GUJARAT TECHNOLOGICAL UNIVERSITY, AHMEDABAD, GUJARAT

COURSE CURRICULUM
COURSE TITLE: ADVANCE OFFSET PRINTING
(Code: 3345802)

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

1. RATIONALE

Offset Printing technology is developing rapidly and offset printing machines of different size, capacity and type are available in market to cater to the needs of the different types of customers. It has therefore become important for every printing engineer to develop competency in offset printing and specially to update knowledge about various advances in Sheet fed and Web fed offset printing technology. The purpose of this course is therefore to enhance the knowledge of existing and new developments on multi technology integration and develop level of skill in offset printing for enhancing performance.

2. COMPETENCY

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

- **Select the appropriate technology depending upon the nature of print job and based on knowledge of modern development in offset printing**

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. Differentiate between different web offset configuration
ii. Describe Importance and use of Infeed unit
iii. Identify appropriate Dryers, Chillers, Ancillary Operation, Inline Operation etc.
iv. Trouble shoot of Web Offset operations.
v. Apply Modern Technology for printing operation.
vi. Operate Metal Decorating Press.

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	200
4	0	4	8	70	30	40	60	

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

5. DETAILED COURSE CONTENT

Unit	Major Learning Outcomes ((in cognitive domain)	Topics and Sub-topics
Unit – I Introduction to Web Offset	1a. Explain Web Offset. 1b. Differentiate between various web offset configuration. 1c. Compare between web fed and sheet fed.	1.1 Introduction of Web Offset Process 1.2 Importance of Web Offset Process 1.3 Types and Different Configuration of Web Offset 1.4 Different Machine Configuration and their job Suitability. 1.5 Differentiate between Web Offset and Sheet fed Offset
Unit – II Web Infeed Unit	2a. Explain importance of infeed unit 2b. Describe different Parts of infeed unit 2c. Identify importance of Web tension Unit	2.1 Types of Reel Stands 2.2 Types of Splicers and their Construction 2.3 Web Tension Unit 2.3.1 Dancer roller 2.3.2 Infeed metering roller 2.3.3 Brakes and Detectors 2.3.4 Reel Motors 2.3.5 Running bands 2.3.6 Tensionometer 2.3.7 Transducers 2.3.8 Surface speed 2.4 Angle bar 2.5 Turner bar 2.6 Web guide roller 2.7 Web Cleaning Brushes 2.8 Surface Treatment 2.9 Static charge elimination
Unit – III Dryers, Chill Rollers and Ancillary Operations	3a. Explain function of dryers 3b. Differentiate between various types of chill rollers 3c. Describe the importance of different ancillary operations	3.1 Need of Dryers And Its Importance 3.2 Types of Dryers 3.3 Need of Chill Rollers And Its Importance 3.4 Types of Chill Rollers 3.5 Introduction of Ancillary Operation 3.5.1 Slitting 3.5.2 Trimming 3.5.3 Web Reconditioners 3.5.4 Blanket Washers 3.5.5 Water Cooled ink Oscillators 3.5.6 Side lay sensors 3.5.7 Cut- off control 3.5.8 Remoisturisers
Unit – IV Advanced Developments	4a. Describe advanced developments in offset printing technology	4.1 Related to Registration 4.1.1 Differential gears 4.1.2 Displacing units 4.1.3 Stroboscope 4.1.4 Oscillating mirror 4.1.5 Video Viewers

Unit	Major Learning Outcomes ((in cognitive domain)	Topics and Sub-topics
		4.1.6 Web to web Register 4.1.7 Mechanical and electrical colour register 4.2 Box tilt, Compensators, Cut-off, Fan out, Viscosity control, Ink Mixing 4.3 Introduction of C. P. C. Technology 4.4 Introduction of different workflow in Offset
Unit V Inline Operation	5a. Explain different inline operation	5.1 Folding and Its Type 5.2 Different Accessories for folding and Its Control 5.3 Troubleshooting for Folding 5.4 Imprinting 5.5 Coating 5.6 Bundling and Strapping
Unit VI Trouble shooting	6a. Execute trouble shooting of web offset	6.1 Trouble shooting related to Paper and Its Remedies 6.2 Trouble shooting related to Ink and Its Remedies 6.3 Trouble shooting related to Dampening and Its Remedies 6.4 Troubleshooting related to Feeding and its Remedies 6.5 Trouble shooting Related to Delivery and Its Remedies
Unit VII Introduction of Metal Decoration Press	7a. Explain metal decoration press and its function and application	7.1 Introduction to Metal Decoration Press and Its uses 7.2 Construction and Working of metal decoration press 7.3 Printing Procedure for metal Decoration Press 7.4 Pre and Post press operation of Metal Decoration Press 7.5 Characteristics of ink Required for metal Decorating press

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

Unit	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
I	Introduction to Web Offset	04	2	2	2	06
II	Web Infeed Unit	08	2	4	4	10
III	Dryers, Chill Rollers and Ancillary Operations	08	2	4	4	10
IV	Advanced Developments	16	6	4	6	16
V	Inline Operation	08	0	5	5	10
VI	Trouble shooting	08	4	4	4	12
VII	Introduction of Metal Decoration Press	04	0	3	3	06
Total		**56**	**16**	**26**	**28**	**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 EXERCISES/PRACTICAL

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

S. No.	Unit No.	Practical/Exercise (Outcomes' in Psychomotor Domain)	Hrs.
1.	I	Study of various multicolour web fed offset printing machine.	04
2.	All	Perform setting of various units, press accessories and auxiliary units with multicolour web fed offset printing machines.	04
3.	All	Perform single colour offset printing of line work job .	04
4.	All	Perform two colour (Duo tone) job printing with registration in offset machine. (Calendar Printing, etc.)	08
5.	All	Perform single colour book publication form printing in	04

S. No.	Unit No.	Practical/Exercise (Outcomes' in Psychomotor Domain)	Hrs.
		offset machine. (Sheet work)	
6.	All	Perform single colour book publication form Printing in Offset machine. (Half sheet work)	04
7.	All	Perform graph sheet printing & registration practice in offset printing machine.	04
8.	All	Perform single colour offset printing of solid image job.	08
9.	All	Perform Multi colour (Four colour) Job printing in Offset machine.	16
		Total	**56**

8. SUGGESTED LIST OF STUDENT ACTIVITIES

Following is the list of proposed student activities such as

i. Visiting Exhibition
ii. Industrial Visit
iii. Industrial Training

9. SPECIAL INSTRUCTIONAL STRATEGIES (if any)

i. Arrange visit to exhibition of printing industry
ii. Arrange lecture by some experienced person working in the industry
iii. Ask students to explore the internet specially the websites of the reputed suppliers of offset printing press and their accessories to know about latest technology available in the market.

10. SUGGESTED LEARNING RESOURCES

A. List of Books:

S. No.	Title of Books	Author	Publication
1	The Lithographers Manual Fifth Edition	Charles Shapiro	GATF (ISBN 0-88362-005-7)
2	Offset Printing And Troubleshooting	k. Goswami	D. K. Consultants
3	Hand book of Printmedai	Helmut Kipphan	Springler (ISBN 3-540-67326-1)
4	Web Press Operating	Daniel G. Wilson	GATF **ISBN 13:** 9780883622902
5.	Web Control	Peter Oresick	GATFISBN-13: 978-0883621929

B. List of Major Equipment/Materials

i. Offset Printing Machine Dominant 712
ii. Offset Printing Machine Vijeta

C. List of Software/Learning Websites

www.heidelberg.com

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**.**