Curriculum
of
Diploma Programme
in
Printing Technology

Department of Science,
Technology and Technical Education (DSTTE),
Govt. of Bihar

State Board of Technical Education (SBTE)
Bihar

Semester – IV

Teaching & Learning Scheme

Course Codes	Category of Course	Course Titles	Teaching & Learning Scheme (Hours/Week)					
			Classroom Instruction (CI)		Lab Instruction (LI)	Notional Hours (TW+SL)	Total Hours (CI+LI+TW+SL)	Total Credits (C)
			L	T				
2427401	PCC	Printing Surface Preparation	3	-	4	2	9	6
2427402	PCC	Binding & Finishing	3	-	4	2	9	6
2427403	PCC	Gravure Technology	3		4	2	9	6
2427404	PCC	Printing Design	3		4	2	9	6
2427405	PCC	Reproduction Photography - I	3		4	2	9	6
Total			**15**	**0**	**20**	**10**	**45**	**30**

Note: Prefix will be added to Course Code if applicable (T for theory Paper, P for Practical Paper and S for Term work)

Legend:

CI: Classroom Instruction (Includes different instructional/implementation strategies i.e. Lecture (L), Tutorial(T), Case method, Demonstrations, Video demonstration, Problem based learning etc. todeliver theoretical concepts)

LI: Laboratory Instruction (Includes experiments/practical performances /problem-based experiences in laboratory, work shop, field or other locations using different instructional/Implementation strategies)

Notional Hours: Hours of engagement by learners, other than the contact hours for ensuring learning.

TW: Term work (includes assignments, seminars, micro projects, industrial visits, any other student activities etc.)

SL: Self Learning, MOOCs, spoken tutorials, online educational resources etc.

C: Credits= (1x CI hours) + (0.5 x LI hours) + (0.5 x Notional hours)

Note: TW and SL have to be planned by the teacher and performed by the learner under the continuous guidance and feedback of teacher to ensure outcome of learning.

Semester - IV

Assessment Scheme

Course Codes	Category of Course	Course Titles	Assessment Scheme (Marks)						Total Marks (TA+TWA+LA)
			Theory Assessment (TA)		Term work &Self-Learning Assessment (TWA)		Lab Assessment (LA)		
			Progressive Theory Assessment (PTA)	End Theory Assessment(ETA)	Internal	External	Progressive Lab Assessment (PLA)	End Laboratory Assessment (ELA)	
2427401	**PCC**	**Printing Surface Preparation**	30	70	20	30	20	30	200
2427402	**PCC**	**Binding & Finishing**	30	70	20	30	20	30	200
2427403	**PCC**	**Gravure Technology**	30	70	20	30	20	30	200
2427404	**PCC**	**Printing Design**	30	70	20	30	20	30	200
2427405	**PCC**	**Reproduction Photography - I**	30	70	20	30	20	30	200
Total			**150**	**350**	**100**	**150**	**100**	**150**	**1000**

Note: Prefix will be added to Course Code if applicable (T for theory Paper, P for Practical Paper and S for Term work)

Legend:

PTA: Progressive Theory Assessment in class room (includes class test, mid-term test and quiz using online/offline modes)

PLA: Progressive Laboratory Assessment (includes process and product assessment using rating Scales and rubrics)

TWA: Term work & Self Learning Assessment (Includes assessment related to student performance in assignments, seminars, micro projects, industrial visits, self-learning, any other student activities etc.

Note:.

- ETA & ELA are to be carried out at the end of the term/ semester.
- Term Work is to be done by the students under the guidance of internal faculty but its assessment will be done **internally (40%)** as well as **externally (60%)**. Assessment related to planning and execution of Term Work activities like assignment, micro project, seminar and self-learning is to be done by internal faculty (Internal Assessment) whereas assessment of output/product/ presentation related to these activities will becarried out by external faculty/expert (External Assessment). However, criteria of internal as well as external assessment may vary as per the requirement of respective course. For valid and reliable assessment, the internal faculty should prepare checklist & rubrics for these activities

A) Course Code : 2427401(T2427401/P2427401/S2427401)

B) Course Title : Printing Surface Preparation

C) Pre-requisite Course(s) :

D) Rationale :

It is technology subject which gives the knowledge of different surface preparation techniques like Photomechanical, offset plates, stencil preparation etc with this information student get awareness to the surface preparation method for particular printing process.

E) Course Outcomes (COs): After the completion of the course, teachers are expected to ensure the accomplishment of following course outcomes by the learners. For this, the learners are expected to perform various activities related to three learning domains (Cognitive, Psychomotor and Affective) in classroom/laboratory/workshop/field/industry.

After completion of the course, the students will be able to-

CO-1 Surface preparation of Metals and Metals for Plate & Block making purpose.

CO-2 Chemistry used for Plate Making,

CO-3 Types of Plates for offset printing,

CO-4 Types of Plates for Flexo Plates

CO-5 Stencil Preparation for Screen Printing Process.,

F) Suggested Course Articulation Matrix (CAM):

Course Outcomes (COs)	Programme Outcomes (POs)							Programme Specific Outcomes* (PSOs)	
	PO-1 Basic and Discipline Specific Knowledge	**PO-2** Problem Analysis	**PO-3** Design/ Development of Solutions	**PO-4** Engineering Tools	**PO-5** Engineering Practices for Society, Sustainability and Environment	**PO-6** Project Management	**PO-7** Life Long Learning	**PSO-1**	**PSO-2**
CO-1	3	1	-	1	1	-	1		
CO-2	3	1	-	3	1	1	1		
CO-3	3	2	2	3	1	1	-		
CO-4	3	2	-	-	2	2	-		
CO-5	3	2	1	3	1	-	1		

Legend: High (3), Medium (2), Low (1) and No mapping (-)

***** PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional

G) Teaching & Learning Scheme:

Course Code	Course Title	Scheme of Study (Hours/Week)					
		Classroom Instruction (CI)		Lab Instruction (LI)	Notional Hours (TW+ SL)	Total Hours (CI+LI+TW+SL)	Total Credits (C)
		L	T				
2427401	Printing Surface Preparation	03	-	04	02	09	06

Legend:

CI: Classroom Instruction (Includes different instructional/implementation strategies i.e. Lecture (L), Tutorial (T), Case method, Demonstrations, Video demonstration, Problem based learning etc. to deliver theoretical concepts)

LI: Laboratory Instruction (Includes experiments/practical performances /problem-based experiences in laboratory, workshop, field or other locations using different instructional/Implementation strategies)

Notional Hours: Hours of engagement by learners, other than the contact hours for ensuring learning.

TW: Term Work (includes assignments, seminars, micro projects, industrial visits, any other student activities etc.)

SL: Self Learning, MOOCs, spoken tutorials, online educational resources etc.

C: Credits = (1 x CI hours) + (0.5 x LI hours) + (0.5 x Notional hours)

Note: TW and SL have to be planned by the teacher and performed by the learner under the continuous guidance and feedback of teacher to ensure outcome of learning.

H) Assessment Scheme:

Course Code	Course Title	Assessment Scheme (Marks)						Total Marks (TA+TWA+LA)
		Theory Assessment (TA)		Term Work & Self-Learning Assessment (TWA)		Lab Assessment (LA)		
		Progressive Theory Assessment (PTA)	End Theory Assessment (ETA)	Internal	External	Progressive Lab Assessment (PLA)	End Laboratory Assessment (ELA)	
2427401	Printing Surface Preparation	30	70	20	30	20	30	200

Legend:

PTA: Progressive Theory Assessment in class room (includes class test, mid-term test and quiz using online/offline modes)

PLA: Progressive Laboratory Assessment (includes process and product assessment using rating Scales and rubrics)

TWA: Term work & Self Learning Assessment (Includes assessment related to student performance in assignments, seminars, micro projects, industrial visits, self-learning, any other student activities etc.

Note:

- Separate passing is must for progressive and end semester assessment for both theory and practical.
- ETA & ELA are to be carried out at the end of the term/ semester.
- Term Work is to be done by the students under the guidance of internal faculty but its assessment will be done **internally (40%)** as well as **externally (60%)**. Assessment related to planning and execution of Term Work activities like assignment, micro project, seminar and self-learning is to be done by internal faculty (Internal Assessment) whereas assessment of output/product/ presentation related to these activities will be carried out by external faculty/expert (External Assessment). However, criteria of internal as well as external assessment may vary as per the requirement of respective course. For valid and reliable assessment, the internal faculty should prepare checklist & rubrics for these activities.

I) Course Curriculum Detailing:

This course curriculum detailing depicts learning outcomes at course level and session level and their attainment by the students through Classroom Instruction (CI), Laboratory Instruction (LI), Term Work (TW) and Self Learning (SL). Students are expected to demonstrate the attainment of Theory Session Outcomes (TSOs) and Lab Session Outcomes (LSOs) leading to attainment of Course Outcomes (COs) upon the completion of the course. While curriculum detailing, NEP 2020 related reforms like Green skills, Sustainability, Multidisciplinary aspects, Society connect, Indian Knowledge System (IKS) and others must be integrated appropriately.

J) Theory Session Outcomes (TSOs) and Units: T2427401

Major Theory Session Outcomes (TSOs)	Units	Relevant COs Number(s)
TSO1.1 Explain about various steps involved for surface preparation of metals for Plate making. Types of Graining- Mechanical & Chemical. And also discussed about various types of Mechanical gaining TSO1.2 Solvent used: Solvent used for chemicals, Solvent used for Ink and Grease TSO1.3 Anodizing: Anodizing process used for surface preparation of metals for plate making. TSO1.4 Details study about various Metals used for plate & block making purpose and its characteristics as: Copper, Aluminum, Magnesium, and Zink	**Unit 1.0 - Surface preparation of Metals and Metals for Plate & Block making purpose** **1.1** Graining **1.2** Solvents used for plate making **1.3** Anodizing **1.4** Metals used for plate & Block making .	CO1
TSO2.1 Explain about variables used in chemistry for Plate making as Bicromate & Colloid Ratio. TSO2.2 PH of the coating TSO1.3 Coating Thickness. TSO1.4 Age of dried Coating TSO1.5 Temperature TSO1.5 Relative Humidity	**Unit 2.0 Chemistry used for Plate Making,** **Six Variables used in plate making as** **2.1** Bichromate – Colloid Ratio **2.2** PH of the coating **2.3** Coating Thickness **2.4** Age of dried Coating **2.5** Temperature **2.6** Relative Humidity	CO2
TSO 3.1 Explain in details about process involved in surface plate making TSO 3.2 Explain in details about process involved in Deep - Etch plate making TSO 3.3 Explain in details about process involved in wipe - on plate making TSO 3.4 Explain in details about process involved in Bi-Metal & Tri -Metal plate making TSO 3.5 Explain in details about process involved in PS plate making	**Unit 3.0 Types of Plates for offset printing** 3.1 Surface Plates 3.2 Deep – Etch Plates 3.3 Wipe on plates. 3.4 Bi – Metals and Tri- Metals Plates 3.5 Pre – Sensitized Plates	CO3
TSO 4.1 Explain in details about process involved in Rubber type plates for Flexo Printing TSO 4.2 Explain in details about process involved in Sheet Photo polymer type plates for Flexo Printing. TSO 4.3 Explain in details about process involved in Liquid Photo polymer type plates for Flexo Printing.	**Unit 4.0 – Types of Plates for Flexo Plates** 4.1 Rubber Flexo plates. 4.2 Sheet Photo polymer Plates 4.3 Liquid Photo polymer plates	CO4
TSO 5.1 Explain in details about process involved in hand cur stencil method for Screen Printing **TSO 5.2** Explain in details about process involved in Tusche and Glue Stencils method for Screen Printing **TSO 5.3** Explain in details about process involved in Photographic Stencil method for Screen Printing and Types of Photographic Stencil as: Direct stencil, Indirect Stencil and Direct – Indirect Stencil.	**Unit 5.0 Stencil Preparation for Screen Printing Process** 5.1 Hand cut Stencil 5.2 Tusche and Glue Stencils 5.3 Photographic Stencil	CO5

Note: One major TSO may require more than one theory session/ period.

K) Suggested Laboratory (Practical) Session Outcomes (LSOs) and List of Practical: P2427401

Practical/Lab Session Outcomes (LSOs)	S. No.	Laboratory Experiment/ Practical Titles	Relevant Cos Number (s)
LSO 1.0 Students will be able to know about the preparation of Surface plates for offset Printing process.	1.	**Surface Plate Preparation**	CO2
LSO 2.0 Students will be able to know about the preparation of wipe on plates for offset Printing process.	2.	**Wipe on plate preparation**	CO2
LSO 3.0 Students will be hands on practices for preparation of stencils for screen printing process	3.	**Stencil preparation**	CO4

L) Suggested Term Work and Self-learning: S2427401 Some sample suggested assignments, micro project and other activities are mentioned here for reference.

a. Assignments: Questions/ Problems/ Numerical/ Exercises to be provided by the course teacher in line with the targeted COs.

1. Enlist the details of coating material used for various types of plate making.
2. Write the step by step process involved in the preparation of Deep – Etch plates.
3. Enlist the process and type of photographic stencil preparation.

b. Micro Projects:

1. Prepared the photographic stencil and do the screen printing.
2. Details study of the surface preparation of various metals for plate making.

c. Other Activities:

1. Seminar Topics:
    - Block making process for Letter press printing
    - Photopolymer plates for Flexo printing
    - Bi- Metal & Tri- Metal Plates used in offset printing.
2. Visits: Visit nearby press in to understand the processing of the PS plates by CTP.
3. Self-learning topics:
    - Selection of suitable printing surface, printing substrate for respective printing processes.
    - Become hands on expert in stencil preparation and screen prining.

M) Suggested Course Evaluation Matrix: The Course teacher has to decide and use appropriate assessment strategy and its weightage in theory, laboratory and Term Work for ensuring CO attainment. The response/performance of each student in each of these designed activities is to be used to calculate CO attainment.

COs	Course Evaluation Matrix						
	Theory Assessment(TA)**		Term Work Assessment (TWA)			Lab Assessment (LA)#	
	Progressive Theory Assessment (PTA) Class/Mid Semester Test	End Theory Assessment (ETA)	Term Work & Self-Learning Assessment			Progressive Lab Assessment (PLA)	End Laboratory Assessment (ELA)
			Assignments	Micro Projects	Other Activities*		
CO-1	15%	10%	15%	-	-	10%	20%
CO-2	25%	25%	25%	25%	25%	10%	20%
CO-3	20%	20%	25%	25%	25%	40%	20%
CO-4	20%	20%	15%	25%	25%	20%	20%
CO-5	20%	25%	20%	25%	25%	20%	20%
Total Marks	**30**	**70**	**20**	**20**	**10**	**20**	**30**
			50				

Legend:

*: Other Activities include self- learning, seminar, visits, surveys, product development, software development etc.

**: Mentioned under point- (N)

#: Mentioned under point-(O)

Note:

- The percentage given are approximate
- In case of Micro Projects and End Laboratory Assessment (ELA), the achieved marks will be equally divided in all those COs mapped with total experiments.
- For CO attainment calculation indirect assessment tools like course exit survey need to be used which comprises of questions related to achievement of each COs.

N) Suggested Specification Table for End Semester Theory Assessment: Specification table represents the reflection of sample representation of assessment of cognitive domain of full course.

Unit Title and Number	Total Classroom Instruction (CI) Hours	Relevant COs Number (s)	Total Marks	ETA (Marks)		
				Remember (R)	Understanding (U)	Application & above (A)
Unit 1.0 - Surface preparation of Metals and used for Plate & Block making purpose	06	CO1	15	4	3	3
Unit 2.0- Types of Plates for offset printing	18	CO2	20	10	10	5
Unit 3.0 - Types of Plates for Flexo Plates	8	CO3	15	7	4	4
Unit 4.0- Stencil Preparation for Screen Printing Process.	8	CO4	12	4	4	4
Unit 5.0 - Trouble shooting during Surface preparation of various printing process	8	CO5	8	3	3	2
Total	**48**	**-**	**70**	**28**	**24**	**18**

Note: Similar table can also be used to design class/ mid-term/ internal question paper for progressive assessment.

O) Suggested Assessment Table for Laboratory (Practical):

S. No.	Laboratory Practical Titles	Relevant Cos Number (s)	PLA/ELA		
			Performance		Viva-Voce (%)
			PRA* (%)	PDA** (%)	
1.	**Surface Plate Preparation**	CO2	40	40	20
2.	**Wipe on plate preparation**	CO2	50	40	10
3.	**Stencil preparation**	CO4	60	30	10

Legend:

PRA*: Process Assessment

PDA**: Product Assessment

Note: This table can be used for both end semester as well as progressive assessment of practical. Rubrics need to be prepared by the course teacher for each experiment/ practical to assess the student performance.

P) Suggested Instructional/ Implementation Strategies: Different Instructional/ Implementation Strategies may be appropriately selected, as per the requirement of the content/ outcome. Some of them are Improved Lecture, Tutorial, Case Method, Group Discussion, Industrial visits, Industrial Training, Portfolio Based Learning, Role-Play, Live Demonstrations in Classrooms, Lab, Field, Information and Communications Technology (ICT) Based Teaching Learning, Blended or flipped mode, Brainstorming, Expert Sessions, Video Clippings, Use of Open Educational Resources (OER), MOOCs etc.

Q) List of Major Laboratory Equipment, Tools and Software:

S. No.	Name of Equipment, Tools and Software	Broad Specifications	Relevant Experiment/ Practical Number
1.	Whirler , sponge, exposing unit,	All tools and equipment's are used for coating of surface and wipe on plates	1
2	Frame, squeeze, clamp, Exposing unit, Tape,	All tools and equipment's are used for stencil preparation for screen printing.	2

R) Suggested Learning Resources:

(a) Books:

S. No.	Titles	Author(s)	Publisher and Edition with ISBN
1.	Lithographers Manual	Charles Shapiro	GATF
2.	Offset Plate making		GATF USA
3	Printing Technology	Adams, Faux	
4	Screen Printing	Erin Lacy	

(b) Online Educational Resources:

1. https://youtu.be/9elYzPZi3R0?si=NAA-0YqaDuR_c8Sa
2. https://youtu.be/VSU7SWh76Fc?feature=shared
3. https://printwiki.org

Note: Teachers are requested to check the creative commons license status/ financial implications of the suggested, online educational recourses before use by the students.

(c) Others:

1. Lithographers Manual – A GATF Books

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A) Course Code : 2427402(T2427402/P2427402/S2427402)

B) Course Title : Binding and Finishing Process

C) Pre-requisite Course(s) :

D) Rationale :

This is the core subject after printing is complete, the printed sheet is required to be put in a proper shape such as books, magazines, register etc. For this, knowledge of various methods and techniques of binding and finishing is very essential. A diploma holder is required to supervise the binding and finishing section in a press.

E) Course Outcomes (COs): After the completion of the course teachers are expected to ensure the accomplishment of following course outcomes by the learners. For this, the learners are expected to perform various activities related to three learning domains (Cognitive, Psychomotor and Affective) in classroom/laboratory/workshop/field/industry.

After completion of the course, the students will be able to-

CO-1 History of Binding and finishing Process.

CO-2 Information about Binding Materials used in Press.

CO-3 Pre – Forwarding & Forwarding Operations.

CO-4 Hard case binding and its types.

CO-5 Covering Operation and Finishing Operations with types and style

F) Suggested Course Articulation Matrix (CAM):

Course Outcomes(COs)	Programme Outcomes(POs)							Programme Specific Outcomes* (PSOs)	
	PO-1 Basic and Discipline Specific Knowledge	**PO-2** Problem Analysis	**PO-3** Design/Development of Solutions	**PO-4** Engineering Tools	**PO-5** Engineering Practices for Society, Sustainability and Environment	**PO-6** Project Management	**PO-7** Life Long Learning	**PSO-1**	**PSO-2**
CO-1	3	1	-	1	-	-	1		
CO-2	3	1	2	2	1	2	1		
CO-3	3	2	2	3	1	1	1		
CO-4	3	2	-	1	2	2	-		
CO-5	3	2	1	3	1	-	1		

Legend: High (3), Medium (2),Low(1)and No mapping(-)

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G) Teaching & Learning Scheme:

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		Classroom Instruction (CI)		Lab Instruction (LI)	Notional Hours (TW+ SL)	Total Hours (CI+LI+TW+SL)	Total Credits (C)
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2427402	Binding and Finishing Process	03	-	04	02	09	06

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Course Code	Course Title	Assessment Scheme(Marks)						Total Marks (TA+TWA+LA)
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		Progressive Theory Assessment (PTA)	End Theory Assessment (ETA)	Internal	External	Progressive Lab Assessment (PLA)	End Laboratory Assessment (ELA)	
2427402	Binding and Finishing Process	30	70	20	30	20	30	200

Legend:

PTA: Progressive Theory Assessment in class room (includes class test, mid-term test and quiz using online/offline modes)

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Course Curriculum Detailing: This course curriculum detailing depicts learning outcomes at course level and session level and their attainment by the students through Classroom Instruction (CI), Laboratory Instruction (LI), Term Work (TW) and Self Learning (SL).Students are expected to demonstrate the attainment of Theory Session Outcomes (TSOs) and Lab Session Outcomes (LSOs) leading to attainment of Course Outcomes (COs) upon the completion of the course. While curriculum detailing, NEP 2020 related reforms like Green skills, Sustainability, Multidisciplinary aspects, Society connect, Indian Knowledge System (IKS) and others must be integrated appropriately.

J) Theory Session Outcomes (TSOs) and Units: T2427402

Major Theory Session Outcomes (TSOs)	Units	Relevant COs Number(s)
TSO1.1 Explain about historical developments in Binding Process. TSO1.2 Explain about the Definition and nomenclature of Book Binding. TSO1.3 Explain about warehouses operations TSO1.4. Explain about the different types of Binding and it's method. TSO1.5 Difference between Mechanical method and Binding folders	**Unit 1.0 –History of Binding and finishing Process.** 1.1 Introduction about History of Binding Process. 1.2 Definition and nomenclature of Books. 1.3 Classification of types of binding.	CO1
TSO 2.1 Explain the classification of Binding Materials. TSO 2.2 Explain about the Re enforcements materials. TSO 2.3 Explain about various types of Adhesive used in Binding Process.	**Unit 2.0 – Information about Binding Materials used in Press.** 2.1Classification of Materials. (Paper, Board, Re enforcement Material, Securing Materials, Adhesive and its Types, & Covering materials. 2.2 Different kinds of paper and paper sizes 2.3Miscellaneous Binding Materials.	CO2
TSO 3.1 Explain the operations used in Pre forwarding process. TSO 3.2 Explain the operations used in forwarding process TSO 3.3 Explain about the types of sewing process TSO 3.4 Describe the preparation of books for covering process. TSO 3.5 Describe the preparation of board for attachments.	**Unit 3.0 – Pre – Forwarding & Forwarding Operations.** 3.1 Pre – forwarding Operations i.e Jogging, Knocking, Counting, Folding , Nipping's, gathering and colleting by manual and m/c methods. 3.2 Methods of types of Sewing by manual and automatic m/c. 3.3 Forwarding Operations: In board and out board forwarding operations, Removing the swell, End papers and its types, 3.4. Preparing the books for covering,(Gluing the back, Trimming, Rounding, backing, back lining, Head banding) by manual and m/c 3.5. Preparation and attaching Boards.	CO3
TSO4.1 Explain the operation involves in edition case binding in manual and machine. 1. Case making 2. Casing-in TSO4. 2 Explain the operation involves in Library style binding 1. Making split boards 2. Attaching boards TSO4.3 Explain the operation involves in Register and Exercises note books TSO4.4 Explain the operation involves in account book binding. 1. Tacketing 2. Preparing the spring back 3. Fixing spring backs and boards	**Unit 4.0- Hard case binding and its types.** 4.1Edition case binding 4.2Library style binding 4.3Account book binding 4.4Registers and Exercise note books.	CO4
TSO 5.1 Explain in details about Covering Operations; TSO 5.2 Explain about Banding and its types. TSO 5.3 Describe the main purpose of finishing operation. TSO 5.4 Explain about the Printing, Tooling and Blocking methods of finishing of book covers. TSO 5.5 Discuss about the Engravings, fillet, roll, Pallet, creaser, polishing iron, decorating tool, type	**Unit 5.0 –Covering Operation and Finishing Operations with types and style** 5.1 Applying the adhesive , turning in, pressing, setting the glue for joints, pasting down and pressing 5.2 Banding and its types. 5.3 Purpose of Finishing and methods of finishing operations	CO5

Major Theory Session Outcomes (TSOs)	Units	Relevant COs Number(s)
holder etc. tools of finishing of covers. TSO 5.6 Explain the Blocking powder,Blocking Foils, Gold Rag materials for finishing of covers. TSO 5.7 Describe the purpose of edge decoration. TSO 5.8 Explain the Coloring, Tinting, marbling and Gilding methods of edge decorations.	5.4 Decorating the covers with finishing Tools, Finishing materials. 5.5 Edge decoration; Purposes and methods	

Note: One major TSO may require more than one theory session/ period.

K) Suggested Laboratory(Practical) Session Outcomes(LSOs) and List of Practical: P2427402

Practical/Lab Session Outcomes (LSOs)	S. No.	Laboratory Experiment/Practical Titles	Relevant Cos Number(s)
LSO 1.0 Students will be hands on about types of loose leaf binding Operations.	1	Loose leaf binding operations.	CO1
LSO 2.0 Students will be aware about pre – forwarding and forwarding operation of Binding process.	2.	Pre forwarding and forwarding operations	CO3
LSO 3.0 Students will be hands on about types of Book binding Operations.	3.	Book Binding operations: Perfect Binding, stitching and section sewing.	CO3
LSO 4.0Students will be able familiar about book finishing operations.	4.	Edge decoration	CO5

L) Suggested Term Work and Self-learning: S2427402 Some sample suggested assignments, micro project and other activities are mentioned here for reference.

a. Assignments: Questions/Problems/Numerical/Exercises to be provided by the course teacher in line with the targeted COs.

1. Types of folding process.
2. Write about the Edge decoration process in Book Binding.
3. Write about various types of binding defects, their causes and remedies.
4. Write about the Quality check involve in various stages of book production.

b. Micro Projects:

1. Prepared the Section Folding for stitching & sewing.
2. Book binding with application of adhesive.

c. Other Activities:

1. Seminar Topics:
   - Forwarding and pre forwarding operations of Binding.
   - End Paper , its types and its importance
   - Book restoration: Techniques for Repairing and Preserving old and Damaged Books.
2. Visits: Visit nearby Binding Presses to know about the various types of binding process and how to execute a Job in the post press.
3. Self-learning topics:
   - Identification of binding defects and well known about its cause and remedies.
   - The quality control during purchase of raw materials, during production process and during inspection Before Delivery

M) Suggested Course Evaluation Matrix: The Course teacher has to decide and use appropriate assessment strategy and its weightage in theory, laboratory and Term Work for ensuring CO attainment. The response/performance of each student in each of these designed activities is to be used to calculate CO attainment.

COs	Course Evaluation Matrix						
	Theory Assessment(TA)**		Term Work Assessment(TWA)			Lab Assessment(LA)#	
	Progressive Theory Assessment (PTA) Class/ Mid Semester Test	End Theory Assessment (ETA)	Term Work& Self-Learning Assessment			Progressive Lab Assessment(PLA)	End Laboratory Assessment(ELA)
			Assignments	Micro Projects	Other Activities*		
CO-1	15%	10%	15%	-	-	10%	20%
CO-2	25%	25%	25%	25%	25%	10%	20%
CO-3	20%	20%	25%	25%	25%	40%	20%
CO-4	20%	20%	15%	25%	25%	20%	20%
CO-5	20%	25%	20%	25%	25%	20%	20%
Total Marks	**30**	**70**	**20**	**20**	**10**	**20**	**30**
			50				

Legend:

*: Other Activities include self- learning, seminar, visits, surveys, product development, software development etc.

**: Mentioned under point- (N)

#: Mentioned under point-(O)

Note:

- The percentage given are approximate
- In case of Micro Projects and End Laboratory Assessment (ELA), the achieved marks will be equally divided in all those COs mapped with total experiments.
- For CO attainment calculation indirect assessment tools like course exit survey need to be used which comprises of questions related to achievement of each Cos.

N) Suggested Specification Table for End Semester Theory Assessment: Specification table represents the reflection of sample representation of assessment of cognitive domain of full course.

Unit Title and Number	Total Classroom Instruction (CI) Hours	Relevant COs Number (s)	Total Marks	ETA (Marks)		
				Remember (R)	Understanding (U)	Application & above (A)
Unit 1.0 - History of Binding and finishing Process	9	CO1	12	4	5	3
Unit 2.0- Information about Binding Materials used in Press.	7	CO2	12	5	5	2
Unit 3.0 -Pre – Forwarding & Forwarding Operations.	16	CO3	18	8	6	4
Unit 4.0- Hard case binding and its types.	7	CO4	12	6	4	2
Unit 5.0 - Covering Operation and Finishing Operations with types and style	9	CO5	16	7	6	3
Total	**48**	**-**	**70**	**30**	**26**	**14**

Note: Similar table can also be used to design class/ mid-term/ internal question paper for progressive assessment.

O) Suggested Assessment Table for Laboratory (Practical):

S. No	Laboratory Practical Titles	Relevant Cos Number (s)	PLA/ELA		
			Performance		Viva-Voce (%)
			PRA*(%)	PDA**(%)	
1.	Loose leaf binding operations.	CO1	50	40	10
2.	Pre forwarding and forwarding operations	CO3	60	30	10
3.	Book Binding operations: Perfect Binding, stitching and section sewing.	CO3	40	50	10
4.	Edge decoration	CO5	50	40	10

Legend:

PRA*: Process Assessment

PDA**: Product Assessment

Note: This table can be used for both end semester as well as progressive assessment of practical. Rubrics need to be prepared by the course teacher for each experiment/ practical to assess the student performance.

P) Suggested Instructional/ Implementation Strategies: Different Instructional/ Implementation Strategies may be appropriately selected, as per the requirement of the content/ outcome. Some of them are Improved Lecture, Tutorial, Case Method, Group Discussion, Industrial visits, Industrial Training, Portfolio Based Learning, Role-Play, Live Demonstrations in Classrooms, Lab, Field, Information and Communications Technology (ICT) Based Teaching Learning, Blended or flipped mode, Brainstorming, Expert Sessions, Video Clippings, Use of Open Educational Resources (OER), MOOCs etc.

Q) List of Major Laboratory Equipment, Tools and Software:

S. No.	Name of Equipment, Tools and Software	Broad Specifications	Relevant Experiment/ Practical Number
1.	Binder Folder, needles, Hammer, Mallet, Binder scissor, Brush, Knife ,ruler	All above tools and equipment's are used for Sewing's of the book section.	1
2	Brush, Tools Spine with pallet, Type Holder,Fillet, Creaser, Flat Burnished	Finishing operations in Binding	2

R) Suggested Learning Resources:

(a) Books:

S. No.	Titles	Author(s)	Publisher and Edition with ISBN
1.	Binding and Finishing Processes	B D Mendiratta	Asian Books Private Ltd. Darya ganj New Delhi.
2.	Printing Technology	Adams, Faux	Printing Technology
3	Lithographers Manual		
4.	*Writing for the Web: A Practical Guide*	Cynthia L. Jeney	

(b) Online Educational Resources:

1. https://youtu.be/tSWZBzAiGeQ?si=1BydZW6fR-uiBp0y
2. https://youtu.be/Av_rU-yOPd4?si=C6m-wGNpWdA8_Eqd
3. https://printwiki.org

Note: Teachers are requested to check the creative commons license status/ financial implications of the suggested, online educational recourses before use by the students.

(c) Others:

1. Handbook of Print Media

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A) Course Code : 2427403(T2427403/P2427403/S2427403)

B) Course Title : Gravure Technology

C) Pre-requisite Course(s) :

D) Rationale :

This is a subject of gravure process and technology. Technicians working in printing industry are required to deal with different printing machines of various job. These machines have different operational unit. The diploma holders are required good knowledge of these machines. This subject deals with the printing machines of all the process and their operational units.

E) Course Outcomes (COs): After the completion of the course, teachers are expected to ensure the accomplishment of following course outcomes by the learners. For this, the learners are expected to perform various activities related to three learning domains (Cognitive, Psychomotor and Affective) in classroom/laboratory/workshop/field/industry.

After completion of the course, the students will be able to-

CO-1 Gravure process.
CO-2 Gravure cylinders engraving
CO-3 Components of gravure press
CO-4 Press Design
CO-5 Gravure printing problems and their remedies and quality control

F) Suggested Course Articulation Matrix (CAM):

Course Outcomes (COs)	Programme Outcomes(POs)							Programme Specific Outcomes* (PSOs)	
	PO-1 Basic and Discipline Specific Knowledge	**PO-2** Problem Analysis	**PO-3** Design/ Development of Solutions	**PO-4** Engineering Tools	**PO-5** Engineering Practices for Society, Sustainability and Environment	**PO-6** Project Management	**PO-7** Life Long Learning	**PSO-1**	**PSO-2**
CO-1	3	-	-	1	-	-	3		
CO-2	3		2	2	1	2	3		
CO-3	3	2	2	3	1	1	3		
CO-4	3	3	-	1	2	-	3		
CO-5	3	2	1	3	1	2	3		

Legend: High (3), Medium (2), Low (1) and No mapping(-)

***** PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional

G) Teaching & Learning Scheme:

Course Code	Course Title	Scheme of Study (Hours/Week)					
		Classroom Instruction (CI)		Lab Instruction (LI)	Notional Hours (TW+ SL)	Total Hours (CI+LI+TW+SL)	Total Credits (C)
		L	T				
2427403	Gravure Technology	03	-	04	02	09	06

Legend:

CI: Classroom Instruction (Includes different instructional/implementation strategies i.e. Lecture (L), Tutorial (T), Case method, Demonstrations, Video demonstration, Problem based learning etc. to deliver theoretical concepts)

LI: Laboratory Instruction (Includes experiments/practical performances /problem-based experiences in laboratory, workshop, field or other locations using different instructional/Implementation strategies)

Notional Hours: Hours of engagement by learners, other than the contact hours for ensuring learning.

TW: Term Work (includes assignments, seminars, micro projects, industrial visits, any other student activities etc.)

SL: Self Learning, MOOCs, spoken tutorials, online educational resources etc.

C: Credits = (1 x CI hours) + (0.5 x LI hours) + (0.5 x Notional hours)

Note: TW and SL have to be planned by the teacher and performed by the learner under the continuous guidance and feedback of teacher to ensure outcome of learning.

H) Assessment Scheme:

Course Code	Course Title	Assessment Scheme(Marks)						Total Marks(TA+TWA+LA)
		Theory Assessment(TA)		Term Work& Self-Learning Assessment(TWA)		Lab Assessment(LA)		
		Progressive Theory Assessment (PTA)	End Theory Assessment (ETA)	Internal	External	Progressive Lab Assessment (PLA)	End Laboratory Assessment (ELA)	
2427403	Gravure technology	30	70	20	30	20	30	200

Legend:

PTA: Progressive Theory Assessment in class room (includes class test, mid-term test and quiz using online/offline modes)

PLA: Progressive Laboratory Assessment (includes process and product assessment using rating Scales and rubrics)

TWA: Term work & Self Learning Assessment (Includes assessment related to student performance in assignments, seminars, micro projects, industrial visits, self-learning, any other student activities etc.

Note:

- Separate passing is must for progressive and end semester assessment for both theory and practical.
- ETA & ELA are to be carried out at the end of the term/ semester.
- Term Work is to be done by the students under the guidance of internal faculty but its assessment will be done **internally (40%)** as well as **externally (60%)**. Assessment related to planning and execution of Term Work activities like assignment, micro project, seminar and self-learning is to be done by internal faculty (Internal Assessment) whereas assessment of output/product/ presentation related to these activities will be carried out by external faculty/expert (External Assessment). However, criteria of internal as well as external assessment may vary as per the requirement of respective course. For valid and reliable assessment, the internal faculty should prepare checklist & rubrics for these activities.

I) Course Curriculum Detailing: This course curriculum detailing depicts learning outcomes at course level and session level and their attainment by the students through Classroom Instruction (CI), Laboratory Instruction (LI), Term Work (TW) and Self Learning (SL).Students are expected to demonstrate the attainment of Theory Session Outcomes (TSOs) and Lab Session Outcomes (LSOs) leading to attainment of Course Outcomes (COs) upon the completion of the course. While curriculum detailing, NEP 2020 related reforms like Green skills, Sustainability, Multidisciplinary aspects, Society connect, Indian Knowledge System (IKS) and others must be integrated appropriately.

J) Theory Session Outcomes (TSOs) and Units: T2427403

Major Theory Session Outcomes (TSOs)	Units	Relevant Cos Number(s)
TSO1.1 Briefs out the history of Gravure process. TSO1.2 Explain the principle of gravure process. TSO1.3 Write the advantages and dis-advantages of gravure process. TSO1.4 Explain about cylinder design like mandrel, shaft. TSO1.5 Also explain about the balancing the cylinder. TSO1.6 Describe the static imbalance and dynamic imbalance in cylinder. TSO1.7 How electroplating is done. Explain with proper diagram.	**Unit 1.0 – Gravure process** 1.1 History 1.2 Principle of gravure 1.3 Advantages and disadvantages 1.4 Cylinder construction and preparation 1.5 Electroplating	CO1
TSO 2.1 Explain the types of diffusion etch process. TSO 2.2 Explain the direct transfer process. TSO 2.3 Explain about the Electromechanical process. TSO 2.4 Explain about the laser engraving process. TSO 2.5 Briefly explain proofing? TSO 2.4 How corrections are done in gravure cylinder? TSO 2.6 How to reuse old cylinder? TSO 2.7 Describe the ballard cell cylinder?	**Unit 2.0- Gravure cylinders engraving** 2.1 Diffusion etch 2.2 Direct transfer process 2.3 Electromechanical process 2.4 Laser engraving 2.5 Cylinder Proofing, correction, and chrome plating 2.6 Reuse of cylinder and Ballard cell cylinder	CO2
TSO 3.1 Briefly describe about the doctor blade? TSO 3.2 Explain about the types of cell configuration? TSO 3.3 What is the function of gravure impression cylinder? TSO 3.4 Explain about the impression roller problems, electrostatic assist? TSO 3.5 Explain about the ink transfer process and the need of ink dryer, their function?	**Unit 3.0 –Components of gravure press** 3.1 Doctor blade; types, wear, materials. 3.2 Cell configuration 3.3 Gravure impression cylinder 3.4 Ink transfer and drying	CO3
TSO 4.1. Describe in details about the infeed section TSO 4.2 Explain about the gravure printing unit. TSO 4.3 Explain about the delivery section.	**Unit 4.0 –Press design** 4.1 Infeed section 4.2 Gravure printing unit 4.3 Delivery section	CO4
TSO 5.9 Explain about the scum, line, image blind, cell filling, mottling, adhesion problem, set off,picking, etc? TSO 5.10 Explain about the quality control steps taken in gravure printing press?	**Unit 5.0 – Gravure printing problems and their remedies and quality control** 5.1 Printing Defects 5.2 Quality control aids	CO5

Note: One major TSO may require more than one theory session/ period.

K) Suggested Laboratory (Practical) Session Outcomes (LSOs) and List of Practical: P2427403

Practical/Lab Session Outcomes (LSOs)	S. No.	Laboratory Experiment/Practical Titles	Relevant Cos Number(s)
LSO 1.0 Students will be aware about the make ready, loading and unloading of gravure cylinder.	1.	Introduction of make ready and proofing of gravure press, cylinder loading and unloading of gravure press	CO2
LSO 2.0 Students will be hands on doctor blade setting procedure.	2.	Doctor blade setting procedure	CO3
LSO 3.0Students will be able familiar about the how repairing work of book done.	3.	Web loading and unloading on gravure printing press	CO4
LSO 4.0Students will be able know about the color making process.	4.	Color making and mixing gravure press	CO4
LSO 5.0Students will be able to familiar with tools and equipment used in gravure printing process.	5.	Familiar with tools and equipment used in gravure printing process.	CO4

L) Suggested Term Work and Self-learning: S2427403 Some sample suggested assignments, micro project and other activities are mentioned here for reference.

a. Assignments: Questions/Problems/Numerical/Exercises to be provided by the course teacher in line with the targeted COs.

1. Enlist the tools and materials required for gravure printing.
2. Write the steps by step process involved to print the packaging item by gravure process.
3. Write about the different types of gravure printing defects, their cause and remedies.

b. Micro Projects:

1. Viscometer for Gravure Printing
2. Ink Drying Method.

c. Other Activities:

1. Seminar Topics:

   - The evolution of gravure printing process.
   - Substrate used for Gravure Printing Process.
   - Image carrier preparation.

2. Visits: Visit nearby Gravure press to know about the various steps of gravure process and how to execute a Job in the press.
3. Self-learning topics:

   - Cylinder loading and unloading gravure press.
   - Quality control steps in gravure printing process.

M) Suggested Course Evaluation Matrix: The Course teacher has to decide and use appropriate assessment strategy and its weightage in theory, laboratory and Term Work for ensuring CO attainment. The response/performance of each student in each of these designed activities is to be used to calculate CO attainment.

COs	Course Evaluation Matrix						
	Theory Assessment(TA)**		Term Work Assessment (TWA)			Lab Assessment(LA)#	
	Progressive Theory Assessment (PTA) Class/ Mid Semester Test	End Theory Assessment (ETA)	Term Work& Self-Learning Assessment			Progressive Lab Assessment (PLA)	End Laboratory Assessment (ELA)
			Assignments	Micro Projects	Other Activities*		
CO-1	15%	10%	15%	-	-	10%	20%
CO-2	25%	25%	25%	25%	25%	10%	20%
CO-3	20%	20%	25%	25%	25%	40%	20%
CO-4	20%	20%	15%	25%	25%	20%	20%
CO-5	20%	25%	20%	25%	25%	20%	20%
Total Marks	**30**	**70**	**20**	**20**	**10**	**20**	**30**
			50				

Legend:

*: Other Activities include self- learning, seminar, visits, surveys, product development, software development etc.

**: Mentioned under point- (N)

#: Mentioned under point-(O)

Note:

- The percentage given are approximate
- In case of Micro Projects and End Laboratory Assessment (ELA), the achieved marks will be equally divided in all those COs mapped with total experiments.
- For CO attainment calculation indirect assessment tools like course exit survey need to be used which comprises of questions related to achievement of each COs.

N) Suggested Specification Table for End Semester Theory Assessment: Specification table represents the reflection of sample representation of assessment of cognitive domain of full course.

Unit Title and Number	Total Classroom Instruction (Cl) Hours	Relevant COs Number (s)	Total Marks	ETA (Marks)		
				Remember (R)	Understanding (U)	Application & above (A)
Unit 1.0-Gravure process	10	CO1	15	7	5	3
Unit 2.0- Gravure cylinders engraving	14	CO2	20	8	7	5
Unit 3.0 -Components of gravure press	8	CO3	12	4	4	4
Unit 4.0 –Press design	10	CO4	15	6	6	3
Unit 5.0 – Gravure printing problems and their remedies and Quality control	6	CO5	8	3	3	2
Total	**48**	**-**	**70**	**28**	**25**	**17**

Note: Similar table can also be used to design class/ mid-term/ internal question paper for progressive assessment.

O) Suggested Assessment Table for Laboratory (Practical):

S. No.	Laboratory Practical Titles	Relevant Cos Number (s)	PLA/ELA		
			Performance		Viva-Voce (%)
			PRA* (%)	PDA** (%)	
1.	Introduction make ready and proofing of gravure press, cylinder loading and unloading of gravure press	CO2	50	40	10
2.	Doctor blade setting procedure	CO3	40	50	10
3.	Web loading and unloading on gravure printing press	CO4	50	40	10
4.	Color making and mixing gravure press	CO4	50	40	10
5.	Familiar with tools and equipment used in gravure printing process.	CO4	40	50	10

Legend:

PRA*: Process Assessment

PDA**: Product Assessment

Note: This table can be used for both end semester as well as progressive assessment of practical. Rubrics need to be prepared by the course teacher for each experiment/ practical to assess the student performance.

P) Suggested Instructional/ Implementation Strategies: Different Instructional/ Implementation Strategies may be appropriately selected, as per the requirement of the content/ outcome. Some of them are Improved Lecture, Tutorial, Case Method, Group Discussion, Industrial visits, Industrial Training, Portfolio Based Learning, Role-Play, Live Demonstrations in Classrooms, Lab, Field, Information and Communications Technology (ICT) Based Teaching Learning, Blended or flipped mode, Brainstorming, Expert Sessions, Video Clippings, Use of Open Educational Resources (OER), MOOCs etc.

Q) List of Major Laboratory Equipment, Tools and Software:

S. No.	Name of Equipment, Tools and Software	Broad Specifications	Relevant Experiment/Practical Number
1.	Gravure printing Machine	Machine required to understand the gravure printing process	1
2	Viscosity meter	John CUP, Ford Cup	2

R) Suggested Learning Resources:

(a) Books:

S. No.	Titles	Author(s)
1.	Process & technology, gravure education foundation 2003	
2.	Printing Technology	Adams, Faux
3	Lithographers Manual	
4.	*A hand book of gravure & flexography printing*	Anando seal

(b) Online Educational Resources:

1. https://youtu.be/JOzDcQka3IM?si=g4bDLdzE9XjiGWO1
2. https://youtu.be/0PwaM2myNUA?si=wpbusghp6FTE69EP
3. https://printwiki.org

Note: Teachers are requested to check the creative commons license status/ financial implications of the suggested, online educational recourses before use by the students.

(c) Others:

1. Handbook of Print Media

****

A) Course Code : 2427404(T2427404/P2427404/S2427404)

B) Course Title : Printing Design

C) Pre-requisite Course(s) : Graphic design and Typography

D) Rationale :

Printing design is the step before to reproduce the product. Details about knowledge of Colours and principles of Design the students become more friendly to apply knowledge in professional carrier .The aim of this subject is to study of colours, design principles, colour schemes and techniques of preparation of layouts and dummy.

E) Course Outcomes (COs): After the completion of the course, teachers are expected to ensure the accomplishment of following course outcomes by the learners. For this, the learners are expected to perform various activities related to three learning domains (Cognitive, Psychomotor and Affective) in classroom/laboratory/workshop/field/industry.

After completion of the course, the students will be able to-

CO-1 Colours , Psychological of Colour and Colour Symbolism

CO-2 Colour theory, Colour wheel and Colour Schemes,

CO-3 Dimensions of Colour and measurement of Colour

CO-4 Visual Ingredients of Design and Principle of Design.,

CO-5 Preparation and stages of layout and Dummy Preparation.

F) Suggested Course Articulation Matrix (CAM):

Course Outcomes (COs)	Programme Outcomes (POs)							Programme Specific Outcomes* (PSOs)	
	PO-1 Basic and Discipline Specific Knowledge	**PO-2** Problem Analysis	**PO-3** Design/ Development of Solutions	**PO-4** Engineering Tools	**PO-5** Engineering Practices for Society, Sustainability and Environment	**PO-6** Project Management	**PO-7** Life Long Learning	**PSO-1**	**PSO-2**
CO-1	3	1	-	1	-	-	1		
CO-2	3	1	3	3	1	2	1		
CO-3	3	2	2	3	1	1	-		
CO-4	3	2	-	-	2	2	-		
CO-5	3	2	1	3	1	-	1		

Legend: High (3), Medium (2), Low (1) and No mapping (-)

* PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional

G) Teaching & Learning Scheme:

Course Code	Course Title	Scheme of Study (Hours/Week)					
		Classroom Instruction (CI)		Lab Instruction (LI)	Notional Hours (TW+ SL)	Total Hours (CI+LI+TW+SL)	Total Credits (C)
		L	T				
2427404	Printing Design	03	-	04	02	09	06

Legend:

CI: Classroom Instruction (Includes different instructional/implementation strategies i.e. Lecture (L), Tutorial (T), Case method, Demonstrations, Video demonstration, Problem based learning etc. to deliver theoretical concepts)

LI: Laboratory Instruction (Includes experiments/practical performances /problem-based experiences in laboratory, workshop, field or other locations using different instructional/Implementation strategies)

Notional Hours: Hours of engagement by learners, other than the contact hours for ensuring learning.

TW: Term Work (includes assignments, seminars, micro projects, industrial visits, any other student activities etc.)

SL: Self Learning, MOOCs, spoken tutorials, online educational resources etc.

C: Credits = (1 x CI hours) + (0.5 x LI hours) + (0.5 x Notional hours)

Note: TW and SL have to be planned by the teacher and performed by the learner under the continuous guidance and feedback of teacher to ensure outcome of learning.

H) Assessment Scheme:

Course Code	Course Title	Assessment Scheme (Marks)						
		Theory Assessment (TA)		Term Work & Self-Learning Assessment (TWA)		Lab Assessment (LA)		Total Marks (TA+TWA+LA)
		Progressive Theory Assessment (PTA)	End Theory Assessment (ETA)	Internal	External	Progressive Lab Assessment (PLA)	End Laboratory Assessment (ELA)	
2427404	Printing Design	30	70	20	30	20	30	200

Legend:

PTA: Progressive Theory Assessment in class room (includes class test, mid-term test and quiz using online/offline modes)

PLA: Progressive Laboratory Assessment (includes process and product assessment using rating Scales and rubrics)

TWA: Term work & Self Learning Assessment (Includes assessment related to student performance in assignments, seminars, micro projects, industrial visits, self-learning, any other student activities etc.

Note:

- Separate passing is must for progressive and end semester assessment for both theory and practical.
- ETA & ELA are to be carried out at the end of the term/ semester.
- Term Work is to be done by the students under the guidance of internal faculty but its assessment will be done **internally (40%)** as well as **externally (60%)**. Assessment related to planning and execution of Term Work activities like assignment, micro project, seminar and self-learning is to be done by internal faculty (Internal Assessment) whereas assessment of output/product/ presentation related to these activities will be carried out by external faculty/expert (External Assessment). However, criteria of internal as well as external assessment may vary as per the requirement of respective course. For valid and reliable assessment, the internal faculty should prepare checklist & rubrics for these activities.

I) Course Curriculum Detailing:

Course Curriculum Detailing: This course curriculum detailing depicts learning outcomes at course level and session level and their attainment by the students through Classroom Instruction (CI), Laboratory Instruction (LI), Term Work (TW) and Self Learning (SL). Students are expected to demonstrate the attainment of Theory Session Outcomes (TSOs) and Lab Session Outcomes (LSOs) leading to attainment of Course Outcomes (COs) upon the completion of the course. While curriculum detailing, NEP 2020 related reforms like Green skills, Sustainability, Multidisciplinary aspects, Society connect, Indian Knowledge System (IKS) and others must be integrated appropriately.

J) Theory Session Outcomes (TSOs) and Units: T2427404

Major Theory Session Outcomes (TSOs)	Units	Relevant COs Number(s)
TSO1.1 Explain about Definition of colour, Physical characteristics of colour Like Reflection colour, Transmission colour and Luminous colour TSO1.2 Psychological Implication of colour: Positive & Negative physiology of colour TSO1.3 Symbolism of Colour: Physical properety of colour,- Hot Colour, Warm Colour & Cool colour, Custom & Tradition Colour, External environment	**Unit 1.0 - Colours , Psychological of Colour and Colour Symbolism** 1.1 Definition of Colour . 1.2 Psychology of colour 1.3 Symbolism of Colour	CO1
TSO 2.1 Explain the Colour theory : Aditive and subtractive colour theory, Primary, secondary and tertiary colors and complimentary colour TSO 2.2 Explain about Colour wheels and its TSO 2.3 Explain about Colour schemes as: Achromatic, Monochromatic, Complementary,Split Complimentary and Analogue colour scheme	**Unit 2.0 Colour theory, Colour wheel and Colour Schemes** 2.1 Colour theory 2.2 Colour wheels 2.3 Colour schemes. 2.4 Finishing Operations of paper manufacturing process.	CO2
TSO 3.1 Explain the Dimensions of Colour: Hue, Saturation (Chroma) and Value TSO 3.2 Explain about Measurements of colour density, L*a*b* and LCH, Reflection Densities and transmission Densities. TSO 3.3 Explain about various Equipment's used for measuring of Density, L*a*b* and LCH. Densitometer, colorimeter and spectrophotometer.	**Unit 3.0 – Dimensions of Colour and measurement of Colour** 3.1 Dimensions of Colour. 3.2 Measurement Techniques of colour. 3.3 Equipment's used for colour measurements	CO3
TSO 4.1 Explain the various types of visual ingredients of Design as: Point, Line, white space, shape, size, scale, colour ,tone, shade, Tint, Texture, Patterns, geometrical centers, Optical centers TSO 4.2 Explain about principles of Design as: Balance (Symmetrical, asymmetrical and radical). Harmony, Contrast, Rhythm ,Proportion, Simplicity and unity or Grouping	**Unit 4.0 Visual Ingredients of Design and Principle of Design.,** 4.1 Visual Ingredients of Designs 4.2 Principles of Design	CO4
TSO 5.1 Explain the Material, tools and techniques used for Layout and dummy preparation TSO 5.2 Explain about definition and Purpose of Layout. Styles of Layout – Formal & Informal layout TSO 5.3 Explain about various component and stages of Layout: Component of layout as: Slogan, Sub slogan, Illustration, Copy text, Name of the product, Trade mark, Monogram, Logotype, Address line. etc. TSO 5.4 Explain about Dummy, Type of dummy and details study about house style of the press.	**Unit 5.0 – Preparation and stages of layout and Dummy Preparation.** 5.1 Materials, equipment's and techniques used in preparation of layout. 5.2 Definition, purpose and style of layout. 5.3 Component & Stages of Layout 5.4 Dummy & House Style	CO5

Note: One major TSO may require more than one theory session/ period.

K) Suggested Laboratory (Practical) Session Outcomes (LSOs) and List of Practical: P2427404

Practical/Lab Session Outcomes (LSOs)	S. No.	Laboratory Experiment/ Practical Titles	Relevant Cos Number (s)
LSO 1.0 Students will be able to know about the variety of printed materials and details information about them	1.	**Collection and study of all variety of Printed materials**	CO1
LSO 2.0 Students will be hands on practices for preparation and designing of Logotype, Monograms and trade marks	2.	**Designing of Logotype, Monograms and trade marks**	CO3
LSO 3.0 Students will be hands on practices for preparation and designing of Visiting cards, letterheads, envelops, advertisements and invitation cards	3.	**Designing of layout for Visiting cards, letterheads, envelops, advertisements and invitation cards.**	CO3
LSO 4.0 Students will be hands on practices for preparation and designing of rough and finished layout	4	**Preparing of rough and finished layout**	CO3

L) Suggested Term Work and Self-learning: S2427404 Some sample suggested assignments, micro project and other activities are mentioned here for reference.

a. Assignments: Questions/ Problems/ Numerical/ Exercises to be provided by the course teacher in line with the targeted COs.

1. Enlist the Tools and Equipment's required for layout preparation.
2. Write the step by step process involved in the preparation of layout
3. Enlist the visuals and principles of design.

b. Micro Projects:

1. Prepared the design by using appropriate colour scheme
2. Measurements of Density and colours L*A*B* values of a printed sample.

c. Other Activities:

1. Seminar Topics:
   - Colous and colour theory
   - Principle of Design.
   - Fundamental elements of Design
   - Stages of Layout and dummy
2. Visits: Visit nearby press in his prepress section to learn the designing, layout, and house style of the job.
3. Self-learning topics:
   - Selection of suitable colour scheme as per custom and tradition of society.
   - Become more affective to design point of view during preparation of layout.

M) Suggested Course Evaluation Matrix: The Course teacher has to decide and use appropriate assessment strategy and its weightage in theory, laboratory and Term Work for ensuring CO attainment. The response/performance of each student in each of these designed activities is to be used to calculate CO attainment.

COs	Course Evaluation Matrix						
	Theory Assessment(TA)**		Term Work Assessment (TWA)			Lab Assessment (LA)#	
	Progressive Theory Assessment (PTA) Class/Mid Semester Test	End Theory Assessment (ETA)	Term Work & Self-Learning Assessment			Progressive Lab Assessment (PLA)	End Laboratory Assessment (ELA)
			Assignments	Micro Projects	Other Activities*		
CO-1	15%	10%	15%	-	-	10%	20%
CO-2	25%	25%	25%	25%	25%	10%	20%
CO-3	20%	20%	25%	25%	25%	40%	20%
CO-4	20%	20%	15%	25%	25%	20%	20%
CO-5	20%	25%	20%	25%	25%	20%	20%
Total Marks	**30**	**70**	**20**	**20**	**10**	**20**	**30**
			50				

Legend:

*: Other Activities include self- learning, seminar, visits, surveys, product development, software development etc.

**: Mentioned under point- (N)

#: Mentioned under point-(O)

Note:

- The percentage given are approximate
- In case of Micro Projects and End Laboratory Assessment (ELA), the achieved marks will be equally divided in all those COs mapped with total experiments.
- For CO attainment calculation indirect assessment tools like course exit survey need to be used which comprises of questions related to achievement of each COs.

N) Suggested Specification Table for End Semester Theory Assessment: Specification table represents the reflection of sample representation of assessment of cognitive domain of full course.

Unit Title and Number	Total Classroom Instruction (CI) Hours	Relevant COs Number (s)	Total Marks	ETA (Marks)		
				Remember (R)	Understanding (U)	Application & above (A)
Unit 1.0 - Colours , Psychological of Colour and Colour Symbolism	08	CO1	10	4	3	3
Unit 2.0- Colour theory, Colour wheel and Colour Schemes,	6	CO2	15	6	5	4
Unit 3.0 - Dimensions of Colour and measurement of Colour	8	CO3	15	7	4	4
Unit 4.0- Visual Ingredients of Design and Principle of Design.,	10	CO4	15	8	4	3
Unit 5.0 - Preparation and stages of layout and Dummy Preparation	8	CO5	15	6	6	3
Total	**48**	**-**	**70**	**31**	**22**	**17**

Note: Similar table can also be used to design class/ mid-term/ internal question paper for progressive assessment.

O) Suggested Assessment Table for Laboratory (Practical):

S. No.	Laboratory Practical Titles	Relevant Cos Number (s)	PLA/ELA		
			Performance		Viva-Voce (%)
			PRA* (%)	PDA** (%)	
1.	Collection and study of all variety of Printed materials	CO1	40	40	20
2.	Designing of Logotype, Monograms and trade marks	CO3	40	50	10
3.	Designing of layout for Visiting cards, letterheads, envelops, advertisements and invitation cards.	CO3	70	20	10
4.	Preparing of rough and finished layout	CO3	60	30	10

Legend:

PRA*: Process Assessment

PDA**: Product Assessment

Note: This table can be used for both end semester as well as progressive assessment of practical. Rubrics need to be prepared by the course teacher for each experiment/ practical to assess the student performance.

P) Suggested Instructional/ Implementation Strategies: Different Instructional/ Implementation Strategies may be appropriately selected, as per the requirement of the content/ outcome. Some of them are Improved Lecture, Tutorial, Case Method, Group Discussion, Industrial visits, Industrial Training, Portfolio Based Learning, Role-Play, Live Demonstrations in Classrooms, Lab, Field, Information and Communications Technology (ICT) Based Teaching Learning, Blended or flipped mode, Brainstorming, Expert Sessions, Video Clippings, Use of Open Educational Resources (OER), MOOCs etc.

Q) List of Major Laboratory Equipment, Tools and Software:

S. No.	Name of Equipment, Tools and Software	Broad Specifications	Relevant Experiment/ Practical Number
1.	Pencil, Colour, Scale, Paper	All tools and materials used for making of Trademark, logotype, Monograms, colour wheels	1
2	Computer and Photoshop, CorelDraw soft ware ,	All hardware and software required for drawing and editing of designs and layouts.	2

R) Suggested Learning Resources:

(a) Books:

S. No.	Titles	Author(s)	Publisher and Edition with ISBN
1.	Elements of Design & Typography	B D Mendiratta	Asian Books Pvt. Ltd
2.	Colour in Reproduction	Hilda Sinon	The Viking Press, NYC- A Studio Book
3	Printing Technology	Adams, Faux	

(b) Online Educational Resources:

1. https://youtu.be/DxagsMWUfjw?si=zIMwmORy_pAX_uSd
2. https://youtu.be/Iz94OQxTb4Q?si=qqCV6n_KEtomCe_x
3. https://printwiki.org

Note: Teachers are requested to check the creative commons license status/ financial implications of the suggested, online educational recourses before use by the students.

(c) Others:

1. Lithographers Manual – A GATF Books
2. Design, typography, etc A handbook By Damien Gautier

****

A) Course Code : 2427405(T2427405/P2427405/S2427405)

B) Course Title : Reproduction Photography - I

C) Pre-requisite Course(s) :

D) Rationale :

Study of the technology where image has been transfer through photomechanical process is described as Reproduction Photography. The Reproduction photography process required various typed of operation and handling of different equipment's & machinery. This subject play the role for the students to learn in making of Negative or Positive through photomechanical process which later on used for surface preparation.

E) Course Outcomes (COs): After the completion of the course, teachers are expected to ensure the accomplishment of following course outcomes by the learners. For this, the learners are expected to perform various activities related to three learning domains (Cognitive, Psychomotor and Affective) in classroom/laboratory/workshop/field/industry.

After completion of the course, the students will be able to-

CO-1 Function of Graphic reproduction and Types of originals for reproduction.

CO-2 Process camera, its type and parts of process camera.

CO-3 Photographic Films, Parts of Film and Emulsion of photographic Films

CO-4 Line photography, half tone Photography and Contact Processing.

CO-5 Processing Chemicals used in reproduction photography and its functions

F) Suggested Course Articulation Matrix (CAM):

Course Outcomes (COs)	Programme Outcomes (POs)							Programme Specific Outcomes* (PSOs)	
	PO-1 Basic and Discipline Specific Knowledge	**PO-2** Problem Analysis	**PO-3** Design/ Development of Solutions	**PO-4** Engineering Tools	**PO-5** Engineering Practices for Society, Sustainability and Environment	**PO-6** Project Management	**PO-7** Life Long Learning	**PSO-1**	**PSO-2**
CO-1	3	1		1	-	-	1		
CO-2	3	1	2	3	1	1	1		
CO-3	3	2	2	2	1	1	1		
CO-4	3	2	1	2	2	2	2		
CO-5	3	2	1	3	1	-	1		

Legend: High (3), Medium (2), Low (1) and No mapping (-)

***** PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional

G) Teaching & Learning Scheme:

Course Code	Course Title	Scheme of Study (Hours/Week)					
		Classroom Instruction (CI)		Lab Instruction (LI)	Notional Hours (TW+ SL)	Total Hours (CI+LI+TW+SL)	Total Credits (C)
		L	T				
2427405	**Reproduction Photography - I**	03		04	02	09	06

Legend:

CI: Classroom Instruction (Includes different instructional/implementation strategies i.e. Lecture (L), Tutorial (T), Case method, Demonstrations, Video demonstration, Problem based learning etc. to deliver theoretical concepts)

LI: Laboratory Instruction (Includes experiments/practical performances /problem-based experiences in laboratory, workshop, field or other locations using different instructional/Implementation strategies)

Notional Hours: Hours of engagement by learners, other than the contact hours for ensuring learning.

TW: Term Work (includes assignments, seminars, micro projects, industrial visits, any other student activities etc.)

SL: Self Learning, MOOCs, spoken tutorials, online educational resources etc.

C: Credits = (1 x CI hours) + (0.5 x LI hours) + (0.5 x Notional hours)

Note: TW and SL have to be planned by the teacher and performed by the learner under the continuous guidance and feedback of teacher to ensure outcome of learning.

H) Assessment Scheme:

Course Code	Course Title	Assessment Scheme (Marks)						
		Theory Assessment (TA)		Term Work & Self-Learning Assessment (TWA)		Lab Assessment (LA)		Total Marks (TA+TWA+LA)
		Progressive Theory Assessment (PTA)	End Theory Assessment (ETA)	Internal	External	Progressive Lab Assessment (PLA)	End Laboratory Assessment (ELA)	
2427405	Reproduction Photography - I	30	70	20	30	20	30	200

Legend:

PTA: Progressive Theory Assessment in class room (includes class test, mid-term test and quiz using online/offline modes)

PLA: Progressive Laboratory Assessment (includes process and product assessment using rating Scales and rubrics)

TWA: Term work & Self Learning Assessment (Includes assessment related to student performance in assignments, seminars, micro projects, industrial visits, self-learning, any other student activities etc.

Note:

- Separate passing is must for progressive and end semester assessment for both theory and practical.
- ETA & ELA are to be carried out at the end of the term/ semester.
- Term Work is to be done by the students under the guidance of internal faculty but its assessment will be done **internally (40%)** as well as **externally (60%)**. Assessment related to planning and execution of Term Work activities like assignment, micro project, seminar and self-learning is to be done by internal faculty (Internal Assessment) whereas assessment of output/product/ presentation related to these activities will be carried out by external faculty/expert (External Assessment). However, criteria of internal as well as external assessment may vary as per the requirement of respective course. For valid and reliable assessment, the internal faculty should prepare checklist & rubrics for these activities.

I) Course Curriculum Detailing: This course curriculum detailing depicts learning outcomes at course level and session level and their attainment by the students through Classroom Instruction (CI), Laboratory Instruction (LI), Term Work (TW) and Self Learning (SL). Students are expected to demonstrate the attainment of Theory Session Outcomes (TSOs) and Lab Session Outcomes (LSOs) leading to attainment of Course Outcomes (COs) upon the completion of the course. While curriculum detailing, NEP 2020 related reforms like Green skills, Sustainability, Multidisciplinary aspects, Society connect, Indian Knowledge System (IKS) and others must be integrated appropriately.

J) Theory Session Outcomes (TSOs) and Units: T2427405

Major Theory Session Outcomes (TSOs)	Units	Relevant COs Number(s)
TSO1.1 Explain about Definition and function of graphic reproduction TSO1.2 Originals for Graphic Reproduction and Classification of originals as; i) Line Original ii) Half tone Original iii) Continuous tone Originals Types of Originals are as: i) Black & white Original ii) Full colour Original TSO1.3 Explain about characteristics and requirements of originals, Scaling of originals.	**Unit 1.0 - Function of Graphic reproduction and Types of originals for reproduction.** 1.1 Definition & Function of Graphic reproduction 1.2 Originals and classification of Originals 1.3 Characteristics & Requirements of Originals for Reproduction.	CO1
TSO 2.1 Explain about the process camera and its role and importance in reproduction photography. TSO 2.2 Explain about Types of process camera as: Horizontal Camera, Vertical Camera, Darkroom Camera, Vertical Enlarger type camera, and Computerized Camera. TSO 2.3 Explain about various parts of camera and its function as: Copy Board, Illuminants, Lens, Film holder, Screen holder, Track & Gallery etc.	**Unit 2.0 Process camera, its type and parts of process camera.** 2.1 Process Camera and its function in Reproduction photography. 2.2 Types of Process Camera 2.3 Parts of Process Camera.	CO2
TSO 3.1 Explain about the photographic films and its type as : Monochromatic Films, Orthochromatic Films and Panchromatic Films TSO 3.2 Explain about various layers of films and its function as: Annihilation layer, Light sensitive layer, Substratum layer, Base layer, Protective layer etc. TSO 3.3 Explain about ingredients of emulsion, Structure of emulsions, Requirements of emulsion, Latent Image theory, Study of sensitometric waves-characteristic and Gama curve etc.	**Unit 3.0 – Photographic Films, layers of Film and Emulsion of photographic Films** 3.1 Photographic Films and its type. 3.2 Various layers of photographic films and its function. 3.3 Emulsion of Photography Films and its function, and its ingredients.	CO3
TSO 4.1 Explain about line photography, basic line exposure and evaluation of line negative and positive. TSO 4.2 Explain about halftone photography, Various half tone screen – Glass screen, Contact screen (Grey , magenta & orange contact Screen). Various type of exposure and its purpose: Single and multiple exposure system, Flash & no screen(Bump) exposure, Explain about Screen Distance calculation method. TSO 4.3 Explain about various dot formation Theory as i) Penumbra Theory ii) Pinhole Theory iii) Diffraction Theory TSO 4.4 Explain about evaluation of halftone negative and positive.	**Unit 4.0 Line photography, half tone Photography and Contact Processing.** 4.1 Line Photography and evaluation of line negative & Positive 4.2 Half tone photography- Half tone screen, various types of exposure and its purpose 4.3 Dot formation theory & Screen distance Calculation. 4.4 evaluation of Halftone negative & Positive	CO4
TSO 5.1 Explain about the various type of developer and it's ingredients and their function as: Developing Agent, Preservatives, Accelerator, Restrainer and additives. TSO 5.2 Explain about Stop bath and Fixer chemical used in photography and their function.	**Unit 5.0 – Processing Chemicals used in reproduction photography and its functions** 5.1 Developer and its ingredients and their functions 5.2 Stop bath and Fixer chemical used in photography and their function.	CO5

Major Theory Session Outcomes (TSOs)	Units	Relevant COs Number(s)
TSO 5.3 Explain about Types of reducer and intensifiers used and their function: Types of Reducers: Former, Proportion and Super proportion Reducers. Types of Intensifiers: Physical & chemical Intensifiers.	5.3 Reducers and Intensifiers used in process photography and their functions.	

Note: One major TSO may require more than one theory session/ period.

K) Suggested Laboratory (Practical) Session Outcomes (LSOs) and List of Practical: P2427405

Practical/Lab Session Outcomes (LSOs)	S. No.	Laboratory Experiment/ Practical Titles	Relevant Cos Number (s)
LSO 1.0 Students will be able to know about the Preparation of Line and Half tone Negative and Positive.	1.	**Preparation of Line and Half tone Negative and Positive.**	CO1
LSO 2.0 Students will be hands on practices for preparation of Scaling of different Types of originals	2.	**Scaling of different Types of originals**	CO1
LSO 3.0 Students will be hands on practices for preparation of Negative from Positive and Vice – versa.	3.	**Making positive through Contact Method**	CO3

L) Suggested Term Work and Self-learning: S2427405 Some sample suggested assignments, micro project and other activities are mentioned here for reference.

a. Assignments: Questions/ Problems/ Numerical/ Exercises to be provided by the course teacher in line with the targeted COs.

1. Describe in details about types of originals and characteristics of original.
2. Write the step by step process involved in the preparation of Line and halftone negative.
3. Enlist in the details about photographic films and its processing.

b. Micro Projects:

1. Preparation of the Line negative
2. Processing of photographic Film.

c. Other Activities:

1. Seminar Topics:
   - Photographic Films & emulsion
   - Dot Formation Theory
   - Processing of Film
   - Single and multiple exposure system
2. Visits: Visit nearby press to learn the how the dot generation occurred and learn about AM, FM and Hybrid screening.
3. Self-learning topics:
   - Learning about various types of screening.
   - Learning about latent Image and processing of films.

M) Suggested Course Evaluation Matrix: The Course teacher has to decide and use appropriate assessment strategy and its weightage in theory, laboratory and Term Work for ensuring CO attainment. The response/performance of each student in each of these designed activities is to be used to calculate CO attainment.

COs	Course Evaluation Matrix						
	Theory Assessment(TA)**		Term Work Assessment (TWA)			Lab Assessment (LA)#	
	Progressive Theory Assessment (PTA) Class/Mid Semester Test	End Theory Assessment (ETA)	Term Work & Self-Learning Assessment			Progressive Lab Assessment (PLA)	End Laboratory Assessment (ELA)
			Assignments	Micro Projects	Other Activities*		
CO-1	15%	10%	15%	-	-	10%	20%
CO-2	25%	25%	25%	25%	25%	10%	20%
CO-3	20%	20%	25%	25%	25%	40%	20%
CO-4	20%	20%	15%	25%	25%	20%	20%
CO-5	20%	25%	20%	25%	25%	20%	20%
Total Marks	**30**	**70**	**20**	**20**	**10**	**20**	**30**
			50				

Legend:

*: Other Activities include self- learning, seminar, visits, surveys, product development, software development etc.

**: Mentioned under point- (N)

#: Mentioned under point-(O)

Note:

- The percentage given are approximate
- In case of Micro Projects and End Laboratory Assessment (ELA), the achieved marks will be equally divided in all those COs mapped with total experiments.
- For CO attainment calculation indirect assessment tools like course exit survey need to be used which comprises of questions related to achievement of each COs.

N) Suggested Specification Table for End Semester Theory Assessment: Specification table represents the reflection of sample representation of assessment of cognitive domain of full course.

Unit Title and Number	Total Classroom Instruction (CI) Hours	Relevant COs Number (s)	Total Marks	ETA (Marks)		
				Remember (R)	Understanding (U)	Application & above (A)
Unit 1.0 - Function of Graphic reproduction and Types of originals for reproduction	6	CO1	8	3	3	2
Unit 2.0- Process camera, its type and parts of process camera.	6	CO2	8	3	3	2
Unit 3.0 - Photographic Films, Parts of Film and Emulsion of photographic Films	10	CO3	16	7	6	3
Unit 4.0- Line photography, half tone Photography and Contact Processing.	16	CO4	22	9	9	4
Unit 5.0 - Processing Chemicals used in reproduction photography and its functions	10	CO5	16	7	6	3
Total	**48**	**-**	**70**	**29**	**27**	**14**

Note: Similar table can also be used to design class/ mid-term/ internal question paper for progressive assessment.

O) Suggested Assessment Table for Laboratory (Practical):

S. No.	Laboratory Practical Titles	Relevant Cos Number (s)	PLA/ELA		
			Performance		Viva-Voce (%)
			PRA*(%)	PDA**(%)	
1.	**Preparation of Line and Half tone Negative and Positive.**	CO1	60	30	10
2.	**Scaling of different Types of originals**	CO1	40	40	20
3.	**Making positive through Contact Method**	CO3	60	20	20

Legend:

PRA*: Process Assessment

PDA**: Product Assessment

Note: This table can be used for both end semester as well as progressive assessment of practical. Rubrics need to be prepared by the course teacher for each experiment/ practical to assess the student performance.

P) Suggested Instructional/ Implementation Strategies: Different Instructional/ Implementation Strategies may be appropriately selected, as per the requirement of the content/ outcome. Some of them are Improved Lecture, Tutorial, Case Method, Group Discussion, Industrial visits, Industrial Training, Portfolio Based Learning, Role-Play, Live Demonstrations in Classrooms, Lab, Field, Information and Communications Technology (ICT) Based Teaching Learning, Blended or flipped mode, Brainstorming, Expert Sessions, Video Clippings, Use of Open Educational Resources (OER), MOOCs etc.

Q) List of Major Laboratory Equipment, Tools and Software:

S. No.	Name of Equipment, Tools and Software	Broad Specifications	Relevant Experiment/ Practical Number
1.	Process camera, Lens, Half tone screen,	All tools and equipment's are used for making of line and half tone Negative and Positive	1
2	Scale & Knife	Tools and equipment's are used for Scaling of originals, Negatives and Positives.	2
3	Contact Vacuumed camera	This Camera is used for making positive from negative and vice –versa.	3

R) Suggested Learning Resources:

(a) Books:

S. No.	Titles	Author(s)	Publisher and Edition with ISBN
1.	Halftone Photography		GATF
2.	Graphic Reproduction in photographic		Focal Press London
3.	Reproduction Photography		W H burden

(b) Online Educational Resources:

1. https://youtu.be/SSsIkkSIVzY?si=rH_rw_zX30g5w2mX
2. https://youtu.be/ALdTY6nb-iM?si=sk4vHMKL0gIkkWdC
3. https://youtu.be/9A-JAEb7gSE?si=81bo3fq6a8ChVsYk
4. https://printwiki.org

Note: Teachers are requested to check the creative commons license status/ financial implications of the suggested, online educational recourses before use by the students.

(c) Others:

1. Lithographers Manual – A GATF Books
2. Printing Technology – Adam Faux

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