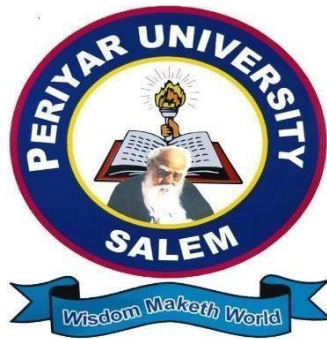


**PERIYAR UNIVERSITY
PERIYAR PALKALAI NAGAR
SALEM - 636 011**



**DEGREE OF BACHELOR OF ARTS
IN
DIGITAL PRINT MEDIA CHOICE
BASED CREDIT SYSTEM**

**SYLLABUS FOR B.A JOURNALISM AND MASS
COMMUNICATION (DIGITAL PRINT MEDIA)**

**FOR THE STUDENTS ADMITTED FROM THE
ACADEMIC YEAR 2021 - 2022 ONWARDS**

**B.A JOURNALISM AND MASS COMMUNICATION
(DIGITAL PRINT MEDIA)**

Program Outcome

1. Provides job as a professional Graphics Designer.
2. Helps students to be self-employed in printing and media field.
3. Create idea to the students regarding their higher studies in the field of Journalism and Mass communication.
4. Basic drawing and visual concepts are made known to the students.
5. Focus on obtaining management related jobs to our students.
6. Both software and hardware skills are made well-known to our students.
7. Different types of printing techniques from traditional to modern methods are thought to the students.
8. Knowledge regarding Quality maintenance, press management, machinery maintenance are made known to the students.
9. Post-Press techniques such as binding, packaging finishing operations are thought to the students.

REGULATIONS

1. ELIGIBILITY FOR ADMISSION

A pass in Higher Secondary Examination or an Examination accepted as equivalent thereto by the syndicate (**10+2 or 10+3 year Diploma**), subject to such conditions as may be prescribed thereto are permitted to appear and qualify for the **Bachelor of Science DIGITAL PRINT MEDIA Degree Examination** of this university after a course of study of three academic years.

2. DURATION OF THE COURSE

The course shall extend over a period of three years comprising of six semesters with two semesters in one academic year. There shall not be less than 90 working days for each semester. Examination shall be conducted at the end of every semester for the respective subjects.

3. COURSE OF STUDY

The course of study shall comprise instruction in the following subjects according to the syllabus and books prescribed from time to time. The syllabus for various subjects shall be clearly demarcated into five viable units in each paper/subject. Part -I, Part-II, Part – III and Part – IV subjects are as prescribed in the scheme of examination.

4. EXAMINATIONS

The theory examination shall be three hours duration to each paper at the end of each semester. The candidate failing in any subject(s) will be permitted to appear for each failed subject(s) in the subsequent examination. The practical examinations for UG course should be conducted at the end of the even semester.

4.(a) Submission of record note books for practical examinations

Candidates appearing for practical examinations should submit bonafide Record Notebooks' prescribed for practical examinations, otherwise the candidates will not be permitted to appear for the practical examinations. However, in genuine cases where the students, who could not submit the record note books, they may be permitted to appear for the practical examinations, provided the concerned Head of the department from the institution of the candidate certified that the candidate has performed the experiments prescribed for the course. For such candidates who do not submit Record Books, zero (0) marks will be awarded for record note books.

5. Revision of Regulations and Curriculum

The University may revise /amend/ change the Regulations and Scheme of Examinations, if found necessary.

6. (a). Passing Minimum – Theory

The candidate shall be declared to have passed the examination if the candidate secure not less than 40 marks out of 100 (**CIA – 10 marks out of 25 and EA – 30 marks out of 75**) in the University examination in each theory paper.

6. (b). Passing Minimum – Practical

The candidate shall be declared to have passed the examination if the candidate secure not less than 40 marks put together out of 100 (**CIA – 16 marks out of 40 and EA –24 marks out of 60**) in the University examination in each practical paper.

7. Question Paper Pattern for B.Sc. Visual Communication Course

7.1(a). THEORY - Question Paper Pattern [EA] (Total Marks: 75)

PART – A (15 x 1 = 15 Marks)

(Answer ALL questions), (Objective Type - Three questions from each unit)

PART – B (2 x 5 = 10 Marks)

(Answer ANY TWO questions) & (One question from each unit with 2 out of 5 questions))

PART – C (5 x 10 = 50 Marks)

(Answer FIVE questions) & (Either or Pattern i.e. Internal Choice)

7.1(b). THEORY - Internal Marks Distribution [CIA] (Total Marks: 25)

- ❖ Attendance :5 Marks
- ❖ Assignment :5 Marks
- ❖ Internal Examinations :15 Marks

7.2(a). PRACTICAL – Marks Distribution & Question paper Pattern (Max. Marks: 100)

[External [EA]: 60 Marks & Internal [CIA]: 40 Marks]

8. Commencement of this Regulation

These regulations shall take effect from the academic year 2020 - 2021, i.e. for students who are to be admitted to the first year of the course during the academic year 2020 – 2021 and thereafter.

PERIYAR UNIVERSITY

REGULATIONS FOR B.A JOURNALISM AND MASS COMMUNICATION (DIGITAL PRINT MEDIA)

DEGREE COURSE with Semester System
(Effective from the academic year 2021-2022)

SCHEME OF EXAMINATIONS

(The scheme of examinations under CBCS (Choice Based credit System) for different semesters shall be as follows)

FIRSTYEAR									
SEM	SUBJECT CODE	SUBJECTS	TOTAL	HOURS	CREDITS	CIA	EA	TOTAL MARKS	
			L	T/P					
I	19UFTA01	TAMIL-I	6	T	4	25	75	100	
	19UFEN01	ENGLISH-I-Communicative English	6	T	4	25	75	100	
	20UDP01	CORE-I: Fundamentals of Communication	6	T	4	25	75	100	
	20UDP02	CORE-II: Concept in Visualisation (Drawing)	5	T	4	25	75	100	
	20UDPA01	ALLIEDI-Introduction to Social Psychology	5	T	3	25	75	100	
	19UVE01	Value Education-Yoga	2	T	-	25	75	100	
		Add-On Course -Professional English	3	1	4	25	75	100	
			33		23			700	
II	19UFTA02	TAMIL-II	6	T	4	25	75	100	
	19UFEN02	ENGLISH-II-Communicative English	6	T	4	25	75	100	
	Naan Mudhalvan Skill Course-	Language Proficiency for Employability-Effective English	2	T	2	25	75	100	
	20UDP03	CORE-III: Introduction to Printing Techniques	6	T	4	25	75	100	
	20UDPA02	ALLIEDII-Indian Constitution & Laws for Printing Technology	5	T	3	25	75	100	
	20UDPP01	COREPRACTICALI-Concept in Visualisation	5	P	4	40	60	100	
	19UES01	Value Education-Human Rights	2	T	-	25	75	100	
			Add-On Course-Professional English	3	1	4	25	75	100
				35		25			700
		First Internship Training in any Media/Production House in 30 days/4 weeks [to be undertaken during Summer holidays]	Internship report to be evaluated in 4 th Semester						

SECONDYEAR

SEM	SUBJECT CODE	SUBJECTS	TOTAL	HOURS	CREDI TS	CIA	EA	TOTAL MARKS
III	19UFTA03	TAMIL–III	6	T/P	4	25	75	100
	17UFEN03	ENGLISH–III	6	T	4	25	75	100
	20UDP04	COREIV–Industrial Printing Materials	6	T	4	25	75	100
	20UDPA03	ALLIEDIII–Designing &Planning	5	T	3	25	75	100
	20UDPSB01	SBECI–Photography	5	T	3	25	75	100
	20UDPN01	NMECI–Social Media Management& Marketing	2	T	2	25	75	100
	NMSDC	Digital Skills for Employability- Microsoft office Essentials	2	T	2	25	75	100
			32		22			
IV	17UFTA04	TAMIL–IV	5	T	3	25	75	100
	17UFEN04	ENGLISH–IV	5	T	3	25	75	100
	20UDP05	COREV–Writing for Digital Media	5	T	4	25	75	100
	20UDPP02	COREPRACTICALII–Digital Image Editing	5	P	4	40	60	100
	20UDPP03	COREPRACTICALIII–Page Layout &Design	4	P	4	40	60	100
	NMSDC	SBEC-Digital Skills for Employability- Office Fundamentals	2	T	3	25	75	100
	20UDPN02	NMECII–Mobile App Development	2	T	2	25	75	100
	20UDPI01	First Internship Report Evaluation And Viva	0	P	4	40	60	100
				28		27		
		Second Internship Training in any Media/Production House in 30 days/ 4 weeks [to be undertaken during summer holidays]	Internship report to be evaluated in 6 Semester					

THIRDYEAR

SEM	SUBJECT CODE	SUBJECTS	TOTAL	HOURS	CREDITS	CIA	EA	TOTAL MARKS
V	20UDP06	COREVI–Total Quality Maintenance for Printing	5	T	4	25	75	100
	20UDP07	COREVII–Offset Printing Technology	5	T	4	25	75	100
	20UDP08	COREVIII–Image Processing	5	T	4	25	75	100
	20UDP09	COREIX–Printing Machinery Maintenance	5	T	4	25	75	100
	20UDPE01	Elective–Printing Press Management	5	T	4	25	75	100
	20UDPSB03	SBECIII–Advanced Printing Techniques	5	T	3	25	75	100
	NMSDC	Marketing and Design Tools-Adobe Visual Design	2	T	2	25	75	100
			32		25			
VI	20UDP10	COREX–Digital Printing	6	T	4	25	75	100
	20UDP11	COREX11–PrintFinishing Operations	6	T	4	25	75	100
	20UDPP04	COREPRACTICALIV–Binding& Finishing	5	P	4	40	60	100
	20UDPP05	COREPRACTICALV–Image Processing	5	P	4	40	60	100
	20UDPSB04	SBECIV–E-Marketing	4	T	3	25	75	100
	20UDPP06	COREPRACTICALVI–Digital Print Production Practical	4	P	4	40	60	100
	20UDPR1	Project	0	P	5	40	60	100
	20UDPI02	Internship II-Second Internship Report Evaluation and Viva	0	P	4	40	60	100
	Add on course	NMSDC-Employability Readiness-	-	-	-	-	-	-
				30		32		
TOTALCREDITS&MARKS					154			

PERIYAR UNIVERSITY
REGULATIONS FOR B.A JOURNALISM AND MASS
COMMUNICATION (DIGITAL PRINT MEDIA)
DEGREE COURSE with Semester System
(Effective from the academic year 2021-2022)

SCHEME OF EXAMINATIONS

(The scheme of examinations under CBCS (Choice Based credit System) for different semesters shall be as follows)

FIRST YEAR

PAPER CODE: 20UDP01	SEMESTER I	CORE I & CREDIT : 4
SUBJECT NAME : FUNDAMENTALS OF COMMUNICATION		

Goal: To enable students to learn principles, concepts and media of communication

Objective: On successful completion of this course, the students should have understood the nature and types of communication, Principles of communication, Media's of communication and the models of communication.

Course outcome:

C01	Students would be able to introduce themselves to the theories of Communication.
C02	Students would be able to inculcate the knowledge of Communication models.
C03	Students would be able to develop the knowledge of basic elements of Communication.
C04	Students would be able to acquaint themselves with the various types of Communication.
C05	Students would be able to strengthen the 5Cs of Communication.

UNIT I:

Communication concept elements and process, Defining meaning and scope of communication, Types of communication, Barriers of communication and functions of communication.

UNIT II:

Models of communication, Aristotle's model, Lasswell model, Shanon and Weaver model, Osgood's model

UNIT III:

Theories of Communication, Dependency Theory, cultivation theory, Agenda Setting Theory, Use

and Gratification Theory, Hypodermic Needle Theory, Limited Effects Theory

UNIT IV:

Media Theories, Four theories of Press, Interactive Theory : One step flow, Two step flow (Opinion Leaders) and Multi step flow.

UNIT V:

Relevance of communication theories to practice – Persuasion, Perception, Diffusion of Innovations, Social Learning and Participatory Communication.

Course Outcomes	Program Outcomes								
	P01	P02	P03	P04	P05	P06	P07	P08	P09
1	H	M	L	M	L	M	L	M	L
2	M	L	L	M	H	M	M	M	L
3	H	M	M	L	M	L	L	L	M
4	M	L	M	L	M	L	M	L	M
5	H	H	L	M	M	L	L	M	L

BOOKS FOR REFERENCE:

1. Dennis, Mcquail, Mass Communication Theory, Sage Publication, New Delhi. Schramm, W. & Roberts, D. F.,
2. The Process and Effects of Mass Communication, Urbana, IL: University of Illinois Press. Rayudu. C.S., Communication, Himalaya Publishing House, Mumbai Joshi, P.C.,
3. Communication & Nation – Building – Perspective and Policy, Publication Division, New Delhi. Malhan P.N.,
4. Communication Media, Yesterday, Today and Tomorrow, Publication Division, New Delhi. Agee, Warren K., Ault Philip H.,
5. Introduction to Mass Communication, Oxford & IBH Publishing Company, New Delhi

PAPER CODE: 20UDP02	SEMESTER I	CORE II & CREDIT : 4
SUBJECT NAME : CONCEPT IN VISUALISATION		

Goal: To make the students understand the visualisation concept

Objective: Aims to make the student know about the concept of visualisation in related to colour and designing elements.

Course outcome:

C1	Students will know about the psychology of visual perception
C2	Basic colour theory will be made to known to the students
C3	Students will have clear idea about the basic designing elements
C4	Inculcate knowledge on tone, texture and content in a design
C5	Knowledge regarding the object placement in design is thought

Unit I:

The psychology of Visual perception
Human eye and vision
Spatial Vision
Colour spectrum and Psychology of colour

Unit II:

Colour
Colour Theory
Colour Wheel

Unit III:

Concepts of line
Concepts of form
Concepts of space

Unit IV:

Concepts of tone
Concepts of texture
Concepts of contents

Unit V:

Balance Rhythm,
Unity, Harmony
Perspective, Dominance

Course Outcomes	Program Outcomes								
	P01	P02	P03	P04	P05	P06	P07	P08	P09
C1	L	L	M	H	L	M	L	L	L
C2	M	M	L	H	L	M	M	L	L
C3	M	L	L	H	M	L	L	L	L
C4	M	M	L	H	L	M	L	L	L
C5	M	L	M	H	M	M	L	L	L

BOOKS FOR REFERENCE:

1. A Grammar Book of ART & DESIGN by Raviraj – 2008 – Published by New Century Book House Pvt Ltd, Chennai
2. Creating and Understanding Drawings by Gene A Mittler, James Howze - Macmillan/McGraw-Hill, New York - 1989

PAPER CODE: 20UDPA01	SEMESTER I	ALLIED I & CREDIT : 3
SUBJECT NAME : INTRODUCTION TO SOCIAL PSYCHOLOGY		

Goal: To enable students to understand Social Psychology as a subject and the basic attributes.

Objective: The concept of identity, community and group processes is best understood by students to enable them to gain an insight into psychological aspects in media.

Course Outcome:

CO1	To locate goal to have a successful communication process
CO2	To gain social responsibility among students
CO3	To acquire knowledge in socialization and motivational aspects.
CO4	To coordinate among different dimensions of attitudes.
CO5	To develop technical perspective in psychological aspects

UNIT I:

The Nature and Scope of Social Psychology. The Development of Social Psychology: Early Beginnings – the Contributions of Sociologists and Psychologists: Comte; Le Bon; Durkheim; Cooley;

UNIT II:

Specialization: Social Learning Process. Socialization and Motivation; dependency; Aggression; Need Achievement; affiliation.

UNIT III:

Attitudes and Opinions the Nature and Dimensions of Attitudes. The Formation and Change of Attitudes. Communication and Persuasion. Public opinion – Nature, formation and change. Role of Mass communication in Public Opinion Formation and change.

UNIT IV:

Groups and group Processes; Nature and Types of groups; Development of Groups; group Dynamics; Group norms and conformity; Group structure and group performance; Cooperation and competition.

UNIT V:

Mass Psychology; Audiences and Collective Behavior. Classification of collective masses. Casual Audiences, Intentional Audiences and Audiences and Mass Media. Collective Behavior – the mobs and the Different kinds of Mobs. New Media and Audience Behavior. Social Media and Flash Mobs; Political Movements.

BOOKS FOR REFERENCE:

1. Mc David and Harris; “An Introduction to Social Psychology”. Harper & Row, 1968.
2. D Crytchfold, RS and Ballachey, E L “Individual in Society”. McGraw Hill. New York.
3. Sherif, N and Sherif C.W. “An Outline of Social Psychology” Harper & Row. New York.

Course Outcomes	Program Outcomes								
	P01	P02	P03	P04	P05	P06	P07	P08	P09
C1	H	H	L	H	L	L	L	L	H
C2	L	H	M	L	L	H	M	L	L
C3	L	L	H	L	L	M	M	L	L
C4	L	H	L	L	L	H	L	M	L
C5	H	L	H	H	L	L	L	L	M

PAPER CODE: 20UDP03	SEMESTER II	CORE III & CREDIT : 4
SUBJECT NAME : INTRODUCTION TO PRINTING TECHNIQUES		

Goal: To enable students to learn basic printing techniques and types of printing for different types of jobs.

Objective: On successful completion of this course, the students should have understood history, principles and types of printing such as Offset, Flexography, Gravure, and Screen Printing.

Course outcome:

C01	Students will have knowledge about the emergence of printing.
C02	Students would be able to inculcate the knowledge of principles of printing process.
C03	Students would be able to develop the knowledge on image formation techniques for different printing process.
C04	Students will know about the different types of machines in different printing process.
C05	Students would have clear idea on which type of printing suites for different types of jobs.

UNIT I:

Evolution of Printing
 Structure of Printing Industry
 Applications of Printing Processes

UNIT II:

Basic Principles
 Print recognition of Printing Processes
 Advantages and Limitations of Printing Processes

UNIT III:

Classification of Offset Machines
 Types of Offset Machines
 Classification of Web offset Machines

UNIT IV:

Basic configuration of Flexography Machine
 Types of Flexography Machine
 Special application of flexography

UNIT V:

Classification and types of Gravure machine

Parts of screen printing press

Classification of screen printing machines

BOOKS FOR REFERENCE:

1. What the printer should know paper – Lawrence A. Wilson – GATF Press
2. Hand Book of Print Media – Helmut Kipphan
3. Introduction to Printing and Finishing – Hugh M Speris
4. The print Production Manual – J.Peacock,C.Berril and M.Barnard

Course Outcomes	Program Outcomes								
	P01	P02	P03	P04	P05	P06	P07	P08	P09
C1	L	M	M	H	M	M	H	M	M
C2	M	M	L	M	M	M	H	M	L
C3	H	M	L	M	L	L	M	L	L
C4	M	H	L	M	L	M	H	H	M
C5	H	H	L	M	M	M	M	M	L

PAPER CODE: 20UDPA02	SEMESTER II	ALLIED II & CREDIT : 3
SUBJECT NAME : INDIAN CONSTITUTION & LAWS FOR PRINTING TECHNOLOGY		

Goal: To enable students to learn basic printing techniques and types of printing for different types of jobs.

Objective: To provide understanding of knowledge of the Indian constitution and familiarize students with the fundamental rights and duties, related to Press laws and understand the importance of media related laws.

Course outcome:

C1	Student Shall have understanding of our Indian Constitution.
C2	Student get aware to legal aspects of the media and its values.
C3	Student have an overview of recent changes and future challenges of media regulation.
C4	Shall have understanding of media ethics.
C5	Student know how media laws and ethics empower media practitioners to perform their duties with commitment.

UNIT I:

Introduction of the Constitution
Preamble of the constitution
Salient features of Constitution
Amendments in Constitution
Special provisions

UNIT II

Fundamental rights
Directive principles of state policies
Fundamental duties
Emergency powers
Media Response to Contemporary Challenges (Ref. Point: Newspaper, Magazines, Journals and TV Coverage)

UNIT III

Press in India
Media laws: Introduction
Significance of media laws
Freedom of expression in context of media
Role of media laws and their application

UNIT IV

Working Journalist Act

Copyright Act.

Contempt of court

IT Act

Right to Information Act

UNIT V

Main Provisions of IPC and CRPC

Official secret Act, Press Council Act

Press and Registration of Book Act

Prasar Bharti Act

Code of Ethics

BOOKS FOR REFERENCE:

1. Law of the Press in India, Durgadas Basu, Prentice Hall, London, 1980.
2. Law of Contempt of Court in India, B. S. Nayar, Atlantic New Delhi, 2004
3. Mass media Law and Regulation in India AMIC publication.
4. Bharat mein Praveshvidhi by Surendra Kumar & Manas Prabhakar.
5. Mass media law and regulation in India, Venkat Aiyer, AMIC publication.

Course Outcomes	Program Outcomes								
	P01	P02	P03	P04	P05	P06	P07	P08	P09
C1	L	M	H	L	M	L	L	M	L
C2	L	M	M	L	M	L	L	H	L
C3	M	H	H	L	L	L	M	L	L
C4	L	M	M	L	M	L	M	M	L
C5	M	H	L	L	M	L	L	L	L

PAPER CODE: 20UDPP01	SEMESTER II	CORE PRACTICAL I & CREDIT : 4
SUBJECT NAME : PRACTICAL I - CONCEPT IN VISUALISATION		

Goal: Determine the nature and extent of the visual materials needed.

Objective: Find and access needed images and visual media effectively and efficiently
Interpret and analyze the meanings of images and visual media

Course outcome:

C1	Students will know about the creation of geometrical shapes
C2	Basic perspectives in drawing skill will be made known to the students
C3	Students will have clear idea about the overlapping objects
C4	Inculcate knowledge on Light and shade to an drawing or graphics
C5	Drawing using digital mediums are thought to the students

The drawing record should contain exercises completed by each student in every practical class during the first semester with proper dates and signature of the course teacher. It should contain a content page of exercises completed by individual students. The following exercises are compulsory. Each exercise should have at least 5 drawings. {Roughs also should be submitted along with the final drawings.}. Introduction to Materials – pencils, brushes and effects.

- * Geometrical shapes
- * Perspectives
- * Overlapping objects
- * Light and shade
- * Drawings using different medium

Course Outcomes	Program Outcomes								
	P01	P02	P03	P04	P05	P06	P07	P08	P09
C1	L	L	M	H	L	M	L	L	L
C2	M	M	L	H	L	M	M	L	L
C3	M	L	L	H	M	L	L	L	L
C4	M	M	L	H	L	M	L	L	L
C5	M	L	M	H	M	M	L	L	L

SECOND YEAR

PAPER CODE: 20UDP04	SEMESTER III	CORE IV & CREDIT : 4
SUBJECT NAME : INDUSTRIAL PRINTING MATERIALS		

Goal: To enable students to learn about the different types of printing materials used in an printing industry.

Objective: To make the students to know about the manufacturing process of paper, board and ink. Also know about the international paper and board sizes and quality.

Course outcome:

C01	Student understand the raw materials used for paper and board manufacturing.
C02	Student get to know about the manufacturing process of paper and board.
C03	Shall have a clear idea on different paper and board sizes and their quality.
C04	Student shall have understanding of ink manufacturing process and the raw materials required.
C05	Student know ink drying problems and the remedies.

UNIT I:

Composition of paper
Fibrous materials
Manufacture of paper
Bleaching process

UNIT II:

Operations in paper making machine
Paper finishing
Packing and Delivery
Board making

UNIT III:

Classifications of paper for printing
Choice of appropriate quality of paper for different printing processes
Paper and Board sizes
Runnability Properties
Printability Properties
Paper Problems

UNIT IV:

Raw materials used for manufacturing of printing inks
General characteristics and requirements of printing inks
Inks for different printing processes
Ink properties
Ink types

UNIT V:

Ink Drying and Ink Problems
Ink problems
Causes and remedies for Ink problems

BOOKS FOR REFERENCE:

1. Lawrence H.Wilson, What the printer should know about paper, GATF Press, Third Edition, 2000.
2. Lothar Gottsching & Heikki Pakarinen, Paper making Science and Technology, Book7, Fapet Publishing, 2000
3. Charles Finley, Printing Paper and Ink, Delmar Publisher, 1997.
4. R.H.Leach, The Printing Ink Manual, 5th Edn., Chapman & Hall, London, 2002

Course Outcomes	Program Outcomes								
	P01	P02	P03	P04	P05	P06	P07	P08	P09
C1	L	M	M	L	M	L	M	H	H
C2	M	M	M	L	H	L	M	M	H
C3	H	M	L	L	M	M	L	H	M
C4	M	L	M	L	L	L	M	H	L
C5	L	M	L	L	H	M	L	M	H

PAPER CODE: 20UDPA03	SEMESTER III	ALLIED III & CREDIT : 3
SUBJECT NAME : DESIGNING & PLANNING		

Goal: To enable students to learn about the principles and fundamentals of design and typefaces.

Objective: To make the students to know about design principles, usage of different typefaces, layout preparation for books and magazines.

Course Outcome:

C01	Student understand the basic designing elements and their principles.
C02	Student get to know about the elements of colour and multi colour printing techniques.
C03	Shall have a clear idea on typefaces and its applications.
C04	Student know layout creation techniques for books, magazines and newspaper.
C05	Student shall have understanding on proofing methods and its procedure.

Unit I:

Fundamentals of design elements - Line, shape, texture, balance, and contrast.
Principles of symmetrical and asymmetrical arrangements.

Unit II:

Colour elements – colour application, colour terms - warm colour, cool colours, colour wheel describing complementary, split, double split complementary.
Selection of colours for multi colour printing.

Unit III:

Main group of typeface design, characters, Type, font series and families.
Typographic specifications for different classes of work - Bookwork, Magazine work, Newspaper work and Direct mail literatures.
Choosing typefaces for different processes and different paper surfaces.
Application and importance of Legibility and Readability.
Layout preparation - stages, arrangement of integration of layout and text matter.
Introduction to Dummy preparation and its necessity.

Unit IV:

Book design - format, parts, page layout and jacket.
Magazine design - format, Parts and Types and classification of Magazines.
Newspaper design - Newspaper parts, layout design principles, Design elements, Styles of Newspaper headlines.
Design aspects of other printed products - Leaflet, Pamphlet, Catalogue, Brochure, Booklets, Labels, Cartons, Typeface and colour selection.

Unit V:

Type fonts.

Style of house – copy preparation and its advantages, rules of house style.

Proof stages for different kinds of jobs.

Proof reading symbols, meanings and importance.

Casting off – procedures and advantages.

BOOKS FOR REFERENCE:

What the printer should know paper – Lawrence A. Wilson – GATF Press

Hand Book of Print Media – Helmut Kipphan

Introduction to Printing and Finishing – Hugh M Speris

Printing Paper and Ink – Charles Finley.

The print Production Manual – J.Peacock, C.Berril and M.Barnard

Course Outcomes	Program Outcomes								
	P01	P02	P03	P04	P05	P06	P07	P08	P09
C1	H	M	M	H	L	M	M	L	L
C2	H	L	M	H	L	M	M	M	L
C3	H	L	L	M	L	L	H	M	L
C4	H	M	M	M	H	H	H	M	M
C5	M	M	L	L	L	L	M	H	L

PAPER CODE: 20UDPSB01	SEMESTER III	SBEC I & CREDIT : 3
SUBJECT NAME : PHOTOGRAPHY		

Goal: To create interest in photography among students and create self-employment in the field of photography.

Objective: To impart concepts and importance of photography, Impart knowledge on lighting principles and types of photography.

Course Outcome:

C01	Learner would learn the concepts and importance of photography.
C02	Learner would be able to understand photo coverage and photo Journalism.
C03	Learner would be to ready to join any media organization as photo Journalist.
C04	Learner would know the importance of photo features.
C05	Learner would know different branches of photography and may be self-employed.

Unit I:

Introduction and Development of Photography
 Photo Journalism, Development
 Role and importance in media
 Tools of Photography, types of camera
 Traditional and digital camera, Part of Camera, Camera control,

Unit II:

Digital Photography
 Emergence of Digital technology
 Selecting Images,
 Size, and quality
 Indoor and Outdoor Photography

Unit III:

Lighting principles
 Role of lighting
 Different types of lighting and its uses
 Role of subject, quality of photograph
 Developing of different size of photograph

Unit IV:

Photograph Editing Techniques
Cropping, Enlarging & reducing
Clubbing/Grouping
Colour composition
Filter, length, focus, Shots

Unit V:

Branches of Photography needs and importance
Advertising photography
Modelling & portfolio
Wildlife Photography
Photography and Ethics.

BOOKS FOR REFERENCE:

1. Digital Photography (Hindi) Books – Author Vishnu Priya Singh, Publisher Computech Publication Limited.
2. Digital Photography (Hindi) Hardcover- 2018 by RiyajHasan (Author)- Book Enclave, Jaipur.
3. Photography Technics and Uses (Photography Taknik and Pryog) by Narendra Singh
4. Yadav and Published by Rajasthan Hindi Granth Academy.
5. Practical Photography Digital Camera School : The Step-by-step Guide to Taking Great Picture- By Publisher Carlton Books Ltd. (London).

Course Outcomes	Program Outcomes								
	P01	P02	P03	P04	P05	P06	P07	P08	P09
C1	M	H	H	M	L	H	M	M	M
C2	M	H	H	M	L	M	L	L	L
C3	M	H	H	M	M	H	H	M	M
C4	M	H	H	L	L	M	M	M	L
C5	H	H	M	M	L	H	L	L	M

PAPER CODE: 20UDPN01	SEMESTER III	NMEC I & CREDIT : 2
SUBJECT NAME : SOCIAL MEDIA MANAGEMENT & MARKETING		

Goal: To help students learn the working of media organizations

Objective: To help students develop the skill of media management

Course Outcome:

C01	Students tend to know about the management structure & its function
C02	Content related to production management are thought to the students
C03	Students inculcate knowledge on media convergence
C04	Advertising management skills are developed among the students
C05	Skills related to marketing management are made known to the students

Unit I: MANAGEMENT STRUCTURE & ITS FUNCTIONS

Management in Media organization – Structure – nature and process of management – levels of management– Skills, functions and management roles. Theories of management – classical, human relationships, modern approaches to management. Societal and organizational environment.

Unit II: PRODUCTION MANAGEMENT

Management in Media organization – Structure – nature and process of management – levels of management– Skills, functions and management roles. Theories of management – classical, human relationships, modern approaches to management. Societal and organizational environment.

Unit II: MEDIA CONVERGENCE

Entrepreneurship – Monopoly, oligopoly. Financial management – Media convergence, economics. Future of media business –Employment opportunities and status of media industry.

Unit IV: ADVERTISING MANAGEMENT

Advertising management - profit, sales and market share objectives, setting the budget, media selection and media scheduling.

Unit V: MARKETING MANAGEMENT

Marketing – management – creativity and innovation – internal communication and external communication. Understanding market and factors - audiences – research and analysis, ratings, trends in marketing and selling.

BOOKS FOR REFERENCE:

1. Block *et al* (2001). *Managing in the Media*. Focal Press.
2. Alan B. Albarran, Sylvi (2006). *A handbook of Media management and Economics* – Lawrence Elbaun Associate Publishers.
3. Andrej vizjak and Max Riglstter (2003). *Media management*, Springer,
4. William jameswillis and diane B.willis (2006). *New Directions in Media Management*, Routledge.
5. Alan B. Albarran (2009). *Management of Electronic Media*, Wadsworth.

Course Outcomes	Program Outcomes								
	P01	P02	P03	P04	P05	P06	P07	P08	P09
C1	L	H	L	L	H	M	H	H	M
C2	M	H	L	L	H	M	H	M	H
C3	H	H	M	L	L	M	M	M	M
C4	M	M	L	L	M	M	M	M	L
C5	L	H	L	L	H	M	M	M	H

PAPER CODE: 20UDP05	SEMESTER IV	CORE V & CREDIT : 4
SUBJECT NAME : WRITING FOR DIGITAL MEDIA		

Goal: To make the students understand the writing procedures and techniques for various media particularly for digital media.

Objective: To make the students develop knowledge on good writing techniques for news print, radio, television and new Medias.

Course Outcome:

C01	Student understand the basic writing procedure for media
C02	Inculcate knowledge on writing for digital print media
C03	Students gathered knowledge on writing for web copy and mobile
C04	Information related to search engine optimisation is thought to the students
C05	Logic and tools related to online copywriting is made known to the students

Unit I:

Sources of Information

Characteristics of different types of media

Varying user experience to different medium

Writing for pictures/images.

Unit II:

Writing for Print medium

Public Relations and Press Releases

News stories and Features.

Online story.

Unit III:

Types of web copy:

Short copy

Long copy

Blogging

Website copy

Writing for mobile

Unit IV:

HTML for formatting

SEO copywriting

Optimization of human and machine users

Unit V:

Best practices of online copywriting:

Conceptual copywriting

Layout and legibility

Language

Logic

Tools of Trade

BOOKS FOR REFERENCE:

1. Mencher, Melvin, (2003), "News Reporting and Writing". New York. McGraw Hill Pub.
2. eMarketing, The essential guide to marketing in a digital world 5th Edition

Course Outcomes	Program Outcomes								
	P01	P02	P03	P04	P05	P06	P07	P08	P09
C1	L	M	H	L	M	H	M	M	L
C2	M	M	H	L	L	H	M	M	L
C3	M	M	M	L	M	M	H	H	M
C4	M	L	M	L	M	H	M	M	M
C5	M	L	M	L	M	M	M	H	L

PAPER CODE: 20UDPP02	SEMESTER IV	PRACTICAL II & CREDIT : 4
SUBJECT NAME : DIGITAL IMAGE EDITING		

Goal: To create student employability in the field of Graphics Designing especially in raster graphics process.

Objective: To make the student familiar in handling image editing software's with all the techniques of colour corrections, retouching, manipulation etc.

Course Outcome:

C01	To make student familiar with image resizing with regards to resolution.
C02	To familiarize student with handling colour concept in digital image.
C03	Student must have clear idea about the redrawing using paths.
C04	To make students understand about the layer mask, retouching and applying layer style concept.
C05	Student should be familiar with creating their own Greeting card, cover page or any graphics designing projects.

1. Photoshop Toolbar.
2. Transforming Images (Image Size, Canvas Size, Resolution, Rotate, Scale, Skew, Distort, Perspective, Flip Horizontal, Flip Vertical)
3. Color Correction using Adjustment Layers.
4. Selecting images using Marquee tool, Magic wand tool, Lasso Tool.
5. Selecting images using Path.
6. Re-drawing Picture.
7. Creating Layer Mask, Vector Mask & Alpha Channel.
8. Retouching Images using Clone Stamp tool, Healing Brush tool & Patch tool.
9. Working with Layer Styles (Drop Shadow, Inner Shadow, Outer Glow, Inner Glow, Bevel & Emboss)
10. Working with Layer Styles (Satin, Color Overlay, Gradient Overlay, Pattern Overlay, Stroke)
11. Designing a Greeting Card in Photoshop
12. Designing a Note Book Cover Page
13. Designing a Banner
14. Designing a Web page
15. Creating a Simple Animation in Photoshop

Course Outcomes	Program Outcomes								
	P01	P02	P03	P04	P05	P06	P07	P08	P09
C1	H	M	L	M	L	H	M	M	M
C2	H	M	M	H	L	H	L	M	L
C3	H	M	L	H	L	H	M	L	L
C4	H	H	M	M	M	H	M	L	L
C5	H	H	L	M	L	H	M	L	H

PAPER CODE: 20UDPP03	SEMESTER IV	PRACTICAL III & CREDIT : 4
SUBJECT NAME : PAGE LAYOUT & DESIGN		

Goal: To create student employability in the field of pagination, newspaper and graphics designing industry.

Objective: To make the student familiar in creating page layout and improve their skills in graphics designing software's.

Course Outcome:

C01	To make student familiar in working with text & pages to produce inner pages for books, magazines and newspaper.
C02	To familiarize student to create simple designs on different business needs.
C03	Student will have the ability to create a logo for any concern, company or product.
C04	To make students to design their own calendar with the layout and date.
C05	Student should be familiar with creating their Posters, Certificate and generating barcodes.

1. Creating a book work with Master Pages
2. Creating an News Paper Layout
3. Creating an Magazine Cover Page
4. Designing an Bill Book
5. Design an Envelope
6. Creating a Letter Head
7. Design a pamphlet
8. Logo Creation
9. Create a monogram
10. Creating Business Card
11. Create a web banner
12. Creating a monthly Calendar
13. Creating Barcodes
14. Poster Making
15. Create an A4 certificate

Course Outcomes	Program Outcomes								
	P01	P02	P03	P04	P05	P06	P07	P08	P09
C1	H	M	L	M	L	H	M	M	M
C2	H	M	M	H	L	H	L	M	L
C3	H	M	L	H	L	H	M	L	L
C4	H	H	M	M	M	H	M	L	L
C5	H	H	L	M	L	H	M	L	H

PAPER CODE: 20UDPN02	SEMESTER IV	NMEC II & CREDIT : 2
SUBJECT NAME : MOBILE APP DEVELOPMENT		

Goal: To help students to gain a basic understanding of Android application development

Objective: To facilitate students to understand android SDK. To inculcate working knowledge of Android Studio development tool

Course Outcome:

C01	Identify various concepts of mobile programming that make it unique from programming for other platforms
C02	Critique mobile applications on their design pros and cons
C03	Utilize rapid prototyping techniques to design and develop sophisticated mobile interfaces
C04	Program mobile applications for the Android operating system that use basic and advanced phone features
C05	Deploy applications to the Android marketplace for distribution

UNIT I:

Introduction to Android: The Android Platform, Android SDK, Eclipse Installation, Android Installation, Building you First Android application, Understanding Anatomy of Android Application, Android Manifest file.

UNIT II:

Android Application Design Essentials: Anatomy of an Android applications, Android terminologies, Application Context, Activities, Services, Intents, Receiving and Broadcasting Intents, Android Manifest File and its common settings, Using Intent Filter, Permissions.

UNIT III:

Android User Interface Design Essentials: User Interface Screen elements, Designing User Interfaces with Layouts, Drawing and Working with Animation.

UNIT IV:

Testing Android applications, Publishing Android application, Using Android preferences, Managing Application resources in a hierarchy, working with different types of resources.

UNIT V:

Using Common Android APIs: Using Android Data and Storage APIs, Managing data using Sqlite, Sharing Data between Applications with Content Providers, Using Android Networking APIs, Using Android Web APIs, Using Android Telephony APIs, Deploying Android Application to the World.

BOOKS FOR REFERENCE:

1. Reto Meier, “Professional Android 2 Application Development”, Wiley India Pvt Ltd
2. Mark L Murphy, “Beginning Android”, Wiley India Pvt Ltd
3. Android Application Development All in one for Dummies by Barry Burd, Edition: I

Course Outcomes	Program Outcomes								
	P01	P02	P03	P04	P05	P06	P07	P08	P09
C1	H	M	L	M	L	H	M	M	M
C2	H	M	M	H	L	H	L	M	L
C3	H	M	L	H	L	H	M	L	L
C4	H	H	M	M	M	H	M	L	L
C5	H	H	L	M	L	H	M	L	H

PAPER CODE: 20UDP06	SEMESTER V	CORE VI & CREDIT : 4
SUBJECT NAME : TOTAL QUALITY MAINTENANCE FOR PRINTING		

Goal: To inculcate the knowledge on maintaining quality and maintenance in each and every stages of printing.

Objective: To develop a quality atmosphere in printing industry and the printed products.

Course Outcome:

C01	To make students understand the basic concept of quality and the quality control process.
C02	To inculcate knowledge on the importance of inspection and testing.
C03	Students will know about the process control methods in printing industry.
C04	Students will have an idea about the importance of instruments used for quality control in printing industries.
C05	Information regarding the ISO implementation for an printing industry would be made clear to the students.

Unit I: INTRODUCTION

Definition of Quality terms
Quality control Process
Basic elements of Total Quality Management
Statistical Process Control Tools
Basic concepts of Kaizen, JIT, 5S, Six Sigma

Unit II: Material Inspection and Testing

Storage and Handling of Substrates and Chemicals
Testing procedures for Paper and board
Dampening solution testing methods
Ink testing methods
Introduction to light viewing booth

Unit III: Process Control

Quality control targets
Color Control patches
Wastage Management
Process control charts

Unit IV: Calibration of Instruments and Profile

Principle of Densitometer
Principle of Spectrophotometer
Analysis of Print Attributes
CTP calibration and Linearization process

Unit V: Implementation of ISO for Print Quality

Introduction to ISO 9001
Press Calibration to ISO-12647-2 standard
Implementation of ISO standards in printing organization
Customer Satisfaction for print industry

BOOKS FOR REFERENCE:

1. Total Quality Management, Dale H. Besterfield, Pearson Education, Delhi, 2002
2. Implementing Quality Management in the Graphic Arts, Herschel L and Michael J
3. Apfelberg, GATF, Pittsburgh, 1999
4. Digital 19 x 25 –in Test Form 4.1, User Guide, GATF, Pittsburgh, USA 1998
5. Colour control in lithography, Kelvin Tritton, Pira International Surrey UK 1995

Course Outcomes	Program Outcomes								
	P01	P02	P03	P04	P05	P06	P07	P08	P09
C1	M	L	L	L	M	L	H	H	M
C2	M	L	L	L	M	L	H	H	H
C3	M	L	M	L	M	M	H	H	H
C4	M	L	L	L	L	L	M	H	M
C5	M	M	L	L	H	M	M	H	H

PAPER CODE: 20UDP07	SEMESTER V	CORE VII & CREDIT : 4
SUBJECT NAME : OFFSET PRINTING TECHNOLOGY		

Goal: Is to make the students learn about the offset printing techniques, its types and its structure.

Objective: To create knowledge among the students regarding the technical specification of offset printing machines suitable for different printing types.

Course Outcome:

C01	To make students understand the principles of lithography and its types.
C02	To inculcate knowledge about the different printing units in offset machines.
C03	Techniques on handling the feeder and delivery unit in offset printing will be made known to the students.
C04	Students will get particular knowledge on web offset printing and its types.
C05	Information regarding post press operation related to the offset printing will be learned by the students.

UNIT I - Introduction to Sheet fed Offset Presses

Principles to Lithography

Structure and Type of presses – Inline Press, Stack Press, Blanket-to-Blanket Press, Common Impression Press

UNIT II - Printing Unit in Offset Press

Plate Cylinder, Blanket Cylinder, Impression Cylinder, Transfer Cylinder, Delivery Cylinder

Inking System – Construction, Setting Rollers- Form Roller to Oscillator, Form Roller to Plate, Ductor Roller Setting, Inking System Problems – Roller Streaks, Glazed Rollers, Fountain Blade Problems, Roller Problems

Dampening System – Construction, Composition of Dampening Solution, Dampening Solution pH, Conductivity, Dampening system Roller setting

UNIT III - Sheet Control and Delivery in Offset Press

Types of Automatic Feeder – Single sheet feeder, Stream Feeder

Feeder Head Components – Air blast Nozzle, Rear Pickup Suckers, Forwarding Pickup Suckers, Sheet Steadier's, Separator Brushes and fingers

Sheet Registering Devices – Front lay and Side lay

Delivery Section – Jogging the delivery pile, Delivery Assist Devices – Suction Slow down Rollers, Blow downs, Wedges.

UNIT IV - Webfed Offset Press – Infeed the Web Guiding Devices

Roll Stands and Dancer Roll Principle – Types of Reel Stands

Automatic Splicers – Zero Speed Paster, Flying Paster

Web Control – Metering Roller, Box Tilt, Web break detectors, Bustle Wheel.

UNIT V - Webfed Offset Press – Delivery Unit

Types of Dryers and Chill Rollers

Mechanics of Folders – Former board Mechanics, Cut off Cylinder Mechanics, Jaw Folder Mechanics, Chopper Folder Mechanics

Types of Folders – Combination Folder, Ribbon Folder, Former Folder, Double Former Folders.

Auxiliary Equipment's – Stackers, Bundlers, Sheeters, Perforators, Imprinters, Sidelay Sensors.

BOOKS FOR REFERENCE:

1. A Manual for Lithographic Press Operations – A.S. Porter
2. Handbook of Print Media – Dr.Helmut Kipphan
3. Sheetfed Offset Press Operating – Lloyd P.Dejidas and Thomas M.Destree, GATF.
4. Offset Lithography – S.Jaganathan, K.T.Chary
5. Web Offset Press Operating – Daniel G. Wilson, GATF
6. Modern Lithography Printing – Ian Faux

Course Outcomes	Program Outcomes								
	P01	P02	P03	P04	P05	P06	P07	P08	P09
C1	M	H	L	L	M	M	H	M	M
C2	L	M	L	L	M	M	H	M	L
C3	L	M	L	L	M	M	H	M	L
C4	M	H	L	L	M	M	H	M	M
C5	M	H	L	L	M	M	H	H	H

PAPER CODE: 20UDP08	SEMESTER V	CORE VIII & CREDIT : 4
SUBJECT NAME : IMAGE PROCESSING		

Goal: To make the students know about the image processing techniques in printing industry.

Objective: Aims to convey information about the colour and its reaction towards the originals and making the originals ready for image processing techniques.

Course Outcome:

C01	Students will know about the colour concept and its reaction towards the light
C02	Handling of camera and scanner will be made known to the students
C03	Image reproduction techniques will be made known to the students
C04	Students will be known about the film processing techniques
C05	Offset plate making techniques will be thought to the students

Unit I: Originals and Colour

Originals
 Classification of originals
 Light and Colour
 Properties of colour
 Electromagnetic spectrum and the visible spectrum

Unit II: Digital Reproduction Techniques

Digital Camera – Basic Elements
 Image capturing techniques
 Image editing and manipulations

Unit III: Line and Halftone Photography

Line Reproduction
 Halftone Reproduction
 Working Principles of Scanners and their types
 Steps in Halftone Reproduction using Scanner

Unit IV: Film Processing

Photographic Films
 Structure of photographic films
 Film processing chemicals
 Film processing
 Computer to film technology

Unit V: Offset Plate Processing

Type of Plates

Facilities and Equipment's used in Plate Making department

Control of plate making variables – Quality control aids

Processing steps involved in preparation of PS Plates Processing steps involved in preparation of Wipe-on Plates

Plate making troubles

BOOKS FOR REFERENCE:

1. Graphic Reproduction Photography - J.W. Burden, Focal Press, London. Reproduction
2. Photography for Lithography - GATF. Electronic colour separation - Dr.R.K.Molla,
3. R.K.Print ing and Publishing Company, West Virginia, U.S.A. Standardized Lithographic colour printing - PIRA Guide. Colour Separation Techniques - Mills South Worth, Graphic Arts Publishing Co., New York. Reproduction of colour - R.W.G. Hunt, Fountain Press.
4. Graphic Reproduction - Eagle head publishing Ltd., Surrey, U.K. Principles of colour reproduction applied to photomechanical reproduction, Colour photography and the ink, paper and other related industries – John Wiley & Sons, U.K. The Lithographers manual - 7th Edition - GATF. The Lithographers manual - 9th Edition - GATF.

Course Outcomes	Program Outcomes								
	P01	P02	P03	P04	P05	P06	P07	P08	P09
C1	M	L	L	H	M	M	H	H	L
C2	H	H	L	M	M	H	M	L	M
C3	H	M	M	M	L	M	H	M	H
C4	M	L	L	L	L	L	H	M	H
C5	M	M	L	L	M	M	H	H	M

PAPER CODE: 20UDP09	SEMESTER V	CORE IX & CREDIT : 4
SUBJECT NAME : PRINTING MACHINERY MAINTENANCE		

Goal: To make all the students have knowledge about the machine maintaining procedures

Objective: Aims to convey detail information about the different maintaining techniques to be followed in a printing press in different stages

Course Outcome:

C01	Students inculcate knowledge on maintenance of machinery and its detail procedures
C02	Different parts of machinery and its maintenance procedure is thought to the students
C03	Difference between mechanical and electrical elements are made known
C04	Lubricating and reconditioning procedures are thought to the students
C05	Maintenance of mechanisms are thought to the students

Unit I: Maintenance Management

1.1 - Maintenance – Definition, Objectives, Types of Equipment Maintenance – Planned maintenance and unplanned maintenance.

1.2 - Types of Planned maintenance - Preventive Maintenance, Predictive Maintenance and Scheduled maintenance Merits and demerits. Unplanned maintenance - Breakdown Maintenance or Emergency maintenance - Merits and Demerits. Contract maintenance - Definition - Merits and Demerits.

1.3 - Preventive Maintenance Functions - Planning, scheduling, Repair cycles, Dispatching and Controlling.

1.4 - Safety Precautions and House Keeping – safety precautions to be followed in press area and Five steps of housekeeping (5S method).

Unit II: Power Transmission

2.1 - Chain Drives - Introduction, Types of Chains – Roller Chain, Silent Chain, Ewart Chain and Bead Chain, Merits and Demerits of Chain Drives.

2.2 - Belt Drives - Introduction, Types of Belts – Flat belt, Rope belt, Tooth Belt, V belt and Timing Belt, Merits and Demerits of Belt drives.

2.3 - Gear Drives - Introduction, Types of Gears – Spur gear, Helical gear, Bevel gear, Worm gears and Herringbone gear, Merits and Demerits of gear drives.

2.4 - Maintenance and Lubrication of Drive Systems - Chain Drive, Belt Drive and Gear Drive.

2.5 - Direct drive technology – Introduction, Advantages and Application in the printing field.

Unit III: Mechanical and Electrical Elements

3.1 - Bearings, Types of Bearings - Sliding bearings and Antifriction bearings – Ball bearings, Needle bearings and Roller bearing. Merits and Demerits.

3.2 - Cams and Follower, Types of Cams and Followers – Disk Cam, Translation Cam, Groove Plate Cam, Cylindrical Cam, Eccentric Cam and Tow Wipe Cam. Advantages of cam and Follower.

3.3 - Springs, Types of springs – Helical Spring, Conical spring, Volute Spring and Torsion Springs and its application.

3.4 - Electrical Elements - Introduction to Contactors and its types, Introduction to Limit Switches and its application, Introduction to over Load Relay Switches and its types, Thermal and Magnetic, Introduction to Sensors and Detectors and its application, Introduction to Electrical Panels.

Unit IV: Lubrication and Reconditioning

4.1 - Lubrication – Introduction, Advantages, Types of Lubricants - Solid, Semisolid and Liquid. Lubrication Schedule, Chart and Paint Marks.

4.2 - Equipment's and Tools used in Erection and Reconditioning - Cranes, Hoists, Spanner, Wrenches, Screwdriver, Spirit level, Dial Indicator with gauge, Feeler gauge, Micrometer and Vernier Calipers, Application.

4.3 - Test Run – Types of test runs - Idle, Performance, Accuracy, Rigidity and Vibration test.

Unit V: Maintenance of Mechanisms

5.1 - Electrical Maintenance – Introduction to AC and DC motors, Maintenance Check list for motors, Common problems with Electricity.

5.2 - Pneumatic System Maintenance - Introduction to pneumatic system functioning, Compressor types Reciprocating and Rotary compressor, Application in Printing Field and Check List for pneumatic system maintenance.

5.3 - Hydraulic System Maintenance - Introduction to Hydraulic System, Application in Printing field and Check list for Hydraulic System maintenance.

5.4 - Mechatronics – Introduction and applications in Printing Field.

BOOKS FOR REFERENCE:

1. H.P. Garg, Industrial maintenance, S. Chand & Company Ltd., Lewis and Tow, Readings in maintenance, Management Cohners Books. A.S.Porter, A manual for Lithographic press operation, Lithographic Training Services. Lithoprinting Ian Faux, Blueprint Publications.
2. Lithographers Manual, Graphic Arts Technology Foundations, U.S.A. Faires, V.M. – Design of machine elements, The Macmillan Co., London. Shirley, Mechanical Engineering Design, McCrawhill. Dobrovalsky et.al., “Machine Elements”. MIR Publications.

Course Outcomes	Program Outcomes								
	P01	P02	P03	P04	P05	P06	P07	P08	P09
C1	L	M	L	L	M	M	H	H	M
C2	L	H	L	L	L	M	H	M	H
C3	L	M	L	L	L	H	H	M	M
C4	L	M	L	L	M	M	H	H	M
C5	L	H	L	L	L	M	H	M	H

PAPER CODE: 20UDPE01	SEMESTER V	ELECTIVE I & CREDIT : 4
SUBJECT NAME : PRINTING PRESS MANAGEMENT		

Goal: To make the students know about the management procedures in a printing press.

Objective: The subject aims to convey information to the students regarding the accounting and management procedures to be followed in a printing press.

Course Outcome:

C01	Basic knowledge of costing is made known to the students
C02	Estimating procedures are thought to the students
C03	Students inculcate knowledge on accounting and its types
C04	Difference between market and sales and its importance are made known to the students
C05	Managing principles are made known to the students

UNIT I: COSTING

Meaning and objects of costing, advantages of costing.
 Methods of costing, classifications of costing in printing industry.
 Variable direct costs, fixed direct costs and fixed indirect costs.
 Capital cost of machinery equipment, utilization of machineries.
 Interest on the capital cost of the machines.
 Depreciation insurance on machinery.
 Wages of Direct Labour.
 Direct materials costing.
 Costing of machine operations.
 Costing of manual operations.

UNIT II: ESTIMATING

Meaning, differentiating costing and estimating.
 Qualification of an estimator.
 Responsibilities of an estimator.
 Reasons for variation in estimating.
 Forms used in estimating.
 Factors to be considered while estimating.
 Procedures for preparing estimates and submitting quotations.
 The factors, which decide the final cost of printed products.
 Use of Computers in estimating.

UNIT III: ACCOUNTING (THEORY ONLY)

Object of book keeping
 Various systems of book keeping
 Difference between Double entry and single entry book – keeping systems. Advantages and disadvantages of double entry book keeping.
 Meaning of important book – keeping terms.
 Relationship between book – keeping and accounting
 Source documents (supporting documents). Branches of accounting.
 Classification of accounts – Journal, Ledger, Subsidiary book – Cash book and Petty cash book, trial balance.

UNIT IV: MARKET AND SALES

Introduction to marketing and sales.

Marketing department organizational structure.

Duties and qualities of salesman.

Sales forecasting factors and their importance.

Advertising agencies and their roles.

Structure of advertising to manufacturers, customers and society. Communication in management – definition/meaning, purpose.

General communication process, models of communication. Communication skills – verbal and non-verbal.

Effective communication and its barriers. Essentials of written communication.

4Cs of good communication.

Replies to enquiries, orders and complaints.

UNIT V: PRINCIPLES OF MANAGEMENT

Printing press (organization) plant layout.

Principles of layout, plant location, building.

Ergonomics of management – lighting, glare/contrast, climate, safety and noise.

General plant safety procedures.

Safety in prepress departments.

Safety in presswork departments.

Safety in binding, finishing and converting departments.

Safety in materials handling.

BOOKS FOR REFERENCE:

1. What the printer should know paper – Lawrence A. Wilson – GATF Press
2. Flexography primer – J. Page Cronch
3. Gravure Primer – Cheryl L. Kasunich
4. Hand Book of Print Media – Helmut Kipphan

Course Outcomes	Program Outcomes								
	P01	P02	P03	P04	P05	P06	P07	P08	P09
C1	L	H	M	L	H	M	M	H	M
C2	M	H	M	L	H	M	M	H	L
C3	L	H	M	L	H	M	M	H	M
C4	M	H	M	L	H	M	M	H	M
C5	M	H	M	L	H	M	L	H	M

PAPER CODE: 20UDPSB03	SEMESTER V	SBEC III & CREDIT : 3
SUBJECT NAME : ADVANCED PRINTING TECHNIQUES		

Goal: Deliver knowledge on the advanced printing techniques to the students.

Objective: Aims to convey detail knowledge on the advanced and upcoming printing techniques.

Course Outcome:

C01	Digital imaging and printing techniques are made known to the students
C02	Students inculcate knowledge on the types of non-impact printing techniques
C03	Knowledge on security printing and its materials are conveyed to the students
C04	Students are thought about the special printing techniques used for unique production methods
C05	Emerging printing process are made known to the students

Unit I: Digital Printing Technologies

- 1.1 Digital printing – Definition, Scope and job suitability of Digital printing process.
- 1.2 Basic principle of Computer-to-Film, Computer-to-Plate, Computer-to-Press and Computer-to-Print.
- 1.3 Computer-to-Press – Working principle of Direct Imaging with once imageable master and Working principle of Direct Imaging with re-imageable master.
- 1.4 Computer-to-Print – Working principle

Unit II: Non-Impact Printing Technologies

- 2.1 Basic principle of Non-impact printing technology, Flow chart of NIP technology and Applications of NIP technology.
- 2.2 Basic principle of Electrophotography – Imaging, Inking, Toner transfer, Toner fixing and cleaning.
- 2.3 Basic principle of Ionography – Imaging, Developing, Toner transfer, Toner fixing, cleaning and erasing.
- 2.4 Basic principle of Thermography – Direct thermography, Transfer thermography, working principle of thermal transfer and thermal sublimation printing systems and Properties of ink tonner for Thermography.
- 2.5 Basic principle of Ink jet printing - Continuous ink jet and Drop on demand ink jet, working principles of continuous ink jet and drop on demand ink jet and Properties of ink tonner for ink jet printing.

Unit III: Security Printing Features and Materials

- 3.1 Security design features - Pantograph screens, Void pantograph Screen, ODT - optical deterrent technology, Guilloches, Warning bands, Code safe, High resolution graphics and Padlock icon - Application of security printing.
- 3.2 Security papers – Safety paper, Chemical reactive paper, Special papers, Water mark paper and Copy evident paper.
- 3.3 Security threads - Metalized thread, Windowed thread, Holographic windowed thread, Micro text, Clear text and Thermo text.
- 3.4 Watermark, Classification of watermark - Line drawing watermark, shaded watermark and Digital watermark.
- 3.5 Security inks – Trademark colours, Colour changing ink, Magnetic ink, Copy protection ink, Erasable ink, Fugitive ink, Pen reactive ink, Heat reactive ink, Coin reactive inks, Migrating ink, Bleeding inks, Florescent ink, Metallic ink and UV ink.

Unit IV: Special Printing Technologies

- 4.1 Basic principles of hybrid printing system and Application of Hybrid printing systems.
- 4.2 Basic principles of holograms making process, Components of hologram making system - laser, lenses, beam splitter, mirrors, holographic film and Process steps of hologram making system.
- 4.3 Basic principles of lenticular printing process.
- 4.4 Basic principles of waterless offset printing, Plate structure of waterless offset printing, Merits and Demerits of waterless offset printing.

Unit V: Emerging Printing Process

- 5.1 Basic principles of E-book, List of various manufactures of E-book, Application of E-book, Basic principles of E-ink and Concept of E-ink with microcapsules filled with a coloring agent.
- 5.2 Basic principles of “Gyricon” E-paper, Types of display of E-paper, Application of E-paper, Concepts of rewritable paper, Imaging and erasing processes for rewritable paper.
- 5.3 Introduction about 3D printing, Types of 3D printing direct and binder 3D printing, Steps involved in 3D printing process and Application of 3D printing

BOOKS FOR REFERENCE:

1. Printing on a digital world - Darid Bergsland, Delmar Publish Inc., New York 1997.
2. Gutenberg goes Digital - Michael Limburg, Blueprint publication, London.
3. A hand book for Printing and Packaging Technology - Bishwanath Chakravarthy, Galgotia Publications, New Delhi. Output Hard copy devices - Robert c.Durbee (Ed.) Academic Press Inc.
4. What the printer should know about paper - W.H.Bureau, GATF. The Printing Ink Manual - R.H. Lench and R.J.Pierce (Ed) 5th Ed., Blue print. Non Impact Printing - Gerhard A. Nothmanm,
5. GATF. The Impact Printing for the commercial printer - techno Economic Forecast (1988 - 1993)

Course Outcomes	Program Outcomes								
	P01	P02	P03	P04	P05	P06	P07	P08	P09
C1	M	H	M	L	H	M	H	M	M
C2	L	M	L	L	M	M	H	M	H
C3	L	M	M	L	M	M	H	H	M
C4	L	M	H	L	M	L	M	L	M
C5	L	M	L	L	M	M	H	M	H

PAPER CODE: 20UDP10	SEMESTER VI	CORE X & CREDIT : 4
SUBJECT NAME : DIGITAL PRINTING		

Goal: To make the students know about the latest digital printing techniques.

Objective: Convey information regarding the digital imaging techniques and colour management in different stages of printing.

Course Outcome:

C01	Students inculcate knowledge on the workflow in digital pre-press stage
C02	Deliver knowledge to the students regarding the digital photography and the digital proofing methods
C03	Students gathered knowledge on digital image assembly using different data formats
C04	Colour calibration techniques are made known to the students
C05	Direct imaging from Computer to Plate techniques are thought to the students

Unit I: Digital Prepress – Introduction

1.1 - Digital Description of the Printed page - Elements of Digital Page – Integration of Text, Images, Graphics, Layout and Prepress checklist.

1.2 - Dot Shape – Round, square, elliptical and composite shapes, Amplitude Modulation /Frequency Modulation Screening Difference between AM and FM screening and Benefits of FM screening.

1.3 - Input and Output Resolution - Scanning Frequency, Picture element and scanning frequency formula. Image - dependent Effects and Corrections – Spreads and Chokes, Trapping, Moire and interference of dot pattern.

1.4 - Under Colour Removal, Grey Component Replacement, and Un sharp Masking Techniques - Advantages of UCR, GCR & USM. Difference between UCR and GCR. Chromatic composition and achromatic composition.

Unit II: Digital Photography & Digital Proofing

2.1 - Image capturing with Digital camera – Special features of Digital Camera – Tone Value Quantization, Focal length of lens and Aspect Ratio and Link up to a Computer.

2.2 - Charge Coupled Device and Complementary Metal Oxide Semiconductor - Definition and difference between CCD and CMOS.

2.3 - Scanner designs and models, Flatbed Scanners - Diagram, functions of scanners and advantages of flatbed scanner.

2.4 - Digitizing and Re-digitizing - Various Re-digitizing Techniques Copy dot, De-screening and mixed mode. Digital Proofs and Press Proofs.

Unit III: Digital Image Assembly and Data Formats

3.1 - Page Assembly and Imposition - Digital assembly techniques of CTF and CTP. Imposition - Image register and alignment, Imposition plans - Sheet wise, Work and turn and Work and tumble.

3.2 - Full Sheet Output, Full sheet production in the workflow, Imposition through Software and Full sheet production workflow.

3.3 - Imposition Workflows - Types of Imposition programs, Imposition sheet, demands on Imposition programs and Imposition workflows and considerations for impositions.

3.4 - Raster Image Processor (RIP) - Workflow diagram – Interpreter, Renderer, Rasterizer and Bitmap. File Formats Postscript, TIFF, JPEG, GIF, LZW, EPS, PDF, PPF, 1 bit TIFF and JDF.

3.5 - Data Formats - Bitmap & Vector, Applications of storage media - Data distribution, Archiving and Backup or transport.

Unit IV: Colour Management

4.1 - Definition of Colour, Colour Management and Needs - Targets of Print Colour Management, CIE Chromaticity Diagram - CIE Lab Values – Spectrophotometry, Spectral Reflectance curves of colours. Colour perception and colorimetric description of colour.

4.2 - Colour measuring instruments, Colorimetry and Densitometry – Densitometer, Spectrophotometer diagrams and functions.

4.3 - Profiles for Monitor, Scanner and Printer – International Colour Consortium - ICC Profiles, generating ICC profiles for monitor, Scanner and Printer, Device-independent CIE LAB colour space, rendering intents – Perceptual, Relative, Absolute and saturation.

4.4 - Image Reproduction Process using Colour Management Implementing Colour Management, Diagram for Colour perception and the colorimetric description of colour and 3cs’ of colour management.

Unit V: Computer to Plate systems

5.1 - Types of Computer to Plate Systems – Image register and Alignment, Types of CTPs, Advantage of CTP, Components of Computer to Plate system, Different Configuration of CTPs Flatbed, Internal Drum and External Drum.

5.2 - Workflows - PDF and JDF - Portable Document Format, Job Definition Format and their advantages. Preflighting techniques, the process and preflighting checks.

5.3 - Computer to Plate workflow, Types of Lasers – UV, Violet, Thermal and Computer to plate technology for flexography, gravure and screen printing processes. 5.4 - Printing plates for Digital Imaging - Types of Plates used in CTP - Silver halide plates, Photopolymer plates, Thermal plates, Inkjet plates - Automatic plate processor diagram and its functions.

BOOKS FOR REFERENCE:

1. Printing on a digital world - Darid Bergsland, Delmar Publish Inc., New York 1997.
2. Gutenberg goes Digital - Michael Limburg, Blueprint publication, London.
3. The Impact Printing for the commercial printer - techno Economic Forecast (1988 - 1993) - GATF.

Course Outcomes	Program Outcomes								
	P01	P02	P03	P04	P05	P06	P07	P08	P09
C1	H	M	M	L	M	M	H	H	L
C2	H	H	H	L	H	M	M	L	L
C3	H	L	L	L	M	M	H	M	L
C4	H	M	L	L	M	M	M	L	L
C5	M	M	M	L	M	M	H	L	L

PAPER CODE: 20UDP11	SEMESTER VI	CORE XI & CREDIT : 4
SUBJECT NAME : PRINT FINISHING OPERATIONS		

Goal: Students will inculcate knowledge on the post-press stage in printing process.

Objective: To convey information regarding the binding and packaging techniques which was carried out after the printing stage.

Course Outcome:

C01	Print finishing operations and the materials used will be known to the students
C02	Trimming operations and different packaging techniques are fed to the students
C03	Different types of binding procedures are made known to the students
C04	Students inculcate knowledge on different packaging wrappers
C05	Content regarding machines used in binding and packaging are thought to the students

Unit I:

- 1.1 - Brief Introduction to Print Finishing.
- 1.2 - Lamination and Varnishing.
- 1.3 - Classification and Function of Packaging.
- 1.4 – Types of Cartons and Die making process.
- 1.5 – Materials Used in Binding and Packaging.

Unit II:

- 2.1 – Cutting, Trimming, Creasing, Gathering.
- 2.2 - Collating, Perforating, Numbering, Head band, Edge Decoration
- 2.3 - Factors influencing the design of a package
- 2.4 – Introduction to Food packaging, Aseptic Packaging.
- 2.5 – Flexible pouch forming.

Unit III:

- 3.1 - Stitching and types.
- 3.2 – Sewing and types.
- 3.3 - Loose Leaf Binding, Spiral Binding and Comb Binding.
- 3.4 - Perfect Binding, clamping station, milling station, gluing station, nipping station and delivery station.
- 3.5 - Case Binding – preparation of case and casing-in.

Unit IV:

- 4.1 - Closures - Screw cap, Lug cap, Roll on, Crown Cap, Child resistant and Tamper evident Closure.
- 4.2 - Dispensing devices - Snip-top, Dial disc, Dip tube, Brush applicator, Shaker sifter and push-pull type.
- 4.3 - Cushioning Materials, Types - Resilient, Non-resilient and Space fillers.
- 4.4 - Types of Strapping and Sealing tapes.
- 4.5 - Shrink-Wrapping, Sleeve wrap and Envelope wrap.
- 4.6 - Skin Packaging, Blister Packaging, Strip Packaging, Stretch Wrapping.
- 4.7 - Introduction to RFID, QR Code and Barcode, applications in packaging.

Unit V:

5.1 - Guillotine machines, Trimmers, Folding machines.

5.2 - Wire-stitching machine. Thread stitching machine. Sewing machines. Gathering machines. Book back gluing machine. Rounding and backing machine. Back lining machine. Case making machine. Back forming machine. Pressing machine. Perfect binding machine. Laminating machine. Wrapping machine.

5.3 - Thermo Forming machine, Shrink wrap, skin pack, Blister pack, etc. Strip packaging, Shrink packaging, Blister Packaging, Skin packaging, and stretch wrapping. Plastic corrugated boxes, lined cartons. Barcode - types of Barcodes. Metal converting machine. Machines used in making caps and closures.

BOOKS FOR REFERENCE:

1. Introduction to Printing and Finishing – Hugh M Speris
2. The print Production Manual – J.Peacock,C.Berril and M.Barnard
3. Guarding of folding box gluers - British Printing Industries federation.

Course Outcomes	Program Outcomes								
	P01	P02	P03	P04	P05	P06	P07	P08	P09
C1	L	H	M	L	M	L	M	M	H
C2	L	M	L	L	L	M	L	M	H
C3	M	H	L	L	M	L	M	H	H
C4	L	M	L	L	L	M	L	M	H
C5	M	H	L	L	H	H	L	M	H

PAPER CODE: 20UDPP04	SEMESTER VI	CORE PRACTICAL IV & CREDIT : 4
SUBJECT NAME : BINDING AND FINISHING		

Goal: To create self-employment options among the students.

Objective: Aims to give hands on training regarding different binding and finishing techniques.

Course Outcome:

C01	Different binding equipment's are made known to the students
C02	Students tend to know the different binding materials used
C03	Different types of binding methods are well known to the students
C04	Different indexing methods are also made known to the students
C05	Students gathered knowledge on edge decoration and marbling

CONTENTS

1. Study of equipments, tools and materials in binding department.
2. Different styles of Endpaper.
3. Styles of Sewing.
4. Styles of Binding.
 - 4.1 Quarter bound cut flush and turned in with squares.
 - 4.2 Half bound conventional and modern.
 - 4.3 Full bound.
 - 4.4 Case making.
 - 4.5 Account book binding.
5. Indexing.
 - 5.1 One letter index.
 - 5.2 Two letter index.
 - 5.3 Vowel index.
6. Edge decoration and marbling.

Course Outcomes	Program Outcomes								
	P01	P02	P03	P04	P05	P06	P07	P08	P09
C1	L	M	L	L	M	M	L	H	H
C2	M	M	M	L	M	L	M	M	H
C3	L	H	L	M	L	M	L	L	H
C4	M	H	M	L	L	L	M	H	H
C5	L	H	L	M	L	M	L	M	H

PAPER CODE: 20UDPP05	SEMESTER VI	CORE PRACTICAL V & CREDIT : 4
SUBJECT NAME : IMAGE PROCESSING		

Goal: To deliver complete knowledge on digital image processing to the students.

Objective: Input, processing and output techniques in handling a digital image stages are fed to the students.

Course Outcome:

C01	Digital camera handling techniques are made known to the students
C02	Students will get knowledge on using scanners as an image input device
C03	Colour correction, black and white to colour image conversion techniques are delivered to the students
C04	Colour conversion methodology are practised by the students
C05	Printing plate making process are learnt by the students

CONTENTS

1. Image capturing using a Digital Camera
2. Scanning a Line Original using Flatbed Scanner
3. Scanning a continuous tone original using flatbed scanner
4. Scanning text matter using Optical Character Recognition (OCR)
5. Colour Corrections of scanned image
6. Convert Black and white photograph to colour photograph
7. Enhancement of low key originals
8. Convert the given graphics to a safe colour gamut CMYK to RGB / RGB to CMYK
9. Performing channel separation
10. Preparation of Pre-sensitized plates / Wipe-on Plates.

Course Outcomes	Program Outcomes								
	P01	P02	P03	P04	P05	P06	P07	P08	P09
C1	M	H	H	M	M	M	L	M	L
C2	H	H	M	M	M	M	L	L	M
C3	H	H	L	M	M	H	M	M	L
C4	H	H	M	M	M	M	L	L	M
C5	H	H	L	M	M	H	M	M	L

PAPER CODE: 20UDPSB04	SEMESTER VI	SBEC IV & CREDIT : 3
SUBJECT NAME : E-MARKETING		

Goal: To deliver detail information about the E-Marketing techniques to the students.

Objective: Aims to convey knowledge regarding the usage of internet related to business and marketing.

Course Outcome:

C01	Students inculcate knowledge regarding basic internet usage
C02	Components and functions of E-Marketing was made known to the students
C03	Strategies of Digital Marketing are made known to the students
C04	Types of E-Marketing are made known to the students
C05	Students will gather detail information regarding the branding of digital media.

Unit I:

Internet: Concept & evaluation, Features of Internet: email, WWW, ftp, telnet, newsgroup & video conferencing; Intranet & Extranet, ISDN, TCP/IP, Limitation of internet, Hardware & software requirement of Internet.

Unit II:

E-Marketing: Business to Business (B2B), Business to customer (B2C) e-commerce; Online Sales force, On line Service and Support; EDI: Functions & components.

Unit III:

Digital Marketing Strategy, Building blocks of Digital Marketing Strategy,

Unit IV:

Types of E-Marketing: Search Advertisement, Online Advertisement, Affiliate Marketing, Video Marketing. Types of E-Marketing: Social Media Channel, E-Mail Marketing, Mobile Marketing.

Unit V:

Branding on Digital Media: Audience research and engagement in global environment, Building brand on digital media, Story Telling and user generated content on digital media network.

BOOKS FOR REFERENCE:

1. Frontiers of E-Commerce Ravi Kalkota , TMH
2. O. Brien J. Management Information System, TMH
3. eMarketing: The essential guide to marketing in a digital world - Fifth Edition By Rob Stokes and the Minds of Quirk

Course Outcomes	Program Outcomes								
	P01	P02	P03	P04	P05	P06	P07	P08	P09
C1	M	H	H	L	M	H	L	M	L
C2	L	H	M	L	H	M	L	L	L
C3	M	M	H	M	H	M	M	M	L
C4	H	H	M	L	M	H	L	M	L
C5	M	M	H	L	M	M	M	L	L

PAPER CODE: 20UDPP06	SEMESTER VI	CORE PRACTICAL VI & CREDIT : 4
SUBJECT NAME : PRACTICAL VI – DIGITAL PRINT PRODUCTION		

Goal: To make every student to learn different stages of printing and produce a quality output.

Objective: Aims to make every student to undergo all the stages in printing to get all the exercise done.

Course Outcome:

C01	Graphics designing skill of the student will be known
C02	Output using different printing techniques will be given by the students
C03	Students will come to know about the different printing presses by their own
C04	Basic material requirement for a printing job will be made known to the students
C05	Estimating and printing cost will be known to the students

Every student should create a set of professional business stationery collateral set for which includes the following

1. Banner
2. Pamphlet
3. Letter Head
4. Envelop
5. Business Card
6. Pen
7. Diary
8. ID card
9. Wall clock
10. Phone case
11. Paper bag
12. Coffee Mug
13. CD cover & sticker
14. Dangler
15. Folder

Course Outcomes	Program Outcomes								
	P01	P02	P03	P04	P05	P06	P07	P08	P09
C1	H	H	M	M	H	H	M	L	L
C2	L	H	M	L	M	M	H	H	M
C3	M	M	M	L	M	M	H	M	H
C4	L	H	M	L	H	M	M	H	H
C5	L	H	M	L	H	L	M	H	M