



GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Diploma in Engineering

Level: Diploma

Branch: Printing Technology

Course / Subject Code : DI01058011

Course / Subject Name : Fundamentals of Printing Technology

w. e. f. Academic Year:	2024-25
Semester:	1 st
Category of the Course:	PCC -01

Prerequisite:	Basic knowledge of Mathematics, Physics and Chemistry.
Rationale:	This course aims at creating a foundation among entry level students. It introduces common concepts frequently used in printing industry such as different printing techniques, their characteristics, advantages, disadvantages, image carrier and applications. The course also provides skills of pre-press, press & post-press sequences, ink, paper and other printing substrates. After completion of this course, a student can understand the flow of printing job, its important raw materials as well as merits of the processes of any particular job.

Course Outcome:

After Completion of the Course, Student will able to:

No	Course Outcomes	RBT Level
01	Identify various printing techniques.	R, A, E
02	Select relevant Conventional Printing Process for a print job.	R, A, E
03	Select different Digital Printing Process for a print job.	R, A, E
04	Sequence pre-press, press and post press workflow.	R, A, E
05	Select required substrates and inks for printing	R, A, E
06	Dispose printing waste safely.	R, A, E

*Revised Bloom's Taxonomy (RBT)

Teaching and Examination Scheme:

Teaching Scheme (in Hours)			Total Credits L+T+ (PR/2)	Assessment Pattern and Marks				Total Marks
L	T	PR		C	Theory		Tutorial / Practical	
			ESE (E)		PA / CA (M)	PA/CA (I)	ESE (V)	
4	0	0	4	70	30	0	0	100



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Course Content:

Unit No.	Content	No. of Hours	% of Weightage
Unit – I Introduction to Printing	1.1 Historical background of printing 1.2 Movable, wooden and metal type printing- invention 1.3 Printing processes- basics, workflow 1.4 Size and scope of printing industry 1.5 Structure of printing industry 1.6 Organization of printing services 1.7 Different stages of Printing Cycle. 1.8 Compare the kind of services provided by printing firms.	10	10
Unit – II Conventional printing	2.1 Conventional printing process- Physical and chemical properties, 2.2 Working principle, Identification of image area & non-image area, 2.3 Basics of each conventional printing process and its importance, 2.4 Advantages and disadvantages of each conventional Printing Process. 2.5 Study of various printing processes with the help of printed samples. 2.6 Applications of each conventional printing process.	18	29
Unit – III Digital printing	3.1 Working principle of different digital printing processes. 3.2 Concept of Variable Data Printing 3.3 Basics of digital process for printing 3.4 Digital printing process and their samples. 3.5 Importance of each Digital Printing Process. 3.6 Advantages & disadvantages of each digital printing process. 3.7 Application of Digital Printing Process	10	16
Unit– IV Pre-Press, Press, and Post Press Activities	4.1 Workflow of printing 4.2 Concept of Pre-press, press and Post press or Finishing department 4.3 Typography, Graphic Design and process photography 4.4 Binding and finishing processes. 4.5 Converting Processes and Packaging Processes.	8	21
Unit– V Inks and Substrates	5.1 Ingredients of Ink. 5.2 Printing ink drying system. 5.3 Types of paper and boards.	8	14



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	5.4 Standard paper sizes. 5.5 Other substrates for printing.		
Unit- VI Handling Print Waste	6.1 Print waste-concept. 6.2 Sustainability aspect of print waste 6.3 Print waste handling- Methods and disposal 6.4 Disposing technique of printing waste 6.5 Methods of handling print waste with examples.	6	10
	Total	60	100

Suggested Specification Table with Marks (Theory):

Distribution of Theory Marks (in %)					
R Level	U Level	A Level	N Level	E Level	C Level
17	56	25	17	05	05

Where R: Remember; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create (as per Revised Bloom's Taxonomy)

References/Suggested Learning Resources:

(a) Books:

1. Handbook of Print Media - Helmut Kipphan Ed. - Heidelberg Druckmaschinen AG, Springer Heidelberg, Published in 2001
2. ISBN 978-3-540-29900-4
3. The Print and Production Manual - Sean Smyth - Pira International Limited, Randalls Road, Leatherhead,
4. Published in 2008, ISBN-13 : 978-1858025148
5. Introduction to Printing - Herbert Simon - Publisher: Faber and Faber, Published in 1963, ISBN-13 : 978-0571084081
6. Graphic Design and Print Production Fundamentals - Graphic Communications Open Textbook Collective - Publisher: B Campus, Publication Date: November 12, 2015, Print ISBN: 978-1-989623-66-4
7. The Complete Book on Printing Technology - NIIR Board - Publisher: Asia Pacific Business Press Inc. (1 January 2003)
8. ISBN-13 : 978-8178330525
9. Printing Technology 5th Edition - J. Michael Adams - Publisher: Delmar Cengage Learning Publication date: 12 July 2001, ISBN-13: 978-0766822320



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(b) Open source software and website:

1. <https://www.youtube.com/watch?v=RW1HJdW5XLs>
2. <https://www.youtube.com/watch?v=5LMU-zB8Sro>
3. <https://www.youtube.com/watch?v=IDGJkAKFnGI>
4. <https://www.youtube.com/watch?v=PYtd9PtkYbs>
5. <https://www.youtube.com/watch?v=WB0HnXcW8qQ>
6. https://www.youtube.com/watch?v=hTF_fgPWoTo
7. https://www.youtube.com/watch?v=CcSsM772_18
8. <https://www.youtube.com/watch?v=pNZb7CXUjs0>
9. https://www.youtube.com/watch?v=h1bt3pom_MQ
10. <https://www.youtube.com/watch?v=diH2fv288bQ>
11. <https://www.youtube.com/watch?v=nUXDltQfqSA>
12. <https://www.prepressure.com/>
13. <https://guides.library.illinois.edu/>
14. <https://en.wikipedia.org/wiki/Printing>
15. https://www.youtube.com/watch?v=LB__fEeO6no
16. <http://agpcptech.weebly.com/>
17. <https://www.youtube.com/watch?v=TAO4mlYnxCw>
18. <http://printwiki.org/>

Suggested Project List: -

1. Collect 5 samples printed by Offset Printing Process and prepare a report.
2. Collect 5 samples printed by Gravure Printing Process and prepare a report.
3. Collect 5 samples printed by Flexography Printing Process and prepare a report.
4. Collect 5 samples printed by Screen Printing Process and prepare a report.
5. Collect samples of different binding styles and prepare report on it.
6. Prepare a short report on Indian Printing Industry.
7. Visit Offset Press and prepare their product portfolio.
8. Visit Gravure Press and prepare their product portfolio.
9. Visit Flexography Press and prepare their product portfolio.
10. Visit Screen Printing Unit and prepare their product portfolio.
11. Collect samples with different finishing effects like Coating, Lamination, Embossing, Die-cutting etc. and prepare a report.
12. Collect samples of different types of substrates and prepare catalogue.
13. Collect information of different inks and paper manufacturer.
14. Collect report of handling print waste with figures, tables and comparative charts and strategies used. Compile as a report.
15. Collect information of environment friendly packaging recommendations. Make a presentation



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16. Collect information of Go Green concept in Printing Industry. Prepare an article.

Suggested Activities for Students:

Students should perform following activities in group and prepare reports of about 5 pages for each activity. They should also collect/record physical evidences for their (student's) portfolio which may be useful for their placement interviews:

1. Prepare specification of Printing and allied machineries for different printing processes.
2. Collect specifications, prices, terms and conditions along with sources of supply and prepare report on types of substrates used to replace non-recyclable substrates.
3. Prepare list of national and regional printing companies covering providing services to different sectors.
4. Prepare list of major paper manufactures along with details of their products.
5. Prepare list of major Ink manufactures along with details of their products.
6. Collect samples with specifications and related details of different finishing process.
7. Prepare a collage of different entrepreneurship opportunities in printing industry.
8. Prepare a flowchart of different operation done in printing press.
9. Prepare a hierarchy chart of one print organization.
10. Give a seminar on any printing relevant topic.
11. Undertake a market survey of different printing process and prepare a report.
12. Prepare showcase portfolios of different printed samples.
13. Collect different image carrier and prepare a report.

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