Bachelor of Printing Technology & Graphic Arts
3 years-6 semesters course

New Credit based syllabus 2016-17

SCHEME FOR CHOICE BASED CREDIT SYSTEM (CBCS) AND AWARDING GRADES TO THE STUDENTS IN UNIVERSITY DEPARTMENTS
w.e.f. June, 2016 (Academic Year, 2016-2017)

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1. Preamble

The University Grants Commission (UGC) has initiated several measures to bring equity, efficiency and excellence in the Higher Education System of country. The important measures taken to enhance academic standards and quality in higher education include innovation and improvements in curriculum, teaching-learning process, examination and evaluation systems, besides governance and other matters.

The UGC has formulated various regulations and guidelines from time to time to improve the higher education system and maintain minimum standards and quality across the Higher Educational Institutions (HEIs) in India. The academic reforms recommended by the UGC in the recent past have led to overall improvement in the higher education system. However, due to lot of diversity in the system of higher education, there are multiple approaches followed by universities towards examination, evaluation and grading system. While the HEIs must have the flexibility and freedom in designing the examination and evaluation methods that best fits the the curriculum, syllabi and teaching–learning methods, there is a need to devise a sensible system for awarding the grades based on the performance of students. Presently the performance of the students is reported using the conventional system of marks secured in the examinations or grades or both. The conversion from marks to letter grades and the letter grades used vary widely across the HEIs in the country. This creates difficulty for the acadamia and the employers to understand and infer the performance of the students graduating from different universities and colleges based on grades.

The grading system is considered to be better than the conventional marks system and hence it has been followed in the top instutitions in India and abroad. So it is desirable to introduce uniform grading system. This will facilitate student mobility across institutions within and across countries and also enable potential employers to assess the performance of students. To bring in the desired uniformity, in grading system and method for computing the cumulative grade point average (CGPA) based on the performance of students in the examinations, the UGC has formulated these guidelines.

2. Applicability of the Grading System

These guide lines shall apply to all undergraduate and postgraduate level degree, diploma and certificate programmes under the credit system awarded by the Central, State and Deemed to be universities in India.

3. Definitions of Key Words:

1. **Academic Year:** Two consecutive (one odd + one even) semesters constitute one academic year.
2. **Choice Based Credit System (CBCS):** The CBCS provides choice for students to select from the prescribed courses (core, elective or minor or soft skill courses).
3. **Course:** Usually referred to, as 'papers' is a component of a programme. All courses need not carry the same weight. The courses should define learning objectives and learning outcomes. A course may be designed to comprise lectures/ tutorials/laboratory work/ field work/ outreach

activities/ project work/ vocational training/viva/ seminars/ term papers/assignments/ presentations/ self-study etc. or a combination of some of these.

4. **Credit Based Semester System (CBSS):** Under the CBSS, the requirement for awarding a degree or diploma or certificate is prescribed in terms of number of credits to be completed by the students.

5. **Credit Point:** It is the product of grade point and number of credits for a course.

6. **Credit:** A unit by which the course work is measured. It determines the number of hours of instructions required per week. One credit is equivalent to one hour of teaching (lecture or tutorial) or two hours of practical work/field work per week.

7. **Cumulative Grade Point Average (CGPA):** It is a measure of overall cumulative performance of a student over all semesters. The CGPA is the ratio of total credit points secured by a student in various courses in all semesters and the sum of the total credits of all courses in all the semesters. It is expressed up to two decimal places.

8. **Grade Point:** It is a numerical weight allotted to each letter grade on a 10-point scale.

9. **Letter Grade:** It is an index of the performance of students in a said course. Grades are denoted by letters O, A+, A, B+, B, C, P and F.

10. **Programme:** An educational programme leading to award of a Degree, diploma or certificate.

11. **Semester Grade Point Average (SGPA):** It is a measure of performance of work done in a semester. It is ratio of total credit points secured by a student in various courses registered in a semester and the total course credits taken during that semester. It shall be expressed up to two decimal places.

12. **Semester:** Each semester will consist of 15-18 weeks of academic work equivalent to 90 actual teaching days. The odd semester may be scheduled from July to December and even semester from January to June.

13. **Transcript or Grade Card or Certificate:** Based on the grades earned, a grade certificate shall be issued to all the registered students after every semester. The grade certificate will display the course details (code, title, number of credits, grade secured) along with SGPA of that semester and CGPA earned till that semester.

4. Semester System and Choice Based Credit System

The Indian Higher Education Institutions have been moving from the conventional annual system to semester system. Currently many of the institutions have already introduced the choice based credit system. The semester system accelerates the teaching-learning process and enables vertical and horizontal mobility in learning. The credit based semester system provides flexibility in designing curriculum and assigning credits based on the course content and hours of teaching. The choice based credit system provides a 'cafeteria' type approach in which the students can take courses of their choice, learn at their own pace, undergo additional courses and acquire more than the required credits, and adopt an interdisciplinary approach to learning, It is desirable that the HEIs move to CBCS and implement the grading system.

5. Types of Courses:

Courses in a programme may be of three kinds: Core, Elective and Foundation.

1. Core Course:-

There may be a Core Course in every semester. This is the course which is to be compulsorily studied by a student as a core requirement to complete the requirement of a programme in a said discipline of study.

2. Elective Course:-

Elective course is a course which can be chosen from a pool of papers. It may be:
- Supportive to the discipline of study
- Providing an expanded scope
- Enabling an exposure to some other discipline/domain
- Nurturing student's proficiency/skill.

An elective may be "Generic Elective" focusing on those courses which add generic proficiency to the students. An elective may be "Discipline centric" or may be chosen from an unrelated discipline. It may be called an "Open Elective."

3. Foundation Course:-

The Foundation Courses may be of two kinds: Compulsory Foundation and Elective foundation. "Compulsory Foundation" courses are the courses based upon the content that leads to Knowledge enhancement. They are mandatory for all disciplines. Elective Foundation courses are value-based and are aimed at man-making education.

6. Examination and Assessment

The HEIs are currently following various methods for examination and assessment suitable for the courses and programmes as approved by their respective statutory bodies. In assessing the performance of the students in examinations, the usual approach is to award marks based on the examinations conducted at various stages (sessional, mid-term, end-semester etc.,) in a semester. Some of the HEIs convert these marks to letter grades based on absolute or relative grading system and award the grades. There is a marked variation across the colleges and universities in the number of grades, grade points, letter grades used, which creates difficulties in comparing students across the institutions. The UGC recommends the following system to be implemented in awarding the grades and CGPA under the credit based semester system.

I.   **6.1. 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.

II. 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:

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

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

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-

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

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

III. 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 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 keekping to the Controller of Examinations as soon as all the formalities are over.

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   **(Professor B.A. Chopade)**

Date: 7/ 5 /2016   Vice -Chancellor

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad

Department of Printing Technology & Graphic Arts

First Semester Revised Syllabus effective from June 2016

-Bachelor of Printing Technology & Graphic Arts (BPT&GA)-

COURSE STRUCTURE
Bachelor of 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.	BPT-101T	*(Foundation Course)* Computer Basics & Computer Fundamentals	4	-	4	80	20
2.	BPT-101P		-	2	4	40	10
3.	BPT-102T	*(Foundation Course)* Computer Operating Skills	4	-	4	80	20
4.	BPT-102P			2	4	40	10
5.	BPT-103T	*(Core Course)* Computer Design	4	-	4	80	20
6.	BPT-103P			2	4	40	10
7.	BPT-104T	*(Core Course)* Text Setting	4	-	4	80	20
8.	BPT-104P			2	4	40	10
9.	BPT-105T	*(Core Course)* Image Processing	4	-	4	80	20
10.	BPT-105P			2	4	40	10
		Total= 30 Credits					

1. **L** for Theory Lecture
2. **P** for Practical

(Foundation Course)
Subject Name- Computer Basics & Computer Fundamentals   **No. of credits-4**
Subject Code- BPT-101T   **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, 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.

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.

(Foundation Course)

Subject Name- Computer Basics & Computer Fundamentals   **No. of credits-2**
Subject Code- BPT-101P   **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 bullet sand 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 at able,- 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 envelops 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**:-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,

(Foundation Course)
Subject Name-Computer Operating Skills   **No. of credits-4**
Subject Code- BPT-102T   **No. of Contact Hours/Week-4**
Internal+**External-(20+80)**
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 Web Pages 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

(Foundation Course)
Subject Name- Computer Operating Skills   **No. of credits-2**

Subject Code- BPT-102P   **No. of Contact Hours/Week-4**
Internal+External-(10+40

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 message Receiving /Deleting a message
02	**Introduction to Windows-**2.1 What is an operating system and basics of Windows
03	**The User Interface-**1) Using Mouse and Moving Icons on the screen 2)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 Directories Creating 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

(Core Course)
Subject Name-Computer Design   **No. of credits-4**
Subject Code- BPT-103T   **No. of Contact Hours/Week-4**
Internal+External-(20+80)

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, CorelDraw, Photoshop, Illustrator, Acrobat reader, Introduction to Corel Draw- File handling, Creating, Saving, retrieving. Introduction to Tools- Pointer, Text, Crop, Orient, Line, Rectangle, Ellipse, Pen, Magnifier, Gradient., 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

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.

(Core Course)
Subject Name-Computer Design   **No. of credits-2**
Subject Code- BPT-103P   **No. of Contact Hours/Week-4**
Internal+External-(10+40)

No.	Practical
01	Introduction & Installation to different version of Corel Draw.
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 Corel Draw.*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 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

(Core Course)
Subject Name-Text Setting   **No. of credits-4**
Subject Code- BPT-104T   **No. of Contact Hours/Week-4**

Internal+External-(20+80)

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

Unit-2:Typographic Principles - 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., Dimensional attributes of a type such as x-height, ascender, descanter and base line., Study of expanded, normal and condensed type., 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 -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, Measure ments.,Definition and unit of set, measure and gauge of a page or lay-out. Definition of verso and recto format of a layout, Definition of casting-off and copy fitting method of typesetting approaches. Advantages and limitation of casting-off and copy fitting approaches., Examples of type setting calculation based on casting-off and copy fitting

Unit-4:Formatting Page Layout -Paragraph style - indention, Tabs, alignment, leading, Character style - font, style, size, spacing, Study of graphic terminology associated with page. page layout - Running heads, Column guides, page numbering, margins, Formatting graphics with the text in columns and tables. Proofing and Proof Reading.,Study of graphic terminology associated with page, and different Imposition schemes. ,Need and setting of headers and footers, Font Technology- Type Technology, hot metal - Punch and matrices, casting, type of metals,Type Design - Analog, Artwork, templates, punches and matrices and Digital – Stored & modified digitally, analog output on printers., Hardware & Software - Microsoft, Aldus, Adobe, Format designing software, Postscript, And TIFF.,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.

Unit-5:Regional Language Scripts -*Regional Language scripts - an overview in comparison with Roman script – in relation,ToDevnagari.*Problems of Regional scripts - Nonlinear, Phonetic script, number of characters, Non- availability of software' setc, *Software available for Devnagari and its use. Bi-lingual type formats

(Core Corse)
Subject Name-Text Setting   **No. of credits-2**
Subject Code- BPT-104P   **No. of Contact Hours/Week-4**
Internal+External-(10+40)

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 Verleg, 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.		

(Core Corse)
Subject Name-Image Processing   **No. of credits-4**
Subject Code- BPT-105T   **No. of Contact Hours/Week-4**
Internal+External-(20+80)

Unit-1: Customizing the Desk Top-***-Rulers *-Grids *-Guidelines *-Color Palettes *-Floating Toolbox
Unit-2:-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

(Core Course)
Subject Name-Image Processing   **No. of credits-2**
Subject Code- BPT-105 P   **No. of Contact Hours/Week-4**
Internal+External-(10+40)

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 Corel Draw 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

Second Semester

COURSE STRUCTURE
Bachelor of 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.	BPT-106T	*(Foundation Course)* Binding & Finishing Technology	4	-	4	80	20
2.	BPT-106P		-	2	4	40	10
3.	BPT-107T	*(Foundation Course)* Design & Artwork	4	-	4	80	20
4.	BPT-107P			2	4	40	10
5.	BPT-108T	*(Core Course)* Printing Material Science	4	-	4	80	20
6.	BPT-108P			2	4	40	10
7.	BPT-109T	*(Core Course)* Printing Processes	4	-	4	80	20
8.	BPT-109P			2	4	40	10
9.	BPT-110T	*(Core Course)* Reproduction Processes	4	-	4	80	20
10.	BPT-110P			2	4	40	10
		Total= 30 Credits					

1. **L** for Theory Lecture
2. **P** for Practical

(Foundation Course)
Subject Name- Binding & Finishing Technology　　　　**No. of credits-4**
Subject Code- BPT- 106T　　　　　　　　　　　　**No. of Contact Hours/Week-4**
Internal+External-(20+80)

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-Introduction- *Introduction to the terms 'Binding ' and 'Finishing'.**,** *List of major operations performed in binding and finishing Pre-forwarding, Forwarding, Finishing Tools and equipment's used for binding, binder's aids and or marks.*Material used in Binding and Finishing * 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.* Study of different types applications of board used in binding and finishing work.*Securing materials-Thread, wire, tape, cord – Selection based on application, gauge of wire, thread strength, and cost. *Covering materials- Binding cloth, Mull cloth, rexine, leather – grain direction, surface, Applications, cost.* 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- Pre-forwarding and Forwarding Operations* Pre-forwarding Operation –Jogging & knocking, removing Mis-registrered 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, lining the back, edge coration, cutting the boards, capping up, squaring the board, lacing in, covering, setting the points, pasting down, pressing, jacketing. Cutting, Slitting and Trimming Operations. * Single knife guillotine machine-Major parts & their functions, maintenance, Safety devices, Trim disposal system, application.*Straw board cutter – construction and working.*Three Knife Trimmer- Major parts, functions and its application. **Folding and Gathering Operations-***Knife folding; Buckle folding, Combination folding- Principle, Construction & Working. *Hand folding- methods and various folding schemes, advantages and limitations. * Gathering machines - Major parts & their functions.

Unit-3-* Adhesive or Perfect Binding Principle & Machine * Major parts & their functions, maintenance, safety devices, application * Types - Burst binding, Notch binding, Two shot wet on wet binding. **Securing Methods & Covering Styles-*** Study of construction and working principle of wire stitching machine.*Thread securing methods *Study of construction and working principle of book sewing machine.*Case binding, Case making machine - Parts, Function*Covering- Quarter, Half, Full, Limp & Library style binding.*Boarding methods- pasting down, split, drawn in work, cut flush, extra square, ASTI (all sides turned in).

Unit-4 -* Stationery Book Binding & Loose Leaf Binding-Wire-o-wire, spiral, comb binding techniques, machine construction & working, Loose leaf binding – Thong binder, Universal style.***Repairing Of Old Books.-**Inspections, pulling to pieces dry & wet, cleaning, washing, resizing, mending, splitting& inlaying art plates, guarding, re-sewing (over casting, whip sewing, stub binding).

Unit-5- Finishing operations-Laminating, Blocking, Numbering, Perforation, Creasing, Die cutting, Edge decoration, Index cutting, Foil stamping, graining, varnishing.

(Foundation Course)
Subject Name- Binding & Finishing Technology No. of credits-2
Subject Code- BPT-106P   No. of Contact Hours/Week-4
Internal+External-(10+40)

No.	Practical

01	Introduction To Binding And Binder's Tools.
02	Machines And Equipment.
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	MendirattaPrintek	Publication, 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

(Foundation Course)
Subject Name- Design & Artwork　　　　　　　　　**No. of credits-4**
Subject Code- BPT-107 T　　　　　　　　　**No. of Contact Hours/Week-4**
Internal+External-(20+80)

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

Unit-2 - Colors in Graphic Design-Color Terminology Hue, value, chromo, brightness, shades, tint, color symbolism.* Color Relationship Cool, warm, contrast, complementary and colors schemes.*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 - Preparation of Layout for Graphic Reproduction-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.* Study of basic geometric shapes, space, use of tools such as geometric and optical center.* 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.

Unit-4 - Imposition and Planning-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.*Study of different types of graphic marks incorporated in an imposition scheme.* Different converting operations such as collating, folding, trimming and binding, etc. that governs the use or selection of imposition scheme.*Limitations such as working of folding machine, page sizes, types of paper and their physical properties. Introduction to electronic imposition. * Graphic Design Considerations for various printed jobs such as newspaper,

magazine, leaflet, folder, letterhead, visiting card, and envelopes etc.

Unit-5 -Desk Top Publishing Systems-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.*Brief overview of Desk Top Publishing Systems, their application areas, various related hardware and component parts of ideal DTP system.*Different DTP Page make-up software and main feature of ideal DTP software or package.*Brief overview of Page Maker and Quark press DTP package in terms main features, application area, advantages and limitation.

(Foundation Course)
Subject Name- Design & Artwork   **No. of credits-2**
Subject Code- BPT-107P   **No. of Contact Hours/Week-4**
Internal+External-(10+40)

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	NirmalaSadanPrakashan, New Delhi
9	B. D. Mendiratta	Composing and Typography	Printek Publications, New Delhi

(Core Course)
Subject Name -Printing Material Science   **No. of credits-4**
Subject Code- BPT-108T   **No. of Contact Hours/Week-4**
Internal+External-(20+80)

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-Basics of Printing Inks.- Study of required qualities and classification of pigment- carbon black, inorganic and organic- used in printing inks.*Study of purpose, required properties, types and examples of vehicles. Study of different additives used in preparation of vehicle.*Study of purpose, required properties, types and examples of vehicles. Study of different additives used in preparation of vehicle * Study of ink requirements. *Study of classification of ink requirements. Classification of ink on the basis of its viscosity.* Study of different requirements of flexographic, gravure and screen printing ink requirements.* Study of different requirements of lithographic offset, letterpress, and waterless offset ink requirements.

Unit-2- Ink Properties and printing problem-Study of optical properties such as gloss, brightness and opacity.*Study of definition and measurement unit of ink tack, viscosity and their relationship.*Effect of tack on the performance of wet-on-wet and wet-on-dry lithographic printing. Study of trouble and remedies *Drying Mechanism or Theories. *Study of absorption drying theory and its practical application i.e. quick set inks.*Study of evaporation drying theory and its practical application i.e. heat set inks.*Study of theory oxidation polymerization and its practical application.*Study of radiation drying and curing, microwave drying, infrared drying and ultraviolet curing.

Unit-3-Paper Making-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. *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. *Study of working principle and construction of general papermaking machine.*Study of working principle types and applications of calendaring and machine glazing finishing process.*Introduction to recycled paper, its advantages and manufacturing process.

Unit-4- Influence of Moisture and Relative Humidity on Paper-Study of the relative humidity, its formula and factors affecting it. Simple problems based on calculation of relative humidity.* Study of effect of relative humidity on paper and board properties and its consequences on printability and runnability. *Study of effect of moisture on paper and board properties and its consequences on printability and runnability.

Unit-5-Paper Properties and printing Problems-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.*Study of Surface strength and internal bond strength such as Picking, Fluffing, Splitting, Testing technique.*Study of Surface Strength properties such as Stiffness, Folding endurance, Burst strength, Tear resistance.* Study of Surface Optical properties such as Gloss, Brightness, Whiteness, yellowness and tint indicates, Fluorescence, opacity.

(Core Course)
Subject Name- Printing Material Science   **No. of credits-2**
Subject Code- BPT-108P   **No. of Contact Hours/Week-4**
Internal+External-(10+40)

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	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

(Core Course)
Subject Name- Printing Processes   **No. of credits-4**
Subject Code- BPT-109T   **No. of Contact Hours/Week-4**
Internal+External-(20+80)

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

Unit-2-Introduction to Printing-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.*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.*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-Prepress Techniques-Introduction to prepress technologies *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.*Introduction to different prepress techniques employed in Printing.*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.*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 image carrier making of individual conventional printing technology- Lithographic Offset, Letterpress, Flexography, Gravure, Screen.

Unit-4- Post Press Techniques-Introduction to different post press techniques employed in Printing.
* Introduction to equipments and consumables used in Commercial and publication printing.
* Introduction to equipments and consumables used in Packaging and converting printing.

Unit-5-Application in Packaging Technology *Application of printing processes in packaging technologies, Application of printing technology in retail market.

(Core Course)
Subject Name- : Printing Processes   **No. of credits-2**
Subject Code- BPT- 109P   **No. of Contact Hours/Week-4**
Internal+External-(10+40)

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	

(Core Course)
Subject Name- Reproduction Processes   **No. of credits-4**
Subject Code- BPT-110T   **No. of Contact Hours/Week-4**
Internal+External-(20+80)

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-**Equipments Used In Reproduction Photography-**Study of different types, construction, working principles, use and limitations of reproduction camera. Study of construction, working principles and

advantages of contact frame.*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.*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.*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-Recording Media-Study of need, required characteristics and different types of media used in reproduction process of graphic reproduction. 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.*Classification of photographic film on the basis of- spectral sensitivity, speed, and contrast. Study of resolving power of an emulsion.*Study of different stages, photo kinetics, chemistry involved in film making such as- exposure, latent image formation, chemical development, chemical fixing.

Unit-3-Originals For Graphic Reproduction-Study of classification and the basis of classification used for graphic original. Factors governing selection of the graphic original.*Study of required physical and optical properties or characteristics of different types of graphic originals.*Study of magnification and terminology of magnification of originals. Simple problems based on magnification

Unit-4-Densitometry and Sensitometry-Need and advantages of densitometry and Sensitometry
* Definition and types of opacity and optical density.*Study of construction, types and working principle of densitometers. , List of application area of different densitometer, Factors affecting Sensitometry and study of sensitometric curves & characteristic curves- gamma, contrast, reciprocity law and its failure.*Sensitometric terms- opacity, specular & diffused density. Study of defects such as halation and irradiation, Intermittency effect, Herschel effect and Callier coefficient.

Unit-5-Halt tone Dot Formation Techniques-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.
* 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.*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.*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.

(Core Course)
Subject Name- Reproduction Processes   **No. of credits-2**
Subject Code- BPT-110P   **No. of Contact Hours/Week-4**
Internal+External-(10+40)

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

Bachelor of Printing Technology & Graphic Arts

3 years-6 semesters course

New Credit based syllabus 2016-17

SCHEME FOR CHOICE BASED CREDIT SYSTEM (CBCS) AND AWARDING GRADES TO THE STUDENTS IN UNIVERSITY DEPARTMENTS
w.e.f. June, 2016 (Academic Year, 2016-2017)

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1. Preamble

The University Grants Commission (UGC) has initiated several measures to bring equity, efficiency and excellence in the Higher Education System of country. The important measures taken to enhance academic standards and quality in higher education include innovation and improvements in curriculum, teaching-learning process, examination and evaluation systems, besides governance and other matters.

The UGC has formulated various regulations and guidelines from time to time to improve the higher education system and maintain minimum standards and quality across the Higher Educational Institutions (HEIs) in India. The academic reforms recommended by the UGC in the recent past have led to overall improvement in the higher education system. However, due to lot of diversity in the system of higher education, there are multiple approaches followed by universities towards examination, evaluation and grading system. While the HEIs must have the flexibility and freedom in designing the examination and evaluation methods that best fits the the curriculum, syllabi and teaching–learning methods, there is a need to devise a sensible system for awarding the grades based on the performance of students. Presently the performance of the students is reported using the conventional system of marks secured in the examinations or grades or both. The conversion from marks to letter grades and the letter grades used vary widely across the HEIs in the country. This creates difficulty for the acadamia and the employers to understand and infer the performance of the students graduating from different universities and colleges based on grades.

The grading system is considered to be better than the conventional marks system and hence it has been followed in the top instutitions in India and abroad. So it is desirable to introduce uniform grading system. This will facilitate student mobility across institutions within and across countries and also enable potential employers to assess the performance of students. To bring in the desired uniformity, in grading system and method for computing the cumulative grade point average (CGPA) based on the performance of students in the examinations, the UGC has formulated these guidelines.

2. Applicability of the Grading System

These guide lines shall apply to all undergraduate and postgraduate level degree, diploma and certificate programmes under the credit system awarded by the Central, State and Deemed to be universities in India.

3. Definitions of Key Words:

1. **Academic Year:** Two consecutive (one odd + one even) semesters constitute one academic year.
2. **Choice Based Credit System (CBCS):** The CBCS provides choice for students to select from the prescribed courses (core, elective or minor or soft skill courses).
3. **Course:** Usually referred to, as 'papers' is a component of a programme. All courses need not carry the same weight. The courses should define learning objectives and learning outcomes. A course may be designed to comprise lectures/ tutorials/laboratory work/ field work/ outreach

activities/ project work/ vocational training/viva/ seminars/ term papers/assignments/ presentations/ self-study etc. or a combination of some of these.

4. **Credit Based Semester System (CBSS):** Under the CBSS, the requirement for awarding a degree or diploma or certificate is prescribed in terms of number of credits to be completed by the students.

5. **Credit Point:** It is the product of grade point and number of credits for a course.

6. **Credit:** A unit by which the course work is measured. It determines the number of hours of instructions required per week. One credit is equivalent to one hour of teaching (lecture or tutorial) or two hours of practical work/field work per week.

7. **Cumulative Grade Point Average (CGPA):** It is a measure of overall cumulative performance of a student over all semesters. The CGPA is the ratio of total credit points secured by a student in various courses in all semesters and the sum of the total credits of all courses in all the semesters. It is expressed up to two decimal places.

8. **Grade Point:** It is a numerical weight allotted to each letter grade on a 10-point scale.

9. **Letter Grade:** It is an index of the performance of students in a said course. Grades are denoted by letters O, A+, A, B+, B, C, P and F.

10. **Programme:** An educational programme leading to award of a Degree, diploma or certificate.

11. **Semester Grade Point Average (SGPA):** It is a measure of performance of work done in a semester. It is ratio of total credit points secured by a student in various courses registered in a semester and the total course credits taken during that semester. It shall be expressed up to two decimal places.

12. **Semester:** Each semester will consist of 15-18 weeks of academic work equivalent to 90 actual teaching days. The odd semester may be scheduled from July to December and even semester from January to June.

13. **Transcript or Grade Card or Certificate:** Based on the grades earned, a grade certificate shall be issued to all the registered students after every semester. The grade certificate will display the course details (code, title, number of credits, grade secured) along with SGPA of that semester and CGPA earned till that semester.

4. Semester System and Choice Based Credit System

The Indian Higher Education Institutions have been moving from the conventional annual system to semester system. Currently many of the institutions have already introduced the choice based credit system. The semester system accelerates the teaching-learning process and enables vertical and horizontal mobility in learning. The credit based semester system provides flexibility in designing curriculum and assigning credits based on the course content and hours of teaching. The choice based credit system provides a 'cafeteria' type approach in which the students can take courses of their choice, learn at their own pace, undergo additional courses and acquire more than the required credits, and adopt an interdisciplinary approach to learning, It is desirable that the HEIs move to CBCS and implement the grading system.

5. Types of Courses:

Courses in a programme may be of three kinds: Core, Elective and Foundation.

1. Core Course:-

There may be a Core Course in every semester. This is the course which is to be compulsorily studied by a student as a core requirement to complete the requirement of a programme in a said discipline of study.

2. Elective Course:-

Elective course is a course which can be chosen from a pool of papers. It may be:
• Supportive to the discipline of study

• Providing an expanded scope

• Enabling an exposure to some other discipline/domain

• Nurturing student's proficiency/skill.

An elective may be "Generic Elective" focusing on those courses which add generic proficiency to the students. An elective may be "Discipline centric" or may be chosen from an unrelated discipline. It may be called an "Open Elective."

3. Foundation Course:-

The Foundation Courses may be of two kinds: Compulsory Foundation and Elective foundation. "Compulsory Foundation" courses are the courses based upon the content that leads to Knowledge enhancement. They are mandatory for all disciplines. Elective Foundation courses are value-based and are aimed at man-making education.

6. Examination and Assessment

The HEIs are currently following various methods for examination and assessment suitable for the courses and programmes as approved by their respective statutory bodies. In assessing the performance of the students in examinations, the usual approach is to award marks based on the examinations conducted at various stages (sessional, mid-term, end-semester etc.,) in a semester. Some of the HEIs convert these marks to letter grades based on absolute or relative grading system and award the grades. There is a marked variation across the colleges and universities in the number of grades, grade points, letter grades used, which creates difficulties in comparing students across the institutions. The UGC recommends the following system to be implemented in awarding the grades and CGPA under the credit based semester system.

IV.   6.1. Grade Awards:-

v)   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

vi) Non appearance in any examination/assessment shall be treated as the students have secured zero mark in that subject examination/assessment.

vii) 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.

viii) 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.

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

The computation of SGPA &CGPA will be as below:

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

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

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

d. 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-

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

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

VI. 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.

b. **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**

iii) 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.

iv) 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 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 keekping to the Controller of Examinations as soon as all the formalities are over.

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   **(Professor B.A. Chopade)**

Date: / / 2016   Vice – Chancellor

Dr. BabasahebAmbedkarMarathwada University, Aurangabad

Department of Printing Technology & Graphic Arts

Third Semester Revised Syllabus effective from June 2015
-Bachelor of Printing Technology & Graphic Arts (BPT&GA)-

COURSE STRUCTURE
Bachelor of 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.	BPT-111T	*(Foundation Course)* Screen Printing	4	-	4	80	20
2.	BPT-111P		-	2	4	40	10
3.	BPT -112T	*(Foundation Course)* Image Carrier Plano	4	-	4	80	20
4.	BPT -112P			2	4	40	10
5.	BPT -113T	*(Core Course)* Image Carrier Relief and Gravure	4	-	4	80	20
6.	BPT -113P			2	4	40	10
7.	BPT -114T	*(Core Course)* Press Work Relief and Gravure	4	-	4	80	20
8.	BPT -114P			2	4	40	10
9.	BPT -115T	*(Core Course)* Press Work Plano Sheet fed	4	-	4	80	20
10.	BPT -115P			2	4	40	10
		Total= 30 Credits					

1. **L** for Theory Lecture
2. **P** for Practical

Subject Name-Screen Printing **No. of credits-4**
Subject Code- BPT- 111T **No. of Contact Hours/Week-4**
Internal+External-(20+80)

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
* Introduction to Screen Printing *Introduction to characteristics and application areas of screen printing technology. *Comparison of screen printing technology with other printing technologies.

Unit-2

*Image Carrier Used in Screen Printing *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.* Study of construction, types, advantages, limitations and applications of differenttypes of frames used in screen image carrier.* Study of construction, types, advantages, limitations and applications of *Differenttypes of screen fabric or mesh materials used screen printing. Study of terminology associated with screen fabric such as threads per inch, plain and twillweave, etc.* Study of different types of light sensitive chemistries used for stencil making forscreen 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

Screen Printing. Study of construction and workingdifferent types machine configurations used in screen printing * Study of construction, types, advantages and applications areas of different types squeezes used in screen printing. * Study of different types, formulation and application areas of inks and varnishes used for screen printing. *Study of different types of printing troubles encountered and remedies *Selected subsequently.* Study of different types of ink drying mechanism used on screen printing machines.*Study of different types of substrates and their application areas used in screen printing

Unit-4

* Inline Operations Used in Screen Printing.* 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

*Quality Control in Screen Printing * Study of viscosity, tack, specific gravity requirements of screen printing inks, varnishes and solvents. *Importance of color of fabric, fabric stretching angle, tension value whilefabric stretching. Study of effect of moisture and relative humidity on screen*printing image carrier and its operation. Study of effect of off-contact, squeezepressure and angle on print quality. To study the calculation of ink volumedepositionand image elongation in screen printing.* Study of graphic quality control aids used in screen printing to achieve tone and color reproduction.

Subject Name- Screen Printing   **No. of credits-2**
Subject Code- BPT-111P   **No. of Contact Hours/Week-4**
Internal+External-(10+40)

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.

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. Cincinnafiohio, OSA
03	Screen Printing History & Process	Rita, Gilbert	Holt, Rinehart & Winston, Newyork, Chicago.
04	Screen Printing Water Based Technique	Roni, Hennins	Watson-Guftill Publication Newyork.

Subject Name -Image Carrier Plano **No. of credits-4**
Subject Code- BPT-112T **No. of Contact Hours/Week-4**
Internal+External-(20+80)

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

*Introduction to Lithographic Image Carrier * Study of AloisSenefelder's invention of lithography and study of lithographic principle *Study of basis of classification, classification and features of lithographic image carrier *Study of development of lithographic image carrier from litho stone to metalbased plates * Base of Lithographic Image Carrier- Ideal chemical and physical properties of different types of base used for Lithographic image carrier * Study of different surface treatments such as graining counter etching givento lithographic image carrier base to improve surface energy and contact angle with liquid.

Unit-2

*Chemistry and Sensitometry of Lithographic Image Carrier * Study of light sensitive chemistry and sensitometric properties of egg albumenbased coating. Study of light sensitive chemistry and sensitometric propertiesof coatings used for wipe-on lithographic plates. * Study of light sensitive chemistry and sensitometric properties of diazoand photopolymer type coatings used in lithographic plates and their photographic requirements * Study of different methods used to know sensitometric properties of different light sensitive chemistries and their exposure time standardization.* Other Raw Materials Used in Lithographic Image Carrier making * Study chemical and physical properties and constitution of pretreatment and processing chemicals such as developer, gum-arabic, deep etch solution, platefinisher, lacquer, etc, used in lithographic image carrier making.* Photographic positive and negatives and their ideal optical and physical requirements for different plate making techniques. * 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.

Unit-3

*Plate Making Environment and Storage *Ideal requirements of storage conditions for raw materials used lithographicimage 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. *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. * 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

* Lithographic Image Carrier Making * Detailed study of stages involved in different types of wipe-on lithographic plate making.*Detailed study of stages involved in different types of wipe-on lithographic plate making. * Detailed study of stages involved in different types of deep-etch lithographicplate making. *Detailed study of stages involved in different typesof photopolymer lithographic plate making.

Unit-5

*Image carrier For Waterless Lithography * Study of construction and working principle of image carrier used for waterless lithography * Detailed study of stages involved in different types of waterless lithographic plate making. * Quality Control In Image Carrier making- Study of purpose, construction and working principle of different graphic aid incorporated with photographic filmon lithographic image carrier such as star target, slur target, gray scale, color control patches, etc.

Subject Name- Image Carrier Plano   **No. of credits-2**
Subject Code- BPT-112P   **No. of Contact Hours/Week-4**
Internal External-(10+40)

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

Subject Name-Image Carrier Relief and Gravure   **No. of credits-4**
Subject Code- BPT- 113T   **No. of Contact Hours/Week-4**
Internal+External-(20+80)

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
*Introduction relief and gravure printing image carriers *Study of classification and features of relief based image carrier * Study of development of relief based image carrier fin letter press and flexographic image technologies* Conventional Relief Image Carrier * Study of construction, advantages, limitations   and raw material properties of founders movable type * Study of construction, advantages, limitations and raw material properties ofmetal stereo and electro type

duplicate plate* 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

*Photographic Relief Image Carriers i.e. Plates * Study of construction, advantages, limitations and raw material's physical, chemical Andsensitometric properties of photopolymer plate. Study of classification, applications of photopolymer and nylo plate. * Photographic positive and negatives and their ideal optical and physical requirements for different plate making techniques. * Detailed study of the stages, troubles and remedies involved in different types

Of photopolymer, liquid photopolymer and nylo plate. * Introduction to computer-to-plate technology, its advantages, types. Sensitometry, light sensitive chemistry used, laser engine, printing resolution selected forflexographic CTP systems. Introduction to heat sensitive flexographic CTP systems

Unit-3

* Block Making Process * Study of characteristics and construction of block. Study of requirements of metals used as a surface in block making. Study of photographic requirements of blocktype image carrier. * Study of properties of, different processing chemicals and light sensitive chemistry used in block making. * Study of different stages, troubles and remedies involved in different block making process. Study of different finishing operations performed on block suchas routing, beveling and mounting.

Unit-4

* Gravure Printing Cylinder * Study of characteristics and construction of gravure printing cylinder. Study ofrequired properties of surface metals such as copper, nickel used in gravure

printing cylinder making. *Study of purpose, working and construction of electroplating bath.

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

Unit-5

*Electronic Engraving of Gravure Printing Cylinder * Study of working principle and construction of electronic engraving unit. *Study of cell type, cell wall, depth-to-opening ratio, cell angle, engravingresolution, calculation of total engraving time. * Study of different types and calculation of volume formula of engraved cell geometries such as inverted pyramidal, quadrangular, channeled, hexagonal, etc. * Study of printing quality of electronically engraved gravure printing cylinder in termsof resolution, color density, etc. Study of troubles and remedies involved in an electronic engraving of gravure printing cylinder. *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. * 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.

Subject Name-Image Carrier Relief and Gravure　　　　**No. of credits-2**
Subject Code- BPT 113P　　　　　　　　　　　　　　**No. of Contact Hours/Week-4**
Internal+External-(10+40)

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.

- **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 VidhyarthiGriha	S.V.Agashe
07	Gravure Primer	GATF, USA	

Subject Name- Press Work Relief and Gravure   **No. of credits-4**
Subject Code- BPT-114T   **No. of Contact Hours/Week-4**
Internal+External-(20+80)

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

Platen and Flat Bed Cylinder Machines. 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. * Study of working principle, construction, types, application areas, advantagesand limitations of flat bed cylinder machines using relief principle. Study of troubles and remedies related to impression and printing on flat bed cylinder machine * 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

Flexographic Printing Technology. Study of application areas and advantages of flexography. Construction, design considerations of general flexographic printing machine * 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. * 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 ananilox roll. * 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. * 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

*Flexographic Printing Machine * Study of construction, applications and limitations of an in line flexographic printing machine* Study of construction, applications and limitations of stack flexographic printing machine. * Study of construction, applications and limitations of common impression flexographic printing machine *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.* Study of working principle, design, advantages and limitations of different color registration system used on flexographic printing machine.

Unit-4

*Gravure Printing Technology. * Study of features, application areas and advantages of gravure printing. Construction, design considerations of general gravure printing machine.* 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. * Construction, types, working principle, and general specifications of gravureimpression cylinder its types, required physical properties. Study of troublesand remedies related to impression cylinder * Study of working principle, design, *advantages and limitations of different color registration system used on gravure printing machine * Graphic Design Considerations for various printed jobs such as newspaper,magazine, leaflet, folder, letterhead, visiting card, and envelopes etc.

Unit-5
* Inks for Gravure and Flexographic Printing. * Characteristics, required properties, technical specifications and their ideal values, classification or types of inks used for flexographic and gravure printing technology. * Different ingredients and their function of inks used for flexographic and gravure printing from the end use requirements such as rub resistance, lightfast ness, drying, blocking resistances etc. * Study of types, construction, working principle, advantages of different ink drying system. * Study of troubles and remedies associated with an inking and drying system of flexographic & gravure printing system. *Substrates for Flexographic and Gravure Printing- List of different types Substrates, classification, their physical properties and applications * Different types of surface treatments required for certain non absorbent substrates * Quality Control in Flexographic and Gravure Printing.*Study printing resolution, color strength of flexographic and gravure printing with respect to other printing technologies. * Use of gray scale, color control patch, slur and star target, densitometer in assuring color reproduction.

Subject Name- Press Work Relief and Gravure　　　　**No. of credits-2**
Subject Code- BPT- 114P　　　　　　　　　　　　　**No. of Contact Hours/Week-4**
Internal+External-(10+40)

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 VidhyarthiGriha	S.V. Agashe
07	Gravure Primer	GATF, USA	

Subject Name-Press Work Plano Sheet fed   **No. of credits-4**
Subject Code- BPT-115T   **No. of Contact Hours/Week-4**
Internal+External-(20+80)

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
Sheet Fed Lithographic Machine Introduction to different units along with functions used on sheet fed lithographic machines *Sheet Handling Systems * Study of constriction, working principle and types of feeder mechanism used insheet control on sheet fed press. Study of troublesassociated with feeder mechanism and remedies * Study of constriction, working principle and types of sheet transfer mechanism usedin sheet control on sheet fed press. Study of troubles associated with sheet transfer mechanism and remedies *Study of different types of designs and working principles of grippers used in sheetfed press. Study of troubles associated with grippers and remedies. * Study of perfect printing on sheet fed press and mechanisms used for perfect printing. * 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
*Printing Unit. * Study of construction and design goals of plate cylinder used in sheet fed press. Introduction to different parts of plate cylinder and their function.* Study of different types of gears used in sheet fed press and their characteristics. Study of troubles associated with gears used and remedies. * Study of construction and design goals of blanket cylinder used in sheet fed Press. Introduction to different parts of blanket cylinder and their function * 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 * Study of troubles associated with blanket materials and various measurements and tests done to ensure quality of blanket material. Introduction to ideal storage conditions.* Study of construction and design goals of

impression cylinder used in sheet fed press. Introduction to different parts of impression cylinder and their function.

Unit-3

*Cylinder Setting * Study of bearer-to-bearer contact and bearer-to-bearer clearance press *Checking the parallelism of the blanket & impression cylinders. Troubles associatedwith cylinder parallelism and remedies.*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 *Study and working of different types of dampening system used in sheet fed press and their merits. * Study of various ingredients of dampening solution. Chemistry of dampening solution. Relationship of pH & conductivity. Dampening solution properties related to alcohol & alcohol substitutes *Quality control associated with dampening system. Quality & characteristics of water used in dampening system.

Unit-4

* Inking System *Study and working principle of different inking systems used on sheet fed machine. * 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. * 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

* Sheet transfer and delivery.* Study of components of delivery system. Working of delivery grippers. Study and working of skeleton wheel and transfer drum. * Auxiliary equipments& devices such as anti set-off device, different types of driers * 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. * Ink- Mottling, dot gain, set–off, hickeys, ghosting, chalking, emulsification, piling, tinting, trapping, plate-blinding, scum Dampening – scum, streak, white spots etc *Paper-Characteristics and Ink –Characteristics for Sheet/web- fed, drying* properties Sheet/web - fed, handling and conditioning, storage. * Use of Quality control devices-Printing of dot gain slur gauge, star target, test forme. Advancements inSheet-fed machines

Subject Name-:Press Work Plano Sheet fed   **No. of credits-2**
Subject Code- BPT- 115P   **No. of Contact Hours/Week-4**
Internal+External-(10+40)

 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

Dr. BabasahebAmbedkarMarathwada University, Aurangabad

Department of Printing Technology & Graphic Arts

Syllabus of Fourth Semester

New Revised Syllabus Implemented from June 2016

-Bachelor of Printing Technology & Graphic Arts (BPT&GA)-

COURSE STRUCTURE
Bachelor of Printing Technology & Graphic Arts – 4th semester

Sr. No.	Subject Code	Subject Name	No. of Credits		No. of Hours/ Week	Total Marks (External)	Total Marks (Internal)
			L	P			
1.	BPT-116T	*(Foundation Course)* Press work web	4	-	4	80	20
2.	BPT-116P		-	2	4	40	10
3.	BPT -117T	*(Foundation Course)* Press Management	4	-	4	80	20
4.	BPT -117P			2	4	40	10
5.	BPT -118T	*(Core Course)* Costing and Estimating	4	-	4	80	20
6.	BPT -118P			2	4	40	10
7.	BPT -119T	*(Core Course)* Electronic Color Separation and Correction	4	-	4	80	20
8.	BPT -119P			2	4	40	10
9.	BPT -120T	*(Core Course)* Packaging Technology	4	-	4	80	20
10.	BPT -120P			2	4	40	10
		Total= 30 Credits					

1. **L** for Theory Lecture
2. **P** for Practical

Subject Name-Press Work Web No. of credits-4
Subject Code- BPT-116T No. of Contact Hours/Week-4
Internal+External-(20+80)

Rationale: Web machine operation is required to be learnt in order to understand efficient working procedures. There is plenty of scope for skillful personnel in this branch of printing. This course imparts extensive knowledge about all the elements of web machines used in all the printing processes such as offset, flexography, gravure, as well as quality control procedures & auxiliary operations.

Unit-1
*Introduction Theory * Construction& Design – Common impression cylinder (Satellite),* Blanket to blanket, Inline, Stack, I, Y, H, N configurations, paper path and color combinations, S wrap* Comparison with sheet fed machines *In feed Theory.- Reel stands- Single, Multiple, revolving; locations such asinline, perpendicular, basement; Expanding shaft, tilt lock, chuck systems *Automatic Splicers- Need and types * a. Zero speed- festoon* b. Flying splicer (match speed) * Web tension – Dancer roller & Dancer roller systems, Load-cell roller Mass free dancer sensing , In feed metering rollers;*Brakes – Core brakes, Straps, Reel motors, Running bands, tension meter, * Transducers, surface speed – unwind and rewind*Angle bar, Turner bar, Web guide rollers, web cleaning brushes, surface treatments, static charge elimination.

Unit-2
Need, operations and types-Open flame, High velocity hot air, Oven, radiation, combination. Chill rollers Theory-
Need, operations and types-Baffle plates, Jacketed (Embedded); Silicone application* Folders & related ancillary equipment's Theory.* Need, operations, maintenance, types, -Former & its types, Jaw, Chopper, Combination; cut-off and different products, collect cylinders, conveyor mechanisms, types of folds.

Unit-3
*Image and web control Theory.-*Box tilt, Compensators, Cut-off, Controlling fan out, mechanical and electrical color register, Web to web register, viscosity control – ink mixing (gravure and flexo). *Register control devices:Differential gears, Displacing units, Stroboscopes, Oscillating mirrors, Video viewers.

Unit-4
**Ancillary operations Theory *Slitting and trimming – Blades, slot type, rotary scissors, hard on hardslitters, perforators, sprocket punching. *Webre-conditioners, water-cooled ink oscillators, Blanket washers, Web break detectors, imprinters, side lay sensors, Cut-off control, anti staticdevices, re-moisturisers

Unit-5
* Trouble Shooting for Web Machines Theory *Paper troubles – Out of round rolls, telescopic rolls, picking or splitting,de-laminating, web-wrinkles, web-breaks. Delivery – sagging of web in folder, wrinkling on former, poor folding, smudging and scuffing in folder, set-off on chill rolls / folders, un-even drying, blistering, ink tacky after chill rolls. Print quality – mis-register in running direction, fan-out, printing lacks sharpness, side to side mis-register, ghost images in solids/half-tones.

Subject Name-Press Work Web   **No. of credits-2**
Subject Code- BPT- 116P   **No. of Contact Hours/Week-4**
Internal+External-(10+40)

No.	Practical
01.	Introduction to Web Press.
02.	Difference between sheet fed and web fed.
03.	Text form printing on two color machine.
04.	Web feeding study.
05.	Splicers and festoons on web
06.	Dampening system study with diagram.
07.	Inking systems on Web machine.
08.	Drying and chillers study.
09.	Printing on Web machine.
10.	Additional operations on web presses.
11.	Visit to Presses.
12.	Delivery unit of web press.
13.	Ink setting.
14.	Finishing operations on web machine.

Reference Books

No.	Title of Book	Author	Publisher's Name
01.	Web press operating	GATF	
02.	Web control	Durant	
03.	Handbook of Print media	Heidelberg	
04.	Solving Web-fed press troubles	GATF	

Subject Name- Press Management   **No. of credits-4**
Subject Code- BPT-117T   **No. of Contact Hours/Week-4**
Internal+External-(20+80)

Rationale: To enhance entrepreneurial qualities, knowledge of management of available resources in an economical manner is important. The methodical study of principles of scientific management, layout objectives, and structure of printing industry can inculcate a disciplinary approach among students in dealing with workers, as the student will be the front-end tool of management.
To develop one's own establishment, the student must understand the trade cycle, labor laws, and printers' laws, various schemes of the Central and State Government which provide assistance, and so on. These are all the necessary elements of the course.

Unit-1
*Management Theory.*Requirement and functions such as planning, organizing, directing, Co-coordinating,motivating and controlling.

Unit-2
*Structure of Organization *Functions of sales, marketing, production, and administration departments and their interdependency e.g. structure of printing industry.*Different forms of business organizations- single owner, partner, joint stock and co-operative.*Production, planning and control systems. Delegation and authority, e.g.Newspaper establishment.* Personnel Management Theory.* Workflow and role of personnel manager starting from selection tests to employee retirement* Productivity- Work-study, method study, time of job evaluation and incentives.*Safety in printing press.

Unit-3
*Material Management *Purchase- functions, methods, stock, level, and economic orderquantity
* Store-function of storekeeper, ABC analysis, inventory control.

Unit-4
*Printing Press Theory.*Factors affecting location of press.*Layouts.*Factors affecting production
* Trade cycle. *Demand and Supply.*Laws of demand, supply, diminishing utility, elasticity and equilibrium.*Legal Aspects *Industrial acts- factories act, workman's compensation act, employee's state insurance act, 'payment of wages' act. * Printer's act- copyright act, 'delivery of book' act, press council act and registration of newspaper , Trade unionism and leadership.

Unit-5
*Entrepreneur. * Qualities and functions * Starting small-scale industry and making project report. * Various means of obtaining finance. * Sales & marketing * Communication.-Business-letters, tenders, quotations, report against managementand report against worker. * Types of communication and communication in large scale printing organization

Subject Name : Press Management   **No. of credits-2**
Subject Code – BPT-167P   No. of Contact Hours/week-4
Internal+ External -(10+40)

No.	Practical
01	To study Structure of Organization • Introduction of Organization • Tree diagram of Organization
02	To study various departments of printing press • Pre-press • Press • Post-press
03	To study Management Theory
04	To study the factors that affect production
05	To prepare project report of small scale industry
06	Study Production, Planning & Control
07	Study Enterpreneurship Development

• **References Book**

No.	Author	Title	Publisher
1	L. Heath	Phototypesetting	Watson-GuptillPublications
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	NirmalaSadanPrakashan, New Delhi
9	B. D. Mendiratta	Composing and Typography	Printek Publications, New Delhi

Subject Name -Costing and Estimating   **No. of credits-4**
Subject Code- BPT-118 T   **No. of Contact Hours/Week-4**
Internal+External-(20+80)
Rationale: Costing and Estimating is an integral part of any Business. This course teaches a scientific approach towards costing of different printing elements. The student will understand how a precise value of a job can be determined, what factors should be considered while estimation, what is the upper limit on wastage, how indirect costs are to be allotted to different productive departments, etc.

Unit-1
* Theory.*Outline of British Printing Industries Federation system of costing. *Study of factors affecting profitability and pricing policy. Study of BudgetCenters- cost recovery and service * Study of comparison of actual and budget expenses. Study of forecast of life of assets. *Study of different types and their applications in accounting and costing. Study of Cost control system and cost reduction. *Study of hourly cost rate, machine cost rate and their applications in costing. Study of approaches of allocation of expenses. *Study of different type of cost fixed, variable, unit, their examples from graphic. Arts industry. *Study of time rate and work rate system and their applications in costing.
Unit-2
* Forms * Study of statement-summary-of expenses. Study of work Instruction Ticket. *Study of different types and applications of invoice. Study of cost sheet andIts applications in costing. * Requisition forms used in graphic arts industry. Study of different material Or consumable * Study of estimate form and delivery and sales report.
Unit-3
* Estimating. * Qualities and tools of estimator, standard press routine and its advantages * Estimation of paper-paper size (British & ISO), GSM, wastage allowance. Weight of web & sheets, calculation of no. of pages Ink consumption-SPANKS formula. Finding material calculation. *

Determination of rate for design, DTP, processing, binding and finishing plate Making and printing.
*Study of importance of sequence of various operations and time cycle required foreach operations.
Unit-4
* Legal Aspects * Liability, customer's property, terms, disputes about cost variation & delayed payments, taxes, variation in quantity, local organization & rules.
Unit-5
Study of technical specifications, tender, formats of tender documents, bid, quotation, octroi, VAT, excise, freight charges, penalty clause, TDS, etc.

Subject Name- Costing and Estimating　　　　　**No. of credits-2**
Subject Code- BPT- 118P　　　　　　　　　　**No. of Contact Hours/Week-4**
Internal+External-(10+40)

No	Practical
1	Study of different specifications of substrates such as paper, plastic, paper board, metal, used in various printing technologies.
2	Study of cost and units of cost, along with examples, for different types of substrates such as paper, plastic, paper board, metal, used in various printing technologies. Costing of such substrates for different volumes of jobs.
3	Study of different specifications of different image carrier materials such as emulsion, screen fabric, photopolymer plate, pre sensitized plate, gravure cylinders, and processing chemicals used in various printing technologies.
4	Study of cost and units of cost, along with examples, for different image carrier materials such as emulsion, screen fabric, photopolymer plate, pre sensitized plate, gravure cylinders, and processing chemicals used in various printing technologies
5	Study of different specifications of different adhesives, securing materials, binding cloth, rexine, leather, etc.
6	Study of cost and units of cost, along with examples, for different adhesives, securing materials, binding cloth, rexine, leather, etc.
7	Calculation of requirement of material and consequent costing for 1/8 size, 96/ 188 page text book to be printed by lithographic offset printing.
8	Calculation of requirement of material and consequent costing for A4 size 96 page magazine to be printed by lithographic offset printing.
9	Calculation of requirement of material and consequent costing for 12/16/24 page regular newspaper and tabloid to be printed by lithographic offset printing.
10	Verification of SPANKS ink consumption formula on lithographic offset, gravure and screen printing machine.
11	Calculation of requirement of material and consequent costing for sachet, pouches and labels to be printed by gravure and/or flexographic printing machines.
12	Calculation of requirement of material and consequent costing for A4 size 96 page magazine to be printed by different digital printing techniques.

References:

No.	Title of Book	Author	Publisher's Name
1	Costing & Estimating	B.D.Mendiratta	
2	Printer's Costing	Ruggles	India Academic or Printing Graphic Arts.

Subject Name- Electronic Color Separation and CorrectionNo. of credits-4
Subject Code- BPT-119T   **No. of Contact Hours/Week-4**
Internal+External-(20+80)

Rationale: This course provides an understanding of the basics related to color scanners, color imaging systems, digital camera, computer-to-plate, computer-to-print and digital proofing. Greater emphasis is laid to understanding the reproduction process utilizing scanners, operating systems, digital cameras & digital proofing.

Unit-1
*Basics of color reproduction. * Introduction to color theories. *Electronic Radiation. * Tristmulues method of color preparation on human – Rods & cones &wavelength – spectral energy. * Attribution of color – Hue, Color fullness, Brightness and Different color models * Study of Color separation, Screen angles, filters. *Color Correction – Reasons, Brief overview of optical methods. * Device dependent color, device independent colors *Study of different Color gamuts.
Unit-2
Introduction scanners Theory. Principal of working of Drum Scanner. Important components of scanners *Principal of Working of flat bed scanners & components of scanner. Factors affecting   scan quality. *(Correction) UCM (not UCM) Image Capture elements P.MT, CCD. Advantages & Disadvantages.*Different movement of scanners.
Unit-3
* Scanner programming objectives Theory.*Restrictions of photomechanical reproduction
 Substrate characteristics, ink characteristics, printing process, screen patterns, proportionality, and Additivity failure, image carrier induced distortion.*Problems in color Reproduction-Color chart.-Study of the concept of Duo tone, Hexachrome spot colors. - Study of AM, FM & Hybrid screening techniques *Input and output Theory *Input devices – Scanners, digital of file picture
* Output method – Drum scanner Image setter using LED. * Type of Image setters - Internal, external, capstan- Advantages & Disadvantages*Pixel Resolution Raster. *Postscript, P.D.L, PPD, RIP & PDF.
Unit-4
* Scanner operating * Evaluating originals-picture information* Selection of dpi with respect to enlargement, resolution, dpi, lpi.- Grey levels, Halftone dot formation by Dithering.*Copy reparation of scanning, cleaning the original, setting and registering the aids, mounting originals , oil mounting. *Imaging systems-technology and operation Theory *System capabilities, image assembly and retouching, tone and color adjustment * Technology a) Software-Application for page make up and image manipulation, specialized software- Imposition, trapping, work flow
* Imaging system operation-job description, classifying work, pre-planning and
work procedures. Copy Dot scanner
Unit-5
* Image recording and data storage Theory , TDS, etc. * Files, Determining file size, File format

* Data compression, transmission and film recording *Recording and storage-equipment and media used for data storage * Digital Workflow – overview * Color Scanning, Digital images color correction*D. T. P- Creating Graphics Logos. -Page make up – Text, Image & logos. - Integration Imposition – Saving as Postscript. - Out put - Servers - File Server – LAN environment. - Data Server – OPI, PDF, RIP - Spoolers - Workflow for output of files in network -Preflighting. * Color System & management - CIE – Spectral reflectance – Standard observer - Color stimuli. Tristimulus value XYZ, CIELAB, Metermerism ICC, ICC profile. * Color management System – Profile connection space PLS, Color matching Module (CMM) & their function -Device department workflow -Device independent workflow using PCS, CMM. * Color rendering intents (Gamut Compression)

Subject Name-Electronic Color Separation and CorrectionNo. of credits-2
Subject Code- BPT- 119P No. of Contact Hours/Week-4
Internal+External-(10+40)

No.	Practical
01	To study of Color Theories & Different Scanner.
02	Getting to know the Work Area.
03	Using the file browser
04	Working with Selections
05	Layer Basics
06	Basic Pen tool Techniques & Paths
07	Masks & Channels
08	Retouching & editing
09	Creating Special Effects
10	Basic photograph correction
11	Advanced layer Technique
12	Create Design
13	Different types of file
14	Preparing Images for Two color printing.
15	Adding Interactive slices & Rollovers
16	Demonstration of Katana Image Setter
17	Color Separation, Screen Angles & #
18	Four color Separation.

Reference Book

No	Title of Book	Author	Publisher's Name
01	Color Scanning & Imaging Systems	Gary S. Field	GATF
02	Graphic Reproduction Photography	J. W. Burden	Focal Press London.
03	Photo Mechanics & Printing	Gorden&Monsen	
04	Color & Its Reproduction	Gary Field	GATF
05	Manual For Photographic Reproduction	R E. Jacobson	

Subject Name- Packaging Technology No. of credits-4
Subject Code- BPT-120T No. of Contact Hours/Week-4

Internal+External-(20+80)

Rationale: Packaging is becoming one of the large segments of printing and related industry. This course intends to deal with additional knowledge of packaging requirements such as variety of substrates, finishing operations, conversion, etc.

Unit-1
* Introduction.*Definition of packaging and Package Criteria * Basic Requirement of good Packaging and Function of Package. Various Printing Processes used for Packaging *Rigid Packaging *Specialty Papers for Packaging its properties and applications- Tissue Paper,
Printing Paper, High Gloss Paper, Cover Paper, Waxed Paper, Water Proof Paper, Parchment Paper.*Boards-Types of Boards and Application, Properties of Boards. Corrugated Board-Material, Components of Corrugated Board, Types of Corrugated Boards * Carton: What is carton? The function of carton.Flow Chart of die cutting and punching, die making- unit die, jigged die. Application of cartons * Brief introduction of multi wall sacks. Material used for multi wall sacks andits application.

Unit-2
**Flexible Packaging* Advantages and limitations of plastic packaging.Various applications of plastic packaging * Plastic materials with their properties and applications Polyolefin, Aluminum Foil, Cellophane, PVC, Nylon, Polyester, Polystyrene, PVDC.* Plastic Woven Sacks- Introduction, method of making plastic woven sacks, material and application *Image Capture elements P.MT, CCD. Advantages & Disadvantages.*Different movement of scanners.

Unit-3
* Methods.*Working principle and construction of Blown film extrusion, Design consideration
of blown film extrusion, *Study of construction, working principle and general specification of
Co-extrusion methods.*Stretch blow molded bottles Properties and limitations of PET bottle.
*Closures and closure liner – Thermoplastic: Polyethylene, Polypropylene, Thermo*set: phenolic and urea. *Concept of blister packing, study of construction, working principle of machine used
in blister packaging, application of blister packaging. * Concept of shrink and stretch wrapping, advantages, application and comparison between shrink and stretch wrapping. Materials used and its properties.* Dry bond and wet bond adhesive lamination, working principle of lamination machines. *Working principle of aerosol packaging technology, pack contents, aerosol cans,
and methods of filling aerosol containers.

Unit-4
* Food Packaging *Dairy Products: effect of microorganism, temperature, light and oxygen, materials used and packaging techniques *Carbonated Soft Drinks packaging technique and consideration. *Coffee, Tea, Juices, Beverages packaging considerations. Snacks Food and Bakery Products basic deterioration and package materials.* Flesh Food concept and materials used. * Specialized packaging for food products Theory. *Concept of Aseptic processing and packaging, study and types aseptic fillingand packaging system, requirement of films for aseptic packaging. Concept of Bag in box and its applications. * Tetra pack, function of layer in pack, materials used and application.

Unit-5
* Metal container. *Tin plate cans, lacquer for metal plates, drums. * Aluminum foil propertied and applications, laminated tubes-introductionand manufacturing process.*Suggestion /Recommendation *Packaging and life cycle and Environmental aspects (pollution, aroma) * Recovery/recycling, waste disposal, "Bans and restriction"

Subject Name- Packaging Technology No. of credits-2
Subject Code BPT- 120P   No. of Contact Hours/Week-4
Internal+External-(10+40)

No	Practical
01	Prepare a carton design for given products.
02	Measurement of Vibration strength of package.
03	Measurement of Drop strength of package.
04	Measurement of Compression strength of a corrugated container.
05	Measurement of Water Vapor Transmission rate of shipping container.
06	Measurement of Water Resistance Test of shipping container.
07	Ply Separation Test of solid or corrugated fiberboard.
08	Measurement of Crush resistance of corrugated container.

References Book

No.	Title of Book	Author	Publisher's Name
01	Plastics in Flexible Packaging.	A. S. Athalye	Multi-Tech Publishing Co.
02	Package Printing	Nelson R. Eldred	Jelmar Publishing Co., Inc P O Box 488, Plainview, New York 11803
03	Package Printing	Robert P. Long	Graphic Magazines, Inc. Garden City, NY 11534, USA
04	The Wiley Encyclopedia of Packaging Technology	Aaron L. Brody, Kenneth S. Marsh	A Wiley-Interscience Publication
05	Modern Packaging Films	S.H. Pinner	London Butter Worths
06	Structures and Forms in Paper Board Package Design	HareshPathak	Super Book House
07	Packaging Design An Introduction	Laszlo Roth	Van Nostrand Reinhold New York
08	A Handbook for Printing And Packaging Technology	BishwanathChakravarty	Galgotia
09	Paper and Board in Packaging	J. H. Young	The Macmillan Company New York

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Department of Printing Technology & Graphic Arts

Fifth Semester Revised Syllabus effective from June 2011

-Bachelor of Printing Technology & Graphic Arts (BPT&GA)-

COURSE STRUCTURE
Bachelor of Printing Technology & Graphic Arts- 5th semester

Sr. No.	Subject Code	Subject Name	No. of Credits		No. of Hours/ Week	Total Marks (External)	Total Marks (Internal)
			L	P			
1.	BPT-121T	Digital Printing	4	-	4	80	20
2.	BPT-121P	Practical based on Digital Printing	-	2	4	40	10
3.	BPT-122T	Advanced Imaging Techniques	4	-	4	80	20
4.	BPT-122P	Practical based on Advanced Imaging Techniques	-	2	4	40	10
5.	BPT-123T	Newspaper Technology	4	-	4	80	20
6.	BPT-123P	Practical based on Newspaper Technology	-	2	4	40	10
7.	BPT-124T	Security Printing	4	-	4	80	20
8.	BPT-124P	Practical based on Security Printing	-	2	4	40	10
9.	BPT-125T	Final Seminar Presentation (Research work)	4	-	4	100	
10.	BPT-125P	Seminar Work Updates	-	2	4	50	
		Total= 30 Credits					

1. **L** for Theory Lecture
2. **P** for Practical
3. **T** for Term work

Subject Name-Digital Printing   **No. of credits-4**
Subject Code- BPT-121T   **No. of Contact Hours/Week-4**
Internal+External-(20+80)

Rationale: Operating different bulky and large printing, inking and other ancillary units   involving experienced manpower are bound to have certain limitations on costing of different jobs or services of the printing industry. Also, different raw material and intermediate processes, changeovers, are time consuming and perhaps less environment friendly. Digital Printing techniques at sans image carrier, ancillary units are replacing conventional imaging technologies at faster rate. Output quality of the digital printing technique promises saving in turnaround time, cost incurred on account of manpower required, and effective use of raw materials and last but not the least excellent quality of the product. These techniques also offer easiest ways of printing with benefits such as just in time printing, lowest waste and distribute and printing approach. Thus understanding the concepts of digital printing its scope in inevitable for sprints of career in printing technology.

Unit-1

1.0 Introduction to Digital Printing Technology
1.1 Definition, applications and advantages of digital printing technologies
1.2 Comparison of conventional and digital printing technologies used in graphic reproduction processes. Introduction to application areas of digital printing technology in graphic arts industry such as computer-to-film, computer-to-plate, computer-to-press, computer-to-print and digital proofing

Unit-2

2.0 Toner Based Digital Printing System
2.1 Study of working principle, types and examples of selenium material, organic photo conductors, charge generation materials and charge transport materials.
2.2 Study of working principle, types, requirements and examples of developing medium i.e. liquid and dry toner used in electro photographic digital printing system.
2.3 Study of working principles of applications of toner based digital printing system mono and color digital photocopying systems.
2.4 Study of characteristics and applications of ion deposition, electrostatic and magneto graphic toner based digital printing system.
2.5 Study of required properties of substrates used in electro photographic digital printing system. Study of trouble and remedies related to use of such substrates.

Unit-3

3.0 Non Toner Based digital printing system
3.1 Study of working principle, types and applications of an ink jet and thermal transfer digital printing systems.
3.2Study of required properties of substrates used in ink jet and thermal transfer digital printing system. Study of trouble and remedies related to use of such substrates.
3.3 Large Format Printing
    - List of digital printing technologies used in a large i.e. wide format digital printing. Construction of general wide format printer and its technical specifications.
    -Study of application areas and list of substrates used in large format digital printing systems.

Unit-4

4.0 Study of Digital Proofing Systems

4.1 Study of different types, need, advantages and color gamut requirement of digital proofing system.

4.2 List of different digital printing technologies used in digital color proofing systems.

Unit-5

5.0 Hardware and Software used in Digital Printing

5.1 Study of functions, types and comparison of different types of Raster Image Processor (RIP).

5.2 Study of general technical specification such as memory, processor, etc., as required for different hardware and output device. Study of factor affecting output resolution in different digital printing device. Calculation of output resolution in different digital printing devices. Definition, working, advantages and limitation of Hi-Fi color gamut and hexa chrome printing process.

Subject Name-Digital Printing   **No. of credits-2**
Subject Code- BPT-121P   **No. of Contact Hours/Week-4**
Internal+External-(10+40)

No	Practical
01	Create a Letterhead using Corel Draw software &Submit a copy.
02	Create an Envelope design using Corel Draw software & Submit a copy.
03	Create an Identity card design using Corel Draw software & Submit a copy.
04	Create a Leaflet design using Corel Draw software & Submit a copy.
05	Create a Brochure design Using Corel Draw software & submit a copy.
06	Create Visiting Card using Corel Draw using Corel Draw & submit a copy.
07	Create a Paper Advertisement using Photoshop CS2 software & Submit a copy.
08	Create a Leaflet using Photoshop CS2 software & Submit a copy.
09	Create a Visiting Card using Photoshop CS2 software & Submit a copy.
10	Create a Letterhead using Photoshop CS2 software & Submit a copy.

Reference Books

No	Author	Title	Publication
1	Hugh Speirs	Introduction to Prepress	BPIF Publishing
2	Bob Thompson	Printing Materials: Science and Technology	PIRA International
3		Handbook of Imaging Materials	
4	Helmut Kipphan	Handbook of Print Media: Technologies and Production methods.	Heidelberg and Springer
5	Kennard Cloud	Electronic Imaging Applications in Graphic Arts	Proceedings
6	Joe Farace	Digital Imaging	Focal Press Ltd. London

Subject Name- Advanced Imaging Techniques   No. of credits-4
Subject Code- BPT-122T   No. of Contact Hours/Week-4
Internal+External-(20+80)

 Rationale: Pre-Press activities such as operating reproduction photography camera, printing down frame, off-line chemical processing of exposed film and plate required more manpower. Number of raw material and are time consuming and perhaps less environment friendly. Digital Imaging techniques at sans camera, printing down frame and even film are replacing conventional imaging technologies at faster rate. Output quality rendered by any of the digital imaging technique promises saving in turnaround time, cost incurred on account of manpower required, and effective use of raw materials. These techniques also offer easiest ways of storing original, positives and negatives in digital form and unmatched digital quality. Thus understanding the concepts of digital imaging its scope in inevitable for sprints of career in printing technology.

Unit-1

1.0 Overview Of Conventional Imaging Techniques And Digital Imaging
1.1 Study of page make up, photographic characteristics of image carriers of
different printing processes.
1.2 Definition, applications and factors that accelerated the development of Digital
Imaging in graphic prepress technologies.
1.3 Comparison of conventional film, plate making and digital imaging approaches used
in graphic reproduction. Advantages of Digital Imaging prepress techniques
i.e. computer-to-film and computer-to plate

Unit-2

2.0 Requirements For An Ideal Digital Imaging System.
2.1 Energy i.e. photo speed requirements of different light sensitive chemistries in
use. Comparison of direct and indirect methods of plate making.
2.2 Requirements for computer-to-plate and computer-to-film devices. Study of
required properties of illuminants used in computer-to--plate and computer-to
     -film devices
2.3 Different types of Digital Imaging systems. Classification of computer-to-plate
and computer-to-film systems as light and non-light sensitive.
2.4 Silver Halide Based Light Sensitive Digital Imaging Systems.
2.5 Study of working principle, spectral sensitivity, stages involved in different silver
halide based computer-to-plate &computer-to-film systems.
2.6 Study of advantages, applications and limitations of silver halide based
computer-to-plate and computer-to-film systems.

Unit-3

3.0 Electro Photography Based Light Sensitive Digital Imaging Systems.
3.1 Study of working principle, spectral sensitivity, stages involved in different
electro photography based computer-to-plate &computer-to-film systems.
3.2 Study of advantages, applications and limitations of electro photography
based computer-to-plate and computer-to-film systems.

Unit-4

4.0 Organic Photopolymer Light Sensitive Digital Imaging Systems
4.1 Study of working principle, spectral sensitivity, stages involved in organic
photopolymer based computer-to-plate systems.
4.2 Study of advantages, applications and limitations of organic photopolymer
based computer-to-plate and computer-to-film systems.

Unit-5

5.0 Non Light Sensitive Or Heat Based Digital Imaging Systems
5.1 Study of working principle and characteristics of imaging with the help of thermal
cross-linking mechanism and comparative sensitivities of optical i.e. light sensitive
and cross-linked plates.
5.2 General comparison of light and non-light sensitive Digital Imaging systems used
in graphic prepress industry.
5.3 Digital Thermal Imaging Systems.
5.4 Study of working principle, stages involved in different laser ablation i.e. heat
based computer-to-plate making systems.

Subject Name-Advanced Imaging Techniques　　　　**No. of credits-2**
Subject Code- BPT-122P　　　　　　　　　　**No. of Contact Hours/Week-4**
Internal+External-(10+40)

No	Practical
01	Comparison of different light sensitive computer-to-film technologies on the basis of spectral sensitivity, photo speed, output resolution, recording light source, etc.
02	Study of construction of an image setter and listing its mechanical and optical elements and technical specifications.
03	Demonstration of replenishment of chemicals on an image setter.
04	Study of recording light source used in an image setter.
05	Study of RIP software and hardware used in an image setter.
06	Study of routine and preventive maintenance methods of an image setter.
07	Comparison of different light sensitive computer-to-plate technologies on the basis of spectral sensitivity, photo speed, output resolution, recording light source, etc.
08	Study of construction of an image setter and listing its mechanical and optical elements and technical specifications.
09	Demonstration of replenishment of chemicals on plate setter.
10	Study of recording light source used in plate setter.
11	Study of RIP software and hardware used in plate setter.
12	Study of routine and preventive maintenance methods of an image setter.

- **References Book**

No	Author	Title	Publication
1	Hugh Speirs	Introduction to Prepress	BPIF Publishing
2	Bob Thompson	Printing Materials: Science and Technology	PIRA International
3		Handbook of Imaging Materials	
4	Helmut Kipphan	Handbook of Print Media: Technologies and Production methods.	Heidelberg and Springer
5	Kennard Cloud	Electronic Imaging Applications in Graphic Arts	Proceedings
6	Joe Farace	Digital Imaging	Focal Press Ltd. London

Subject Name - Newspaper Technology   **No. of credits-4**
Subject Code-BPT-123T   **No. of Contact Hours/Week-4**
Internal+External-(20+80)

Rationale: Detailed study of newspaper and its technology.

Unit-1

1.0-Newspaper organization
    -various depts
    -workflow of newspaper
    -newspaper design

Unit-2

2.0**.** Telecommunication systems in Newspaper, remote printing processes.

Unit-3

3.0 Newspaper materials
3.1 Different grades of newspaper, inks & their properties.

Unit-4

4.0 Newspaper production, pre-press CTP in newspaper, presses used for
newspaper production. Drive concepts for newspaper presses, mailroom systems

Unit-5

5.0 Automatic workflow systems studying PPI media technologies etc.
5.1 Waster management in Newspaper Industry.

Subject Name-NewspaperTechnology　　　　　　**No. of credits-2**
Subject Code- BPT-123P　　　　　　　　　**No. of Contact Hours/Week-4**
Internal+External-(10+40)

No	Practical
01	Introduction to type of Web Presses as per the configuration & end products.
02	Study of various units & their setting.
03	Study of pre-make ready & make ready operations.
04	Printing single &multi color jobs.
05	Introduction to Digital presses & their working.
06	Folders used for web offset printing
07	Inking System for web offset printing
08	Dampening System for web offset printing

References:

No.	Title of Book	Author	Publisher's Name
1	Newspaper Organization	Rucker & Williams	Iowa state university press, U.S.A.
2	Typography & Design for Newspaper special	Rolf F. Rehe	IFRA publication.

Subject Name- Security Printing　　　　　　**No. of credits-4**
Subject Code- BPT-124T　　　　　　　　　**No. of Contact Hours/Week-4**
Internal+External-(20+80)

Rationale: Detailed study of security printing and its technology.

Unit-1

1.0 Introduction to security printing.
1.1 Optical document security.

Unit-2

2.0Design of security documents
2.1 Inks used in security printing.

Unit-3

3.0 Smart cards, club cards, credit / debit cards, RFID technology

Unit-4

4.0 MICR / OCR / cheque printing technology
4.1 Counterfelt+ foreign prevention
4.2 Cheque fraud prevention

Unit-5

5.0 Substrates, Inks, Watermarks,
5.1 Testing, Deterrant measures
5.2 Hologram, Kinegram, invisible document security, brand protection.

Subject Name- Security Printing	**No. of credits-2**
Subject Code- BPT-124P	**No. of Contact Hours/Week-4**
Internal+External-(10+40)	

Term work for 50 marks

No	Practical
01	**CURRENCY PRINTING** :- Creation & Graphics, Making of a bank note, Applications of Computers in Designing Currency, Signatures & numbering, Manufacture of Bank notes, Paper Specifications, Watermark & Other Protective devices, Digital Watermark Currency, Circulation & Bank maintenance, special issues counterfeiting.
02	**CHEQUE PRINTING, NUMBERING AND BAR CODING :-** Introduction, Pre-Encoding and Post Encoding, Printing Tolerances, Testing equipment, E13B Characters, RBI Specifications, Principles of Cheque Design. Numbering with MICR Ink on Rotary presses, Trouble Shooting, Modulus Systems, Weighted & Unweighted. Introduction, Principles of Bar Coding, Types of Coding, EAN 13 Code, Code 39 ACA etc., Typical Bar Code Machines & Print wheels, Scanners and their functions.
03	**COMPUTER FORMS :-** Paper Characteristics, Form Construction & Specification, Form Label Combination Intelligent Electronic forms, Form automation, Form Manufacture & Printing.
04	**HOLOGRAMS, CREDIT CARDS & PASSPORTS :-** Introduction, Manufacturing Process, Holographic Recording & Master Origination, Finishing Process, Types of Holograms, Security holograms, clickograms, sterogram, Anigram etc. Introduction, Materials used of specifications, Embossing, Magnetic Strip Recording and Specifications, Manufacturing techniques.
05	**SECURITY INKS & SUBSTRATES** Introduction, UV curing, photochromic inks, Monochromic Inks, Invisible Phosphorescent inks, Water resistant inks. Thermo chromic inks, Solvent Sensitive inks, optically variable ink, Magnetic inks, Biometric ink, Fugitive ink, Secondary fluorescing ink, Watermarks, Security Fibers, Planchettes, Fluorescent Hilites, Iridescent coating, Security threads, Holographic foil, Colouredcentre paper.

Reference Book

No	Title of Book	Author	Publisher's Name
01	Optical Document security.	Rudolf von Renessa	
02	MICR cheques + other documents	Kant Dabholkar	
03	Ciuide to Protectivity& Authenticating products and documents		
04	Anti counterfeitiy technology guide.		

Subject Name- Final Seminar Presentation (Research work)   **No. of credits-4**
Subject Code- BPT-125T   **No. of Contact Hours/Week-2**
Total=100 marks

Rationale: Project work is regarded as the culmination of the learnt practical and theoretical content of any specialized technical area. Student undergoing the project having adequate theoretical knowledge can apply various technical concepts and fundamentals to create engineer or present a new mechanism or rectify it technically. While doing or applying technical concepts towards completion of project work the student can rely-to some extent-upon the experience of professional practices such as industrial visits and training, seminar presentation and information search, etc. The successful execution of project work on the contemporary topics helps students reinforce, hone and sharpen their technical skill and ultimately building up and exhibiting their attitude towards the technology they will be in.

Subject Name-Seminar Work Updates   **No. of credits-2**
Subject Code-BPT-125P   **No. of Contact Hours/Week-4**
Internal+External-50

-Students will meet and interact with Seminar Guide twice in a week.

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad

Department of Printing Technology & Graphic Arts

Six Semester Revised Syllabus effective from June 2011

-Bachelor of Printing Technology & Graphic Arts (BPT&GA)-

COURSE STRUCTURE
Bachelor of Printing Technology & Graphic Arts- 6th semester
Total Credits- 30

Sr. No.	Subject Code	Subject Name	Credits	Total Marks
1.	BPT-126	Industrial Internship Dissertation	20	500
2.	BPT-127	Industrial Internship Updates	10	250

BPT-126   Industrial Internship Dissertation   Credits=20

Final Presentation in PowerPoint by the student will be evaluated. Student has to submit dissertation report in two Hardbound copies and a soft copy in CD to department before the examination.

BPT-127   Industrial Internship Updates   Credits=10

The student has to submit the Internship Report to department before the final dissertation examination. This includes the description of the machines or instruments the student worked on, the readings and observations on the printing technology/process he worked with. Industrial

Internship report is total of all weekly reports of the student. The student has to submit one report a week, likewise till the end of the internship, finally a compilation of all weekly reports named as Industrial Internship Report. Student has to submit Industrial Internship Report in two Hardbound copies and a soft copy in CD to department before the examination.