GUJARAT TECHNOLOGICAL UNIVERSITY, AHMEDABAD, GUJARAT

COURSE CURRICULUM
COURSE TITLE: IMAGE GENERATION AND CORRECTION
(Code: 3345804)

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

1. RATIONALE

In the era of technology integration, it has become important to possess the knowledge of various technologies of generating Images for printing by different methods. The purpose of this subject is to enhance the knowledge and skill level in Image Generation technologies with the use of currently available software.

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 competency

- **Generate image for printing by using modern technology.**

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.

   i. Undertake color separation and correction process in image generation with the help of computers.
   ii. Use mechanical and digital halftone screening and filters
   iii. Generate image using different software
   iv. Appreciate role of internet and multimedia packages.
   v. Create desired effects by using different types of Scanners.

4. TEACHING AND EXAMINATION SCHEME

Teaching Scheme (In Hours)			Total Credits (L+T+P)	Examination Scheme				
				Theory Marks		Practical Marks		Total Marks
L	**T**	**P**	**C**	**ESE**	**PA**	**ESE**	**PA**	
3	0	2	5	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 Color Separation	1a. Describe handling methods for originals. 1b. Explain light and color theory. 1c. Use screen angle.	1.1 Handling different types of originals for color process. 1.2 Light and color theory. 1.3 Introduction of Filters - color separation filters, color correction filters and other filters, filter factor and filter ratio.
Unit– II Halftone Screening Work	2a. Differentiate between various types of glass & contact screen. 2b. Explain Theory of dot formation. 2c. Use AM & FM screening in digital technology.	2.1 Introduction of Various types of Glass & Contact screens for color reproduction. 2.2 Understanding use of contact box screening, point source light. 2.3 Understanding Theories of Dot formation. 2.4 Screen angle – Moiré, Barite rules in angular adjustment. 2.5 Use of AM & FM screening in Image Generation.
Unit– III Introduction of Inherent errors of Trichromatism & Color Correction	3a. Explain inadequacies in filtration, unequal spectral sensitivity, proportionality failure, additively failure, HUE deficiencies etc. 3b. Describe various color correction methods, touching methods, tonal correction methods. 3c. Explain generation of black printer	3.1 Inadequacies in filtration, Unequal spectral sensitivity. 3.2 Proportionality, Additively failure, super additive 3.3 HUE Deficiencies of the tri-chromatic inks. 3.4 Evolution of subtractive primary – study of filtered densitometer readings of actual inks and effects. 3.5 Types of color correction methods: Manual, Photographic, Electronic, Hand Retouching and Dot Etching. 3.6 Types of masks: Tonal mask, Shadow mask, Light Pre mask, Contact reducing mask 3.7 Generation of Black Printer : Under Color Removal and its Variants, Grey Color Replacement.
Unit– IV Reproduction by Electronic Scanning.	4a. Describe basic types of Scanner. 4b. Classify scanners & study quality control aids of scanner	4.1 Types of Scanners: Handheld, Flatbed, Drum Etc. 4.2 Terminology and Basic concepts of Modern Scanner 4.3 Classification by output Scanner : Line, Continuous tone, Halftone, Black & white, Color 4.4 Dot area and Densitometer, Electronic Unsharp Masking 4.5 Introduction of Quality control Aids of Scanning 4.6 Digital Scanner, Analog Scanner

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics
Unit - V Quality Control	5a. Select appropriate quality control aids 5b. Use spectral curve. 5c. Use densitometer.	5.1 Grey scale and color control scale, Color guide, Color Chart. 5.2 Spectral curve for photographic Materials. 5.3 Use of Densitometer, measurement and control of color for printing.
Unit – VI Designing Software and Internet	6a. Work on different designing software. 6b. Prepare design in designing software. 6c. Describe working of internet. 6d. Explain benefits of multimedia. 6e. Use software for distance communication.	6.1 Tools and equipment for creation of design/art work. 6.2 Prepare design using multicolor combination. 6.3 Working of internet. 6.4 Benefit of internet for printing industry. 6.5 Role of World Wide Web (www) in printing industry. 6.6 Benefits of Multimedia packages. 6.7 Software for Distance communication.

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	Color Separation	06	0	4	4	08
II	Halftone Screening Work	06	2	2	4	08
III	Inherent Errors of Trichromatism & Color Correction	08	4	6	4	14
IV	Reproduction by Electronic Scanning.	08	2	6	6	14
V	Quality Control	08	2	6	8	16
VI	Designing Software and Internet	06	2	4	4	10
	Total Hrs	42	12	28	30	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/EXERCISE

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 (Outcomes' in Psychomotor Domain)	Hrs.

1	I	Demonstrate Color Separation methods
		Students will prepare the report including following.
		    a.Sketches
		    b.Software used
		    c.Procedure
			4

2	II	Demonstrate use of Halftone Screening and Filters
		Students will prepare the report including following.
		    a.Procedure of Screening.
		    b.Screen Types and Its Uses
		    c.Use of filters
			4

3	III	Demonstrate Color Correction.
		Students will prepare the report including following.
		    a.Software used for color correction
		    b.Procedure
		    c.Use of different tools for color correction
			4

4	IV	Demonstrate and explain Scanner with Its Construction.
		4.1 Flatbed
		4.2 Drum Scanner
		Students will prepare the report including following.
		    a.Sketches.
		    b.Specifications.
		    c.Uses of above all.
			4

5	V	Explain Scanning procedure for originals and Software Used.
		5.1 Flatbed
		5.2 Drum Scanner
		Students will prepare the report including following.
		    a.Procedure.
		    b.Software Used
		    c.Different Parameter For Scanning
			2

6	VII	Demonstrate use of different quality control aids.
		Students will prepare the report including following.
		    a.Sketches.
		    b.Procedure
			2

7	VIII	Design using different software for designing.
		Students will prepare the report including following.
		    a.Explain Tools
		    b.Explain Menu
			2

8	VIII	Prepare a Design
		Students will prepare the report including following.
		    a.Draw rough layout
		    b.Design
		    c.Hard copy
		    d.Procedure
			4

9	IV	Demonstrate use of UCR and GCR	4

		Students will prepare the report including following. a.Software used for UCR and GCR b.Purpose c.Procedure	
Total			30

8. SUGGESTED LIST OF STUDENT ACTIVITIES

i.Students will prepare File/Journal for the above mentioned Practical.

ii.Students will learn different designing software used in industry and compare chart of various facility or innovative function given in software.

iii.List common troubles in designing .

9. SPECIAL INSTRUCTIONAL STRATEGIES (if any)

Give as many practice exercise to students as possible and give continuous feedback to improve the quality till they get the desired effects.

10. SUGGESTED LEARNING RESOURCES

A. List of Books:

S. No.	Title of Books	Author	Publication
1	Color scanning and imaging systems.	Gary G. Field	GATF (ISBN 9780883621202)
2	Graphic Reproduction Photography	J. W. Burden	978-0240507576
3	Hand book of Printmedia	Helmut Kipphan	Springler (ISBN 3-540-67326-1)
4.	Color and its Reproduction	Gary G. Field	GATF ISBN (978-0883620885)

B.   List of Major Equipment/ Instrument.

i.Computer lab

ii.Process Film Viewer Box

iii.Process Camera Contact Printing Cabinet

iv.Flatbed Scanner

v.Laser Printer

C. List of Software/Learning Websites.

i. Adobe PageMaker

ii.CorelDRAW

iii.QuarkXPress

iv.Adobe In Design

v.Adobe Photoshop

Note: All Software are Trial Version

11.   COURSE CURRICULUM DEVELOPMENT COMMITTEE.

Faculty Members from Polytechnics
- **Prof. B. l. 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**.**