SCHEME OF EXAMINATION
&
SYLLABUS
of
UG Programme (Interdisciplinary)

B.Sc. (Printing & Packaging Technology)
Scheme: D

As per National Education Policy 2020

(Multiple Entry-Exit, Internships and Choice Based Credit System)

w.e.f. Academic Session: 2023-2024(in phased manner)

INSTITUTE OF MASS COMMUNICATION & MEDIA TECHNOLOGY
Kurukshetra University, Kurukshetra
(A+ Grade NAAC Accredited)

under

Faculty of Commerce and Management,

GENERAL INSTRUCTIONS FOR EXAMINERS / PAPER SETTERS / SUBJECT TEACHERS

EVALUATION AND EXAMINATION

- The students will be assessed through a system of Continuous Comprehensive Assessment (CCA).
- Evaluation will be done by Internal assessment (broadly 30% of total weightage) and by end term exam for rest 70%).

Theory Internal Assessment shall broadly based on the following defined composition:

a) Class Participation
b) Seminar/Presentation/Assignment/Quiz/Class Test, etc.
c) Mid-Term Exam

Total Internal Assessment Marks	Class Participation	Seminar/Demonstration/Presentation/ Assignment/Quiz/Class Test, etc.	Mid-Term Exam
10	03	02	05
15	04	04	07
20	05	05	10
25	05	07	13
30	05	10	15

Practical Internal Assessment shall broadly be based on the following defined composition:

a) Class Participation
b) Seminar/Presentation/Viva-voce/Lab Records, etc.
c) Mid-Term Exam

Total Internal Assessment Marks (Practical)	Class Participation	Seminar/Demonstration/Viva-Voce/Lab Record etc.	Mid-Term Exam
05	-	05	NA
10	-	10	NA
15	05	10	NA
30	05	10	15

MODE OF PAPER SETTING FOR END-TERM EXAMINATION:

Every course irrespective of credit will have an End-Term Examination with every course paper having 09 questions in all. Question No. 1 containing short notes will be compulsory. The students will have to attempt Five questions in all selecting at least 1 question from each unit. Duration of the exam will be 3 hours irrespective of credit. These questions shall judge both theoretical and applied knowledge of the students. Case studies may also be given as questions.

Abbreviations used

Abbreviation	Description
AEC	Ability Enhancement Course
C	Credit
CC	Core Course
CC-H	Core Course in Honours Programme (Subject/Discipline)
CC-HM	Core Course in Minor Subject of Honours Programme
CC-M	Core Course in Minor Subject
DSE	Discipline Specific Elective Course
DSE-H	Discipline Specific Elective Course in Honours Programme (Subject/Discipline)
DSEC	Discipline Specific Skill Enhancement Course
MCC	Core Course in Major Subject
MDC	Multidisciplinary Course
PC	Practicum Course
PC-H	Practicum Course in Honours Programme
SEC	Skill Enhancement Course
UG	Under Graduate
V/VOC	Vocational Course
VAC	Value Added Course

Scheme of Examination of UG Programme (Interdisciplinary) B.Sc. (Printing & Packaging Technology)
Scheme:D in accordance with NEP 2020 (Multiple Entry-Exit, Internships and Choice Based Credit System)
w.e.f. Academic Session 2023-24 (in phased manner)

Semester-I

Course Code	Course Title	Course Type	Contact Hours per Week				Credits	Marks					Duration of Exam
			L	T	P	Total		T	IA (T)	P	IA (P)	Total	
B23-PPT-101	Printing Process	CC-A1	3	-	2	5	4	50	20	20	10	100	3 Hours
B23-PPT-102	Typography	CC-B1	3	-	2	5	4	50	20	20	10	100	3 Hours
B23-PPT-103	Fundamental of packaging	CC-C1	3	-	2	5	4	50	20	20	10	100	3 Hours
B23-PPT-104	Science of Communication	CC-M1	2	-	-	2	2	35	15	-	-	50	3 Hours
B23-PPT-105	Printing Technology	MDC-1	2	-	2	4	3	35	15	20	5	75	3 Hours
	As available in pool of subjects approved by KUK	AEC-1	2	-	-	2	2	35	15	-	-	50	3 Hours
	As available in pool of subjects approved by KUK	SEC-1	2	-	2	4	3	35	15	20	5	75	3 Hours
	As available in pool of subjects approved by KUK	VAC-1	2	-	-	2	2	35	15	-	-	50	3 Hours
						Total Credits	**24**	**Total Marks**				**600**	

Semester-II

Course Code	Course Title	Course Type	Contact Hours per Week				Credits	Marks					Duration of Exam
			L	T	P	Total		T	IA (T)	P	IA (P)	Total	
B23-PPT-201	Food Packaging	CC-A2	3	-	2	5	4	50	20	20	10	100	3 Hours
B23-PPT-202	Graphic Design	CC-B2	3	-	2	5	4	50	20	20	10	100	3 Hours
B23-PPT-203	Sheet fed Offset Technology	CC-C2	3	-	2	5	4	50	20	20	10	100	3 Hours
B23-PPT-204	Computer Science	CC-M2	2	-	-	2	2	35	15	-	-	50	3 Hours
B23-PPT-205	Packaging Technology	MDC-2	2	-	2	4	3	35	15	20	5	75	3 Hours
	As available in pool of subjects approved by KUK	AEC-2	2	-	-	2	2	35	15	-	-	50	3 Hours
	As available in pool of subjects approved by KUK	SEC-2	2	-	2	4	3	35	15	20	5	75	3 Hours
	As available in pool of subjects approved by KUK	VAC-2	2	-	-	2	2	35	15	-	-	50	3 Hours
						Total Credits	**24**	**Total Marks**				**600**	

Internship of 4 credits of 4-6 weeks duration after 2nd semester
Exit option: Under graduate certificate in B.Sc. (Printing & Packaging Technology) with 52 credits.

Semester-III

Course Code	Course Title	Course Type	Contact Hours per Week				Credits	Marks					Duration of Exam
			L	T	P	Total		T	IA (T)	P	IA (P)	Total	
B23-PPT-301	Image Reproduction Technology	CC-A3	3	-	2	5	4	50	20	20	10	100	3 Hours
B23-PPT-302	Paper and Ink Technology	CC-B3	3	-	2	5	4	50	20	20	10	100	3 Hours
B23-PPT-303	Flexography	CC-C3	3	-	2	5	4	50	20	20	10	100	3 Hours
B23-PPT-304	Components of Multimedia	CC-M3	3	-	2	5	4	50	20	20	10	100	3 Hours
B23-PPT-305	Printing Materials Technology	MDC-3	2	-	2	4	3	35	15	20	5	75	3 Hours
	As available in pool of subjects approved by KUK	AEC-3	2	-	-	2	2	35	15	-	-	50	3 Hours
	As available in pool of subjects approved by KUK	SEC-3	2	-	2	4	3	35	15	20	5	75	3 Hours
							Total Credits :24	**Total Marks**				**600**	

Semester-IV

Course Code	Course Title	Course Type	Contact Hours per Week				Credits	Marks					Duration of Exam
			L	T	P	Total		T	IA (T)	P	IA (P)	Total	
B23-PPT-401	Pre-Press Technology	CC-A4	3	-	2	5	4	50	20	20	10	100	3 Hours
B23-PPT-402	Web-Fed Offset Technology	CC-B4	3	-	2	5	4	50	20	20	10	100	3 Hours
B23-PPT-403	Gravure Technology	CC-C4	3	-	2	5	4	50	20	20	10	100	3 Hours
	As available in pool of subjects approved by KUK	CC-M4 (V)					4					100	3 Hours
	As available in pool of subjects approved by KUK	AEC-4	2	-	-	2	2	35	15	-	-	50	3 Hours
	As available in pool of subjects approved by KUK	VAC-3	2	-	-	2	2	35	15	-	-	50	3 Hours
							Total Credits 20	**Total Marks**				**500**	

Internship of 4 credits of 4-6 weeks duration after 4th semester
Exit option: Under graduate certificate in B.Sc. (Printing & Packaging Technology) with 96 credit

Semester-V

Course Code	Course Title	Course Type	Contact Hours per Week				Credits	Marks					Duration of Exam
			L	T	P	Total		T	IA (T)	P	IA (P)	Total	
B23-PPT-501	Binding and Finishing Technology	CC-A5	3	-	2	5	4	50	20	20	10	100	3 Hours
B23-PPT-502	Book and Newspaper Publishing	CC-B5	3	-	2	5	4	50	20	20	10	100	3 Hours
B23-PPT-503	Quality Control	CC-C5	3	-	2	5	4	50	20	20	10	100	3 Hours
	As available in pool of subjects approved by KUK	CC-M5(V)	3	-	2	5	4	50	20	20	10	100	3 Hours
	Internship		-	-	-	-	4	-	-	-	-	100	-
Total Credits :20								**Total Marks**				**500**	

Semester-VI

Course Code	Course Title	Course Type	Contact Hours per Week				Credits	Marks					Duration of Exam
			L	T	P	Total		T	IA (T)	P	IA (P)	Total	
B23-PPT-601	Digital Printing	CC-A6	3	-	2	5	4	50	20	20	10	100	3 Hours
B23-PPT-602	Security Printing	CC-B6	3	-	2	5	4	50	20	20	10	100	3 Hours
B23-PPT-603	Costing and Estimating	CC-C6	4	-	-	4	4	70	30	-	-	100	3 Hours
B23-PPT-604	Artificial Intelligence and Cyber security	CC-M6	3	-	2	5	4	50	20	20	10	100	3 Hours
	As available in pool of subjects approved by KUK	CC-M7 (V)	3	-	2	5	4	50	20	20	10	100	3 Hours
Total Credits 20								**Total Marks**				**500**	

Exit option: Under graduate certificate in B.Sc. (Printing & Packaging Technology) with 132 credit

SEMESTER I

B-23/PPT/101
PRINTING PROCESS

Time-3 Hours
Total Credits – 04
Theory - 50
Internal assessment (T) – 20
Practical-20
Internal assessment (P) – 10
Total Marks – 100

Note- The question paper will contain nine questions. Students are required to attempt five questions in all. There will be two questions in each Unit from Unit-I to Unit-IV. Students are required to attempt one question from each unit from I to IV. Q. No. 1 containing short notes covering the entire syllabus is compulsory. All the questions will carry equal marks. The students can attempt question paper either in English or in Hindi language.

COURSE LEARNING OBJECTIVES:

- CLO 1: Know about historical development of printing
- CLO 2: Develop the knowledge about the different printing processes
- CLO3: Acquire knowledge aboutbasic operations in printing.
- CLO4: Know aboutworking of printing machines and defects.

UNIT	Topic		Contact Hours
UNIT- I	**History of printing:** History of Printing, Scope of Indian Printing Industry, Applications of printing Industry, Indian printing Industry- An emerging market, size of the industry, total contribution to the economy, employment opportunity, Recent trends in Printing.	**CLO 1**	**12**
UNIT- II	**Printing Processes:** Introduction to conventional printing processes- Relief, Planography, Intaglio, Screen. On Demand printing, Electrostatic, Digital and Mini Offset. Specialized printing -Thermography, Die Stamping, Hot foil stamping, Hologram printing. Suitability & limitations and applications of various printing Processes	**CLO 2**	**12**
UNIT-III	**Basic operations in printing**- Pre -Press,Press and Post –press section,: Basic concepts, Typesetting of text matter, formatting the text pagination and arranging the pictures and graphics, Film outputting of text and visual elements particularly color separation, assembly of film and plate making. press: Pre make ready, make-ready operations , Finishing operations	**CLO 3**	**12**
UNIT IV	**Running Defects of different printing process:** Common printing defects comes in various printing processes, causes and their remedies.	**CLO4**	**12**

Practical

1. Identification of different tools &equipment used in letterpress.
2. Schematic diagram of different Printing Processes.
3. Printing of line & half tone block in single & multi color.
4. Operational and mechanical features of different letter press Printing Machines.
5. Study of Running & printing faults on letter press machine.
6. Identification of different printing processes
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Reference books:

1. Letter Press Printing Part 1, 2, By C.S. Misra
2. Printing Technology By Adams, Faux, Rieber
3. Screen Printing Review ByBabett Magee
4. Screen Printing By John Stephens
5. Art and Print Production By N.N. Sarkar

B-23/PPT/102
TYPOGRAPHY

Time-3 Hours
Total Credits – 04
Theory - 50
Internal assessment (T) – 20
Practical-20
Internal assessment (P) – 10
Total Marks – 100

Note- The question paper will contain nine questions. Students are required to attempt five questions in all. There will be two questions in each Unit from Unit-I to Unit-IV. Students are required to attempt one question from each unit from I to IV. Q. No. 1 containing short notes covering the entire syllabus is compulsory. All the questions will carry equal marks. The students can attempt question paper either in English or in Hindi language.

COURSE LEARNING OBJECTIVES:

- CLO 1: Introduction about the basics of Typography.
- CLO 2: Know about classification of printing types.
- CLO 3: Understand about Typesetting tools and equipments.
- CLO 4: Know about composition and paper calculation

UNIT	Topic		Contact Hours
UNIT- I	**Introduction to Typography -** definition, concept and scope, Printing type - Two Dimensional and Three-Dimensional structure their characteristics, Printers Measurement and Systems: Point System, other units of measurements and application. Design features and principles of printing types, fundamental and finishing strokes of types.	**CLO 1**	**12**
UNIT- II	**Classification of printing types** based on serifs, point sizes, cases, faces, series, families etc. type font and sorts, principles of size and design identification, Suitability of different types for different processes and publications, typesetting Calculations relating to type sizes and dimensions of printing pages.	**CLO 2**	**12**
UNIT-III	**Typesetting Department**:-Work and role of the type-setting, department with in a printing press, Photo Type -setting., Proofing and Proofing Reader's marks; word breaks; proofing stages. Composing Tools and Equipment, Basic composing tools for hand composition, spacing material; locking- up devices; proofing presses, kinds of rules.	**CLO 3**	**12**

UNIT-IV	**Composition** Imposition, Sheet work, Half-sheet work, Work and tumble & Work and twist. The regular schemes up to 32 pages (upright and landscape), Planning of composition department, Floor plan and arrangement of equipment, Paper and its calculation.	**CLO 4**	

Practical

1. Block Lettering & Numbering (Normal Types).
2. Four-line Principle (Drawing).
3. Physical (Features) parts of the type (Structural Diagram).
4. Fundamental strokes.
5. Finishing strokes & their identification.
6. Introduction to various fonts & their drawing characteristics.

Reference books:

1	Theory & practice of composition	-	By A.C. Goel
2	Composing & Typography Today	-	By B.D. Mehandirutta.
3.	Letter Press Printing Part I, II	-	By C.S. Mishra
4.	Printing Technology		By Adams,Faux,Riber
5.	Art & Print Production		By N.N. Sarkar

B-23/PPT/103
FUNDAMENTALS OF PACKAGING

Time-3 Hours
Total Credits – 04
Theory - 50
Internal assessment (T) – 20
Practical-20
Internal assessment (P) – 10
Total Marks – 100

Note- The question paper will contain nine questions. Students are required to attempt five questions in all. There will be two questions in each Unit from Unit-I to Unit-IV. Students are required to attempt one question from each unit from I to IV. Q. No. 1 containing short notes covering the entire syllabus is compulsory. All the questions will carry equal marks. The students can attempt question paper either in English or in Hindi language.

COURSE LEARNING OBJECTIVES:

CLO 1: Know about the Basics of Packaging
CLO 2: Understand about the folding Carton Production & Innovative Packaging Techniques
CLO 3:Acquire knowledge about Packaging Distribution & logistics
CLO 4: Know about future Trends and Finishing operations

	Topic		Contact Hours
UNIT- I	**Basics of Packaging:** **Packaging** Introduction, Classifications of Packaging - Flexible packaging and rigid packaging, Function of a package, Types of package, Factors influencing design of a package, Elements of Package Design, Hazard on the package - mechanical, climatic, biological and other hazards.	**CLO 1**	**12**
UNIT- II	**Folding Carton Production & Innovative Packaging Techniques** Folding cartons production process, types of folding carton, Paperboard, types of paperboard used in carton making, components in a corrugated board, Vacuum packaging, shrink packaging, stretch wrapping, blister packaging, Aerosol packaging, Blow Molding - Extrusion blow Molding, Injection blow molding.	**CLO 2**	**12**
UNIT- III	**Packaging Distribution & logistics** Introduction to logistics, element of logistics, distribution of channels, Packaging Cycle, Product life curve, classification of pallets, material handling techniques-warehousing & storage, Markings on Package - Handling marks, routing marks, information marks, shelf life,	**CLO 3**	**12**
UNIT-IV	**Future Trends and Finishing operations** Futuristic trends in packaging, adhesive tapes - fabric tapes, paper tapes, film tapes, foil tapes, foam tapes, two faced tapes. Labels-designing, manufacturing and applications, Packaging finishing operations – coating, lamination, hot & cold foil stamping, die-cutting, embossing & de-embossing, liner and folding & gluing.	**CLO 4**	**12**

Practical

1. Designing and preparation of various flexible packages.
2. Designing and preparation of various rigid packages.
3. Study and operation of various packaging machines.
4. Designing & preparation of various designs of paper bags.
5. Testing of raw materials like- paper, paperboard, plastic and ink.
6. Drop test, Vibration test, inclined impact test, Compression test.

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Reference books:

Packaging design and performance - **Frank Paine**

Advances in plastic packaging technology - **John Briston**.

Packaging design an introduction - **Laszlo Roth**.

Packaging Technology - Volume I, II, III - IIP

B23-PPT-104

Science of communication

Credits – 02
Theory- 35
Internal Assessment- 15
Total Marks – 50

Note- The question paper will contain nine questions. Students are required to attempt five questions in all. There will be two questions in each Unit from Unit-I to Unit-IV. Students are required to attempt one question from each unit from I to IV. Q. No. 1 containing short notes covering the entire syllabus is compulsory. All the questions will carry equal marks. The students can attempt question paper either in English or in Hindi language.

COURSE LEARNING OBJECTIVES:

After completing the Course, the student will be able to:

- CLO 1:.understand the basic concepts of communication
- CLO 2: know about the communication principles and process
- CLO 3: learn about the various kinds of communication
- CLO 4:.understand the different models of communication

UNIT	Topic		Contact Hours
UNIT- I	• Definition, Concept, process and elements of communication • Need and scope of Communication in society • Functions of communication • Barriers in communication	**CLO1**	**12**
UNIT- II	• Principles of communication • Socialization and communication • Verbal communication • Non-verbal communication • Traditional forms of communication	**CLO2**	**12**
UNIT-III	• Levels of communication and interaction: intra-personal, interpersonal, Group, public and mass communication. • Indian concept of communication	**CLO3**	**12**
UNIT-IV	Models of communication • Aristotle • SMR • SMCR • Berlo • Shannon ad Weaver • Osgood • Schramm	**CLO4**	**12**

B-23/PPT/105
PRINTING TECHNOLOGY

Time-3 Hours
Total Credits – 03
Theory - 35
Internal assessment (T) – 15
Practical-20
Internal assessment (P) – 5
Total Marks – 75

Note- The question paper will contain nine questions. Students are required to attempt five questions in all. There will be two questions in each Unit from Unit-I to Unit-IV. Students are required to attempt one question from each unit from I to IV. Q. No. 1 containing short notes covering the entire syllabus is compulsory. All the questions will carry equal marks. The students can attempt question paper either in English or in Hindi language.

COURSE LEARNING OBJECTIVES:

- CLO 1: Know about historical development of printing
- CLO 2: Develop the knowledge about the different printing processes
- CLO 3: Acquire knowledge about basic operations in printing.
- CLO 4: Know about working of printing machines and defects.

UNIT	Topic		Contact Hours
UNIT- I	**Scope of printing:** Scope of Indian Printing Industry, Applications of printing Industry, Indian printing Industry- An emerging market, size of the industry, total contribution to the economy, employment opportunity, Recent trends in Printing.	**CLO1**	**12**
UNIT- II	**Types of Printing:** Relief, Planography, Intaglio, Screen. On Demand printing, Electrostatic, Digital and -Thermography, Die Stamping, Hot foil stamping, Hologram printing.3D printing	**CLO2**	**12**
UNIT-III	**Pre press ,Press and Post press operations**-,: Basic concepts, Typesetting of text matter, formatting the text pagination and arranging the pictures and graphics, Film outputting of text and visual elements particularly color separation, assembly of film and plate making. press: Pre make ready, make-ready operations , Finishing operations	**CLO3**	**12**
UNIT-IV	**Printing Defects :**Common printing defects comes in various printing processes like Picking and Plucking, show through, set off etc, causes and their remedies.	**CLO4**	**12**

Practical

1. Identification of different tools &equipment used in letterpress.
2. Schematic diagram of different Printing Processes.
3. Printing of line & half tone block in single & multi color.
4. Operational and mechanical features of different letter press Printing Machines.
5. Study of Running & printing faults on letter press machine.
6. Identification of different printing processes
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Reference books:

1. Letter Press Printing Part 1, 2, By C.S. Misra
2. Printing Technology By Adams, Faux, Rieber
3. Screen Printing Review ByBabett Magee
4. Screen Printing By John Stephens
5. Art and Print Production By N.N. Sarkar

SEMESTER II

B-23/PPT/201
FOOD PACKAGING

Time-3 Hours
Total Credits – 04
Theory - 50
Internal assessment (T) – 20
Practical-20
Internal assessment (P) – 10
Total Marks – 100

Note- The question paper will contain nine questions. Students are required to attempt five questions in all. There will be two questions in each Unit from Unit-I to Unit-IV. Students are required to attempt one question from each unit from I to IV. Q. No. 1 containing short notes covering the entire syllabus is compulsory. All the questions will carry equal marks. The students can attempt question paper either in English or in Hindi language.

COURSE LEARNING OBJECTIVES:

CLO1: Develop the knowledge of Food Packaging
CLO2: Understand the Aseptic packaging of foods
CLO3: Develop the knowledge of Active and Smart packaging
CLO4: Understand the properties & selection of packaging materials

UNIT	Topic		Contact Hours
UNIT- I	**Introduction** • Food packaging: Definition, Functions of food packaging, Need of food packaging, Role of packaging in extending shelf life of foods Safety assessment of food packaging materials, Different forms of packaging. Rigid, semi-rigid, flexible forms of packaging in food industries, Different packaging system for-Dehydrated foods, Frozen foods, Dairy products, Fresh fruits, Vegetables, Meat, Poultry, Sea foods.	**CLO1**	**12**
UNIT- II	**Aseptic packaging of foods** • Principles of sterilization, sterilization of packaging material, verification of sterilization processes, aseptic packaging systems: carton systems, can systems, bottle systems, sachet and pouch systems, cup systems	**CLO2**	**12**
UNIT-III	**Active and Smart packaging** • Definition • Smart packaging systems • intelligent packaging systems: Quality Indicators, Time-temperature	**CLO3**	**12**

	• indicators, gas concentration indicators, RFID; • Safety and Regulatory issues		
UNIT-IV	**Properties & selection of packaging materials** • Tensile strength, bursting strength, tearing resistance, puncture • resistance, impact strength, tear strength, • Barrier properties of packaging materials,, • prediction of shelf life of foods,	**CLO4**	**12**

Practical

1. Identification of different types of packaging and packaging materials

2. Determination of tensile strength of given material

3. Determination of tearing strength of paper

4. Determination of bursting strength of packaging material

6. Determination of drop test of food package

7. Visit to relevant industries

8 Introducing the students with the latest trends in packaging consulting the web sites and magazines

Reference books:

Gordon L. Robertson, Food Packaging: Principles and Practice, Third Edition,2013.

Gordon L. Robertson, Food Packaging and Shelf Life: A Practical Guide,2010.

Ruben Hernandez, Susan E. MSelke, John Culter, John D. Culter,

Plastics Packaging: Properties, Processing, Applications, and Regulations,2000.

Walter Soroka, Fundamentals of Packaging Technology-Fourth Edition,

B-23/PPT/202
GRAPHIC DESIGN

Time-3 Hours
Total Credits – 04
Theory - 50
Internal assessment (T) – 20
Practical-20
Internal assessment (P) – 10
Total Marks – 100

Note- The question paper will contain nine questions. Students are required to attempt five questions in all. There will be two questions in each Unit from Unit-I to Unit-IV. Students are required to attempt one question from each unit from I to IV. Q. No. 1 containing short notes covering the entire syllabus is compulsory. All the questions will carry equal marks. The students can attempt question paper either in English or in Hindi language.

COURSE LEARNING OBJECTIVES:

CLO1: Know about basic of Graphic Design
CLO2: Develop the knowledge about the different types of letterforms
CLO3: Acquire knowledge about basic color schemes.
CLO4: Know about desktop publishing

UNIT	Topic		Contact Hours
UNIT- I	**INTRODUCTION** **Graphic Design**, Visual Art, Communication Art, Graphic Art, Components of Graphic Communication, Functions of Graphic Communication **Elements of design**: point line, shape, size, tone, value, weight, texture space, etc. Principles of design- balances, proportion, rhythm, unity, contrast.	**CLO1**	**12**
UNIT- II	**Types of Letterforms**: Typography- Structure Design and Function, Typefaces, Type families, Function of Type Composition. **Visual Images**: Functions, Categories of Visuals, Originals, Visuals on Printed page, Editing of Illustrations **Layout Planning**: Thumbnail Sketches, Rough Layout, Comprehensive Layout	**CLO2**	**12**
UNIT-III	**Colour in Design**: Introduction, Functions of Colour, Colour Vision. Colour Combination, Colour Schemes, Colour Perspective, Reproduction of Colour: Fake colours, Spot	**CLO3**	**12**

	Colours, Process Colours **Copy for Printing:** Verbal Copy, Copy Marking, Copy Fitting, Typesetting Proofreading **Visual Copy:** Cropping and Scaling,, Sizing and Marking, Reproduction of Illustrations		
UNIT-IV	**DESKTOP PUBLISHING** Capabilities, Users of Desktop Publishing System, Equipment Required for Desktop Publishing, Features of Some Specific Software Programmes: CorelDraw, Photoshop, PageMaker, QuarkXPress Design management: Definitions in advertising art, modern art abstract art, applied art, advertising, publicity, public relations, sale promotion, sales manager	**CLO4**	**12**

Practical

1. Introduction to computers, various software used for designing purpose – Demonstration (Manipulation of same design)
2. Logo designing
3. Color wheel
4. Designing of visiting card. Letterhead,
5. Envelop, Bill form, Receipt, Invitation card, Posters,
6. Title page of a Book, Magazine Cover page.

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Reference books:

The Designer's Handbook by Alistair Campbell
2. Design & Technology by Van No strand
3. Handbook of Advertising Art Production by schelmmer.
4. Art & Print Production by N.N. Sarkar.
5. Advertising, Art & Production by J. Nath

B-23/PPT/203
SHEET FED OFFSET TECHNOLOGY

Time-3 Hours
Total Credits – 04
Theory - 50
Internal assessment (T) – 20
Practical-20
Internal assessment (P) – 10
Total Marks – 100

Note- The question paper will contain nine questions. Students are required to attempt five questions in all. There will be two questions in each Unit from Unit-I to Unit-IV. Students are required to attempt one question from each unit from I to IV. Q. No. 1 containing short notes covering the entire syllabus is compulsory. All the questions will carry equal marks. The students can attempt question paper either in English or in Hindi language.

COURSE LEARNING OBJECTIVES:

-CLO1: Know about Basic of planography printing
- CLO2: Develop the knowledge about the infeed unit of sheet fed offset printing machine.
- CLO3: Acquire knowledge about basic operations in printing unit
- CLO4: Know about working of printing machines delivery unit.

UNIT	Topic		Contact Hours
UNIT- I	**Basic principles in planography printing:** Lithography and Offset Printing Process, History, Principle, advantages, limitations, types and their uses. Press configurations. Various Required and auxiliary elements, Requirements and Needs of production room	**CLO1**	**12**
UNIT- II	**Infeed unit** – Function of feeding unit, pile table, air blast nozzles, Sucker, separator brushes & fingers. Sheet control devices-conveyor assemblies, conveyor tape, hold down rods, Sheet feeding system, Sheet register- Front lay & Side lay, Sheet detectors	**CLO2**	**12**
UNIT-III	**Printing unit** Plate Cylinder- parts of plate cylinder, plate punching & mounting Blanket cylinder- Types of blanket cylinder, Care of blanket, blanket cleaning device, Impression cylinder, inking system-Introduction, types of inking system, Dampening system, Types of dampening system, Ingredients of fountain solution, Ph& Conductivity of dampening system,	**CLO3**	**12**
UNIT-IV	**Delivery unit-** Gripper, Types of gripper, Sheet transfer, Delivery unit components, Anti set-off spray equipment. Extended pile delivery, Continuous pile delivery. Pre make ready, make ready, Sheet control devices.	**CLO4**	**12**

Practical

1. One colour printing.
2. Four colour printing.
3. Study of the various mechanisms.
4. Study of the fountain solution ingredients
5. Study of the lubrication system.
6. Setting the feeder, feed board, lays and delivery.
7. Identification of printing faults in the given samples-reasons and remedial actions.

Reference books:

Manual For Lithographic Press Operation - **A. S. Porter**
Modern Lithography Introduction to Printing Technology - **Hugh M Speirs**.
Sheetfed Press Operation-**GATF**.
Offset Technology – **C.S.Mishra**.
Lithographers Manual Lithographic Technology - **Erwin A Dennis, Olusegun Odesina**.

B23-PPT-204

COMPUTER APPLICATIONS

Time- 3 Hours
Credits – 02
Theory- 35
Internal Assessment- 15
Total Marks – 50

Note- The question paper will contain nine questions. Students are required to attempt five questions in all. There will be two questions in each Unit from Unit-I to Unit-IV. Students are required to attempt one question from each unit from I to IV. Q. No. 1 containing short notes covering the entire syllabus is compulsory. All the questions will carry equal marks. The students can attempt question paper either in English or in Hindi language.

COURSE LEARNING OBJECTIVES:

- CLO1: Understand the basic knowledge of computer system.
- CLO2: Know about the functioning of different parts of computer.
- CLO3: Knowledge about Operating System.
- CLO4:Understand the basics of Application Software.

UNIT	Topic		Contact Hours
UNIT- I	Computer- Origin, Evolution and Generation of Computer Characteristics of Computer Types of Computer Block Diagram of Computer	**CLO1**	**12**
UNIT- II	Basic Components of a Computer-: Input Devices Output Devices Storage organization: Primary & Secondary Memory	**CLO2**	**12**
UNIT-III	Introduction to Software Types of Software - System software, Application software Operating system and its functions Introduction of MS Window and its various versions	**CLO3**	**12**
UNIT- IV	Introduction to MS Word and its uses Various Menus, Toolbars & Buttons Paragraph and Page Formatting Creation &Working with Tables, Mail Merge Introduction to MS PowerPoint and its uses Creating a New Presentation	**CLO4**	**12**

References:

- Ram, B. 4th ed New Age; ***Computer Fundamentals: Architecture & Organization*** Sinha, P. K. BPB; ***Computer Fundamentals: Concepts, Systems & Applications***
- Sinha, P. K/ Sinha, P. 3rd ed BPB; ***Computer Fundamentals: Concepts, Systems & Applications***
  Data Communications and Networking by Behrouz A. Forouzan, Sophia Chung Fegan; Published by Huga Media.2011
- Goel, Anita Pearson; ***Computer Fundamentals***

B-23/PPT/205
PACKAGING TECHNOLOGY

Time-3 Hours
Total Credits – 03
Theory - 35
Internal assessment (T) – 15
Practical-20
Internal assessment (P) – 5
Total Marks – 75

Note- The question paper will contain nine questions. Students are required to attempt five questions in all. There will be two questions in each Unit from Unit-I to Unit-IV. Students are required to attempt one question from each unit from I to IV. Q. No. 1 containing short notes covering the entire syllabus is compulsory. All the questions will carry equal marks. The students can attempt question paper either in English or in Hindi language.

COURSE LEARNING OBJECTIVES:

CLO1: Know about **Basics of Packaging**

CLO2: Knowledge about the different Packaging Material
CLO3: Acquire knowledge about Innovative Packaging Techniques.
CLO4: Know about Future and Environments Impact.

UNIT	Topic		Contact Hours
UNIT- I	**Basics of Packaging:** Introduction, Function of a package, Factors influencing design of a package, Computer Aided Package Design, Packaging Cycle, Product Package Relationship, Product life curve, Elements of Package Design. Classification of Packaging - Flexible package type, Rigid package types. Hazards on package - Mechanical, Climatic, Biological and other hazards. Markings on package - Handling marks, routing marks, information marks.	**CLO1**	**12**
UNIT- II	**Packaging Material:** Effect of moisture on wood, preservation of wood, advantages. Boards-types, paper-types. Glass properties, advantages, types, basic approaches to designing a bottle, thermal shock test, pressure test, impact test, density test. Plastics-BOPP, HDPE, LDPE, LLDPE, PVC, PP, PET, Polyolefin, Cellulosic, Polyimides, advantages, functions	**CLO2**	**12**

	&applications. Tests on plastics, Metals - functions, uses. Aluminium foils - Manufacturing of foil, properties, applications, methods of laminating foil to film or paper.		
UNIT-III	**Innovative Packaging Techniques**: Gas packaging - MAP & CAP, Vacuum packaging, shrink packaging, stretch wrapping, blister packaging, skin packaging, strip packaging, Aerosol packaging container, working principle. Injection Blow Moulding, Extrusion blow Moulding, Extrusion. Injection Moulding, Compression moulding, Thermo forming. Vacuum forming, Pressure forming, Matched mould forming.	**CLO3**	**12**
UNIT IV	**Future and Environments Impact:** Futuristic trends in packaging. Advancements in food packaging. Environmental implications of packaging - recycling, Legal aspects in packaging.	**CLO4**	**12**

Practical

1. Identification of different tools &equipment used in letterpress.
2. Schematic diagram of different Printing Processes.
3. Printing of line & half tone block in single & multi color.
4. Operational and mechanical features of different letter press Printing Machines.
5. Study of Running & printing faults on letter press machine.
6. Identification of different printing processes

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Reference books:

1. Letter Press Printing Part 1, 2, By C.S. Misra
2. Printing Technology By Adams, Faux, Rieber
3. Screen Printing Review ByBabett Magee
4. Screen Printing By John Stephens
5. Art and Print Production By N.N. Sarkar

SEMESTER III

B-23/PPT/301
IMAGE REPRODUCTION TECHNOLOGY

Time-3 Hours
Total Credits – 04
Theory - 50
Internal assessment (T) – 20
Practical-20
Internal assessment (P) – 10
Total Marks – 100

Note- The question paper will contain nine questions. Students are required to attempt five questions in all. There will be two questions in each Unit from Unit-I to Unit-IV. Students are required to attempt one question from each unit from I to IV. Q. No. 1 containing short notes covering the entire syllabus is compulsory. All the questions will carry equal marks. The students can attempt question paper either in English or in Hindi language.

COURSE LEARNING OBJECTIVES:

- CLO1: Know about basic principles of reproduction photography
- CLO2: Develop the knowledge about the Halftone photography
- CLO3:Acquire knowledge about basic Contrast control
- CLO4: Know about Color Reproduction photography.

UNIT	Topic		Contact Hours
UNIT- I	**Basic principles of reproduction photography**: line photography; Basic density range of line original Basic line exposure for computerized camera with on-line or off-line densitometer, equipments and accessories. Contact photography – Spreads and chokes, Line separation from black and white art work, Evaluation of line negative.	**CLO1**	**12**
UNIT- II	**Halftone photography** – Introduction to the concepts, Theories of dot formation, Selection of screen ruling, Introduction to different halftone screens, glass screen (brief study), contact screens – Grey and magenta Contact screen manufacture, Density gradient of contact screens, Negative, Positive, standard or universal contact screen. Pre-screened emulsion. Half tone exposure: Special features of half tone exposure. Factors affecting the halftone exposure. Basic halftone exposure setting on ordinary and computerized camera with off-line and on-line densitometer.	**CLO2**	**12**
UNIT-III	**Contrast control:** Contrast with glass screen: S.D. variation, multiple stop system (brief study) Contrast control with contact	**CLO3**	**12**

	screens Determining B.D.R. and main exposure of the contact screen, Highlight compensation, Use of CC filters with magenta contact screen determining CC filters and exposure calculations. Auxiliary or supplementary exposures: Contrast control with supplementary exposures. Flash exposure-Deciding the basic flash exposure, for contact screens Exposure calculations. No screen exposure-calculations. Line and halftone combination, Evaluation of halftone negative.		
UNIT-IV	**Color Reproduction:** Definition and concepts Introduction to Corpuscular and Wave nature of light. The visual spectrum, Additive Synthesis and subtractive synthesis, Additive and subtractive combination for graphic for reproduction and practical interpretation of color-theories. Mechanism of vision and theory of color-vision, colorimetric Properties, Color and appearance measurement. Introduction to Colorimeter and Spectrometer.	**CLO4**	**12**

Practical

1. Study and Setting of image reproduction camera with diagram.
2. Process of Line negative and positive preparation.
3. Halftone negative and positive preparation
4. Study of different types of filters with diagram.
5. Study of Dots preparation with Diagram.
6. Different types of screen in reproduction technology
7. Study of Densitometer.

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Reference books:

Line photography- Karl Davis Robinson

Halftone Photography – Erwin Jaffe

Small Offset Preparation & Process- Les Crawhurst

Printing Technology- Adams, Faux, Rieber.

Reproduction Systems- V.S. Raman

Digital Photography- Anthony Hamber, Phill Green.

B-23/PPT/302
PAPER AND INK TECHNOLOGY

Time-3 Hours
Total Credits – 04
Theory - 50
Internal assessment (T) – 20
Practical-20
Internal assessment (P) – 10
Total Marks – 100

Note- The question paper will contain nine questions. Students are required to attempt five questions in all. There will be two questions in each Unit from Unit-I to Unit-IV. Students are required to attempt one question from each unit from I to IV. Q. No. 1 containing short notes covering the entire syllabus is compulsory. All the questions will carry equal marks. The students can attempt question paper either in English or in Hindi language.

COURSE LEARNING OBJECTIVES:

- CLO1: Know about Paper fibers and non-fibers materials
- CLO2: Develop the knowledge of Recycled paper
- CLO3: Acquire knowledge about basic of printing ink.
- CLO4: Know about various types of Security printing Ink.

UNIT	Topic		Contact Hours
UNIT- I	**Paper:** Introduction, Paper fibers and non-fibers materials, Paper manufacture - Pulp preparation - mechanical pulp, Chemical processes, semi chemical process. Bleaching, Screening and Cleaning, Stock preparation, Paper making machine - Wire section, Press section and Drier sections, Calendaring and, super calendaring.	**CLO1**	**12**
UNIT- II	**Recycled paper**-Introduction, Recycling process, De-inking chemistry-Pulping, Ultrasonic treatment, Flotation deinking, wash deinking, Printing defects associated with paper. Reel defects. Paper Testing, Influence of moisture and RH on paper, Paper storage and handling, Paper properties- physical, strength, optical, and printing- printability, runnability.	**CLO2**	**12**
UNIT-III	**Printing Inks** - Introduction, Ingredients in Ink- pigments, vehicles, additives, Drying mechanisms- physical drying, absorption drying, evaporation drying, chemical drying systems, radiation drying and curing, microwave drying, infrared drying, Ink requirements for printing processes,	**CLO3**	**12**
UNIT-IV	**Security printing Ink**- Ink manufacturing machines, Security Inks, Types of security inks, Special security features - fluorescence, phosphorescence, Basic properties of ink, Trends and developments in ink manufacturing process, Environmental considerations in security printing.	**CLO4**	**12**

Practical

1. Collections of different samples of Paper and paper boards.
2. Study of GSM Tester along with paper GSM testing.
3. Study of various component of inks use in printing and packaging industries.
4. Collection of Printed paper samples through various printing processes.
5. Ink tackiness Test.
6. Ink Viscosity Test.
7. Different types of Inks uses in printing and their study.

Reference books:

1. Printing materials science & technology - Bob Thompson-PIRA
2. Advances in printing science & technology Vol.24 - J. Anthony Bristow
3. Hand book of Print & Production - Micheal Barnard, John Peacock
4. Introduction to Printing Technology - Hugh M.Speirs. SIGPA - 1987

B-23/PPT/303
FLEXOGRAPHY

Time-3 Hours
Total Credits – 04
Theory - 50
Internal assessment (T) – 20
Practical-20
Internal assessment (P) – 10
Total Marks – 100

Note- The question paper will contain nine questions. Students are required to attempt five questions in all. There will be two questions in each Unit from Unit-I to Unit-IV. Students are required to attempt one question from each unit from I to IV. Q. No. 1 containing short notes covering the entire syllabus is compulsory. All the questions will carry equal marks. The students can attempt question paper either in English or in Hindi language.

COURSE LEARNING OBJECTIVES:

- CLO1: Know about Image carriers for flexography
- CLO2: Develop the knowledge about the different printing press of flexography
- CLO3: Acquire knowledge about basic Mounting and Proofing.

CLO4: Know about Markets for today and tomorrow of Flexographic

UNIT	Topic		Contact Hours
UNIT- I	**Image carriers for flexography:** Introduction. Thickness of flexo graphic plates. Photopolymer flexographic plates Advantages of photo polymer plates. Disadvantages of photo polymer plates. Solid photo polymer plates. Photo initiators and photo sensitizers. Washout solvents. Liquid photo polymer plates. Base material for photo polymer plates. Rubber flexo plates, photo engravings, duplicate plates. Rubber plate making process – Advantages of rubber plates, disadvantage of rubber plates. Photo polymer plate making process, sheet photo polymer plate making, liquid photo polymer plate making. Letter press plates – Introduction, photo polymer letterpress plates	**CLO1**	**12**
UNIT- II	**The Printing press:** Flexo press types - Stack press, Central impression cylinder press, Inline press, Tension control in flexographic m/c, Unwind equipments - general, single-position unwind - flying-splice unwind, unwind tension systems, cooling drum a out feed unit. Rewind equipments - surface winders, center winders, rewind tension systems. Web guides. Printing stations - two roll, anilox roll, reverse angle doctor blade system, Deck control, Continuous inking, side and circumferential register control, Dryers. Mechanical components - CI drum, plate cylinders. Anilox roll - construction, cell structure, anilox roll wear,	**CLO2**	**12**

	selecting the night anilox roll, chrome plating. Fountain rolls - formulating rubber for rolls, Flexo roller covering, Care of covered rolls.		
UNIT-III	**Mounting and Proofing:** Introduction. Checking the equipment. Operation care of equipment. Understanding the mounting instructions. Mounting and proofing a complete line job - proofing the first set of plates, proofing for printability, methods of prepress make-ready, wrapping mounted cylinders. Miscellaneous procedures - removing plates from the cylinder, mounting metal-backed plates, reusing sticky back, plate staggering, use of release agents. Tools for the operator. Basic requirements for process colour printing. Press room practices. Environment and safety concerns. **Flexography and Bar-coding:** Barcode structures. Types. Verifying/Analyzing printed barcodes. UPC and flexographic printing. UDC film masters and printing capability tests. The shipping container symbol (SCS). SCS shipping contain Barcode printing.	**CLO3**	**12**
UNIT-IV	**Beyond the Horizon- Tomorrows Flexography:** Flexographic substrates. Narrow web presses-Narrow web press components, Future narrow web flexography. Wide web presses. Corrugated presses. Pre-printed liner presses. Future of Ink distribution system. Tomorrow's flexographic plates. News print for water-base flexography. Markets for today and tomorrow.	**CLO4**	**12**

Practical

1. Study of different types of flexographic machines and their components with diagram.
2. Study of Preparation of Rubber plates, Liquid photo polymer and Sheet photo polymer plates.
3. Plate mounting procedure on flexographic plate cylinder.
4. Make ready and pre make ready procedures in a flexographic machine.
5. Draw the diagram of 6 color and 8 color flexographic machines.
6. Collection of Different samples of printing through flexography printing.
7. Study of different types of inks uses in flexography process.

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Reference books:

1. Flexography principles and practices - Foundation of flexographic technical association
2. Hand book of Print & Production - Micheal Barnard, John Peacock
3. Introduction to Printing Technology - Hugh M.Speirs. SIGPA - 1987
4. Printing Technology- Adams, Faux, Rieber.

B23-PPT-304
Components of Multimedia

Time-3 Hours
Total Credits – 04
Theory - 50
Internal assessment (T) – 20
Practical-20
Internal assessment (P) – 10
Total Marks – 100

Note- The question paper will contain nine questions. Students are required to attempt five questions in all. There will be two questions in each Unit from Unit-I to Unit-IV. Students are required to attempt one question from each unit from I to IV. Q. No. 1 containing short notes covering the entire syllabus is compulsory. All the questions will carry equal marks. The students can attempt question paper either in English or in Hindi language.

COURSE LEARNING OBJECTIVES:

After completing the Course, the student will be able to:

- CLO1: familiar with the basic elements of multimedia and hardware-software requirements.
- CLO2: understand the primary elements of multimedia i.e. text and image for the multimedia applications and projects
- CLO3: study the relation of necessary elements i.e. audio and video and audio-visual media
- CLO4: understand the animation concepts and the importance of animation in multimedia industry.

UNIT	Topic		Contact Hours
UNIT- I	Multimedia basics: definition, meaning, need of multimedia, Basic elements of multimedia Hardware and software requirements for multimedia Transition from conventional media to multimedia multimedia authoring basics, authoring tools	**CLO1**	**12**
UNIT- II	Text: usage of text and fonts in Multimedia projects, families and faces of fonts, outline fonts, bitmap fonts and hypertext, script, typeface, text design and effects Image: definition, image data types, vector vs bitmap graphics, layers, colour formation, image file formats, compression techniques	**CLO2**	**12**
UNIT-III	Audio: definition, digitization of sound, frequency and bandwidth, decibel system, data rate, audio file format, sound synthesis, MIDI, recording and mixing, audio console, audio software and hardware Video: video basics, video standards, analog video, digital video, video recording and storage formats, shooting and editing video, audio-video integration, file formats	**CLO3**	**12**
UNIT-IV	Animation: definition, history and types of animation, cell animation, stop motion, morphing, difference between 2D and 3D animation, adding video effects, sfx and vfx, virtual reality (VR), kinematics	**CLO4**	**12**

Practical

1. To prepare a file with Text and Paragraph alignment.
2. To edit an Image by Cropping, resizing the same.
3. To edit a image by using five filters and effects
4. To prepare a power point presentation by using multimedia components

Book References:

- Multimedia Basics, Volume 1 by Andreas Holzinger, Firewall Media.
- Fundamentals of Multimedia, Ze-Nian Li, Mark S. Drew, Pearson Prentice Hall, 2004
- Multimedia Basics, Suzanne Weixel, Jennifer Fulton, Karl Barksdale, Cheryl Morse, Bryan Morse, Thomson/Course Technology
- Malik and Agarwal, S. and A. (October 2012). "Use of Multimedia as a New Educational Technology Tool–A Study"(PDF). International Journal of Information and Educat

B-23/PPT/305
PRINTING MATERIAL TECHNOLOGY

Time-3 Hours
Total Credits – 03
Theory - 35
Internal assessment (T) – 15
Practical-20
Internal assessment (P) – 5
Total Marks – 75

Note- The question paper will contain nine questions. Students are required to attempt five questions in all. There will be two questions in each Unit from Unit-I to Unit-IV. Students are required to attempt one question from each unit from I to IV. Q. No. 1 containing short notes covering the entire syllabus is compulsory. All the questions will carry equal marks. The students can attempt question paper either in English or in Hindi language.

COURSE LEARNING OBJECTIVES:

CLO1: Know about different metals and photographic materials used in printing
CLO2: Develop the knowledge about the Light Sensitive Materials

CLO3: Acquire knowledge about Adhesives and Miscellaneous Materials

CLO4: Know about materials handling and storage in printing and packaging industries.

UNIT	Topic		Contact Hours
UNIT- I	**Metals** Type of metals and characteristics of metals used for type alloys for foundry types, hot metal composition and stereos, Physical and chemical properties of aluminum, zinc, copper, nickel, chromium, magnesium in relation to printing applications. **Photographic Materials** Main kinds of films and photographic papers used in graphic orgination Films positives, mainbase, stripping, thickness, right and wrong reading, negatives; paper positive materials. Developers, Reducers, Intensifiers.	**CLO1**	**12**
UNIT- II	**Light Sensitive Materials** Various sensitized materials, used and relationship with processes Silver halide emulsions-classification according to speed, contrast and spectral sensitivity. **Paper and Ink** Fibrous and Non-fibrous materials used in paper and board manufacturing. General characteristics and requirements	**CLO2**	**12**

	of printing inks formulations pigments, vehicles, varnishes, solvents, agents.		
UNIT-III	**Adhesives** Classes and characteristics of adheisves used in binding and warehouse work and their range of applications selection for specific purpose. **Miscellaneous Materials** Book binding materials Different types of rubber used in printing. Use of leather, cloth, rexine, threads, tapes, stitching wire, metal foils and covering materials used for binding and print finishing.	**CLO3**	**12**
UNIT-IV	**Materials Handling** A brief Survey of materials handling and storage, Handling and storage of paper, printing surfaces, films, chemicals and other printing materials. Systems and methods of storage. Precautions in handling, storage, use and care of various printing substrates, materials and chemicals. wastage reduction. Receiving, storage and delivery of raw, semi finished and finished products.	**CLO4**	**12**

Practical

1. Study of different types of paper
2. Study of different types of Ink used in different printing processes
3. Study of different types of Adhesives.
4. Handling and Storage of Materials.
5. Study of different types of Photographic films and plates.

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Reference books:

- Artb and print production by N.N. Sarkat
- Printing Technology by Adam faux

SEMESTER IV

B-23/PPT/401
PRE-PRESS TECHNOLOGY

Time-3 Hours
Total Credits – 04
Theory - 50
Internal assessment (T) – 20
Practical-20
Internal assessment (P) – 10
Total Marks – 100

Note- The question paper will contain nine questions. Students are required to attempt five questions in all. There will be two questions in each Unit from Unit-I to Unit-IV. Students are required to attempt one question from each unit from I to IV. Q. No. 1 containing short notes covering the entire syllabus is compulsory. All the questions will carry equal marks. The students can attempt question paper either in English or in Hindi language.

COURSE LEARNING OBJECTIVES:

- CLO1: Know about basic processes in pre –press section
- CLO2: Develop the knowledge about the Colour Reproduction
- CLO3:Acquire knowledge aboutbasic of Colour Separating methods
- CLO4: Know about various proof and Press proofing techniques.

UNIT	Topic		Contact Hours
UNIT- I	**Pre-press**- Processes in pre –press, Basic colour theory, colour scheme, Additive and Subtractive colours, Process colours, Application of the colour theory to colour reproduction, Exposure, Colour balance, Memory colours, Contrast, Film transparency.	**CLO1**	**12**
UNIT- II	**Colour Reproduction** - Process cameras-Vertical process camera and Horizontal process camera, Parts of process camera, Image setter-Drum and Flatbed Image setter, Ctp (Computer to plate) operations, Ctp types, Colour control - Gray scale, Colour patches, Colour bar, Densitometer.	**CLO2**	**12**
UNIT-III	**Colour Separating methods** -Direct separation method and Indirect colour separation method, Methods and procedures followed for making the black printer negative, Objectives of colour correction, Hand correction, Tools used for hand correction, Masking, Types of mask, Electronic colour separation and correction.	**CLO3**	**12**
UNIT - IV	**Press proofing**- Proofing methods, Purpose of proofing and importance, Types of proofing press, Photographic film, Scanner, Types of scanner, Quality control in Pre-press, Overview of colour reproduction from original to printing.	**CLO4**	**12**

Practical

1. Setting of process camera
2. Study of image setter and CTP
3. Study of Additive and Subtractive colours
4. Gray Scale (Drawing).
5. Six Colour Wheel.
6. Study of Densitometer
7. Study of different types of scanner with diagram.

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Reference books:

1. Dr. R.W.G. Hont :- The reproduction of colour. Fountain Press, 4th edition.

2. Miles Southworth& Donna Southworth :- Colour Reproduction. Graphic Arts Publishing,

3.1 Edition. 3. Gary G. Field :- Tone & Colour correction (GATF).

B-23/PPT/402
WEB-FED OFFSET TECHNOLOGY (THEORY)

Time-3 Hours
Total Credits – 04
Theory - 50
Internal assessment (T) – 20
Practical-20
Internal assessment (P) – 10
Total Marks – 100

Note- The question paper will contain nine questions. Students are required to attempt five questions in all. There will be two questions in each Unit from Unit-I to Unit-IV. Students are required to attempt one question from each unit from I to IV. Q. No. 1 containing short notes covering the entire syllabus is compulsory. All the questions will carry equal marks. The students can attempt question paper either in English or in Hindi language.

COURSE LEARNING OBJECTIVES:

- CLO1: Know about **Development and growth of web offset press**

CLO2: Develop the knowledge about the Web Control and Auxiliary equipment

- CLO3: Acquire knowledge aboutbasic operations in Dry-offset printing.

CLO4: Know aboutcontrol panels of the web offset machines.

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UNIT	Topic		Contact Hours
UNIT- I	**Development and growth of web offset press-** Full size and mini web press; four basic types of web offset press, Press specially used for newspaper and magazine production in single and multicolour, Factors to be considered for selecting the press. **Components of web offset press-** Infeed, tension control Pre-conditioners, drier and chill rolls, folders, sheeters and winders, Adjustment, operation and maintenance of the major components. **Inking systems and dampening systems for web offset-** Conventional and non-conventional dampening systems, UV inks and setting systems Causes and correction of ink-related problems, Properties and requirements of heat set inks.	**CLO1**	**12**
UNIT- II	**Web Control** Roll stands and automatic pasters, Detection of web breaks and control of tension, Web Flutter, causes and correction of misregister, Control of fan out, Sidelay, cut-off, web-to-web and ribbon control. **Auxiliary equipment** Various types of in-built and optional equipment availability for web-offset and their uses; -Remote control console, Plate	**CLO2**	**12**

	scanners, scanning densitometer, closed-loop system, web preconditioners, sheet cleaners, ink agitators, water coded ink oscillators, fountain solution recirculation systems, fountain solution mixers, refrigerating fountain solution, automatic blanket washers, side lay sensors, web break defectors, remoisturizers-liquid applicator system, roller applicators systems, antistatic devices, Imprinters, Perfectors, cutoff controls, straboscope, synchroscope, counters-Denex laser counter, stobb counter. **Web-paper ,Plate and blankets** Properties and requirements of paper used for web offset Printability, Care and handling of rolls. Various types used for web-offset, their characteristics, merits and demerits for specific work, Cylinder pressures and Printing Make-ready.		
UNIT-III	**Dry Offset** Dry-offset; advantages and disadvantages, Comparative study of dry offset, letterset and lithographic offset processes, difference between dry offset and letterset machines and inks job suitability. Description of the process, Method of producing image and non-image areas, Importance of the correct formulation of waterless lithographic inks.	**CLO3**	**12**
UNIT-IV	**Introduction to types of drives used in web offset machines** Brief introduction to control panels of the web offset machines. **Folders** Introduction, folding principles, parts of folder, combination folder, ribbon folder, double-former folder, the me-chanics of folding process of jaw fold, chopper fold mechanism. Operation of collect cylinder, press folders, double former prefolder, flow folders, insert folders.	**CLO4**	**12**

Practical

1. Pre -make ready and make ready operations in web offset printing.
2. Collections of various printing samples through web offset printing.
3. Trouble shooting during printing.
4. Study of Electronic control panel.
5. Blanket and plate cylinder setting with diagram .
6. Damping and inking roller setting.
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Reference books:

- Web offset press operating- **David B. Crouse**
- Offset M/c II - **C. S. Mishra**
- Manual for Lithography Press Operation - **A. S. Porter**

B-23/PPT/403
GRAVURE TECHNOLOGY

Time-3 Hours
Total Credits – 04
Theory - 50
Internal assessment (T) – 20
Practical-20
Internal assessment (P) – 10
Total Marks – 100

Note- The question paper will contain nine questions. Students are required to attempt five questions in all. There will be two questions in each Unit from Unit-I to Unit-IV. Students are required to attempt one question from each unit from I to IV. Q. No. 1 containing short notes covering the entire syllabus is compulsory. All the questions will carry equal marks. The students can attempt question paper either in English or in Hindi language.

COURSE LEARNING OBJECTIVES:

- CLO1: Know about historical development of gravure printing
- CLO2: Develop the knowledge about the Gravure Doctor blade assembly
- CLO3:Acquire knowledge about basic Gravure Press and Its components
- CLO4: Know about various Substrates. Used in Gravure printing process

UNIT	Topic		Contact Hours
UNIT- I	**Gravure:** History of gravure, Gravure products and markets – Publication gravure – gravure packaging and converting – product gravure. **Gravure cylinder preparation** – Diffusion etch – Direct Transfer-Electromechanical process – Laser cutting. Electronic engraving systems today. Chemical engraving methods and equipments – cell configurations-advantages and disadvantages. Cylinder correction methods – Re-etching electro mechanical engravings, Colour balance etches. Well formation – variables, basic types. Cylinder construction and preparation – Cylinder design, types. Balancing the cylinder. Copper plating and polishing, Reuse of cylinders.	**CLO1**	**12**
UNIT- II	**Gravure Doctor blade assembly** – Blade angles. Blade distance from Nip, Blade edge, Blade mounting. Doctor Blade wear – Fatigue, Corrosion, Abrasive, Adhesive wear, Doctor blade materials, Doctor blade Holder configurations, Blade setting procedures, Preparing blade for use, Doctor blade problems. **Gravure Impression Roller** – function, Roller covering, Roller pressure, Cylinder diameter, Roller design & configuration. Balance-static & Dynamic. Roller setting. New developments. Storage of impression rollers. Impression roller problems.	**CLO2**	**12**

	Impression mechanisms mechanical, Hydraulic, Pneumatic.		
UNIT-III	**Gravure Press and Its components:** A generic printing unit. Sleeve & solid cylinder, single and two revolution, sheet fed and web fed machines, Typical press configurations. Gravure publication press-characteristics. **Packaging Gravure Press** – Folding carton Press. Flexible Packaging press, Label press. Product gravure. Other gravure press – Intaglio plate printing, offset gravure and flexogravure. Gravure with flexo units. Gravure units as other equipment. Gravure folders – types. Gravure Ink Dryers – Need for ink dryers, Drying water based inks, Dryers functioning, Dryer limitations, supply air valves, balancing the dryer, filters & dampers, roller condition vital. Heat Sources – steam, electric and gas, combination gas/oil, thermic oil, waste heat form incinerators. Solvent Recovery Methods. ready, make-ready operations , Finishing operations	**CLO3**	**12**
UNIT-IV	**Gravure Substrates:** Paper substrates-Rotonews papers, Coated papers, Gravure packaging paper substrates – properties. Label stock, Paper board. Non Paper substrates – surface preparation, plastics-properties. Metalized films – Aluminium foil, Foil laminations. Gravure advantages, limitations. Future of Gravure Printing Industry.	**CLO4**	**12**

Practical

1. Study of various components of a Gravure printing machine with diagram.
2. Pre-make ready and Make-ready operations in Gravure Printing Process...
3. Study of feeding unit and delivery unit of a Web-fed Gravure printing machine.
4. Single and Multi colour printing by using Gravure Printing Process.
5. Collections of various samples of Gravure Printing Process.
6. Gravure setting and impression roller/cylinder in a printing machine.
7. Check the practical problems/defects in a Gravure printing machine.

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Reference books:

- Gravure process and technology – GAA.
- Printing Technology – Adams, Faux, Rieber.