

GUJARAT TECHNOLOGICAL UNIVERSITY, AHMEDABAD, GUJARAT

**COURSE CURRICULUM
COURSE TITLE: ADVANCED IMAGE CARRIER
(Course: 3345801)**

Diploma Programs in which this course is offered	Semester in which offered
Printing Technology	4 th Semester

1. RATIONALE

In the developing era of technology in printing field, it has become necessary to possess the advance knowledge of various Image Carriers for various Printing processes. The purpose of this course is to enhance the knowledge and skill about various Image Carriers and advancements in technology.

2. COMPETENCY:

The course content should be taught and curriculum should be implemented with the aim to develop required skills in students so that they are able to acquire following competencies.

- **Apply various kinds of Image carriers as per requirement of printing job.**

3. COURSE OUTCOMES (COs)

The theory should be taught and practical should be carried out in such a manner that students are able to acquire required learning out comes in cognitive, psychomotor and affective domain to demonstrate following course outcomes.

- Describe Exposing system and RIP
- Prepare- Computer to Plate System for Offset
- Identify and prepare appropriate Plates for given print job.
- Select material for Gravure Cylinder.
- Develop Plates for Auto Plate Processor.

4. TEACHING AND EXAMINATION SCHEME

Teaching Scheme (In Hours)			Total Credits (L+T+P)	Examination Scheme				Total Marks
L	T	P		Theory Marks		Practical Marks		
			ESE	PA	ESE	PA		
3	0	2	8	70	30	20	30	150

Legends: L-Lecture; T – Tutorial/Teacher Guided Student Activity; P –Practical; C – Credit;; ESE –End Semester Examination; PA – Progressive Assessment.

5. DETAILED COURSE CONTENTS

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics
Unit –I Introduction to Computer to Film or Image Setter	1a. Identify different film materials. 1b. Use of computer to film Systems. 1c. Explain types of image setter 1d. Describe exposing system and RIP	1.1 Introduction of Computer to Film or Image setter 1.2 Different Film material used 1.3 Construction of Image setter 1.4 Types of Image setter 1.4.1 Internal Drum 1.4.2 External Drum 1.4.3 Flatbed 1.4.4 High Resolution Etc. 1.5 Exposing system 1.6 RIP
Unit– II Computer to Plate System for Offset	2a. Explain computer to plate system and its types, construction	2.1 Design Principle 2.1.1 Internal Drum 2.1.2 External Drum 2.1.3 Flatbed 2.2 Construction and Exposing assembly 2.3 Plate construction 2.4 Types of Plates used in CTP 2.5 Introduction of CTCP
Unit– III Flexo Plates	3a. Differentiate between parts of flexo printing plates. 3b. Describe procedure for making rubber plates 3c. Describe procedure for making photopolymer plates 3d. Explain CTP	3.1 Different Parts of Flexo Plates. 3.2 Procedure of making Rubber Plates 3.3 Merits and Demerits of Rubber Plates 3.4 Procedure of Making Photopolymer Plates. 3.5 Types of Photopolymer Plates 3.6 Merits and Demerits of Photopolymer Plates 3.7 Computer to Flexo Plates 3.8 Merits and Demerits of CTF Plates
Unit– IV Cylinder Materials and its Variables	4a. Describe procedure for making Gravure cylinder making 4b. State cylinder making materials and their properties	4.1 Cylinder materials and their Properties 4.2 Cylinder making Steps like finishing, cutting, removal, testing, degreasing, polishing correction, plating, etc. 4.3 Electroplating Process 4.4 Cylinder Correction Process
Unit– V Cylinder Engraving Methods	5a. Explain different cylinder Engraving methods	5.1 Hand Engraving Methods 5.2 Chemical Engraving 5.3 Electronic Engraving 5.4 Computer to Cylinder Method
Unit - VI Auto Plate Processor	6a. Describe auto plate processor and its construction.	6.1 Introduction of Auto Plate Processor 6.2 Auto Plate Processor Construction 6.3 Auto Plate Processor Different Parts 6.4 Maintenance of Auto Plate Processor and Cleaning and changing of solution

6. SUGGESTED SPECIFICATION TABLE WITH HOURS & MARKS (THEORY)

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total
I	Introduction to Computer to Film or Image setter.	08	04	04	04	12
II	Computer to Plate system for Offset	08	04	04	06	14
III	Flexo Plates	08	06	04	04	14
IV	Cylinder materials and its Variables	06	04	02	04	10
V	Cylinder Engraving Methods	06	02	04	04	10
VI	Auto Plate Processor	06	02	04	04	10
	Total Hrs	42	22	22	26	70

Legends: R = Remember; U= Understand; A= Apply and above levels (Bloom's Revised taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

7. SUGGESTED LIST OF PRACTICAL/EXERCISES

The practical/exercises should be properly designed and implemented with an attempt to develop different types of skills (**outcomes in psychomotor and affective domain**) so that students are able to acquire the competencies/programme outcomes. Following is the list of practical exercises for guidance.

*Note: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of certain outcomes in affective domain which would in turn lead to development of **Course Outcomes** related to affective domain. Thus over all development of **Programme Outcomes** (as given in a common list at the beginning of curriculum document for this programme) would be assured.*

Faculty should refer to that common list and should ensure that students also acquire outcomes in affective domain which are required for overall achievement of Programme Outcomes/Course Outcomes

Sr. No.	Unit No.	Practical/ Exercises (Outcome in psychomotor domain)	Approx. Hours. Required
1	I	Demonstrate and explain Imagesetter and Its Construction i.Flatbed ii.Internal Drum iii.External Drum iv.High Resolution Prepare the report including following. a.Sketches. b.Specifications. c.Uses of above all components	02

2	I	Demonstrate and Explain Computer to Plate System v.Flatbed vi.Internal Drum vii.External Drum Pprepare the report including following. d.Sketches. e.Specifications..	02
3	II	i.Demonstrate different parts of flexo plates ii.Demonstrate Procedure of making rubber plates iii.Demonstrate Procedure of making photo polymer plates	04
4	III	i.Identify different cylinder materials used for cylinder making ii.Demonstrate different steps of cylinder making iii.Demonstrate electroplating process iv.Demonstrate cylinder correction methods	04
5	IV	i.Demonstrate hand engraving methods ii.Demonstrate chemical engraving methods iii.Demonstrate electronic engraving methods iv.Demonstrate computer to cylinder methods	10
Total			28

8. SUGGESTED LIST OF STUDENT ACTIVITIES

- i. Students will prepare file/journal for the above mentioned practical.
- ii. Identify different image carrier and materials used for various image carrier available in department. Also sketch them.
- iii. List common troubles faced in any other image carrier.

9. SPECIAL INSTRUCTIONAL STRATEGIES (if any)

- i. Arrange visit to nearby offset printing press
- ii. Arrange lecture by some experienced person working in the industry

10. SUGGESTED LEARNING RESOURCES

A. List of Books:

S. No.	Title of Books	Author	Publication
1	Gravure Process and Technology	Charles Shapiro	GATF (ISBN 0-88362-005-7)
2	Offset Printing And Troubleshooting	k. Goswami	D. K. Consultants
3	Hand book of Print media	Helmut Kipphan	Springler (ISBN 3-540-67326-1)
4.	Flexography : Principles and Practices	George Cusdin	FTA ASIN: B00DD5TT0Q

B. List of Major Equipment/ Instrument.

- i.Linig up Table
- ii.Retouching Desk
- iii.Printing Down Frame

- iv. Whirler
- v. Process Film Viewer Box
- vi. Process Camera Contact Printing Cabinet
- vii. Defused Light Retouching Table
- viii. Computer
- ix. Flatbed Scanner
- x. Laser Printer

C. List of Software/Learning Websites.

- i. Adobe PageMaker
- ii. CorelDRAW
- iii. QuarkXPress
- iv. Adobe InDesign
- v. Adobe PhotoShop

Note: All Software are of Trial Version

11. COURSE CURRICULUM DEVELOPMENT COMMITTEE.

Faculty Members from Polytechnics

- **Prof. B. I. Patel**, I/C Head of Department of Printing Technology, RCTI, Ahmedbad.
- **Prof. S. D. Gohel**, Lecturer in Printing Technology, RCTI, Ahmedbad.

Coordinator and Faculty Members from NITTTR Bhopal

- **Dr. Nishith Dubey**, Professor, Dept. of Vocation Education & Entrepreneurship Development
- **Dr. Shashi Kant Gupta**, Professor and Coordinator for State of Gujarat.