

# GUJARAT TECHNOLOGICAL UNIVERSITY

## DIPLOMA IN PRINTING TECHNOLOGY

### SEMESTER: V

Subject Name:     **Quality Control in Printing**

Sr. No.	Course content
1.	<b>Substrates &amp; Their Properties and Applications (Uses):</b> 1.1 Paper 1.2 Board 1.3 Wrapping Paper 1.4 Metal 1.5 Ceramic 1.6 Plastic
2.	<b>Standard Sizes of Paper:</b> 2.1 British standard sizes 2.2 Metric standard sizes 2.3 International standard sizes 2.4 Sketch of international sizes of paper' card and envelope 2.5 Use of paper sizes in books, Card, envelope and business Stationary
3	<b>Materials For Papermaking:</b> 3.1 Materials for fibers 3.2 Materials for sizing 3.3 Materials for filling 3.4 Materials for coating 3.5 Materials for Pulp 3.6 Pulp Manufacturing process (Mechanical, Chemical, Sizing, Beating and Coating processes)
4	<b>Paper Manufacturing Process:</b> 4.1 Sketch of paper Mfg. machine 4.2 Water mark 4.3 Wire mark 4.4 Calendaring 4.5 Surface sizing
5	<b>Physical Characteristics of Paper:</b> 5.1 Physical strength 5.2 Formation 5.3 Smoothness 5.4 Levelness 5.5 Compressibility 5.6 Porosity 5.7 Opacity 5.8 Surface strength 5.9 Receptivity to ink 5.10 Moisture content 5.11 Dimensional stability 5.12 Grain

	5.13 Colour and brightness 5.15 Uniformly 5.16 Resistance properties <ol style="list-style-type: none"> <li>1. Rub-resistance</li> <li>2. Light-resistance</li> <li>3. Resistance to water</li> <li>4. Resistance to solvents</li> <li>5. Resistance to alkali</li> <li>6. Resistance to acid</li> <li>7. Resistance to soap</li> <li>8. Resistance to detergent</li> <li>9. Resistance to oil and fats</li> <li>10. Resistance to waxes</li> </ol>
<b>6</b>	<b>Paper Testing:</b> 6.1 Subjective paper test 6.2 Objective paper test 6.3 Grammage ( Basic weight of substance) 6.4 Test strength of paper <ol style="list-style-type: none"> <li>1. Tensile strength</li> <li>2. Bursting strength</li> <li>3. Tearing strength</li> <li>4. Folding resistance</li> </ol> 6.5 Optical Properties <ol style="list-style-type: none"> <li>1. Opacity</li> <li>2. Gloss</li> <li>3. Colour</li> </ol> 6.6 Moisture content, Humidity and Relative Humidity, Effects on film and chemical, effect of humidity on Blanket 6.7 Dimensional stability 6.8 Surface strength <ol style="list-style-type: none"> <li>1. Fluffing</li> <li>2. Picking</li> </ol> 6.9 Smoothness 6.10 Oil absorbency 6.11 Water absorbency
<b>7</b>	<b>Ink Manufacturing System:</b> 7.1 Sketch drawing of three roller mill and ball mill. 7.2 Mixing and milling 7.3 Manufacturing of paste and liquid ink. 7.4 Letterpress ink 7.5 Litho / Offset ink 7.6 Liquid ink 7.7 Varieties of ink 7.8 Specialized ink 7.9 Ingredients of Ink. (Pigments, Vehicles, Resins, Solvent, Plasticizers, Dryers, Additives Characteristics of ink's ingredients) 7.10 Drying methods of ink. (Oxidation, Evaporation, Absorption, Precipitation, Heat Curing, UV Curing)
<b>8</b>	<b>Characteristics of Ink:</b> 8.1 Flow properties 8.2 Press stability

	8.3 Drying time on paper 8.4 Lithographic performance 8.5 Printability 8.6 Ink thickness
<b>9</b>	<b>INK Testing:</b> 9.1 Flow Properties 1. Viscosity 2. Yield value 3. Plastic viscosity 4. Thixotropy 5. Tack 9.2 Press stability 9.3 Drying time on paper 9.4 Lithographic performance 9.5 Printability 9.6 Ink film thickness
<b>10</b>	<b>PH Value:</b> 10.1 Define PH 10.2 PH scale 10.3 PH of paper 10.4 PH of chemicals 10.5 PH of fountain solution
<b>11</b>	<b>Test Photographic Films:</b> 11.1 Properties of photographic film. 11.2 Test sensitivity 11.3 Test fogginess 11.4 Test humidity
<b>12</b>	<b>Visual Defects on Print Products:</b> 12.1 Scumming 12.2 Tinting 12.3 Slurring 12.4 Chalking 12.5 Crystallization 12.6 Improper half-tone quality 12.7 Verification of shades 12.8 Ink density 12.9 Half tone quality
<b>13</b>	<b>INSPECT PRODUCT</b> 13.1 Uses of reflection densitometer. 13.2 Comparison of multicolour job with print control strip.

## Laboratory Experience:

1. Study of the substance of a printing paper.
2. Study of the covering power of printing ink.
3. Study of testing of printing ink for viscosity.
4. Study of testing of printing ink for drying time.
5. Study of testing of printing ink for gloss.
6. Study of testing ink for colour correctness.
7. Study of testing of printing ink PH value of paper chemicals.
8. Testing of bursting strength of paper.
9. Testing of tensile strength of paper.
10. Testing of folding strength of paper.
11. Testing of tearing strength of paper.
12. Testing of paper for its machine direction and cross direction
13. Testing of coating of paper.
14. Testing of moisture content of paper.
15. Testing of fibers pattern (Microscopic Exam) of paper.
16. Test each properties of film.
17. Test opacity of film emulsion with transmissions densitometer and compare with standards.

## Reference Books:

Sr. No.	Name of Books	Authors & Publisher
1.	Printing Basic Science	Charles C Ammodh
2.	Printing Science	F. Pitman & L. C. Yung
3.	What the lithographer should know about Paper	R. F. Reid, G. A. T. F
4.	What the lithographer should know about Ink	R. F. Reid, G. A. T. F
5.	The science of Physics is lithographer	Er. Win Joffe, G. A. T. F.
6.	Lithographer	-- do --
7.	Material in Printing Process	Faber
8.	Graphic Art Manual	Janet N. Field