

Preliminary knowledge of the following Acts and rules made thereunder-

- The Water (Prevention and Control of Pollution) Act - 1974.

- The Air (Prevention and Control of Pollution) Act - 1981.

- The Environmental Protection (Prevention and Control of Pollution) Act -1986. Rules notified under EP Act - 1986 Viz.

  # The Manufacture, Storage and Import of Hazardous Chemical (Amendment) Rules, 2000

  # The Hazardous Wastes (Management and Handling) Amendment Rules, 2003.

  # Bio-Medical Waste (Management and Handling) (Amendment) Rules, 2003.

  # The Noise Pollution (Regulation and Control) (Amendment) Rules, 2002.

  # Municipal Solid Wastes (Management and Handling) Rules, 2000.

  # The Recycled Plastics Manufacture and Usage (Amendment) rules, 2003.

4. ENVIRONMENTAL IMPACT ASSESSMENT (EIA) :

- Basic concepts, objective and methodology of EIA.

- Objectives and requirement of Environmental Management System (ISO-14000) (An Introduction).

5. DISASTER MANAGEMENT :

Definition of disaster - Natural and Manmade, Type of disaster management, How disaster forms, Destructive power, Causes and Hazards, Case study of Tsunami Disaster, National policy- Its objective and main features, National Environment Policy, Need for central intervention, State Disaster Authority- Duties and powers, Case studies of various Disaster in the country, Meaning and benifit of vulnerability reduction, Factor promoting vulnerability reduction and mitigation, Emergency support function plan.

Main feature and function of National Disaster Management Frame Work, Disaster mitigation and prevention, Legal Policy Frame Work, Early warning system, Human Resource Development and Function, Information dissemination and communication.

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6.2 PRESS TECHNOLOGY-II

Rationale :

This is a technology subject. Technicians working in printing industry are required to deal with different printing machines 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.

Detailed Contents

1. Offset Printing Machine:

1.1 Sheet Fed Offset mechines : Classification, purpose, Sizes; Speeds ; suitability; Single, Two and multi colour and perfecting machines; mechanical and operational features, Different models used in modern industry.

1.2 Plate Cylinder, blanket cylinder, impression cylinder, packing of these Cylinders. Stretch during impression,

1.3 Registration systems: registration devices for book work single colour and multicolour printing; electronic register control.

1.4 Blanket and rollers: Structure and properties of blankets care and maintenance. Kinds of rollers their funtions, merits and limitations.

1.5 Pre-make ready and Make ready operation for printing of single colour, two colour and book jobs on sheet-fed offset machines.

1.6 Make ready operation for multi colour Printing, Colour sequence and its effects, Procedure and uses of Colour mixing and matching.

1.7 Web-fed offset printing machines, Mechanical and operational features, different types and their use in the printing industry.

1.8 Modern devices for Web Control, Multi Colour, Ink Control, Dampening systems, Heat set and Cold set inking system, Drying chamber, Silicou unit and Delivery attachment.

1.9 Automatic reel changing, modern controls of inking and dampening system.

1.10 U.V. ink printing.

2. Digital Printing :

2.1 Colour Management - Introduction and image reproduction process.

2.2 Characterising input and output devices, use of CIELAB, CMS.
2.3 Digital printing processes - Silver Faldire, Phernal, Inkjet, Electrostatic Process.

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2.4 Market and Applications - Introduction, defining "On Demand Printing", defining variable printing, Typical lenghts, Short-run process colour printing. On demand printing and publishing concepts.

LIST OF PRACTICALS

1. Adjusting automatic feeders.
2. Plate clamping, blanket fitting, preparing for run.
3. Preparation of fountain solution, dampening rollers.
4. Adjusting inking and dampening rollers, ink - fountain setting.
5. Makeready and printing of text, line and halftone work in Single, Two, Three, and four colour.
6. Measurement of ink control strip through densitometer.
7. Make ready and practice on sheet fed and Web offset printing machines.
8. Preparing Digital Proofs with image reproduction process using colour management.

REFERENCE BOOKS

1. Technology of offset printing, C.S. Misra Anupam Prakashan Allahabad-India.
2. Durrant, W.R., Machine Printing, Focal Press, London.
3. Hutching, E.D., Printing By Letterpress, Heinemann, London.
4. Lithographers Manual, GATF, USA.
5. Offset Press Operating, GATF, USA.
6. Flexography; Principles & Practice, Flexographic Technical Association, USA.
7. Offset Mudran Shastra, C.S. Misra Anupam Prakashan, Allahabad.
8. Colour and its reproduction - by Gray and Field.
9. Colour and Quality - by heidelberg.
10. Pocket guide to colour with digital application - by Thaomas E Schildgen, Frank Beah.
11. Computer to plate primer - by Richard M Adams and Frank J Romano.
12. Electronic Colour Seperation - by Dr. R. K. Molla.
13. The PDF Print Production Guide - by Joseph Marin and Julie Sheffo.
14. On demand printing - by Howord M. Fenten, Frank J. Romano.

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6.3 BINDING & PACKAGING-II

Rationale :

This core subject deals with the special binding systems and automatic binding system. Advancements in binding process is taking place with great speed. A Diploma holder is required to supervise this section in a press. Therefore knowledge of this subject is very essential.

1. Banding & Laces:

   Single, double, double string, russia, lacing.

2. Publishers Binding:

   Folding, bundling, attaching plate and end papers gathering, sewing, nipping, spine gluing, trimming, spring back, edge decoration, rounding and backing, lining, Alternative forwarding techniques, board cutting and cloth cutting, case making, cover decoration, casing-in, pressing, inspection, dispatch.

3. Book Repairing Work:

   Pulling a book, removing old groove, by trimming the book, applying the glue on loose leaf., over cast, strainthening out of vellum leaves, pressing.

4. Loose leaf binding and mechanical binding:

   Interscrew, ring metal, prong metal, thong metal, record or universal metal, metal back ledger, metal spriral or coil, wiro, plastic comb.

5. Automation in bindery:

   Folfing machine, bundling machine, gathering machine, wire stitching machine, thread stitching and looping machine, three- knife book trimmers, continuous trimmers, book back gluing machine. Rounding and backing machine, back-lining machine, lining up and head binding machine, case- making machine, automatic case making machine, back forming machine, casing in machine, pressing machine, Cold foil stamping machine, Automatic book finishing machine, types and suitability of machines for various classes of work.

6. "Embalishment :" UV coating, Aquaous coating, electron beam coating.

   PACKAGING

7. Introduction and uses of packaging.

8. Principles of Packaging :

   Concept of packaging, functions of packaging, packaging and productivity, package components export packaging.

9. Types of Packaging :

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Paper based packaging materials, plastics in packaging, glass and metal containers in packaging, flexible packaging.

10. Packaging Techniques :

Packaging of accessories and spares - skin, blister and shrink packaging, stretch wrapping - strip packaging, blister packaging, pharma packaging.

11. Packaging Management :

Package design - an important marketing tool, systems approach to pakaging, scientific packaging and loss prevention.

11. Production Control:

Departmental planning and layout, modern producion techniques and work-flow sequence, prevention of deterioration: insects, fungi.

LIST OF PRACTICALS

1. Cutting machines: Understanding of various types of automatic cutters, automatic spacing, fixing and changing of knives, safety on cutters, maintenance and regular routine work in handling and care of machines.
2. Folding machines : Understanding of various types of automatic folders, knife folding and buckle folding, different folds, their names and purposes, adjustments, maintenance and regular routine work in handling and care of machines.
3. Introduction to binding machine : Tipping machine, Gathering - automatic, Collating- automatic, Rounding and backing machines, Case making machine.
4. Sewing machine: different types, method of sewing, maintenance routine.
5. Adhesive binding: automatic machines, understanding of various types, perfect binder.
6. Mechanical and loose leaf binding machines used.
7. Printing and decorating cover-stamping with ink, with foil, blind.
8. Packaging design : Prepare the package on pulp board

Refernece Books

1. Martin, A.G., Finishing Process in Printing, Focal, 1972.
2. Johnson, A.W., Manual of Book Binding, Thames and Hudson.
3. Alex J. Vaughan, Modern Book binding
4. Learance Twon, Bookbinding by Hand.
5. Doeglas Cockerell, Bookbinding and the Care of Books.
6. Hanlon, J.F., Handbook of Packaging Engg. McGran Hill.
7. Pain, F.A., Fundamentals of Packaging, 1981.
8. Handbook of print media - by Helmut Kippan Ed., Heidelberg.

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6.4 PRINTING COSTING AND ESTIMATING

Rationale :

Costing and Estimating: Printing supervisors, owners of printing presses and so on, have to study costing for the purpose of cost recovery and cost control. The study of a scientific system of costing will give them proper guidance as to how the maximum utilization of the resources of the factory can be achieved and do away with waste of time and money.

In an extrenely competitive market, scientific estimating can guaranctee the meaningful survival of a printing organisation by enabling it to forecast correctly and judiciously the estimated cost of jobs, the overhead expenditure of a business, and the amount of profit to be made from each job.

DETAILED CONTENT

1. Costing :

1.1 Introduction - the object of costing the factors likely to affect profitability, informations sought in costing, national expenses, the outline of British Federation system of costing.

1.2 A study of the budget - classification of expenditure bases of allocation, apportionment and re-apportionment to cost centres, calculation of cost recovery rates, recovery of all budgeted costs, assessment of capital values, forecasting the life of assests-methods of depreciation, cost sheet and estimate form.

2. Estimating

2.1 The importance of accurate estimating The tools of an estimator - Output tabel

2.2 Calculations of of the printing substrate and flexible packaging materials.

2.3 Estimating for various method os image carrier preparation (conventional and latest printing processes)

2.4 Estimating of ink, Toner, Binding and Finishing materials.

2.5 Estimating for the warehouse.

2.6 Online estimating : Benifits, Types and processes.

2.7 Data base printing management system.

Reference Books

1. Cost Accountancy for printers, British Printing Industries Federation, Landon.

2. Estimating for Printers, British Printing Industries Federation, Landon.

3. Estimating Methods and cost analysis for printers, Balaraman and Krishnamurthy, Ramya Features, Chinnai.

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4. Principles of applied costing for printing industry, K.S. Venkatraman, AIFMP, New Delhi.

5. Lagat Parikalan tatha Mulyankan, L.R. Nagpal, Neelam Prakashan, Chandigarh.

6. Mudran Samagri Prodyogiki, M.N. Lidbide, Madhaya Pradesh Hindi Granth, Academy Bhopal.

7. Costing and estimating for printers - by B. D. Mendiratta.

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6.5 BOOK DESIGN AND PRINTING PRODUCTION

Rationale :

This is diversified course. The objective of the course is to impart knowledge and skills in book production, an area of inter-disciplinary approach in printing technology.

DETAILED CONTENT

1. Selection of Book Format :

1.1 Standard and non standard formats: International ISO range, US/European Standard, metric book publishing format.

1.2 Making the right choice for book formate.

2. Preparation of Text :

2.1 Copy preparation, Presentation, copy editing, house style, defining the structure.

2.2 Designing the Text, Selection of type face, type area, page margins and text type size, heading styles, subsidiary text and illustration captions, Prelims and end matter.

3. Preparation of Illustration:

3.1 Line art work, tone illustration and the process of picture research, assessing originals for reproduction, line illustrations and tone illustrations.

3.2 Digital Image Eidting

4. Preparation of Cover and Jackets :

4.1 The cover/jacket brief; reviewing rough, drawing up and assessing finished art work- specifying the art work size presentation.

4.2 Bar codes-1 D and 2 D,QR Barcodes

5. Text Setting:

5.1 The type setting cycle: Steps in text processing, front end operations and page make-up techniques, output.

5.2 Marking proofs and controlling quality.

6. ORIGINATING AND PROCESSING THE ILLUSTRATIONS

6.1 Scanning of mono-colour and multi-colour illustrations.

6.2 Proofing and proof checking; Single colour integrated books, colour books.

7. PROOFING THE COVER/JACKET :

7.1 The originating stages.

7.2 Quality control.

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8. PAPER AND INK :

8.1 Selection of paper for different types of books, paper measurement and calculation defects in paper.

8.3 Printing Inks: Specifying inks and process colour inks, calculation of ink consumption/milage.

9. BOOK PRINTING :

9.1 Sutability of selection of printing processes.

9.2 Selection of printing process : Letterpress, offset, Digital prepress and other processes.

9.2 Planning and plate making,
selection of cover boards and jacket.

9.3 Total quality control management.

10. BINDING AND FINISHING PROCESS :

10.1 Different types of book binding.

10.2 Varnishing lamination, Foil stamping embossing, Trimming, UV coating spot lamination and spot UV.

LIST OF PRACTICALS

(4 Hours)

Study of industry working procedure- Every student require to submit their report in prescribe proforma.

REFERENCE BOOKS

1. TREVIT, J., BOOK DESIGN, COMBRIDGE UNIVERSITY PRESS.

2. WILLIAMS, H. METHODS OF BOOK DESIGN, YALE UNIVERSITY PRESS, USA.

3. BAKER, D, PUBLISHERS GUIDE TO COPY PREPARATION, BLUDPRINT, LONDON.

4. BANN, D., THE PRINT PRODUCTION HANDBOOK, MACDONALD.

5. EVAN H., THE ART OF PICTURE RESEARCH, DAVID & CHARLES.

6. LEE, M., BOOKMAKING, R.R. BOWLER CO., LONDON.

7. BOOK PRODUCTION PRACTICE, PUBLISHERS ASSOCIATION/BRITISH PRINTING INDUSTRIES FEDERATION,LONDON.

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6.6 PROJECT

The students of diploma in "Printing Technology" programme have to do a project work as part of curriculum and in partial fulfillment for the award of diploma by the state Board of Technical Education, Uttar Pradesh.

The objective of project work is to make use of the knowledge gained by the student at various stages of the diploma course and to enable the students to work in convenient groups on a project involving theoretical and experimental studies related to printing technology.

The project work is meant for solving or even indentifying open ended problems and to give remedial suggestions by applying the knowledge and skills gained through various subject areas. It is expected that students will be sent to various printing industries to take live problems from the field, as their project work.

Identification of printing industry and project activities should begin well in advance. Student should also be asked to identify suitable printing industry and project activities, which can be taken by them. One teacher as guide, will supervise and evaluate the project work of the students assigned under guidence.

This helps to judge the level of proficiency, originality and the capacity for application of the knowledge attained by the student, at the end of the course

Each student shall finally produce a comprehensive report, eovering background information, literature survey, problem statement, project work details and conclusions. This final report shall be in type written and bound form.

The following factors to be considered white selecting the projects -

1. The project has to be done by the students themselves and not by any outsider, that is, the diploma students with their own knowledge and skill shall be able to do the project with somebody's guidence.
2. Repetition of same project done by any other batch of same year/ previous years shall not be permitted.
3. The total number of students in a group shall not exceed six.

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R E S O U R C E S

An estimate of the requiremetn of resources, land buildings, equipment, furniture, staff, recurring and non recurring costs for establishing and running this course have been worked out in this chapter. These resources are the bare minimum and must be provided for this course.

1. DEPARTMENT AND LABORATORIES

The following Department and Laboratories for practical training have been identified for conducting Diploma course in Printing Technology.

1. Basic Engineering Department
2. Computer Application Laboratory
3. Printing Science Laboratory
4. Printing Design Studio Department
5. Text & Image Setting Department
6. Reproduction Technology Department
7. Image Carrier Technology Department
8. Printing Process Department
9. Press Technology Department
   (Including Letterpress, Flexography, Screen, Offset and intaglio workshop)
10. Digital Printing Department
11. Binding and Packaging Department.

II STAFF

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A. FACULTY

With the modernisation of curriculum and syllabus for Diploma Course, revision of faculty structure and updating of faculty qualification have become essential to make the faculty relevant to the curriculum.

The recommended faculty structure are given as under.

Staff requirement as per norms

Sl. No.	Designation of the Post	No. of Post
1.	Principal	one
2.	Head of Department Graphic Reproduction	one
3.	Head of Department Printing and Finishing	one
4.	Head of Department Design and Letter Assembly	one
5.	Lecturer in Graphic Design	one
6.	" Graphic Reproduction	one
7.	" Typography	one
8.	" Reproduction Photography	one
9.	" Letter Assembly	one
10.	" Printing Surfaces	one
11.	" Printing Processes	one
12.	" Printing Machine	one
13.	" Offset Machine	one
14.	" Binding & Finishing Process	one
15.	" Process Planning and Film Assembly	one
16.	" Press work	one
17.	" Plate Making	one
18.	" Printing Science	one
19.	" Business Management	one
20.	" Computer Application	one
21.	" Basic Engineering	one

Maintenance of Staff requirement Workshops

Sl. No.	Designation of the Post	No. of Post
	Maintenance Technicians in :	
(a)	Basic Engineering	1
(b)	Priting design Photography & Letter Assembly	1
(c)	Reproduction & Printing Surface Preparation	1
(d)	Press work	1
(e)	Binding and Finishing	1

III Buildings

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Sl. No.	Deseription	Total Requirement (Sq.M.)
III.1	Teaching area	
i.	Class rooms/ tutorial Rooms	375
ii.	Drawing Hall	200
iii.	Laboratories /Workshops	(for a batc
(a)	Basic Engineering lab	100
(b)	Computer Application lab	60
(c)	Printing Science Lab	120
(d)	Printing Design Studio	100
(e)	Letter Assembly I Lab	120
	---do ---	120
(f)	Reproduction & Photography lab	120
(g)	Printing Surface Preparation Lab (plate making)	120
	----do--- II	120
(h)	Press work I Lab	120
	Press work II Lab	120
	Press work III Lab	120
(i)	Binding & Finishing I Lab	120
	Binding & Finishing II Lab	120

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Sl. No.	Description	Total Requirement (Sq.M.)
III.2	Administrative Area	
i.	Principals Room, Confidential Room, Main office, store Library, H.O.D./ Lecturers Room.	650
ii.	Conference Room.	120
iii.	Examination Control Room	60
iv.	N.C.C. Block	75
III.3	Students Amenities	
i.	Cycle Stand	200
ii.	Canteen	50
iii.	Dispensary	30
III.4	Guest House	30
III.5	Residential Area	

Sl. No.	Name of Post	Type of Residence Required and number
1.	Principal	Type IV
2.	H.O.D./Lecturer	(10)
3.	Technician	Type III (5)
4.	Office Staff	Type II (5)
5.	Class IV	Type I (8)

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Sl. No.	Total Population of Students	Hostel Capacity Required
	Hostel Facilities	
1.	225	133

Hostel Accomodation

Required for 150 Students

IV. EQUIPMENT

The details of experiment for the various laboratories and workshops are given in the APPENDIX I

V. FURNITURE

The details of the furniture requirements may be worked out on the basis of students strength and number of laboratories and workshops. Every laboratory, classroom and drawing hall must have chalk board. Lump sum amount may be provided for this purpose.

VI ANNUAL RECURRING EXPENDITURE

VI.1 In additional to staff salaries and allowances the provision for training cost, direct and indirect, may be made for the total number of student per year.

VI.2 Library: there should be provision for purchase of books and journals for this discipline about Rs.- 12,000/ every year.

VII TOTAL COST ESTIMATES

There is difficulty in working out the details of costs for recurring and non - recurring items. The rough cost estimates are to be calculated as per requirment.

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LIST OF EQUIPMENTS

Only those of the equipments given below which are essentially required for the conduction of practicals mentioned in the curriculum are to be procured by the institutions.

"Machine/Equipments/Instruments of old BTE list which are not included below are to be retained in the Lab/Shop for Demonstration purpose but not to be demanded fresh for purchase."

NOTE : Equipment for different shop and lab of latest verson should be purchased.

I. APPLIED PHYSICS LAB

APPLIED PHYSICS LAB

S.No.	Name of Equipment	No.	@ Rs.	Amt.in Rs.
1.	Brass ball with hook 2 cm. dia	2	20	40
2.	Stop watch least count 0.1 Sec	4	500	1000
3.	Wall bracket with clamping arrangement	2	50	100
4.	Meter scale	5	20	100
5.	Searl's conductivity apparatus with copper & steel rods 25 X 4 cm. diameter with all accessaries	2 set	1000	2000
6.	Potentiometer - 10 wires with jocky	4	500	500
7.	Meterbridge complete	2	250	250
8.	Moving coil galvenometer	5	200	600
9.	Moving coil ammeter 0-1 amp., 0-5 amp., 0-10 amp., 1 no of each	8	250	750
10.	Moving coil voltmeter 0-1 V. 0-5 V., 0-10 V. 1 No of each	8	250	750
11.	Resonance Column of steel (with all accessories)	2		
12.	App. for determining coefficient of friction on a horrizontal plane	2 set	1000	1000
13.	Appratus for determining character-stics of P-N junction diode complete with all accessaries	2 set	1500	1500
14.	Post office box dial type with resistance boxes	2	1200	1200
15.	Physical balance with weight box	2	800	1600
16.	Rehostat of different ohm.capacity	16	250	2000
17.	Fortin's barometer with mercury	1	2500	2500
18.	Anemometer cup type	1	1000	1000
19.	Anemometer hand held	1	1000	1000
20.	Spring Force Constant Apparatus with accessories	2		
21.	Screw gauge	5set		
22.	Spherometer	2set		
23.	Halfmeter scale	5set		
24.	Vernier Callipers	5set		
25.	Viscosity Apparatus (Complete with accessories by Stokes method)	2set		
26.	Thermometer of different range	10set		
27.	Reynauld's Hudrometer	1set		
28.	Wall Thermometer	2set		
29.	Tuning Fork's Sets	3set		
30.	Carey Foster Bridge (With all accessories)	2set		

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S.No.	Name of Equipment	No.	@ Rs.	Amt.in Rs.
31.	Battery Eliminator of different types	4set		
32.	Battery Charger	1set		
33.	Standrad Cadiminum Cell	2set		
34.	Multimeter(Digital)_	1set		
35.	Sprit Level	2set		
36.	Drilling Machine	1set		
37.	Lab tables	8		
38.	Lab stools	30		
39.	LPG Gas Burner with Cylinder	1		
40.	Stop Clock	1.pa		

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II. APPLIED CHEMISTRY LAB

S.No.	Name of Equipment	No.	@ Rs.	Amt.in Rs.
1.	Test tube stand	15	10	150
2.	Funnel stand	15	10	150
3.	Burette stand	15	30	450
4.	Pipette stand	15	10	150
5.	Chemical balances with analytical weights 1gm -200gms	5	1500	7500
6.	Fractional weights set with rider	5sets	25	125
7.	Kipp's apparatus 1000 ml. polythen	2	500	1000
8.	Reagents bottles			
	250ml	120	10	1200
	500ml	5	15	75
	1000ml	5	25	125
9.	Wide mouth bottle 250 ml	15	15	225
10.	Winchester bottle 2.5 litre	15	30	450
11.	Test tubes 1/4" x 6"	75	1	75
12.	Boiling tube 1" x 6" hard glass	24	10	240
13.	Pestle and morter 10 cms	2	30	60
14.	Watch glass 7.5 cms	15	5	75
15	Beakers			
	100 ml.	10	15	150
	250 ml.	24	20	480
	400 ml.	12	25	300
	1000 ml.	5	30	150
16.	Weighing bottle 10 ml with lid	15	10	150
17.	Wash bottles	15	15	225
18.	Conical flask 250 ml.	15	30	450
19.	Flat bottom flask 500 ml.	6	40	240
20.	Flat bottom flask 250 ml.	15	25	375
21.	Burette 50 ml.	15	60	900
22.	Pipette 25 ml.	15	20	300
23.	Measuring flask 250 ml. with stopper	15	50	750
24.	Measring cylinder of various sizes (250 ml, 500 ml, 1000 ml) 3 no. of each	9	LS	250
25.	Bunsen's burner of brass	15	50	750
26.	Gas plant petrol 10 to 20 burners automatic	1	5000	5000
27.	Spirit lamp	15	30	450
28.	Tripod stand	15	10	150
29.	Wire gauge 15 X 15 cm. with asbestos	15	15	225
30.	Test tube holder	15	10	150
31.	Porcelain plates	15	20	300
32.	Funnel 15 cm.	15	16	240
33.	Blow pipe & work tools with electric blower for glass blowing	1 set	10000	10000
34.	Cork borers with sharpn	2 set	100	200
35.	Cork pressure	1 set	250	250
36.	Glass cutting knife	1	75	75
37.	Spatula hard & nickel/steel	2 each	50	100
38.	Water tapes with gooseneek	6	200	1200
39.	Gas taps two way	10	150	1500
40.	Pinch cock & screw	15	20	300
41.	Distilled water units (electrical)	1	5000	5000

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S.No.	Name of Equipment	No.	@ Rs.	Amt.in Rs.
42.	Distilled water units (solar)	1	5000	5000
43.	Open balance 1000 gms./10 mg.	1	600	600
44.	Platinium wire	5	25	125
45.	Brush for cleaning various type	40	10	400
46.	Jars 20 Lit. for keeping destilled water	5	100	500
47.	Lab table 2 m. x 1.2 m. x 1 m. hight with central sink and cup boards (Teak wood) with drawers and two built in almirah on each side with reagent racks, better tile top	4	8000	32000
48.	Exhaust fans 18"	4	2000	8000
49.	Side racks and selves for bench reagents made of teak wood for 24 bottels each set	4	2000	8000
50.	Digital balance electronic	1	10000	10000
51.	Hot plates 7-1/2", 3" dia controled 2000 watts	1	1000	1000
52.	Hot air oven thermostatically controled with selves and rotary switches 350 x 350 x 25 high	1	8000	8000
53	pH Meter	1	1000	1000
54	Glass Electrode	2		
55.	Reference Electro	2		
	Miscellaneous	LS		10000

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Name of Equipments	Quantity	Approximate Cost Rs.in Lacs.
1.1 Text and Image Setting LETTER ASSEMBLY		
1.1 Hand Composing		
(i) Case Racks to accomodate 15 cases of English and Hindi)	10 sets	0.30
(ii) Galley Racks (for 100 galleys)	3 Nos	0.30
(iii) Lead/Rule Racks cut to size, rack for leads and rules accomodation 15 cms to 60 cms lenght with three seperators.	1 Nos	0.10
Galleys :-		
(a) Standard folio galleys	06 Nos.	0.10
(b) Standard demy Quarto galleys	12 Nos.	0.20
(iv)Type cases (of standard size) English cases Pair of cases	04	0.10
(v) Double cases	10	0.45
(vi)Devnagari calcuttia style	03 set	0.10
(vii)Types :		
(a) Book faces with standard variations in design & size.	3 faces	0.20
(b) Display faces with complete variations.	3 faces	1.20
(viii)Type metal	1 Quintals	1.00
(ix) Galley Proofing Press(Std.)	1 No.	0.10
1.2 Mechanical Composing		
(i) Phototype setters with accessories	1 Nos.	10.00
(ii) Linotype Machine (Demo)	01	05.00
(iii) Mono Type	1 "	02.00
1.3 Electronic Composing		
(i) Image Setter (Latest Config.)	1No	10.00
1.4 Desk Top Publishing		
(i) Professional System graphic dedicated of latest config. capable of handling latest emage editing software easily	20 No.	10.00
(ii) Desk top publishing terminal latest configuration for	30 No.	15.00
(iii) Lan connectivity with professional server with backup facility capable of handling minimum 20 terminals Each with LAN (Latest configuration)	02 No.	02.50
(iv) Professional laser network printer A3	02 No.	03.00
(v) Professional Scanner A4 (flatbed) high res.	01 No.	01.00
(vi) Professional Scanner A4 (flatbed) high res.	01 No.	02.50
(vii) Inkjet Printer A3 Size High End	02 No.	02.00
(viii)Adobe photoshop(Latest ver multiuser)	01 No.	01.00

(ix)	Coral draw (latest ver multiuser)	01 No.	01.20
(x)	Adobe Acrobat professional(latest version	01 No.	01.00
(xi)	Adobe in design laterst ver.	01 No.	01.50
(xii)	Quark Express 10 or latest version(Mul.Us.)	01 No.	00.50
(xiii)	Adobe page maker 7 or lastest ver.(Mul.Use.)	01 No.	00.20
(ivx)	FOSS inkscape vextor drawing	01 No.	
(xv)	FOSS gimp shop photo plus 6 image editing	01 No.	
(xvi)	R.I.P.	01 No.	

2. Reproduction Technology

(i)	Electronic colour scanner:- with dot generation, negative & Positive output, graphic planning facilities	1 No	33.00
(ii)	Digital & Vertical Camera with all necessary accessories like screens, filters light integrators, lamps, etc.	1 Set each	6.00
(iii)	Enlarger and contact printer with provision for filters.	1 Set	1.50
(iv)	Film/ Bromide processor	1 Set	1.25
(v)	Register Punch Pins and bars	2 Set	0.10
(vi)	Developing Trays	03 Nos.	0.30
(v)	Transmission type digital Densitometer	1 Nos	0.25
(vi)	Reflection type Densitometer	1 Nos.	0.25
(vii)	Spectrophotometer	1 Nos.	0.25
(viii)	Computer to plate with work flow system	1 Nos.	
(ix)	Plate setter and Processor	1 Nos.	0.50

3. Image Carrer Technology

(i)	Photo Polymer Platemaking equipment accessories with latest version	1 set	3.00
(ii)	Whirlers (Offset Plate coating machine) with variable speed range, fitted with warm air system with adjestable temperature control, drain outlet for easy accessibility.	2 Nos.	2.50
(iii)	Printing down units With built in metal halide light source & vacum Pump, rotating plate holder, Exposure Control timer, Exposure control start/ lamp ON OFF device, vacum control device.	2 Nos.	2.00
(iv)	Etching machine	1 No.	1.00
(v)	Graining machine 104 x 129 cm (41" x 51") with rustless plate	1 No.	1.00

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	clamping device adjestable stroke action of markles for variable plate grains, Trongh lined with thick sheets on base sides.		
(vi)	Printing down frame (Automatic)	1 No.	0.75
(vii)	Light sources	2 Sets	1.00
(viii)	Plate processor	1 No.	2.50
(ix)	Misc. equipment, & gauges testing instruments, furnitures, etc.		6.25
			20.00

4. PRESS TECHNOLOGY (Letter press, Flexography, Digital Printing)

(i)	Hand fed platens 9"x13", 10"x15" size 1 no.each	2 Nos.	1.00
(ii)	Automatic platens 10"x15", sizes 1 each	1 Nos.	3.00
(iii)	Automatic Cylinders 15"x20", 20"x30" sizes 1 no. each(For Demo)	2 Nos.	8.00
(iv)	Imposing tables(Standared size having galley of furniture racks)	4 Nos.	0.60
(v)	Type heigh gauge	1 No.	0.10
(vi)	Metal furnitures (made of alloy matel) assoted size	set of 50	0.45
(vii)	Mechanical Quoins (different sizes	set of 50	0.75
(viii)	Flexographic machine Size 24" with heating, sheeting and rewinding arrangements including polythene printing attachments.	1 No.	20.00
(ix)	Miscellaneous equipment for flexography Printing machine	1 50	04.00

5. Digital Printing

(i)	Digital colour printing A3 size with duplexing facility and booklet finishing with latest configuration	01 No.	15.00
(ii)	High end MF printing A3 size with duplexing facility	01 No.	00.20
(iii)	A4 size colour laser printer high end	01 No.	01.00
(iv)	LCD Projector	01 No.	00.70
(v)	Professional graphic dedicated system with latest configuration with OS	20 No.	10.00
(vi)	Work station with 24" professional monitor	01 No.	01.00
(vii)	High end professional scanner a3 with ADF	01 No.	01.00
(viii)	Professional server with backup facility capable of handling mimimum 20 terminals each with LAN (Latest configuration)	02 No.	02.50
(ix)	LAN with complete accessories	02 No.	00.80
(x)	Online UPS 10 KV with on hour backup	02 No.	05.00
(xi)	Air conditioner 2 tons with stablizer	04 No.	01.60
(xii)	Coral draw (latest ver multiuser)	02 No.	02.00
(xiii)	Adobe Acrobat professional(latest version	02 No.	02.00
(xiv)	Adobe in design laterst ver.	01 No.	01.50
(xv)	Adobe CS5(Latest ver multiuser)	02 No.	03.00
(xvi)	ABBY find reader latest version	01 No.	00.70

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(xvii)	Quark Express 10 or latest version(Mul.Us.)	01 No.	00.50
(xviii)	Adobe page maker 7 or lastest ver.(Mul.Use.)	01 No.	00.20
(xix)	Room preparation and furniture	LS	06.00

6. Press Work (Off Set,Screen Printing, Intaglio workshop)

(i)	Medium size offset machines Size 19"x26", fully automatic, Highest Register quality.	1 Nos.	20.00
(ii)	Two colour offset printing. machine size 19"x26", fully automatic sheet fed press, the machine should be able for single sided printing as well as for perfeeting, electronic control devices with all accessories/	1 No.	60.00
(iii)	Web offset with two units Web width size 660 m.m. Automatic blanket to blanket modern registration inking system & other latest device	1 No.	50.00
(iv)	Small offset Machine 10"X15"	1 No.	3.50
(v)	Small offset Machine 10"X20"	1 No.	6.50
(vi)	Gravure machine 24" with auto trminal control unith web aligner of latest configuration	1 No.	17.00
(vii)	Proofing Press	1 No.	4.50
(viii)	Misc. equipments, gaueges, testing equipments including densitometers etc.		0.50

7. Screen Printing :

(i)	All accessories required for printing manually set each of	5 Set.	0.10
(a)	Wooden screen Frames 10"x12", 12"x15", 15"x20" sizes	2 each.	0.10
(b)	Screen cloth, Fine, Medium & Course		0.50
(c)	Squezee 10", 12", 6", 4", 3"	1 set	0.05
(ii)	Semi automatic screen printing machine with stainsteel vaccum bed size 15"X20	1 Set	1.35

8. BINDING AND PACKAGING DEPARTMENT

(i)	Paper cutting machine hand operated	1 No.	0.20
(ii)	Paper cutting machine Semi Automatic	1 No	0.40
(iii)	Automatic paper cutting machine equipped with electronic control and programming devices, with all accessories.	1 No	10.00

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(iv)	Wire stitching machines	2 No	00.25
(v)	Book Sewing machines with latest configuration	12 No	4.50
(vi)	Folding machines automatic equipped with electronic control devices with all accessories.	1 NO	5.00
(vii)	Folding machine semi automatic	1 No	5.00
(viii)	Book backing machine	2 No	0.05
(ix)	Perfect binding single clamp machine with latest configuration	1 No	19.00
(x)	Hard Press	3 No	0.50
(xi)	Board Cutter	1 No	0.50
(xii)	Comb-binding machine	1 No	0.50
(xiii)	Laminating machine other minor binding equipments and accessories.	1 No	1.00
(xiv)	Laminating machine by hot process	1 No	1.00
(xv)	U. V. coating machine	1 No	2.00
(xvi)	U. V. curing machine	1 No	4.00
(xvii)	Hot Foil Stamping Machine	1 No	4.00

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COMPUTER CENTRE

S.No.	DESCRIPTION	QTY.	APPROX. COST (in Rs.)
1.	Computers (Mimumum or latest core 16 or latest core i7, 1GB graphic Card, 4GB RAM, DVD ROM, Hard Disk 500GB with OS and 17" Monitor ora latest config. with all accessories		8,00,000=00
			(in Rs.)
Software :			
	i. MS OFFICE latest version	01	00.55
	ii. Adobe Photoshop latest ver.	01	
	iii. Corel Draw Latest Version	02	
	iv. Adobe Acrobat Professiona Latest Version	02	
	v. Adobe in design latest ver.	02	
	vi. Adobe Photo shop	01	
	vii. Adobe Illustrator Latest Version	01	
3. Hardware			
	i. Hubs-16 port, all accessories related to Networking.		
	ii.Scanner- A4	01	10,000
3.	Ink Jet Printer	01	5,000
4.	Black-Colour Laser Jet	01	20,000
5.	5 KVA on line UPS with minimum 30 miniute battery backup along with sealed maintenance free batteries. Provision for connecting external batteries with network connectivity.	02	3,00000
6.	Window Air Conditioner 1.5 tones capctity with ISI mark alongwith electronic voltage stablizer with over viltage and time delay circuit	04	30,000(EACH)
7.	Room preparation and furniture	LS	

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General Recommendations taken into consideration for deciding staff requirements and other facilities

1. In principle, duration of course will be three years with extra six months of practical Training in industry. In order to implement this Practical Training system efficiently, proper liaison staff should be provided by the State Government in the Institute. Diploma will be awarded to students after the completion of Practical Training. Till the above facilities are provided, the duration, of the course will remain as it is i.e., three years.

2. Many equipments required for setting laboratories and workshop for this course are very sophisticated and may have to be imported. Hence,efforts should be made for geting exemption from custom duty on such equuipment should be sought.

3. The purposeful implementation of the curriculum would necessiate arrangement of faculty development programmes so as to up-to-date the knowledge of the faculty.

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INSTITUTE OF RESEARCH,DEVELOPMENT AND TRAINING U.P.KANPUR -208024

SUBJECT: Questionnaire for ascertaining the job potential and activities of diploma holder in Printing Technology.

PURPOSE: To design and develop diploma curriculum in Printing Technology.

NOTE: 1.Please answer the questions to the points given in the questionnaire.

2.Any other point or suggestion not covered in this questionnaire may be written on a separate paper and enclosed with the questionnaire.

1.Name of the organisation:_____
_____

2.Name & Designation of the officer filling the questionnaire _____
_____

3.Name of the department/section/ shop _____
_____

4.Importent functions of the department/section/shop _____
_____

5.Number of diploma holder employees under your charge in the area of Printing Technology. _____

6.Please give names of modern equipments/machines handled by a diploma holder in Printing Technology.

1. 2. 3.

4. 5. 6.

7.What proficiencies are expected from a diploma holder in Printing Technology.

1. 2. 3.

4. 5. 6.

8.Mention the approximate percentage of the following desired in Diploma teaching.

1. Theoretical knowledge ----------%
2. Practical knowledge ----------%
3. Skill Development ----------%

9.Do you think " on the job training" / Industrial training should form a part of curriculum. (Yes/ No)
if yes then

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(a) Duration of training ----------
(b) Mode of training 1. Spread over different semesters

2. After completion of course

3. Any other mode

10.What mode of recruitment is followed by your organisation.

1. Academic merit
2. Written test
3. Group discussion
4. Interview
5. On the job test.

11. Mention the capabilities/ Qualities looked for while recruiting diploma holder in Printing Technology.

(a) Technical knowledge ----------
(b) Practical skill ----------
(c) Etiquettes and behaviour ----------
(d) Aptitude ----------
(e) Health habit and social background ----------
(f) Institution where trained ----------

12. Which type of assignment do you suggest for an entrepreneure in Printing Technology.

13. In which types of organisations can a diploma holder in Printing Technology work sucessfully.

1 2 3

4 5 6

14. Job procepects for the diploma holder in Printing Technology. for the next ten years in the state / country.

15. In your opinion what should be the subjects to be taught to a diploma student in Printing Technology.

Theory Practical

16. Kindly mention particulars regarding topics/areas which should be given more emphasisin the curriculum .

Theory Practical

17. Kindly state whether your organisation can contribute towards improvement of curriculum in above field. Yes/ No
If yes : Pleas give names of experts in

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your organisation to whom contact.

18. Kindly give your valuable suggestions for being considered at the time of finilisation of curriculum.

19. What changes in technologies or to be incorporated in the development of curriculum on Printing Technology.

(Signature)

Kindly mail the above questionnaire duly filled to:-

Shri Pankaj Yadav
Professor
I.R.D.T.,U.P.,Kanpur

(Please note that all information in this survey is confidential for the use of curriculum design only)

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