

**DR. BABASAHEB AMBEDKAR MARATHWADA
UNIVERSITY, AURANGABAD**

**Department of Printing Technology &
Graphic Arts**

Advanced Diploma in Printing Technology & Graphic Arts
1.5 years-3 semesters course

New Credit based syllabus 2011

Department of Printing Technology & Graphic Arts

SCHEME FOR CHOICE BASED CREDIT SYSTEM (CBCS) AND AWARDING GRADES TO THE STUDENTS IN UNIVERSITY DEPARTMENTS

w.e.f. June, 2011 (Academic Year, 2011-2012)

The CBCS System

University Departments have adopted a credit-based system under the Academic Flexibility Programme of the University from the academic year 2011-2012. This provides the flexibility to make the system more responsive to the changing needs of our students, the professionals and society. It gives greater freedom to students to determine their own pace of study. The credit-based system also facilitates the transfer of credits.

I. Admission / Promotion

Admission to the course in the concern department will be done on the performance of CET score and / or their performance in the qualifying graduate level examination.

The student will apply on the application form of the University provided with the prospectus. Once the student is admitted to the concern department/ course, he/ she will be promoted to next semester with full carryon; subject to the registration of student in every consecutive semester. Dropout student will be allowed to register for respective semester as and when the concerned courses are offered by the department, subject to the condition that his/her tenure should not exceed more than twice the duration of course from the date of first registration at parent department. The admission of concern student will be automatically get cancelled if he/she fails to complete the course in maximum period (Four years/ Eight semesters).

II. Credits and Degrees

- i) A candidate who has successfully completed all the core courses, Elective/ Specialized courses and, seminars and project prescribed and or optional service courses approved by the University for the programme with prescribed CGPA shall be eligible to receive the degree.
- ii) One Credit shall mean one teaching period of one hour per week for one semester (of 15 weeks) for theory courses and two practical/ laboratory/ field/ demonstration hours/ week for one semester.
- iii) Every student will have to complete at least 100 credits to obtain the masters degree (Post graduate degree) in the subjects having practical's/laboratory work/field work/demonstration work, out of which 96 credits should be from their respective subject and four credits from service courses. However the autonomous departments can design the curriculum of more credits and it will be compulsory for the students from the department to complete the credits in their subject accordingly.
- iv) Every student will have to complete at least 68 credits to obtain the masters degree (Post graduate degree) in the subjects without practical's/laboratory work/field work/demonstration work, out of which 64 credits should be from their respective subject and four credits from service courses. However the autonomous departments can design the curriculum of more credits and it will be compulsory for the students from the department to complete the credits in their subject accordingly.

Department of Printing Technology & Graphic Arts

III. Courses

- i) **Core Course:** A core course is a course that a student admitted to a particular P.G. programme must successfully complete to receive the degree. Normally no theory course shall have more than 4 credits.
- ii) **Elective Course:** Means an optional course from the basic subject or specialization.
- iii) **Service course (SC):** The service courses will be offered in third and fourth semesters in different departments of the University. Student should complete at least one service course in any semester.
- iv) Each course shall include lectures/ tutorials / laboratory or field work / Seminar / Practical training / Assignments / mid term and term end examinations / paper / Report writing or review of literature and any other innovative practice etc. to meet effective teaching and learning needs.
- v) **Attendance:** Students must have 75% of attendance in each Core and Elective course for appearing the examination. However student having 65% attendance with medical certificate may apply to the H.O.D for condonation of attendance.

IV. Registration for Service Course:

- i) The student will register the service course of his interest after the start of semester in the concerned department on official registration form. The teacher in charge of the respective course will keep the record of the students registered. Maximum fifteen days period will be given from the date of admission for completion of registration procedure. The Departmental Committee shall follow a selection procedure after counseling to the students etc. to avoid overcrowding to particular course(s) at the expense of some other courses.
- ii) No student shall be permitted to register for more than one service course in a semester.
- iii) The University department shall decide the maximum number of students in each service course taking into account the teachers and Physical facilities available in the Department.
- iv) The University may make available to all students a listing of all the prerequisites, a brief description of list of topics the course intends to cover, the instructor who is giving the courses, the time and place of the classes for the course. This information shall be made available on the University website.
- v) Normally no service course shall be offered unless a minimum of 10 students are registered.
- vi) The student shall have to pay the prescribed fee per course per semester/year for the registration as decided by the University.

V. Departmental Committee:-

Every P.G. programme of the University/ College shall be monitored by a committee constituted for this purpose by the Department. The Committee shall consist of H.O.D. as a Chairman and some/ all the teachers of the Department as its members.

VI. Results grievances Redressal Committee:-

The University shall form a Grievance Redressal Committee for each course in each department with the Course Teacher and the HOD. This Committee shall solve all grievances relating to the Assessment of the students.

Department of Printing Technology & Graphic Arts

VII. Grade Awards:-

- i) A ten point rating scale shall be used for the evaluation of the performance of the student to provide letter grade for each course and overall grade for the Master's Programme. Grade points are based on the total number of marks obtained by him/her in all the heads of examination of the course. These grade points and their equivalent range of marks are shown separately in Table-I.

Table I: Ten point grades and grade description

Sr. No	Equivalent Percentage	Grade Points	Grade	Grade description
1.	90.00-100	9.00-10	O	Outstanding
2.	80.00-89.99	8.00-8.99	A++	Excellent
3.	70.00-79.99	7.00-7.99	A+	Exceptional
4.	60.00-69.99	6.00-6.99	A	Very good
5.	55.00-59.99	5.00-5.99`	B+	Good
6.	50.00-54.99	5.00-5.49	B	Fair
7.	45.00-49.99	4.50-4.99	C+	Average
8.	40.01-44.99	4.01-4.49	C	Below Average
9.	40	4.00	D	Pass
10.	<40	0.00	F	Fail

- ii) Non appearance in any examination/assessment shall be treated as the students have secured zero mark in that subject examination/assessment.
- iii) Minimum D grade (4.00 grade points) shall be the limit to clear/ pass the course/subject. A student with F grade will be considered as 'failed' in the concerned course and he/she has to clear the course by reappearing in the next successive semester examinations. There will be no revaluation or recounting under this system.
- iv) Every student shall be awarded Grade points out of maximum 10 points in each subject (based on 10 points scale). Based on the Grade points obtained in each subject, Semester Grade Point Average (SGPA) and the Cumulative Grade Point Average (CGPA) shall be computed. Results will be announced at the end of each semester and cumulative grade card with CGPA will be given on completion of the course.

VIII. Computation of SGPA (Semester grade point average) & CGPA (Cumulative grade point average)

The computation of SGPA & CGPA will be as below:

- a. Semester Grade Point Average (SGPA) is the weighted average of points obtained by a student in a semester and will be computed as follows:

$$\text{SGPA} = \frac{\text{Sum (Course Credit*Number of Points in concern course gained by the students)}}{\text{Sum (Course Credit)}}$$

The Semester Grade Point Average (SGPA) for all the four semesters will be mentioned at the end of every semester.

Department of Printing Technology & Graphic Arts

- b. The Cumulative Grade Point Average (CGPA) will be used to describe the overall performance of a student in all semesters of the course and will be computed as under-

$$\text{CGPA} = \frac{\text{Sum (All four semester SGPA)}}{\text{Total Number of Semesters}}$$

The SGPA and CGPA shall be rounded off to the second place of decimal.

IX. Evaluation method :-

Each theory course will be of 100 Marks and be divided in to internal examination (Sessional) of 20 Marks and Semester and examination of 80 Marks. (20+80 = 100 Marks)
Each Practical course will be of 50 marks. Research project if any, will be of 100 marks.

a. Internal Evaluation Method

There shall be two and mid semester examinations, first based on 40 percent syllabus taught and second based on 60 percent syllabus taught. The setting of the question papers and the assessment will be done by the concerned teacher who has taught the syllabus. Average score obtained out of two mid examinations will be considered for the preparation of final Sessional marks/grade.

b. Term end examination and evaluation

- i) Semester end examination time table will be declared by the department committee and accordingly the concern course teacher will have to set question paper, conduct theory examination, conduct practical examination with external expert, evaluate, satisfy the objection/query of the student (if any) and submit the result to DC.
- ii) The semester end examination theory question paper will have two parts (20+60 = 80 Marks)
Part A will carry short question of 2-3 marks (fill in the blanks/ multiple choice questions/ match columns/ state true or false/ answer in one sentence) as **compulsory question** and it should cover entire syllabus. (20 Marks)
Part B will carry 7 questions out of which there shall be at least one question from each unit, student will have to answer any five questions out of 1 (60 marks)
- iii) Semester end practical examinations will be of 50 marks each and student will be examined by one external and one internal examiner. Project work and seminar if any, will be evaluated by the external examiners along with guide..
- iv) At the end of each semester the Committee of Department shall assign grades to the students.
- v) The Committee of Department shall prepare the copies of the result sheet in duplicate.
- vi) Every student shall have the right to scrutinize answer scripts of Mid semester / Term end semester examinations and seek clarifications from the teacher regarding evaluation of the scripts immediately thereafter or within 3 days of receiving the evaluated scripts.
- vii) The head of department shall display the grade points and grades for the notice of students.
- Viii) The head of the department shall send all records of evaluation for safe keeping to the Controller of Examinations as soon as all the formalities are over.

Department of Printing Technology & Graphic Arts

X. Grade Card

The University shall issue at the beginning of each semester a grade card for the student in the previous semester and his Semester Grade Point Average (SGPA).

The grade card shall list:

- (a) the title of the courses along with code taken by the student
- (b) the credits associated with the course,
- (c) the grade and grade points secured by the student,
- (d) the total credits earned by the student in that semester.
- (e) the SGPA of the student,
- (f) the total credits earned by the students till that semester and
- (g) the CGPA of the student (At the end of the IVth Semester)

XI. Cumulative Grade Card

At the end of the IVth semester, the University shall issue cumulative grade card to the students showing details of grades obtained by the student in each subject in all semesters along with CGPA and total credits earned.

Aurangabad
Date: 20 / 05 / 2011

(Prof. Vijay Pandharipande)
Vice – Chancellor

**Dr. Babasaheb Ambedkar Marathwada University,
Aurangabad**

Department of Printing Technology & Graphic Arts



First Semester Revised Syllabus effective from June 2011

**-Advanced Diploma in Printing Technology & Graphic Arts
(ADPT&GA)-**

Department of Printing Technology & Graphic Arts

COURSE STRUCTURE

Advanced Diploma in Printing Technology & Graphic Arts- 1st semester

Sr. No.	Subject Code	Subject Name	No. of Credits		No. of Hours/ Week	Total Marks (External)	Total Marks (Internal)
			L	P			
1.	PRND 101	Computer Basics & Computer Fundamentals	4	-	4	80	20
2.	PRND 102	Computer Operating Skills	4	-	4	80	20
3.	PRND 103	Computer Design	4	-	4	80	20
4.	PRND 104	Text Setting	4	-	4	80	20
5.	PRND 105	Image Processing	4	-	4	80	20
6.	PRND 151	Practical based on Computer Basics & Computer Fundamentals	-	2	4	40	10
7.	PRND 152	Practical based on Computer Operating Skills	-	2	4	40	10
8.	PRND 153	Practical based on Computer Design	-	2	4	40	10
9.	PRND 154	Practical based on Text Setting	-	2	4	40	10
10.	PRND 155	Practical based on Image Processing	-	2	4	40	10
Total= 30 Credits							

1. L for Theory Lecture
2. P for Practical

Department of Printing Technology & Graphic Arts

Subject Name- Computer Basics & Computer Fundamentals

No. of credits-4

Subject Code- PRND 101

No. of Contact Hours/Week-4

Internal+External-(20+80)

Rationale: This Subject helps to understand the basics of computer fundamentals

Unit 1

Definition of Computer, Features, Parts of Computer System: (Input, Output, Storage unit, ALU, CU, CPU), Hardware, Software, Data, Information processing cycle. Computer Generations, Computer languages, Compilers, Interpreters. Memory Devices (RAM, ROM & its types) Input Devices: Keyboard and Mouse: The Standard Keyboard Layout, Using Mouse, Other Data Input Devices: Pen, Touch Screens, Bar Code Readers, OCR

Unit 2

Output Devices: CRT Monitors, Printers: Dot Matrix, Ink Jet, Laser Printers. Number Systems (Binary, Octal, Hexadecimal), Computer Arithmetic ('+', '-', '*', '/), Conversions (Octal to Binary, Binary to Octal, Binary to Hexadecimal, Hexadecimal to Binary). Computer codes: BCD, EBCDIC, ASCII, Unicode.

Unit 3

Data Processing: Factors Affecting Processing Speed, Bus, Cache Memory. RISC Processors, Ports: Standard Computer Ports, Serial and Parallel Ports Specialized Expansion Ports: SCSI, USB, FireWire, MIDI, Expansion Slots and Boards, PC Cards, Plug and Play. Secondary Storage Devices: Magnetic Tapes, Magnetic Disks, Optical Disks (Basic Principles of operation, Types, Advantages, Limitations)

Unit 4

Software: System and Application Software Operating System: Purpose of Operating Systems, Types of Operating System, Popular Operating System, And Managing Hardware: Processing Interrupts, Working with Device Drivers, Utility Software, Backup Utilities, and Screen Savers.

Unit 5

Productivity Software: Commercial Software, Freeware and Public Domain Software, Open-Source Software. Understanding the Need for Security Measures: Overview, Need for Computer Security, Basic security concepts, Threats to users, hacking. Protective Measures: keeping system safe, avoiding Identity Theft; keeping data secure (Limiting Physical access, Firewall), Managing cookies, spyware & other bugs.

Department of Printing Technology & Graphic Arts

Subject Name- Computer Basics & Computer Fundamentals

No. of credits-2

Subject Code- PRND 151

No. of Contact Hours/Week-4

Internal+External-(10+40)

No	Practical
01	MS-WORD-- File Management: Opening, creating and saving a document, locating files, copying contents in some different file(s), protecting files, Giving password protection for a file
02	Page Set up: Setting margins, tab setting, ruler, indenting - Editing a document: Entering text, Cut, copy, paste using tool- bars
03	- Formatting a document: Using different fonts, changing font size and colour, changing the appearance through bold/ italic/ underlined, highlighting a text, changing case, using subscript and superscript, using different underline methods
04	- Aligning of text in a document, justification of document, Inserting bullets and numbering - Formatting paragraph, inserting page breaks and column breaks - Use of headers, footers: Inserting footnote, end note, use of comments - Inserting date, time, special symbols, importing graphic images, drawing tools
05	Tables and Borders: Creating a table, formatting cells, use of different border styles, shading in tables, merging of cells, partition of cells, inserting and deleting a row in a table - Print preview, zoom, page set up, printing options - Using Find, Replace options - Using Tools like: Spell checker, help, use of macros, mail merge, thesaurus word content and statistics, printing envelopes and labels
06	- Using shapes and drawing toolbar, - Working with more than one window in MS Word, - How to change the version of the document from one window OS to another - Conversion between different text editors, software and MS word
07	MS-EXCEL- Starting excel, open worksheet, enter, edit, data, formulas to calculate values, format data, create chart, printing chart, save worksheet, switching from another spread sheet
08	Menu commands: create, format charts, organize, manage data, solving problem by analyzing data, exchange with other applications. Programming with MS Excel, getting information while working
9	- Work books: Managing workbooks (create, open, close, save), working in work books, selecting the cells, choosing commands, data entry techniques, formula creation and links, controlling calculations, working with arrays
10	Editing a worksheet, copying, moving cells, pasting, inserting, deletion cells, rows, columns, find and replace text, numbers of cells, formatting worksheet
11	Creating a chart:

Department of Printing Technology & Graphic Arts

	Working with chart types, changing data in chart, formatting a chart, use chart to analyze data
12	Using a list to organize data, sorting and filtering data in list - Retrieve data with MS – query: Create a pivot table, customizing a pivot table. Statistical analysis of data
13	Customize MS-Excel: How to change view of worksheet, outlining a worksheet, customize workspace, using templates to create default workbooks, protecting work book
14	Exchange data with other application: linking and embedding, embedding Objects, linking to other applications, import, export document.

Reference Books

Text Books	1. Norton Peter, “Introduction to Computers”, 2. P. K. Sinha & PritiSinha, “Foundations of Computing”, 1st ed., BPB Publications,
Additional	1. V. Raja Raman, “Introduction to Computers”, 4th ed., PHI, 2. Alex Leon & Mathews Leon, “Introduction to Computers”, Vikas Publishing House, 3. Vikas Gupta, “Complete Computer Kit”, Wiley Dreamtech, Delhi,

Department of Printing Technology & Graphic Arts

Subject Name-Computer Operating Skills
Subject Code- PRND 102
Internal+External-(20+80)

No. of credits-4
No. of Contact Hours/Week-4

Rationale: This Subject helps to understand the basics of computer operating skills.

Unit 1

Basic elements of a communication system, Data transmission modes, Data Transmission speed, Data transmission media, Digital and Analog transmission, Network topologies, Network Types (LAN, WAN and MAN), OSI & TCP/IP Model, Internet: Network, Client and Servers, Host & Terminals, TCP/IP, World Wide Web, Hypertext, Uniform Resource Locator, Web Browsers, IP Address, Domain Name, Internet Services Providers, Internet Security, Internet Requirements, Web Search Engine, Net Surfing, Internet Services, Intranet

Unit 2

Operating System concepts, different types of operating systems, structure of operating system, DOS/UNIX/LINUX commands, working with Windows, Windows 9x/NT/XP, Data Processing, File Systems and Database Management Systems, different types of Database Management System.

Unit 3

E-mail & Internet:

1. Introduction
2. E-mail Account & Its Functions
3. Search Engine
4. Surfing WebPages
5. Basics of Social Networking Site

Unit 4

E-Commerce

Introduction: E-commerce as Business need, E-com Types, Advantages, Disadvantages, e-Commerce Architecture,

Internet Payment Systems

- Characteristics
- 4C Payment Methods
- SET Protocol for Credit Card Payment
- E-Cash, E- Check
- Overview of Smart Card

E-Commerce security

- Need of security
- Encryption: Public Private & Hybrid
- Digital Signature
- Authentication

Unit 5

Introduction to Viruses, Vaccines and firewalls

Department of Printing Technology & Graphic Arts

Subject Name- Computer Operating Skills
Subject Code- PRND 152
Internal+External-(10+40)

No. of credits-2
No. of Contact Hours/Week-4

Practical List

No	Practical
01	Internet and its Applications a Log-in to internet b) Navigation for information seeking on internet c Browsing and down loading of information from internet d) Sending and receiving e-mail -Creating a message -Creating an address book Attaching a file with e-mail messageReceiving a messageDeleting a message
02	Introduction to Windows 2.1What is an operating system and basics of Windows
03	2.2 The User Interface 1 Using Mouse and Moving Icons on the screen The My Computer Icon 3 The Recycle Bin 4 Status Bar, Start and Menu & Menu-selection 5 Running an Application 6 Windows Explorer Viewing of File, Folders and DirectoriesCreating and Renaming of files and folder, opening and closing of different Windows
04	Windows Setting Control Panels 1 Wall paper and Screen Savers 2 Setting the date and Sound 3 Concept of menu Using Help
05	Advanced Windows 1 Using right Button of the Mouse 2 Creating Short cuts 3 Basics of Window Setup 4 Notepad 5 Window Accessories

Department of Printing Technology & Graphic Arts

Subject Name-Computer Design
Subject Code- PRND 103
Internal+External-(20+80)

No. of credits-4
No. of Contact Hours/Week-4

Rationale: The knowledge of Computers and software is not enough. Its application in creating a good design is important. This course deals with electronic ways of page making, designing and imposing techniques. The emphasis is given on practice of software packages related to the printing industry and creative use of the tools available with aesthetic sense.

Unit 1 Introduction to DTP

- 1.1 CorelDraw, Photoshop, Illustrator, Acrobat reader
- 1.2 Introduction to CorelDraw- File handling, Creating, Saving, retrieving.
- 1.3 Introduction to Tools- Pointer, Text, Crop, Orient, Line, Rectangle, Ellipse, Pen, Magnifier, Gradient.
- 1.4 Document setup- Page setup, margins, orientation, units

Unit 2 Text

- 2.1 Font, size, style, leading, kerning, tracking, horizontal scale, hyphenation, intent tap, paragraph, character, alignment, style(cover complete type menu)

Assignment which will take care of whole type menu

1)Visiting card 2) Letterhead 3) Advertise.

- 2.2 Edit menu-Undo, cut, copy, paste, select, select-all, paste multiple, insert object, edit story

Assignment

- visiting card by inserting object press advertisement
- Paste multiple
- Book work application edit story
- Insert object: Assignment based on Photoshop images
- Insert object: Table Assignment

Unit 3 View Menu

- 3.1 To view the entire Guidance bar such as toolbar, menu bar, property bar, status bar, ruler, guidelines, grid, wire frame, draft, normal, enhance
 - 3.2 Layout Menu- Page handling: Insert, Remove, sort pages Column Guides: Auto-flow
- Assignment News paper page layout.

Unit 4 Arrange

- 4.1 Transformation,align& distribute, order , group , ungroup & all, combine, break apart, lock object , unlock object, shaping, convert to curve
- 4.2 Effects- Adjust, transform, correction, artistic media, blend, contour, envelope, Extrude, Bevel, Lens, power clip, rollover, copy effect, clone effect.
- 4.3 Bitmaps- Convert to bitmap, auto adjusts, image adjustment lab, edit bitmap, crop bitmap, resample, mod, quick tress, break link, update from link, 3D effect

Department of Printing Technology & Graphic Arts

Unit 5 Table

5.1 Create new paper, insert, select, and distribute all types of formatting which is related to table.

5.2 Tools- Option, customization, color management, link manager, color styles, pallet editor, graphic & text style.

5.3 Window- View window, cascade, tile vertically, tile horizontally, color pallet, toolbars, close.

5.4 Help- Help topic & what's need.

Department of Printing Technology & Graphic Arts

Subject Name-Computer Design
Subject Code- PRND 153
Internal+External-(10+40)

No. of credits-2
No. of Contact Hours/Week-4

No.	Practical
01	Introduction & Installation to different version of CorelDraw.
02	Type Specimen Sheet- Alphabets – 14 pt. 24 pt. 36 pt. Type variations – light, bold, italic, shaded, underline – 14 pt. Text – 50 words – 10/12 pt., 4 pt. leading, solid setting without leading.
03	An introduction to toolbars & menu bars available in different CorelDraw software.
04	Principles of Design Set the same text in different styles showing emphasis, rhythm, balance (Symmetrical and asymmetrical), Unity, Harmony and Variety.
05	Prepare a letterhead, visiting card, Envelope, adopting and using the same design and trademark.
06	Use of bold and light typeface, alignment, use of rules and color is
07	Press Advertisement Draw an illustration in CorelDraw. Incorporate it in the layout Color Schemes Prepare a box of 9 Squares. Complementary- Fill up the squares with complementary Colors Analogous – Fill up the squares with analogous colors. Achromatic – Fill up with different grays.
08	Prepare a pattern with types or geometrical shapes. Fill up with the help of menus & tools.
09	Poster designing using the same pattern in practical No. 8 along with a slogan.
10	Lay out Grid For Magazine: Prepare a three-column grid for A 4 size magazine.
11	Set two pages of a magazine with photographs based on the three-column grid.
12	Artwork of a four-color job. Cutting and register marks, bleed, color key etc. Different File format.
13	Introduction to the software used in packaging industry for designing of label and carton.
14	Preparation of different carton layouts using CorelDraw and special software developed for packaging industry.

Reference Books:

Sr. No.	Title of Book	Author	Publication
01	Electronic Composition	A. Holmes	
02	Corel Draws Notes		
03	The ABC Of Windows	Alan & Neibauer.	BPB

Department of Printing Technology & Graphic Arts

Subject Name-Text Setting
Subject Code- PRND 104
Internal+External-(20+80)

No. of credits-4
No. of Contact Hours/Week-4

Rationale: Text and graphics are two important parts of printing. Typography and text formatting methods come under the title of Letter Assembly. As a part of print production, the evolution of typesetting methods from metal types to digital fonts should be studied, so that the basics of typography, type style, spacing and formatting the pages can be learnt with proper perspective. It is equally important to study the problems of printing regional language, type setting in bilingual environment, as a large segment of printing industry is related to regional language publishing. The aim of this is to create a proper attitude towards handling computer software for print production

Unit 1 Role of Letter Assembly in Printing

- 1.1 Brief history of development in typesetting from Gutenberg to DTP (Desk top Publishing)
- 1.2 Study of various stages of copy preparation
- 1.3 Comparison and features of Hot Metal and Cold types
Review of Systems and Its Relevance to Present System
- 1.3 Study of advantages and limitations of Hand composing techniques used in type setting.
- 1.4 Study of advantages and limitations of Linotype & Monotype casting techniques used in type setting.
- 1.5 Study of definition, types and application areas of Phototypesetting techniques

Unit 2 Typographic Principles

- 2.1 Study of typographic elements
Understanding mechanical or founder's type, face of types, parts of types, types of strokes and serifs, terminations. Font style and size of type, text and display faces.
- 2.2 Dimensional attributes of a type such as x-height, ascender, descender and base line.
Study of expanded, normal and condensed type.
- 2.3 Definition of legibility and readability. Study of factors governing legibility and readability Study of editing and proofreading of text copy. Study of different proofreading marks.

Unit 3 Typographic Measurement

- 3.1 Need of typographic measurement, different units such as point, em, en and pica.
Inch equivalent of point, em, en and pica units. Examples based on typographic measurements. Definition and unit of set, measure and gauge of a page or lay-out. Definition of verso and recto format of a layout.
- 3.2 Definition of casting-off and copy fitting method of typesetting approaches. Advantages and limitation of casting-off and copy fitting approaches.
- 3.3 Examples of type setting calculation based on casting-off and copy fitting

Unit 4 Formatting Page Layout

- 4.1 Paragraph style - indentation, Tabs, alignment, leading

Department of Printing Technology & Graphic Arts

- 4.2 Character style - font, style, size, spacing
- 4.3 Study of graphic terminology associated with page. page layout - Running heads, Column guides, page numbering, margins
- 4.4 Formatting graphics with the text in columns and tables.
- 4.5 Proofing and Proof Reading.
- 4.6 Study of graphic terminology associated with page, and different Imposition schemes. Need and setting of headers and footers
- 4.7 Font Technology- Type Technology, hot metal - Punch and matrices, casting, type of metals
- 4.8 Type Design - Analog, Artwork, templates, punches and matrices and Digital – Stored & modified digitally, analog output on printers.
- 4.9 Hardware & Software - Microsoft, Aldus, Adobe, Format designing software, Postscript And TIFF.
- 4.10 Bitmap and Vector font formats, True font, Resolution, Output devices - Postscript, RIP Font scaling and Rasterization Study of advantages and applications of PostScript Type! And True Type fonts.

Unit5 Regional Language Scripts

- 5.1 Regional Language scripts - an overview in comparison with Roman script – in relation To Devnagari.
- 5.2 Problems of Regional scripts - Nonlinear, Phonetic script, number of characters Non- availability of software's etc
- 5.3 Software available for Devnagari and its use. Bi-lingual type formats

Department of Printing Technology & Graphic Arts

Subject Name-Text Setting
Subject Code- PRND 154
Internal+External-(10+40)

No. of credits-2
No. of Contact Hours/Week-4

No	Practical
01	Demonstration of Hand set, Linotype, Monotype, Phototypesetting and DTP outputs of text matter.
02	Setting up of new page or master page and changing document set up options in existing publication file.
03	Choosing measurement system and setting up of rulers and working with non printing guides.
04	Creating and applying layout grids, numbering pages, rearranging pages, and creating headers and footers.
05	Setting of text: selecting text, text object, and importing text.
06	Placing text on the page, threading text blocks, threading text frames, and adjusting text objects.
07	Text formatting: using the control palette to format the text, formatting characters, paragraphs, setting indent and tabs, adding space above and below the paragraph.
08	Using different paragraph styles: body text, captions, hanging indent, table head.
09	Using tracking and kerning types, hyphenation and justification methods.
10	Setting word and letter spacing and aligning paragraph.
11	Leading adjusting the space between lines of text, deciding line breaks within paragraphs.
12	Preparation of layout and setting of letterhead.
13	Preparation of layout and setting of visiting card.
14	Preparation of layout and setting of book work page.
15	Preparation of layout and setting of column and tabular text matter.

Ref. Books:

Sr. No	Title of Book	Author	Publisher
01.	Copy Preparation	Cabibi	
02.	Composing & Typography	B. D. Mendiratta	
03.	Printing In A Digital World	David Bergsland	Delmar Publishers, U.S., 1997
04.	Font Technology – Description & Tools	Peter Karow	Springer Verlag, New York, 1994
05.	Typography Of Devnagari	B. S. Naik	Directorate of Languages, Mumbai, 1971
06.	User Guide Of Different Text Editing Software Such As PageMaker And MS Word, Etc.		

Department of Printing Technology & Graphic Arts

Subject Name-Image Processing
Subject Code- PRND 105
Internal+External-(20+80)

No. of credits-4
No. of Contact Hours/Week-4

Unit 1

Customizing the Desk Top

- Rulers
- Grids
- Guidelines
- Color Palettes
- Floating Toolbox

Unit2

Drawing rectangle, squares, ellipses, circles, curves Manipulating Objects

- Moving, reshaping, rotating .Skewing and Mirroring the objects
- Undo, Redo, Delete, Duplicate and clone
- Previewing the objects
- Filling and outline objects

Unit 3

Shaping Objects

- Lines, Rectangles, Ellipses, Curves

Unit 4

Setting up Page layout

Arranging Objects

- Aligning Objects. Changing position of objects
- Converting Objects to curves
- Layers

Unit 5

Draw and edit freehand Curve using Text

- Creating Artistic Text
- Editing Text
- Flow of text between frames
- changing character attribute s
- Fitting text to path character s Rotated to path baselines
- text and path distance
- kerning , proofreading, find and replace
- Tiling Symbols

Department of Printing Technology & Graphic Arts

Subject Name-Image Processing
Subject Code- PRND 155
Internal+External-(10+40)

No. of credits-2
No. of Contact Hours/Week-4

No.	Practical
01	Introduction & Installation to different version of CorelDraw.
02	An introduction to toolbars & menu bars available in different CorelDraw software.
03	Prepare a letterhead, visiting card, Envelope, adopting and using the same design and trademark.
04	Use of bold and light typeface, alignment, use of rules and color is essential.
05	Press Advertisement Draw an illustration in CorelDraw. Incorporate it in the layout Color Schemes Prepare a box of 9 Squares. Complementary- Fill up the squares with complementary Colors Analogs – Full up the squares with analogues colors. Achromatic – Fill up with different grays.
06	Prepare a pattern with types or geometrical shapes. Fill up with the help of menus & tools.
07	Introduction to the software used in packaging industry for designing of label and carton.
08	Preparation of different carton layouts using CorelDraw and special software developed for packaging industry.

Reference books:

No.	Title of Book	Author	Publication
01	Electronic Composition	A. Holmes	
02	Corel Draws Notes		
03	The ABC Of Windows	Alan &Neibauer.	BPB

Department of Printing Technology & Graphic Arts

**Dr. Babasaheb Ambedkar Marathwada University,
Aurangabad**

Department of Printing Technology & Graphic Arts



Second Semester Revised Syllabus effective from June 2011

**-Advanced Diploma in Printing Technology & Graphic Arts
(ADPT&GA)-**

Department of Printing Technology & Graphic Arts

COURSE STRUCTURE

Advanced Diploma in Printing Technology & Graphic Arts- 2nd semester

Sr. No.	Subject Code	Subject Name	No. of Credits		No. of Hours/ Week	Total Marks (External)	Total Marks (Internal)
			L	P			
1.	PRND 106	Binding & Finishing Technology	4	-	4	80	20
2.	PRND 107	Design & Artwork	4	-	4	80	20
3.	PRND 108	Printing Material Science	4	-	4	80	20
4.	PRND 109	Printing Processes	4	-	4	80	20
5.	PRND 110	Reproduction Processes	4	-	4	80	20
6.	PRND 156	Practical based on Binding & Finishing Technology	-	2	4	40	10
7.	PRND 157	Practical based on Design & Artwork	-	2	4	40	10
8.	PRND 158	Practical based on Printing Material Science	-	2	4	40	10
9.	PRND 159	Practical based on Printing Processes	-	2	4	40	10
10.	PRND 160	Practical based on Reproduction Processes	-	2	4	40	10
		Total= 30 Credits					

1. L for Theory Lecture
2. P for Practical

Department of Printing Technology & Graphic Arts

Subject Name- Binding & Finishing Technology
Subject Code- PRND 106
Internal+External-(20+80)

No. of credits-4
No. of Contact Hours/Week-4

Rationale: Binding is required to protect as well as to enhance the appearance of the printed product. This subject is required for students to understand various binding techniques depending upon the need of the product. In today's state of art print houses, most of the finishing operations are carried out using machines, the working and principle of these machines is also a part of the course. Hot foil stamping, numbering, perforating, embossing, die cutting, are the various finishing processes a student should know in order to understand how these processes increase the utility and beauty of the product.

Unit -1

1.0 Introduction

- 1.1 Introduction to the terms 'Binding ' and 'Finishing'.
- 1.2 List of major operations performed in binding and finishing Pre-forwarding, Forwarding, Finishing
- 1.3 Tools and equipment's used for binding, binder's aids and or marks.
Material used in Binding and Finishing
- 1.4 Paper- British standard and ISO paper sizes. Multiples and subdivisions of a given size. Advantages and Limitations of different measurement standards.
Units for number of paper- ream, quire, gross.
- 1.5 Study of different types applications of board used in binding and finishing work.
- 1.6 Securing materials-Thread, wire, tape, cord – Selection based on application, gauge of wire, thread strength, and cost
- 1.7 Covering materials- Binding cloth, Mull cloth, rexine, leather – grain direction, surface, Applications, cost.
- 1.8 Study of properties and applications of different types of adhesives such as glue, paste, hot melt, PUR (polyurethane reactive). Factors controlling selection based on application, cost.

Unit 2

2.0 Pre-forwarding and Forwarding Operations

- 2.1 Pre-forwarding Operation –Jogging & knocking, removing
Mis-registered sheets, counting, folding, bundling, gathering, collating, sewing
Forwarding operations – Removing the swell, fixing end papers, fraying out the slips, gluing the back, trimming, rounding and backing, fixing head & tail bands, liningtheback, edge co ration,cutting the boards, capping up, squaring the board, lacing in, covering, setting the points, pasting down, pressing, jacketing.
Cutting, Slitting and Trimming Operations.
- 2.2 Single knife guillotine machine-
Major parts & their functions, maintenance, Safety devices,
Trim disposal system, application
- 2.3 Straw board cutter – construction and working
- 2.4 Three Knife Trimmer- Major parts, functions and its application

Department of Printing Technology & Graphic Arts

Folding and Gathering Operations

- 2.5 Knife folding; Buckle folding, Combination folding- Principle, Construction & Working.
- 2.6 Hand folding- methods and various folding schemes, advantages and limitations.
- 2.7 Gathering machines - Major parts & their functions.

Unit 3

3.1 Adhesive or Perfect Binding Principle & Machine

- 3.2 Major parts & their functions, maintenance, safety devices, application
- 3.3 Types - Burst binding, Notch binding, Two shot wet on wet binding

Securing Methods & Covering Styles

- 3.4 Study of construction and working principle of wire stitching machine.
- 3.5 Thread securing methods
- 3.6 Study of construction and working principle of book sewing machine
- 3.7 Case binding, Case making machine - Parts, Function
- 3.8 Covering- Quarter, Half, Full, Limp & Library style binding.
- 3.9 Boarding methods- pasting down, split, drawn in work, cut flush, extra square, ASTI (all sides turned in).

Unit 4

4.1 Stationery Book Binding & Loose Leaf Binding

- 4.2 Wire-o-wire, spiral, comb binding techniques, machine construction & working, Loose leaf binding – Thong binder, Universal style.

4.3- Repairing Of Old Books.

- 4.5 Inspections, pulling to pieces dry & wet, cleaning, washing, resizing, mending, splitting& inlaying art plates, guarding, re-sewing (overcasting, whip sewing, stub binding).

Unit 5

5.1- Finishing operations

- 5.2 Laminating, Blocking, Numbering, Perforation, Creasing, Die cutting, Edge decoration, Index cutting, Foil stamping, graining, varnishing.

Department of Printing Technology & Graphic Arts

Subject Name- Binding & Finishing Technology
Subject Code- PRND 156
Internal+External-(10+40)

No. of credits-2
No. of Contact Hours/Week-4

No.	Practical
01	Introduction To Binding And Binder's Tools,
02	Machines And Equipments.
03	Making Quarter Bound Cut Flush Book.
04	Making Quarter Bound Cut Flush Turn-In Book.
05	Making Limp Binding Books
06	Making Tear-Off Pad.
07	Making Perforated Pad
08	Making Pocket Diary.
09	Making Case Board
10	Making Loose Leaf File
11	Making Index Diary
12	Making Counter Foil
13	Making Half Bound Book
14	Making Full Bound
15	Making Miniature Book
16	Making Office File by Multiple Punching Machine
17	Making loose leaf book by Thermal Binder
18	Making Rebinding For A Given Book
19	Demonstration Of Different Samples Having Various Finishing Operations

• **Reference Books**

No.	Title of Book	Author	Publisher's Name
01	Binding & Finishing	MendirattaPrintekPublication, New Delhi	
02	Binding & Finishing GATF		
03	Binding & Finishing	Geoff & Potter	Blue Print
04	Modern Book Binding	Alex J. Vaughan	-----
05	Finishing Processes in Printing	A.G. Martin	Focal Press Ltd., London
06	Manual For Book Binding	Arther W. Johnson	Thames and Hudson

Department of Printing Technology & Graphic Arts

Subject Name- Design & Artwork
Subject Code- PRND 107
Internal+External-(20+80)

No. of credits-4
No. of Contact Hours/Week-4

Rationale: Although type setting technique has evolved through hand typesetting, mechanical type setting and phototypesetting up to high end DTP systems aided by ultra-modern hardware like color scanner and digital camera. The principles of design and typesetting are forming the basis of established modern graphic reproduction processes. Therefore it is of importance for the student of printing technology to learn and understands the various design and type setting principles.

Unit-1

1.0 Graphic Design Fundamentals and Principles

1.1 Study of Graphic Design Fundamentals Point, line, space, weight, size, scale, tone, texture, pattern, color. Study of use, versatility, and purposes of design principles. Study of different media and its substitutes, and economy of graphic design. Study of need layout design with respect to different imaging and printing processes and products e.g. different types of binding styles, provision for a bleed and different types of margins.

1.2 Study of Graphic Design Principles Balance-symmetric and asymmetric, contrast, proportion, unity, rhythm, simplicity, fitness, use, advantages and limitations.

Unit-2

2.0 Colors in Graphic Design

2.1 Color Terminology Hue, value, chroma, brightness, shades, tint, color symbolism.

2.2 Color Relationship Cool, warm, contrast, complementary and colors schemes.

2.3 Graphic Design and printing involving 2, 3 and 4 colors. Study of factors such as target readers, financial input, substrate, number of copies, and printing process, etc, governing or controlling graphic design.

Unit-3

3.0 Preparation of Layout for Graphic Reproduction

3.1 Definition of layout and attributes of a good layout, Study of stages such as visualization, thumbnail and rough layout involved in preparing a good layout.

3.2 Study of basic geometric shapes, space, use of tools such as geometric and optical center.

3.3 Definition, types, applications, advantages and limitation of House Style and Dummy.

House style rules and basis, qualification of proofreader and copyholder, rules for word division and use of hyphenation.

Department of Printing Technology & Graphic Arts

Unit-4

4.0 Imposition and Planning

4.1 Concept and need of imposition and planning in typesetting. Concept of oblong and upright pages. Elements of a standard imposition scheme and their use.

Comparison of different types of imposition schemes of text pages in layout.

4.2 Study of different types of graphic marks incorporated in an imposition scheme.

4.3 Different converting operations such as collating, folding, trimming and binding, etc that governs the use or selection of imposition scheme.

4.4 Limitations such as working of folding machine, page sizes, types of paper and their physical properties. Introduction to electronic imposition.

4.5 Graphic Design Considerations for various printed jobs such as newspaper, magazine, leaflet, folder, letterhead, visiting card, and envelopes etc.

Unit-5

5.0 Desk Top Publishing Systems

5.1 Concept of DTP and (EPC) Electronic Page Composition or DAR) Digital Artwork and Reproduction. Comparison of traditional page make-up and assembly systems with electronic or digital make-up and assembly.

5.2 Brief overview of Desk Top Publishing Systems, their application areas, various related hardware and component parts of ideal DTP system.

5.3 Different DTP Page make-up software and main feature of ideal DTP software or package

5.4 Brief overview of PageMaker and Quark press DTP package in terms main features, application area, advantages and limitation

Department of Printing Technology & Graphic Arts

Subject Name- Design & Artwork
Subject Code- PRND 157
Internal+External-(10+40)

No. of credits-2
No. of Contact Hours/Week-4

No	Practical
1	Drawing various typefaces along with their dimensional attributes such as x-height, ascender and descended lines.
2	Graphic designing for display type (at least two) job.
3	Application and study of design principles making different types of graphic designs.
4	Preparation of color wheel and scheme and symbol for a given graphic product.
5	Preparation of thumbnail, rough layout, house style specimen and dummy for a given graphic product
6	Presentation of collection of various printed products newspaper, magazine advertisements, letterheads highlighting design and layout making principles
7	Presentation of collection of various printed products newspaper, magazine advertisements, letterheads showing page make up and assembly.
8	Preparation of Imposition scheme for 4, 8, and 16 pages of a given size and form in a full sheet work style
9	Preparation of Imposition scheme for 4, 8, and 16 pages of a given size and form in a half sheet work style.
10	Preparation of visiting card, letterhead and classified advertisements using PageMaker DTP package
11	Type setting of text matter for bookwork and newspaper using suitable DTP package such as PageMaker and/or Quark press.
12	Setting of a imposition scheme for 4, 8, 16 page full sheet work using PageMaker DTP package.
13	Setting of a imposition scheme for 4, 8, 16 page half sheet work using PageMaker DTP package.

• References Book

No.	Author	Title	Publisher
1	L. Heath	Phototypesetting	Watson-Guptill Publications
2	D. Wroldridge	Letter Assembly in printing	Pitman Publication, London
3	Geoff Barlow	Typesetting & Composition	Blue Print
4	Rebecca Bridge Altman	PageMaker	BPB Publication New Delhi
5	Hugh Speirs	Introduction to Prepress	BPIF Publishing
6	John Lewis	Typography Design and Practice	Barrie and Jenkins Limited
7	H. S. Warford	Design for Print Production	JE. Reeve Fowkes
8	KailashTakale	A handbook of typography	NirmalaSadhanPrakashan, New Delhi
9	B. D. Mendiratta	Composing and Typography	Printek Publications, New Delhi

Department of Printing Technology & Graphic Arts

Subject Name -Printing Material Science
Subject Code- PRND 108
Internal+External-(20+80)

No. of credits-4
No. of Contact Hours/Week-4

Rationale: Each printing process has a number of variables. Their properties should be understood through scientific analysis in order to get maximum utility. This course is incorporated to give knowledge about materials used in different printing processes and their properties; e.g.: Eutectic alloy in type casting or variables used in paper manufacturing and their effect on properties of paper, or manufacturing of different types of blankets or ink ingredients, their characteristics & performance, ink drying science. Problems in printing are also solved with proper application of printers' science

Unit-1

1.0 Basics of Printing Inks.

- 1.1 Study of required qualities and classification of pigment- carbon black, inorganic and organic- used in printing inks.
- 1.2 Study of purpose, required properties, types and examples of vehicles. Study of different additives used in preparation of vehicle.
- 1.3 Study of purpose, required properties, types and examples of vehicles. Study of different additives used in preparation of vehicle
- 1.4 Study of ink requirements.
- 1.5 Study of classification of ink requirements. Classification of ink on the basis of its viscosity.
- 1.6 Study of different requirements of flexographic, gravure and screen printing ink requirements.
- 1.7 Study of different requirements of lithographic offset, letterpress, and waterless offset ink requirements.

Unit-2

2.0 Ink Properties and printing problem

- Study of optical properties such as gloss, brightness and opacity.
- 2.1 Study of definition and measurement unit of ink tack, viscosity and their relationship.
 - 2.2 Effect of tack on the performance of wet-on-wet and wet-on-dry lithographic printing.
Study of trouble and remedies
 - 2.4 Drying Mechanism or Theories.
 - 2.5 Study of absorption drying theory and its practical application i.e. quick set inks
 - 2.6 Study of evaporation drying theory and its practical application i.e. heat set inks.
 - 2.7 Study of theory oxidation polymerization and its practical application.
 - 2.8 Study of radiation drying and curing, microwave drying, infrared drying and ultraviolet curing

Unit-3

3.0 Paper Making

- 3.1 Introduction to the development of paper making, cellulose fibers and pulps and different sources of cellulose fibers. Study of factor affecting selection of paper such as opacity, smoothness, whiteness and dimensional stability.

Department of Printing Technology & Graphic Arts

- 3.2 Introduction to paper manufacturing. Study of pulp preparation and different methods, stock preparation and beating and refining of the pulp. Study of different non fibrous additives added to the pulp during different stages.
- 3.3 Study of working principle and construction of general papermaking machine.
- 3.4 Study of working principle types and applications of calendaring and machine glazing finishing process.
- 3.5 Introduction to recycled paper, its advantages and manufacturing process.

Unit-4

4.0 Influence of Moisture and Relative Humidity on Paper.

- 4.1 Study of the relative humidity, its formula and factors affecting it. Simple problems based on calculation of relative humidity.
- 4.2 Study of effect of relative humidity on paper and board properties and its consequences on printability and runnability.
- 4.3 Study of effect of moisture on paper and board properties and its consequences on printability and runnability.

Unit-5

5.0 Paper Properties and printing Problems.

- 5.1 Study of Surface and directional properties of paper and board such as Substance, caliper and bulk, Compressibility, Surface smoothness / roughness, Air permeance (porosity), Static and dynamic friction, Absorbency.
- 5.2 Study of Surface strength and internal bond strength such as Picking, Fluffing, Splitting, Testing technique.
- 5.3 Study of Surface Strength properties such as Stiffness, Folding endurance, Burst strength, Tear resistance.
- 5.4 Study of Surface Optical properties such as Gloss, Brightness, Whiteness, yellowness and tint indicates, Fluorescence, opacity

Department of Printing Technology & Graphic Arts

Subject Name- Printing Material Science
Subject Code- PRND 158
Internal+External-(10+40)

No. of credits-2
No. of Contact Hours/Week-4

No	Practical
01	Measurement of GSM/ substance of paper and paperboard.
02	Measurement of caliper of paper and paperboard.
03	Measurement of bulk and bulking index of paper and paperboard.
04	Measurement of coefficient of friction of paper and paperboard.
05	Measurement of tearing strength of paper and paperboard.
06	Measurement of tensile strength of paper and paperboard.
07	Measurement of bursting strength and burst factor of paper and paperboard.
08	Measurement of ash content of paper and paper board.
09	Measurement of gloss and brightness of paper and paperboard.
10	Measurement of opacity of paper and paperboard.
11	Measurement of water absorbency of paper and paperboard.
12	Measurement of relative humidity of different departments of press using paper and paperboard.
13	Measurement of viscosity of liquid and paste inks.
14	Measurement of surface tension of solvents used in manufacturing of different inks.
15	Measurement of reflection densities of process and spot inks.
16	Measure of color of an ink using spectrophotometer and colorimeter.
17	Measurement of color difference using colorimeter.
18	Measurement of tack and drying time of an ink.

References:

No.	Title of Book	Author	Publication
01	Printing Materials: Science and Technology	Bob Thompson	PIRA International
02	Handbook of Pulp and Paper Technology	Kenneth W. Britt	CBS Publisher and Distributors New Delhi-110032.
03	The Printing Ink Manual	D.E. Bisset, C. Goodcare. H.A. Idle, Dr. R.H. Leach & C.H. Williams.	Northwood Publication London
04	Materials in Printing Processes	L.C. Young	Focal Press

Department of Printing Technology & Graphic Arts

Subject Name- Printing Processes
Subject Code- PRND 109
Internal+External-(20+80)

No. of credits-4
No. of Contact Hours/Week-4

Rationale: This course aims at creating a foundation among entry-level students. It introduces common concepts frequently used in the printing industry such as image carrier, reproduction, photography, design, various printing techniques and finishing processes. After completion of this course, a student can understand the flow of a printing job, its important raw materials as well as the merits of the processes of any particular job.

Unit-1

1.0 Printing Technologies.

- 1.1 Introduction to different Printing Technologies
- 1.2 Basic working principles and application area of Printing Technologies such as- Lithographic Offset, Letterpress, Flexography, Gravure, Screen and Digital.

Unit-2

2.0 Introduction to Printing.

- 2.1 An introduction to different communication technologies such as Print Media and Non-Print i.e. an electronic Media. Different media or segments available in each communication technology. Need and definition of Printing i.e. graphic production. An introduction to the stages of development of Printing Technology.
- 2.2 Market share by production volume of each segment such as Packaging and Label, Commercial and Advertising Printing, Books, Magazines and Newspapers, etc of Printing Technology. Comparison of consumption of printed products, from different segments of the Printing Technology, across the world.
- 2.3 Segment wise employment potential and general prevalent hierarchy of Printing Technology in India. List of renowned Indian establishments or houses as an example of every segment of Printing Technology.

Unit-3

3.0 Prepress Techniques.

- 3.1 Introduction to prepress technologies
- 3.2 Study of need, classification and basis of classification of graphic original. Examples of each type of original. Characteristics and requirement of different types of original.
- 3.3 Introduction to different prepress techniques employed in Printing.
- 3.4 Introduction to equipments and consumables used in graphic reproduction photography- darkroom enlarger type camera and contact printer. List of stages involved in positive or negative making.
- 3.5 Definition of image carrier. Basic classification of image carrier- rotary, flat, photosensitive and non-photosensitive. Basic characteristics of image carrier as required for different Printing Technologies. List of equipments and consumables used and stages involved in

Department of Printing Technology & Graphic Arts

image carrier making of individual conventional printing technology- Lithographic Offset, Letterpress, Flexography, Gravure, Screen.

Unit-4

4.0 Post Press Techniques

3.6 Introduction to different post press techniques employed in Printing.

3.7 Introduction to equipments and consumables used in Commercial and publication printing.

3.8 Introduction to equipments and consumables used in Packaging and converting printing.

Unit-5

5.1 Application in Packaging Technology

5.1 Application of printing processes in packaging technologies

Application of printing technology in retail market

Department of Printing Technology & Graphic Arts

Subject Name- : Printing Processes
Subject Code- PRND 159
Internal+External-(10+40)

No. of credits-2
No. of Contact Hours/Week-4

Practicals :

No.	Practical
01	Design – Importance of design concepts for printing & importance use of magnifying glass, Collection of printed products.
02	Camera – Demonstration of process camera, and related equipment & consumables.
03	Composing – Demonstration to type case, composition of visiting card, letterhead
04	Block making – Demonstration of line & half tone block.
05	Letterpress – Demonstration to furniture, chase locking, prints using single page form& half tone block on light platen machine.
06	Plate making – Introduction to plate making equipments, chemicals & terms.
07	Offset – Demonstration of magnifying glass, line & half tone printing. Printing of line job.
08	Screen-printing – Screen making materials & chemicals. Registration methods.
09	Binding – Brief idea of binding materials, tools, and machines. Different styles of binding. Preparation of tear-off pad

Reference books:

No.	Title of Book	Author	Publication
01	Handbook Of Printing Processes	Stevenson	GATF
02	Introduction to Printing and Finishing.	PIRA	
03	Handbook Of Print Media	Kipphan	Heidelberg
04	Printing Technology	Adam Faux	Delmar Publication
05	Primers – GATF Series	As Per GATF Series	GATF
06	Pitman – Series	As Per Pitman Series	
07	Introduction to Prepress.	PIRA	

Department of Printing Technology & Graphic Arts

Subject Name- Reproduction Processes
Subject Code- PRND 110
Internal+External-(20+80)

No. of credits-4
No. of Contact Hours/Week-4

Rationale: This course aims to create a base for advanced pre-press subjects. It deals with the basic elements such as light sources, conversion of art-works to films, camera handling, films & processing chemicals, operation and use of scanner, contact printing & enlarging process, sensitometer and densitometry. As precise film output is one of the important variables for a proper image carrier for any process, this subject carries considerable importance.

Unit-1

1.0 Equipments Used In Reproduction Photography

- 1.1 Study of different types, construction, working principles, use and limitations of reproduction camera. Study of construction, working principles and advantages of contact frame.
- 1.2 Study of different optical devices used on conventional graphic reproduction camera. Study of use and working principle of different optical devices. Study of formulae and relationship between different quantities of lens such as- focal length, depth of focus, depth of field, power, etc. Study of formulae simple problems related to image formation using lens. Study of various lens aberrations and flare.
- 1.3 Study of importance of lens aperture size control and devices available for it. An introduction to time scale and intensity scale approaches employed to control exposure. Study of different quality control means used during use of different reprographic equipments.
- 1.4 Construction, working principle, applications and limitations of digital camera. Advantage of digital photography over conventional photography. Different photo sensors used in digital camera. Unit used to express resolution of digital camera.

Unit-2

2.0 Recording Media

- 2.1 Study of need, required characteristics and different types of media used in reproduction process of graphic reproduction.
- 2.2 Comparative study of different forms of silver halide compounds. Study of chemical ingredients, manufacturing, structure and required physical properties of light sensitive film or emulsion.
- 2.3 Classification of photographic film on the basis of- spectral sensitivity, speed, and contrast. Study of resolving power of an emulsion.
- 2.4 Study of different stages, photo kinetics, chemistry involved in film making such as- exposure, latent image formation, chemical development, chemical fixing

Department of Printing Technology & Graphic Arts

Unit-3

3.0 Originals For Graphic Reproduction

- 3.1 Study of classification and the basis of classification used for graphic original. Factors governing selection of the graphic original
- 3.2 Study of required physical and optical properties or characteristics of different types of graphic originals.
- 3.3 Study of magnification and terminology of magnification of originals. Simple problems based on magnification

Unit4

4.0 Densitometry and Sensitometry.

- 4.1 Need and advantages of densitometry and Sensitometry
- 4.2 Definition and types of opacity and optical density.
- 4.3 Study of construction, types and working principle of densitometers.
List of application area of different densitometer
- 4.4 Factors affecting Sensitometry and study of sensitometric curves & characteristic curves- gamma, contrast, reciprocity law and its failure
- 4.5 Sensitometric terms- opacity, specular & diffused density. Study of defects such as halation and irradiation, Intermittency effect, Herschel effect and Callier coefficient.

Unit-5

5.0 Half tone Dot Formation Techniques

- 5.1 Need of screening in graphic reproduction. Study of construction, working principle, types, And limitation of Glass and contact screen. Study of technical specifications of contact screen such as- basic density range, screen ruling, and dot shape etc.
- 5.2 Evaluation of a halftone. Endpoint dots & programming a computerized camera for half tone exposure. Line & half tone positive making using contact frame & punch register system.
- 5.3 Study of working principle, advantages and limitations of FM (frequency modulated) screening technique Comparison of AM (amplitude modulation) and FM screening. Study of characteristics of hybrid screening technique i.e. combination of AM and FM screening.
- 5.4 Relationship between dpi, ppi and lpi. An introduction to electronic dot generation and its advantages. Study of sensitometric requirements of light sensitive coatings used for screening.

Department of Printing Technology & Graphic Arts

Subject Name- Reproduction Processes
Subject Code- PRND 160
Internal+External-(10+40)

No. of credits-2
No. of Contact Hours/Week-4

No.	Practical
01	Introduction To Various Parts Of Camera (Horizontal & Vertical)
02	Preparation Of Developer, Fixer & Stop Bath. Measuring Humidity And Temperature.
03	Sizing I.E. Scaling Of Originals On Reproduction Camera.
04	Preparation Of Line Negative On Reproduction Camera.
05	Study Of Variation In Exposure Time - Normal, Under, Over.
06	Study Of Variation In Developing Time - Normal, Under, Over.
07	Study Of Variation In Composition Of Developer, Fixer.
08	Demonstration Of Structure & Construction Of Glass Screen.
09	Demonstration Of Contact Printer And Making Film Positive Or Negative Using Contact Printer.
10	Demonstration Of Color Separation Using Different Filters.
11	Study Of Reflection And Transmission Densitometer.
12	Making Color Separation Of A Given Line Original.
13	Making Combination Negative Or Positive Of Line And Halftone Original.
14	Introduction and Calibration Of Digital Camera – Balance Black & White. And handling of digital original produce by digital camera

Reference Books

No.	Title of Book	Author	Publisher's Name
01.	Graphic Reproduction Photography	J. W. Burden	Focal Press Ltd. London
02.	Color & Its Reproduction	Field	GATF
03.	Graphic Arts Photography B&W	John Cogoli	GATF
04.	Basic Of Sensitometry	L. Lobel, M. Dubois	Focal Press Ltd. London
05.	Graphic Arts Photography Color	Fred Wentrel, Ray Blair and Tom Destre	GATF
06.	Digital Imaging	Joe Farace	Focal Press Ltd. London

Department of Printing Technology & Graphic Arts

**Dr. Babasaheb Ambedkar Marathwada University,
Aurangabad**

Department of Printing Technology & Graphic Arts



Syllabus of Third Semester

New Revised Syllabus Implemented from June 2011

**-Advanced Diploma in Printing Technology & Graphic Arts
(ADPT&GA)-**

Department of Printing Technology & Graphic Arts

COURSE STRUCTURE

Advanced Diploma in Printing Technology & Graphic Arts- 3rd semester

Sr. No.	Subject Code	Subject Name	No. of Credits		No. of Hours/ Week	Total Marks (External)	Total Marks (Internal)
			L	P			
1.	PRND 111	Screen Printing	4	-	4	80	20
2.	PRND 112	Image Carrier Plano	4	-	4	80	20
3.	PRND 113	Image Carrier Relief and Gravure	4	-	4	80	20
4.	PRND 114	Press Work Relief and Gravure	4	-	4	80	20
5.	PRND 115	Press Work Plano Sheet fed	4	-	4	80	20
6.	PRND 161	Practical based on Screen Printing	-	2	4	40	10
7.	PRND 162	Practical based on Image Carrier Plano	-	2	4	40	10
8.	PRND 163	Practical based on Image Carrier Relief and Gravure	-	2	4	40	10
9.	PRND 164	Practical based on Press Work Relief and Gravure	-	2	4	40	10
10.	PRND 165	Practical based on Press Work Plano Sheet fed	-	2	4	40	10
		Total= 30 Credits					

1. L for Theory Lecture
2. P for Practical

Department of Printing Technology & Graphic Arts

Subject Name-Screen Printing
Subject Code- PRND 111
Internal+External-(20+80)

No. of credits-4
No. of Contact Hours/Week-4

Rationale: Screen-printing has created a niche by its wide range of applications including packaging and label design, large format printing and special applications. The process also requires less capital for upcoming entrepreneurs. After undergoing the practical of this course, the student would be able to perform – Multi-color printing with proper registration; understanding the cloth type, mesh count, calendaring; different types of image carriers & their preparations; printing on different surfaces; etc.

Unit -1

1.0 Introduction to Screen Printing

1.1 Introduction to characteristics and application areas of screen printing technology. Comparison of screen printing technology with other printing technologies

Unit 2

2.0 Image Carrier Used in Screen Printing

2.1 Study of construction and characteristics of screen printing image carrier.

Study of different forms of image carrier. Comparison of screen printing image carrier with other printing technologies.

2.2 Study of construction, types, advantages, limitations and applications of different types of frames used in screen image carrier.

2.3 Study of construction, types, advantages, limitations and applications of Different types of screen fabric or mesh materials used screen printing. Study of terminology associated with screen fabric such as threads per inch, plain and twill weave, etc.

2.4 Study of different types of light sensitive chemistries used for stencil making for screen printing technology and their application areas.

Study of construction and working of machinery and equipments used in screen i.e. image carrier making such as screen fabric stretching unit, light source, exposure unit, emulsion coating unit, water gun, etc.

Unit 3

3.0 Screen Printing.

3.1 Study of construction and working different types machine configurations used in screen printing

3.2 Study of construction, types, advantages and applications areas of different types squeezes used in screen printing.

3.3 Study of different types, formulation and application areas of inks and varnishes used for screen printing.

3.4 Study of different types of printing troubles encountered and remedies Selected subsequently.

3.5 Study of different types of ink drying mechanism used on screen printing machines.

3.6 Study of different types of substrates and their application areas used in screen printing

Department of Printing Technology & Graphic Arts

Unit 4

4.0 Inline Operations Used in Screen Printing.

4.1 Introduction to different types of inline and finishing operations performed in screen printing such as adhesive and varnish coating, lamination, punching, stripping, and slitting, etc.

Unit 5

5.0 Quality Control in Screen Printing

5.1 Study of viscosity, tack, specific gravity requirements of screen printing inks, varnishes and solvents.

5.2 Importance of color of fabric, fabric stretching angle, tension value while fabric stretching. Study of effect of moisture and relative humidity on screen printing image carrier and its operation. Study of effect of off-contact, squeeze pressure and angle on print quality. To study the calculation of ink volume deposition and image elongation in screen printing.

5.3 Study of graphic quality control aids used in screen printing to achieve tone and color reproduction.

Department of Printing Technology & Graphic Arts

Subject Name- Screen Printing
Subject Code- PRND 161
Internal+External-(10+40)

No. of credits-2
No. of Contact Hours/Week-4

No.	Practical
1	Introduction of different machinery and equipment, raw materials used in screen printing department.
2	Demonstration of various screen making materials such as frame, fabric, squeegee, etc.
3	To prepare screen stencil of different sizes and at different angles by manually stretching of fabric.
4	To prepare screen stencil of different sizes and at different angles by pneumatically stretching of fabric.
5	To prepare screen stencil for line original using different screen making methods.
6	To prepare screen stencil for tone original using different screen making methods.
7	To print visiting card (e.g.) in single color line and tone form on different substrates.
8	To print visiting card (e.g.) in multicolor color line and tone form on different substrates.
9	To print letterhead (e.g.) in single color line and tone form on different substrates.
10	To print letterhead (e.g.) in multicolor color line and tone form on different substrates.
11	To print invitation card (e.g.) in single color line and tone form on different substrates.
12	To print invitation card (e.g.) in multicolor color line and tone form on different substrates.
13	To print signboards, cloth, backlit board, and electronic circuit with screen printing technology.
14	To verify the effect of variation in coating thickness, squeegee angle and squeegee speed on ink deposition.
15	To study the effect of color of cloth i.e. fabric on screen exposure times.
16	Innovative practical, industrial visit with regard to screen printing.

Department of Printing Technology & Graphic Arts

Reference Books

No.	Title of Book	Author	Publisher's Name
01	The Thames & Hudson Manual of Screen Printing	Tima, Mara	Thames & Hudson Ltd. London.
02	Screen Printing Technique	Albert Kosloft	Sings of the Times Publishing Co. Cincinnati, OSA
03	Screen Printing History & Process	Rita, Gilbert	Holt, Rinehart & Winston, Newyork, Chicago.
04	Screen Printing Water Based Technique	Roni, Hennins	Watson-Guiftill Publication Newyork.

Department of Printing Technology & Graphic Arts

Subject Name -Image Carrier Plano
Subject Code- PRND 112
Internal+External-(20+80)

No. of credits-4
No. of Contact Hours/Week-4

Rationale: Offset is still the leading technology of all the printing processes. This course will impart an extensive knowledge of all the elements of image carrier making for the offset process. Imposition schemes, image assembly, various methods of plate making & their proper application, study of useful characteristics of metals, various quality control aids, etc. are the main elements of this course which will enable the student to handle all the necessary operations related to the image carrier.

Unit-1

- 1.0 Introduction to Lithographic Image Carrier
- 1.1 Study of Alois Senefelder's invention of lithography and study of lithographic principle
- 1.2 Study of basis of classification, classification and features of lithographic image carrier
- 1.3 Study of development of lithographic image carrier from litho stone to metal based plates
- 1.4 Base of Lithographic Image Carrier-
Ideal chemical and physical properties of different types of base used for Lithographic image carrier
- 1.5 Study of different surface treatments such as graining counter etching given to lithographic image carrier base to improve surface energy and contact angle with liquid.

Unit-2

- 2.0 Chemistry and Sensitometry of Lithographic Image Carrier
- 2.1 Study of light sensitive chemistry and sensitometric properties of egg albumen based coating. Study of light sensitive chemistry and sensitometric properties of coatings used for wipe-on lithographic plates.
- 2.2 Study of light sensitive chemistry and sensitometric properties of diazo and photopolymer type coatings used in lithographic plates and their photographic requirements
- 2.3 Study of different methods used to know sensitometric properties of different light sensitive chemistries and their exposure time standardization.
- 2.4 Other Raw Materials Used in Lithographic Image Carrier making
- 2.5 Study chemical and physical properties and constitution of pretreatment and processing chemicals such as developer, gum-arabic, deep etch solution, plate finisher, lacquer, etc, used in lithographic image carrier making.
- 2.6 Photographic positive and negatives and their ideal optical and physical requirements for different plate making techniques.
- 2.7 Study of different quality control objective tests such as transmission density, temperature, relative humidity, specific gravity, pH, etc, performed on different types of chemicals used in lithographic image carrier making.

Department of Printing Technology & Graphic Arts

Unit-3

3.0 Plate Making Environment and Storage

3.1 Ideal requirements of storage conditions for raw materials used lithographic image carrier making. Study of different storage methods, equipments used for material handling. Study of concepts such as dark reaction, continuous reaction, shelf life, and pot life.

3.2 Equipments in Lithographic Image Carrier Making- Study of different types, construction, working principle, and limitations of whirler, printing down frame, step-and-repeat machine used in lithographic offset image carrier making.

3.3 Study of different types, construction, working principle, spectral emission characteristics and limitations of light sources or illuminants such as metal halide, carbon arc, mercury vapor, pulsed xenon, etc.

Unit-4.

4.0 Lithographic Image Carrier Making

4.1 Detailed study of stages involved in different types of wipe-on lithographic plate making.

4.2 Detailed study of stages involved in different types of wipe-on lithographic plate making.

4.3 Detailed study of stages involved in different types of deep-etch lithographic plate making.

4.4 Detailed study of stages involved in different types of photopolymer lithographic plate making.

Unit-5

5.0 Image carrier For Waterless Lithography

5.1 Study of construction and working principle of image carrier used for waterless lithography

5.2 Detailed study of stages involved in different types of waterless lithographic plate making.

5.3 Quality Control In Image Carrier making- Study of purpose, construction and working principle of different graphic aid incorporated with photographic film on lithographic image carrier such as star target, slur target, gray scale, color control patches, etc.

Department of Printing Technology & Graphic Arts

Subject Name- Image Carrier Plano
Subject Code- PRND 162
Internal External-(10+40)

No. of credits-2
No. of Contact Hours/Week-4

No.	Practical
01.	To Draw Single page layout.
02.	To Draw 4-page half sheet work.
03.	To Draw 8-page sheet work, 8-page half sheet work and turn.
04.	To Draw 16-page Full sheet work.
05.	8-page half sheet work and tumble.
06.	To Draw 4 ups work & twist.
07.	4-page half sheet work and twist.
08.	To make 4ups positive pasting.
09.	To make 4ups negative pasting
10.	Preparation of plate by- Wipe-on, P.S. positive,P.S. negative, Gum deep-etch, Water deep-etch.
11.	For P.S. plates- Study of variation of exposure on dot formation and processing time- under and over exposed and correctly exposed on the plate by half tone positive.
12	Demonstration of variation in coating thickness and results on gum deep-etch plates
13.	Study of positive, screen angle and squaring-up of positive.

References:

No.	Title of Book	Author	Publisher's Name
01.	Manual For Film Planning & Plate Making	Gatehouse & Roper-	Film Planning
02.		Lithographer's	Manual
03.	Offset Lithographic Plate Making	R.Reed	GATF
04.	Chemistry Of Lithography		GATF

Department of Printing Technology & Graphic Arts

Subject Name-Image Carrier Relief and Gravure
Subject Code- PRND 113
Internal+External-(20+80)

No. of credits-4
No. of Contact Hours/Week-4

Rationale: This course provides an understanding of the basics related to letterpress, flexographic and gravure image carriers. It covers concepts and deals with detailed study of all the variables, processes and technical advancements with limitations. The Gravure process is particularly important for packaging applications. The introductory knowledge of gravure process helps students at the entry level of packaging field. This course will be particularly use full for students seeking a future in the packaging field..

Unit -1

- 1.1 Introduction relief and gravure printing image carriers
- 1.1 Study of classification and features of relief based image carrier
- 1.2 Study of development of relief based image carrier for letter press and flexographic image technologies
- 1.3 Conventional Relief Image Carrier
- 1.4 Study of construction, advantages, limitations and raw material properties of foundry movable type
- 1.4 Study of construction, advantages, limitations and raw material properties of metal stereo and electro type duplicate plate
- 1.5 Study of construction, advantages, limitations and raw material's physical, chemical properties of rubber plate. Detailed study of stages involved in making rubber type duplicate plate.

Unit 2

- 2.0 Photographic Relief Image Carriers i.e. Plates
- 2.1 Study of construction, advantages, limitations and raw material's physical, chemical and sensitometric properties of photopolymer plate. Study of classification, applications of photopolymer and nylo plate.
- 2.2 Photographic positive and negatives and their ideal optical and physical requirements for different plate making techniques.
- 2.3 Detailed study of the stages, troubles and remedies involved in different types of photopolymer, liquid photopolymer and nylo plate.
- 2.4 Introduction to computer-to-plate technology, its advantages, types. Sensitometry, light sensitive chemistry used, laser engine, printing resolution selected for flexographic CTP systems. Introduction to heat sensitive flexographic CTP systems

Unit 3

- 3.0 Block Making Process
- 3.1 Study of characteristics and construction of block. Study of requirements of metals used as a surface in block making. Study of photographic requirements of block type image carrier.
- 3.2 Study of properties of, different processing chemicals and light sensitive chemistry used in block making.

Department of Printing Technology & Graphic Arts

3.3 Study of different stages, troubles and remedies involved in different block making process. Study of different finishing operations performed on block such as routing, beveling and mounting.

Unit 4

4.0 Gravure Printing Cylinder

4.1 Study of characteristics and construction of gravure printing cylinder. Study of required properties of surface metals such as copper, nickel used in gravure printing cylinder making.

4.2 Study of purpose, working and construction of electroplating bath.

4.3 Study of different variables that affect electroplating quality such as immersion factor, current density, temperature, cathode anode distance, etc. Study of calculation of total electroplating time. Study of reclaiming gravure printing cylinder.

4.4 Study of troubles and remedies involved in electroplating of copper and chromium.

Unit 5

5.0-Electronic Engraving of Gravure Printing Cylinder

5.1 Study of working principle and construction of electronic engraving unit.

5.2 Study of cell type, cell wall, depth-to-opening ratio, cell angle, engraving resolution, calculation of total engraving time.

5.3 Study of different types and calculation of volume formula of engraved cell geometries such as inverted pyramidal, quadrangular, channeled, hexagonal, etc.

5.4 Study of printing quality of electronically engraved gravure printing cylinder in terms of resolution, color density, etc. Study of troubles and remedies involved in an electronic engraving of gravure printing cylinder.

5.5 Advanced Gravure Printing Cylinder Making -

Study of gravure cylinder making by laser engraving method. Study of type of laser, its classification, energy requirement. Study of advantages and limitations of gravure cylinder making by laser engraving method. Study of printing quality of laser engraved gravure printing cylinder in terms of resolution, color density, etc.

5.6 Study of gravure cylinder making by electronic beam engraving method. Study of type of laser, its classification, energy requirement. Study of advantages and limitations of gravure cylinder making by electron beam engraving method.

Department of Printing Technology & Graphic Arts

Subject Name-Image Carrier Relief and Gravure
Subject Code- PRND 163
Internal+External-(10+40)

No. of credits-2
No. of Contact Hours/Week-4

No	Practical
01	Introduction to environment different machinery and equipments used in letterpress image carrier making department information.
02	Introduction to environment and different machinery and equipments used in flexographic image carrier making department and tabulating the information.
03	Introduction to environment and different machinery and equipments used in gravure image carrier making department and tabulating the information.
04	Making of single color line blocks for letterpress printing process.
05	Making of half tone blocks for letterpress printing process.
06	Making of die for embossing finishing operation.
07	Making of line and tone nylo plate for letter press printing.
08	Making of half tone nylo plate for full color graphic original's reproduction.
09	Study of effect of effect of under, over exposure and development on an output quality of nylo plate.
10	Making of line and tone sheet photopolymer plate for letter press printing.
11	Making of half tone sheet photopolymer plate for full color graphic original's reproduction.
12	Study of effect of effect of under, over exposure and development on an output quality of sheet photopolymer plate.
13	Making of line and tone sheet photopolymer plate for letter press printing.
14	Making of half tone sheet photopolymer plate for full color graphic original's reproduction.
15	Study of effect of effect of under, over exposure and development on an output quality of sheet photopolymer plate.
16	Study of different quality control graphic aids and instruments used flexographic image carrier making to ensure color and tone reproduction and gray balance.
17	Demonstration of flexographic plate making on CTP unit and electronic engraving of gravure cylinder, electroplating of gravure printing cylinder base and listing of trouble and remedial action taken..
18	Demonstration of chemical etching i.e. imaging of gravure printing cylinder and listing of trouble and remedial action taken.

Department of Printing Technology & Graphic Arts

- **Reference Books**

No.	Title of Book	Author	Publisher's Name
02	Gravure Process Technology	Gravure Association of America	
03	Flexography Primer	GATF, USA	James Crouch
04	Flexography: Principles & Practices	Flexographic Technical Association	N. Y. Flexographic Technical Association
05	Letterpress Plate Making	Pergamon Press	
06	Elements Of Block Making	Pune Vidhyarthi Griha	S.V. Agashe
07	Gravure Primer	GATF, USA	

Department of Printing Technology & Graphic Arts

Subject Name- Press Work Relief and Gravure
Subject Code- PRND 114
Internal+External-(20+80)

No. of credits-4
No. of Contact Hours/Week-4

Rationale: This course provides an understanding of the basics related to letterpress, flexographic and gravure image carriers. It covers concepts and deals with detailed study of all the variables, processes and technical advancements with limitations. The Gravure process is particularly important for packaging applications. The introductory knowledge of gravure process helps students at the entry level of packaging field. This course will be particularly use full for students seeking a future in the packaging field.

Unit-1

1.0 Platen and Flat Bed Cylinder Machines.

1.1 Study of working principle, construction, types, application areas, advantages and limitations of platen machines using relief principle. Study of troubles and remedies related to impression and printing on platen machine.

1.2 Study of working principle, construction, types, application areas, advantages and limitations of flat bed cylinder machines using relief principle. Study of troubles and remedies related to impression and printing on flat bed cylinder machine

1.3 Study of working principle, application areas of different finishing operations such as numbering, embossing, die-cutting, punching along with types of die and cutting rules, hot foil stamping using relief principle. Study of properties and requirements of raw materials used for such applications. Study of troubles and remedies related to impression and finishing process.

Unit-2

2.0 Flexographic Printing Technology.

2.1 Study of application areas and advantages of flexography. Construction, design considerations of general flexographic printing machine

2.2 Study of construction, working principle, types, advantages and limitations of different types of inking systems used on flexographic printing machines. Study of troubles and remedies related to an inking system.

2.3 Construction, working principle, and general specifications of an anilox roll used on flexographic printing machines. Different engraving angles, cell count and their effect on print quality during printing. Study of troubles and remedies related to an anilox roll.

2.4 Construction, types, working principle, and general specifications of flexographic plate cylinder and different plate mounting techniques, their advantages. Study of troubles and remedies related to plate cylinder.

2.5 Construction, types, working principle, and general specifications of flexographic impression cylinder its types, required physical properties. Study of troubles and remedies related to impression cylinder.

Unit-3

3.0 Flexographic Printing Machine

3.1 Study of construction, applications and limitations of an in line flexographic printing machine

3.2 Study of construction, applications and limitations of stack flexographic

Department of Printing Technology & Graphic Arts

printing machine.

3.3 Study of construction, applications and limitations of common impression flexographic printing machine

3.4 Detailed study of different in line operations such as punching, stripping, slitting, lamination and chemical properties and ideal requirements of adhesive used for laminating. Effect of including an inline operation on printing speed and quality. Study of troubles and remedies related to various in line operations.

3.5 Study of working principle, design, advantages and limitations of different color registration system used on flexographic printing machine.

Unit-4

4.0 Gravure Printing Technology.

4.1 Study of features, application areas and advantages of gravure printing.

Construction, design considerations of general gravure printing machine.

4.2 Study of construction, working principle, types, advantages and limitations of an inking systems used on gravure printing machine. Study of troubles and remedies related to an inking system. Study of function, construction, types, and properties of doctor blade. Geometrical terminology involved in angular position of doctor blade with gravure printing cylinder. Effect of angle and pressure of doctor blade on quality of inking.

4.3 Construction, types, working principle, and general specifications of gravure impression cylinder its types, required physical properties. Study of troubles and remedies related to impression cylinder

4.4 Study of working principle, design, advantages and limitations of different color registration system used on gravure printing machine

4.5 Graphic Design Considerations for various printed jobs such as newspaper, magazine, leaflet, folder, letterhead, visiting card, and envelopes etc.

Unit-5

5.0 Inks for Gravure and Flexographic Printing.

5.1 Characteristics, required properties, technical specifications and their ideal values, classification or types of inks used for flexographic and gravure printing technology.

5.2 Different ingredients and their function of inks used for flexographic and gravure printing from the end use requirements such as rub resistance, lightfastness, drying, blocking resistances etc.

5.3 Study of types, construction, working principle, advantages of different ink drying system.

5.4 Study of troubles and remedies associated with an inking and drying system of flexographic & gravure printing system.

5.5 Substrates for Flexographic and Gravure Printing- List of different types Substrates, classification, their physical properties and applications

5.6 Different types of surface treatments required for certain non absorbent substrates

5.7 Quality Control in Flexographic and Gravure Printing.

5.8 Study printing resolution, color strength of flexographic and gravure printing with respect to other printing technologies.

5.9 Use of gray scale, color control patch, slur and star target, densitometer in assuring color reproduction.

Department of Printing Technology & Graphic Arts

Subject Name- Press Work Relief and Gravure
Subject Code- PRND 164
Internal+External-(10+40)

No. of credits-2
No. of Contact Hours/Week-4

No	Practical
1	Demonstration of printing on flat bed cylinder machines.
2	Punching and embossing of different types of substrates on platen punching machines.
3	Single and multicolor line or half-tone printing using block type image carrier on platen machine.
4	Setting up of unwinder and winder units of web fed flexographic printing machine.
5	Setting up of inking unit of web fed flexographic printing machine.
6	Setting up of printing unit of web fed flexographic printing machine.
7	Single and multicolor line or half-tone printing using photopolymer image carrier on flexographic machine on different types of substrates.
8	Setting up of unwinder and winder units of web fed gravure printing machine.
9	Setting up of inking unit of web fed gravure printing machine.
10	Setting up of printing unit of web fed gravure printing machine.
11	Single and multicolor line or half-tone printing using photopolymer image carrier on flexographic machine on different types of substrates.
12	Off line cold laminating gravure and flexo-printed web with appropriate laminating material.
13	Off line hot foil stamping of gravure and flexo-printed samples.
14	Measurement of viscosity of gravure and flexographic inks, surface tension of substrates, ink density, etc.

Reference Book

No.	Title of Book	Author	Publisher's Name
02	Gravure Process Technology	Gravure Association of America	
03	Flexography Primer	GATF, USA	James Crouch
04	Flexography: Principles & Practices	Flexographic Technical Association	N. Y. Flexographic Technical Association
05	Letterpress Plate Making	Pergamon Press	
06	Elements Of Block Making	Pune Vidhyarthi Griha	S.V. Agashe
07	Gravure Primer	GATF, USA	

Department of Printing Technology & Graphic Arts

Subject Name-Press Work Plano Sheet fed
Subject Code- PRND 115
Internal+External-(20+80)

No. of credits-4
No. of Contact Hours/Week-4

Rationale: There are many different Offset presses in the market today with many minute operational differences. The purpose of this course is not to provide a general operational manual, but to deal with the fundamental understanding that will enable the student to run any offset duplicator or single and multi-color sheet-fed offset printing press after studying the manufacturer's operating manual.

This course covers the information necessary to run an offset press and to give important information on press trouble-shooting concerns..

Unit-1

1.0 Sheet Fed Lithographic Machine

1.1 Introduction to different units along with functions used on sheet fed lithographic machines

1.2 Sheet Handling Systems

1.3 Study of constriction, working principle and types of feeder mechanism used in sheet control on sheet fed press. Study of troubles associated with feeder mechanism and remedies

1.4 Study of constriction, working principle and types of sheet transfer mechanism used in sheet control on sheet fed press. Study of troubles associated with sheet transfer mechanism and remedies

1.5 Study of different types of designs and working principles of grippers used in sheet fed press. Study of troubles associated with grippers and remedies.

1.6 Study of perfect printing on sheet fed press and mechanisms used for perfect printing.

1.7 Introduction to registration and fit. Study of three point sheet registration system. Study of troubles associated with three point registration system and remedies.

Unit-2

2.0 Printing Unit.

2.1 Study of construction and design goals of plate cylinder used in sheet fed press. Introduction to different parts of plate cylinder and their function.

2.2 Study of different types of gears used in sheet fed press and their characteristics. Study of troubles associated with gears used and remedies.

2.3 Study of construction and design goals of blanket cylinder used in sheet fed Press. Introduction to different parts of blanket cylinder and their function

2.4 Study of different types of blanket materials used and their required properties. Study of different blanket cleaning solutions used in printing. An introduction To blanket manufacturing process

2.5 Study of troubles associated with blanket materials and various measurements and tests done to ensure quality of blanket material. Introduction to ideal storage conditions.

2.6 Study of construction and design goals of impression cylinder used in sheet fed press. Introduction to different parts of impression cylinder and their function.

Department of Printing Technology & Graphic Arts

Unit-3

3.0 Cylinder Setting

- 3.1 Study of bearer-to-bearer contact and bearer-to-bearer clearance press
- 3.2 Checking the parallelism of the blanket & impression cylinders. Troubles associated with cylinder parallelism and remedies.
- 3.2 Dampening System- Study of construction and design goals of dampening System used in sheet fed press. Introduction to different parts of dampening System and their function
- 3.3 Study and working of different types of dampening system used in sheet fed press and their merits.
- 3.4 Study of various ingredients of dampening solution. Chemistry of dampening solution. Relationship of pH & conductivity. Dampening solution properties related to alcohol & alcohol substitutes
- 3.5 Quality control associated with dampening system. Quality & characteristics of water used in dampening system.

Unit-4

4.0 Inking System

- 4.1 Study and working principle of different inking systems used on sheet fed machine.
- 4.2 Function of different rollers such as ink fountain, doctor or doctor roller, oscillator or vibrators roller, form roller used in inking system. Material used for inking roller and their requirements.
- 4.3 Study of auxiliary equipments and devices used such as ink agitator, fountain splitter, ink level controller, , hickey picking roller, ink replenisher, moisture controller, etc. An introduction to different versions of CIP machines and their advantages.

Unit-5

5.0 Sheet transfer and delivery.

- 5.1 Study of components of delivery system. Working of delivery grippers. Study and working of skeleton wheel and transfer drum.
- 5.2 Auxiliary equipments & devices such as anti set-off device, different types of driers
- 5.3 Troubles and Trouble Shooting- M/c and blanket related-Misfeed, sheet jamming, front or side lay variation, creasing jogging. Gear streaks, slurring, marking, doubling, and uneven impression. Blanket - Loss of sharpness, puncture (low spot), glazing, mis-register, tightness of blanket.
- 5.4 Ink- Mottling, dot gain, set-off, hickies, ghosting, chalking, emulsification, piling, tinting, trapping, plate-blinding, scum Dampening – scum, streak, white spots etc
- 5.5 Paper-Characteristics and Ink –Characteristics for Sheet/web- fed, drying properties Sheet/web - fed, handling and conditioning, storage.
- 5.6 Use of Quality control devices-
Printing of dot gain slur gauge, star target, test forme. Advancements in Sheet-fed machines

Department of Printing Technology & Graphic Arts

Subject Name:-Press Work Plano Sheet fed
Subject Code- PRND 165
Internal+External-(10+40)

No. of credits-2
No. of Contact Hours/Week-4

Practicals :

No.	Practical
01.	Feeder setting for various stocks
02.	Mounting of plate with packing
03.	Mounting of blanket with packing
04.	Gripper setting of impression cylinder
05.	Setting of dampening roller
06.	Preparation of foundation solution
07.	Setting of inking rollers
08.	Study of ink water balance.
09.	Cleaning & wash up
10.	Setting – joggers, skeleton wheels, delivery anti set-off spray
11.	Make ready operations for multicolor printing line and halftone printing
12.	Color sequence alterations
13.	Color chart and color control patch printing.
14.	Checking effect of keeping rollers of same diameter
15.	Study of mechanism of impression lever, inking, dampening lever, feed board devices
16.	Demonstration of CIP enabled sheet fed lithographic offset machines.

Reference books:

No.	Title of Book	Author	Publisher's Name
01.	Lithographer's manual	Latham	GATF
02.	Solving Sheet Fed Offset Problems	GATF	
03.	Litho Printing	Ian Faux	Blue Printing
04.	Machine Printing	W. C. Durrant	
05.	Printing Technology	Adams, Faux	Delmar