# M.D. UNIVERSITY, ROHTAK

**(NAAC Accredited 'A+' Grade)**

# SCHEME OF STUDIES AND EXAMINATION

# B.TECH (Printing Technology)

# SEMESTER 5th AND 6th

# Scheme effective from 2020-21

COURSE CODE AND DEFINITIONS:

| Course Code | Definitions |
|---|---|
| L | Lecture |
| T | Tutorial |
| P | Practical |
| BSC | Basic Science Courses |
| ESC | Engineering Science Courses |
| HSMC | Humanities and Social Sciences including Management courses |
| PCC | Professional Core Courses |
| LC | Laboratory Courses |
| MC | Mandatory Courses |
| PT | Practical Training |
| S | Seminar |
| TH | Theory |
| Pr | Practical |

General Notes:

1. Mandatory courses are non credit courses in which students will be required passing marks in internal assessments.
2. Students will be allowed to use non programmable scientific calculator. However, sharing of calculator will not be permitted in the examination.
3. Students will be permitted to opt for any elective course run by the department. However, the department shall offer those electives for which they have expertise. The choice of the students for any elective shall not be binding for the department to offer, if the department does not have expertise. To run the elective course a minimum of 1/3rd students of the class should opt for it.

**Scheme of Studies and Examination**
**B.TECH (Printing Technology) – 5th Semester**
**w.e.f. 2020-21**

| Sr. No. | Course Code | Course Title | Hours per week | | | Total Contact hrs/week | Credit | Examination Schedule (Marks) | | | | Duration of Exam (Hours) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | L | T | P | | | Internal Assessment | External Examination | Practical | Total | |
| 1 | PT 301G | Reproduction Technology | 3 | 0 | 0 | 3 | 3 | 25 | 75 | | 100 | 3 |
| 2 | PT 303G | Gravure Technology | 3 | 0 | 0 | 3 | 3 | 25 | 75 | | 100 | 3 |
| 3 | PT 305G | Offset Technology-1 | 3 | 0 | 0 | 3 | 3 | 25 | 75 | | 100 | 3 |
| 4 | PT 307G | Printing Image Generation-1 | 3 | 0 | 0 | 3 | 3 | 25 | 75 | | 100 | 3 |
| 5 | PT 309G | Print Media Ethics | 3 | 0 | 0 | 3 | 3 | 25 | 75 | | 100 | 3 |
| 6 | PT 311G | Advertising and Multimedia | 3 | 0 | 0 | 3 | 3 | 25 | 75 | | 100 | 3 |
| 7 | PT 313G | Reproduction Technology Lab | 0 | 0 | 2 | 2 | 1 | 25 | | 25 | 50 | 3 |
| 8 | PT 315G | Gravure Technology Lab | 0 | 0 | 2 | 2 | 1 | 25 | | 25 | 50 | 3 |
| 9 | PT 317G | Offset Technology Lab | 0 | 0 | 2 | 2 | 1 | 25 | | 25 | 50 | 3 |
| 10 | PT 319G | Print Image Generation Lab | 0 | 0 | 2 | 2 | 1 | 25 | | 25 | 50 | 3 |
| 11 | PT 321G | Practical Training | - | - | - | - | - | - | - | * Refer Note 1 | | |
| Total | | | | | | | **22** | | | | **800** | |

***Note:***

1. The evaluation of Practical Training-I will be based on seminar, viva-voce, report submitted by the students. According to performance, the students are awarded grades A, B, C, F. A student who is awarded 'F' grade is required to repeat Practical Training.

   **Excellent: A; Good : B; Satisfactory: C; Not Satisfactory: F.**

**Scheme of Studies and Examination**
**B.TECH (Printing Technology) – 6th Semester**
**w.e.f. 2020-21**

| Sr. No. | Course Code | Course Title | Hours per week | | | Total Contact hrs/week | Credit | Examination Schedule (Marks) | | | | Duration of Exam (Hours) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | L | T | P | | | Internal Assessment | External Examination | Practical | Total | |
| 1 | PT302G | Printing Management | 3 | 0 | 0 | 3 | 3 | 25 | 75 | | 100 | 3 |
| 2 | PT 304G | Print Finishing | 3 | 0 | 0 | 3 | 3 | 25 | 75 | | 100 | 3 |
| 3 | PT 306G | Printing Substrates | 3 | 0 | 0 | 3 | 3 | 25 | 75 | | 100 | 3 |
| 4 | PT 308G | Print Ink Technology | 3 | 0 | 0 | 3 | 3 | 25 | 75 | | 100 | 3 |
| 5 | PT 310G | Print Image Generation- II | 3 | 0 | 0 | 3 | 3 | 25 | 75 | | 100 | 3 |
| 6 | PT 312G | Offset Technology- II | 3 | 0 | 0 | 3 | 3 | 25 | 75 | | 100 | 3 |
| 7 | PT 314G | Print Finishing Lab | 0 | 0 | 2 | 2 | 1 | 25 | | 25 | 50 | 3 |
| 8 | PT 316G | Printing Ink Technology Lab | 0 | 0 | 2 | 2 | 1 | 25 | | 25 | 50 | 3 |
| 9 | PT 318G | Print Image Generation Lab | 0 | 0 | 3 | 3 | 1.5 | 25 | | 25 | 50 | 3 |
| 10 | PT 320G | Offset Technology Lab | 0 | 0 | 3 | 3 | 1.5 | 25 | | 25 | 50 | 3 |
| Total | | | | | | | **23** | | | | **800** | |

## Note:

Each student has to undergo practical training of 6 weeks during summer vacation after 6th semester and its evaluation shall be carried out in 7th Semester.

**REPRODUCTION TECHNOLOGY (PT-301G)**

**Note**: Examiner will set nine questions in total. Question one will be compulsory. Question one will have 6 parts of 2.5 marks each from all units and remaining eight questions of 15 marks each to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each unit.

## Unit-I

**Basic principles of reproduction photography:**line photography; Basic density range of line original Basic line exposure for computerized camera with on-line or off-line densitometer, equipments and accessories.

**Difficult line originals** - Line originals with color; line originals with fine lines screen; line originals with fluorescence effect.

**Contact photography** - Spreads and chokes.

## Unit-II

**Line separation from black and white art work.**

**Evaluation of line negative.**

**Halftone photography -**Introduction to the concepts, Theories of dot formation, Selection of screen ruling, Introduction to different halftone screens glass screen (brief study), contact screens - Grey and magenta Contact screen manufacture, Density gradient of contact screens, Negative, positive, standard or universal contact screen. Comparative study of glass and contact screens. Pre-screened emulsion.

**Half tone exposure:** Special features of half tone exposure. Factors affecting the halftone exposure Basic halftone exposure setting on ordinary and computerized camera with off-line and on-line densitometer.

## Unit-III

**Contrast control :** Contrast with glass screen : S.D. variation, multiple stop system (brief study) Contrast control with contact screens Determining B.D.R. and main exposure of the contact screen, Highlight compensation, Use of CC filters with magenta contact screen determining CC filters and exposure calculations.

**Auxiliary or supplementary exposures**: Contrast control with supplementary exposures. (a) Flash exposure - Deciding the basic flash exposure, for contact screens Exposure calculations.

(b)No-screen exposure-calculations.

**Line and halftone combination**

**Evaluation of halftone negative**

Color reproduction: Definition and concepts Introduction to Corpuscular and Wave nature of light the visible spectrum Additive synthesis and subtractive synthesis Additive and subtractive combination for graphic for reproduction and practical interpretation of color-theories.

Mechanism of vision and theories of color-vision.

Colorimetric Properties, Color and appearance measurement. Introduction to Colorimeter and Spectrometer.

## Unit-IV

**Color separation:**

a) FAKE color reproduction

b) Filters- Color separation filters and other filters; Overlap in the filters. Wide band and Narrow cut Filters
factors and filter ratios.

c) Screen angles-Moiré, juxtaposing rosettes. Basic rules in angular adjustment. Reproduction of
Pre-Printed color originals.

d)Study of quality control aids, gray scale, set of color control patches; Register marks; Register -punch, pin-bars etc.

Introduction to color separation methods and evaluation of direct colour separation.

**Digital photography:**

Electronics and digital imaging. Introduction. The current state of the market. Digital camera, Image quality, digital camera bags, multiband digital cameras. Choosing the right camera for the application. Resolutions- Introduction, monitor spaitial resolution, photographic film formats, resolution and their digital equivalents.

CCD technologies-Introduction, technology, commercial manufacture of CCD's, construction of CCD application, CCD cameras for the professional photographic market, color resolution. Implementation-Lighting for digital photography, over & under exposure characteristics, color balance & consistency, image manipulation. Optics & digital photography – Basic principles of lens selection.

**References:**


Line photography - **Karl Davis Robinson**.

Halftone Photography -**Erwin Jaffe**.

Small Offset Preparation & Process-**Les Crawhurst**

Printing Technology - **Adams, Faux, Rieber**.

Reproduction Systems - **V. S. Raman**.

Digital Photography-**Anthony Hamber, Phill Green**.

# GRAVURE TECHNOLOGY (PT-303G)

**Note**: Examiner will set nine questions in total. Question one will be compulsory. Question one will have 6 parts of 2.5 marks each from all units and remaining eight questions of 15 marks each to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each unit.

## Unit-I

**Gravure:**
History of gravure, Gravure products and markets - Publication gravure - gravure packaging and converting - product gravure. Gravure Screens. Gravure cylinder preparation - Diffusion etch - Direct TransferElectromechanical process - Laser cutting. Electronic engraving systems today. Chemical engraving methods and equipments -cell configurations-advantages and disadvantages. Cylinder correction methods - Re-etching electro mechanical engravings, Color balance etches, spot plating. Well formation - variables, basic types. Cylinder construction and preparation - Cylinder design, types. Balancing the cylinder. Copper plating and polishing, Reuse of cylinders.

## Unit-II

**Doctor blade** - Doctor Blade assembly - Blade angles. Blade distance from Nip, Blade edge, Blade mounting. Doctor Blade wear - Fatigue, Corrosion, Abrasive, Adhesive wear, Doctor blade materials, Doctor blade Holder configurations, Blade setting procedures, Preparing blade for use, Doctor blade problems. Gravure Impression Roller - function, Roller covering, Roller pressure, Cylinder diameter, Roller design & configuration. Balancestatic & Dynamic. Roller setting. New developments. Storage of impression rollers. Impression roller problems. Impression mechanisms mechanical, Hydraulic, Pneumatic.

## Unit-III

**Gravure Press and Its components:**
A generic printing unit. Sleeve solid cylinder, single and two revolution, sheet fed and web fed machines typical press configurations. Gravure publication presses-characteristics. Packaging Gravure Presses - Folding carton Presses. Flexible Packaging presses, Label presses. Product gravure. Other gravure presses - Intaglio plate printing, offset gravure and flexogravure. Gravure with flexo units. Gravure units as other equipment. Gravure roller coating. Gravure folders - types. Gravure Ink Dryers - Need for ink dryers, Drying water based inks, Dryers functioning, Dryer limitations, supply air valves, balancing the dryer, filters & dampers, roller condition vital. Heat Sources - steam, electric and gas, combination gas/oil, thermal oil, waste heat form incinerators. Solvent Recovery Methods. Gravure cylinder preparation- basic construction, surface finishing, sleeve and integral shafting of cylinder, Electo-mechanical, electron beam & Laser engraving.

## Unit-IV

**Gravure Substrates:**
Paper substrates-Roto news papers, Coated papers, Gravure packaging paper substrates - properties. Label stock, Paper board. Non Paper substrates - surface preparation,

plasticsproperties. Metalized films - Aluminum foil, Foil laminations. Gravure advantages, limitations. Future of Gravure Printing Industry.

**References:**

Gravure process and technology - **GAA**.
Printing Technology - **Adams, Faux, Rieber**

# OFFSET TECHNOLOGY – I (PT-305G)

**Note**: Examiner will set nine questions in total. Question one will be compulsory. Question one will have 6 parts of 2.5 marks each from all units and remaining eight questions of 15 marks each to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each unit.

## Unit-I

**Basic principles in planographic printing:**

History of offset process - Principle, advantages, limitations. Press configurations. Infeed unit - pile table, pile height, air blast nozzles, forwarding pickup sucker, rear pickup suckers, separator brushes & fingers. Types of feed board sheet control devices-conveyor assemblies, conveyor tape, hold down rods. Sheet separation system-friction, pneumatic. Forwarding systemsuccession sheet feeder, stream feeder. Front lay, Side lay - push type lays, pull type lays. Side lay settings. Sheet detectors - mechanical types, electromechanical types, photo electric types. No sheet detectors- early or fast detectors. Double sheet detectors. Grippers - spring gripper, pin type gripper, sprung pad gripper - compression spring, tension spring. Plate insertion system - tumbler gripper, rotary gripper. Sheet transfer section - chain transfer, single drum transfer, three drum transfer. Delivery unit- skeleton wheels. Transfer drum. Sheet decurler. Sheet guiding device blow downs. Air cushion transfer drum. Slow down mechanisms. Antisetoff spray equipments. Extended deep pile delivery. Continuous delivery. Metered powder supply. Electrostatic system.

## Unit-II

**Inking system:**

Introduction. Theory of ink-film flow. Dwell time. Ductor, ink duct. Ink feed roller. Oscillating roller. Drive rollers. Intermediate & plate inking rollers. Drum type inking system. Multi roller type inking system. Roller settingSetting form roller to oscillator, setting form roller to plate, setting the duct roller. Roller covering. Roller maintenance-roller removal, replacement, roller storage, roller hardness. Ink agitators.

**Dampening system:**

Introduction. Fountain roller. Dampening feed roller. Scavenger roller. Dampening solutioncomposition, Iso propanol alcohol - substitute of alcohol. pH of dampening solution. Conductivity of dampening system. Damper setting. Brush system for metering. Air knife system for metering. Conventional dampening system - metering dampening on conventional dampening system. Continuous flow dampening system- plate feed-epic litho dampener plate feed continuous flow damp. systems. Dahlgren inker feed dampening system. Roller covers - molleton fabric cover, stockinette cover, paper damper cover, synthetic damper cover. Damper cleaning machine.

## Unit-III

**Printing unit:**

Introduction. Cylinder gears - spur gear, helical gear, bevel gear. Cylinder design. Plate cylinder - cylinder driving, cylinder body, cylinder gap, plate clamping, plate punching, bearer contact cylinder, bearer gap cylinder. Plate mounting. Determining packing requirements, - Packing material, problems due to improper packing. Blanket cylinder - Introduction, functions, manufacture, selecting grade of blanket performance requirement. Types of blanket. Blanket squaring. Blanket punching. Mounting the blanket. Recovering

from blanket smash. Use of slightly damaged blanket. Care of blanket, blanket cleaning device. Impression cylinder.

## Unit-IV

**Process of printing operation:**

Pre make-ready, make ready, inspection of press sheets, control of press function during press run - maintaining the inking system, maintaining the dampening system, the feeder, the delivery. Color sequence in two color and multicolor operations. Printability & run ability. Weton-wet printing. Wet-on-dry printing. Direct imaging presses. Quality control during the press run - Densitometry, color control bars, press room lighting and standard viewing conditions, plate scanner. Printing unit problems. Proof press - requirements & advantages, progressive proof.

**References:**

Manual For Lithographic Press Operation - **A. S. Porter** Modern Lithography
Introduction to Printing Technology - **Hugh M Speirs**. Sheetfed Press Operation-**GATF**.
Offset Technology – **C.S.Mishra**. Lithographers Manual
Lithographic Technology - **Erwin A Dennis, Olusegun Odesina**.

## PRINTING IMAGE GENERATION - I (PT-307G)

**Note**: Examiner will set nine questions in total. Question one will be compulsory. Question one will have 6 parts of 2.5 marks each from all units and remaining eight questions of 15 marks each to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each unit.

### Unit-I

**Assembly of film images:**

Facilities. Equipments and tools required. Materials and supplies. Photographic film- camera film, contact film, room light handling films, duplicating films. Proofing materials - diazo papers, polymer papers, brown print paper, diffusion transfer material, photographic and stabilization paper. Assembly and masking materials - Goldenrod, vinyl, clear film, peelable masking films, photographic masking films. Stripping supplies - screen tints, pressure sensitive tapes, adhesives opaques, cleaning solutions, starch filler, register tabs button & pins. Register masks, GATF image contact masks. Basic steps in planning a film image assembly- Planning the layout, planning the flat, selection of stripping method, changing of information, inspection. Imposition considerations- Sheetfed, web fed. Sheet fed - press considerations, paper, press masks. Web fed - press, paper, press masks. The book signature - parts of a signature. Kinds of press layout - one up layout, one side multiple layout, one side combination layout, sheet wise layout, work and - turn layout, workand- tumble layout. Folding requirements - basic folds, folding dummy, machine folds. Image register system - control from art preparation through press. Film image register systems - Tab-and-button method, Punched - hole method. Film assembly basic - negative film assembly, preparing negativesfor stripping attaching negative to masking material. Attaching negatives to clear polyster. Attaching negatives to peelable masking film. Cutting openings in masking material, Scribing lines. Positive film assembly. Film assembly for single color printing. Assembly for film multiple color printing. Assembly for multiple imaging of plates and film.

### Unit-II

**Screen printing**

Stencil making. Hand painted stencil - Introduction, blockout methods (selective process) - wax resist method. Knife cut stencils. Paper laminates - stages in preparing laminate stencil. Common faults & their cause. Water adhered films. Solvent adhered films. Stencil cutting tools and cutting techniques - swirel knife. Computerized stencil cutting. Photomechanical stencil making - indirect photo stencil film - making an indirect photostencil, indirect photo polymer film. Automatic processing and development - direct emulsion photostencil - making a direct emulsion photostencil, direct emulsion coating m/c. Direct emulsions, direct/indirect photo stencils- making a direct/indirect photostencil, capillary direct film photo stencils- making a capillary direct photostencil. Quality control in photo stencil making.

### Unit-III

**Heat transfer printing, Collotype:**

Heat transfer printing- melts transfer, dry transfer. Collotype.

## Unit-IV

**Planographic plates:**

Introduction. Light sensitive coating -dichromate colloids, diazo compounds, photo polymers, diffusion and transfer methods, electrostatic. Sensitivity of coating to light. Dye-sensitized photo polymerization, dark reaction, post exposure, safe lights, reciprocity law. Action of light sources on coatings, stabilities of coatings. Plate materials - zinc, aluminum, brass, copper, steel, chromium. Action of oil and water on metal - contact angle. Ability to withstand cracking. Susceptibility to dot sharpening. The plate base - cross section of an aluminum plate, cross section of an a plastic plate. Graining of plates - mechanical graining, electrochemical graining. Anodized aluminum, plate washes. Paper plates, paper aluminum laminates, plastic plates. Light sources for plate making - spectral data for various light sources, metal halide, mercury lamps, pulsed - xenon, laser. Treatment of non-image areas - desensitizing gum, chemistry of gum Arabic, other natural & synthetic gums. General processing sequence for a negative working plate. General processing sequence for a positive working plates. Negative working plates- additive presensitized plates, subtractive diazo PS plates, photo polymer presensitized plates, aqueous developable plates, driographic plates, multimetal plates. Producing a multimetal plate. Types- bimetallic, trimetalic. Projection-speed negative plates. Positive working lithographic plates- Presensitized plates, Electrostatic plates. Baking of positive plate Process of making deep etch plate - counter etching, exposing, developing, deep etching, cleaning the image areas, stopping out unwanted areas, comprising the image areas on aluminum plate, applying non blinding lacquer applying deep etch developing ink, remaining the gum stencil, desensitizing, gumming up, putting the plate under asphaltic, removing and adding work. Health and safety in deep-etch plate making.

**References:**

Heidelberg DI Press- Manual Chemistry for Graphic Arts - **Dr. Nelson R. Eldred**.
Offset Plate Making - **Robert F. Reed**.
Printing Technology 3rd Edition. - **Adams, Fax &Rieber**.
Screen Process Printing - **John Stephens**.
Sheet fed Offset Press Operating - **Lloyd P. Dejidas**.
Flexography Premier - **Donna C. Mulvihill**. Stripping - **Harold L. Peck**.
Gravure Process And Technology –GAA. Selecting The Right Litho Plate - BPIF.

# PRINT MEDIA ETHICS (PT-309G)

**Note**: Examiner will set nine questions in total. Question one will be compulsory. Question one will have 6 parts of 2.5 marks each from all units and remaining eight questions of 15 marks each to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each unit.

## Unit-I

**Morality and ethics:**

Introduction, Types of ethics, Nature of Ethics, Objective of ethics, Business Ethics, Business Ethics and Profits; Relationship between Business &Ethics - The Unitarian View, The Separatist View, The Integration View. Nature of Ethics in Business; Characteristics of Business Ethics; Need for Business Ethics; Arguments against Business Ethics, An example of Ethical business Practice, Discussion Situation 1;Discussion Situation2;Discussion Situatation 3; Ethical Practice in Management; Evolution of Business Ethics as a field of study.

**Workplace Justice Issues:**

Automation - De-skilling -Safety -Working hours and tasks privacy -Information Technology Issues in the International Setting- Computer Privacy- Methods of privacy protection: Browser settings- password systems firewalls - anonymous email (proxy) Encryption and virus protection software, and other Internet security related programs- Computer cleaning software.

## Unit-II

**Electronic Property and Copyright:**

Legal protections for computer software. Freedom of expression and Censorship. Paternalism- Freedom and the Internet, Questions about harm- Types of harm- Information Technology and The Future.

**Work life In Indian Philosophy:**

Indian Ethos for the Work life - Man's unique inner resource, Holistic relationship between Man and Nature, Cooperation, Self-Management, Yoga and Meditation, Dharma, The spirit of Renunciation, Indian Values for the Workplace - The importance of relationships in the workplace, Respect for Elders, Respect for Hierarchy and Status, Need for Security, Simple Living and High Thinking, The Karta, Internal Orientation, Wisdom, Balance and Moderation. Rights and Duties. Quality of Work life in Indian Philosophy.

## Unit-III

**Attitudes, Beliefs & Life Positions:**

Concept of Attitudes. Attitudes governing ethical behavior. Wrong attitudes resulting in unethical behaviour.Right attitudes resulting in ethical behavior. Beliefs & Ethical Behaviour. Life Positions & Ethical Behaviors.

**Overviews of the Ethical Value System:**

The System of Universalism, The System of Utilitarianism, The System of Distributive Justice & Social Contracts,

Individual Freedom of Choice, The Legal System & Professional Codes. Culture & Ethics-Social Culture & Individual Ethics-Social Contract Theory, Collective or Socialism Theory, Organic Theory. Idealistic or GroupMind Theory. Similarity of Ethical Values in different Cultures- The Principles, Conclusion. Case Study.

## Unit-IV

**Role of Legislation & Other Bodies in Enforcing Ethical Business Behaviour:**

Relationship between Law and Ethics. Role of the Government of India in enforcing ethical behavior. The Indian Constitution; Indian Business Laws and their impact on Ethical business behavior -(a)Business Laws & (b) Labor

Laws; Conclusion. Relationship Between Ethics & Corporate Excellence- Corporate Mission Statement, Code of Ethics, Organizational Culture,

Ethics & Individual Behavior- Areas of Influence or Areas of Authority and Areas of Interest.Education without Character, Commerce without Morality, Pleasure without Conscience, Wealth without Work, Science without Humanity.

**Social and Economic Responsibilities of Business:**

Social Responsibilities of Business. Why business must be socially responsible; Interaction between business and Society; Major Social responsibilities of Business - Optimum Utilization of scarce national Resources, Responsibility not to make losses, Improved Quality of Life, Responsibility of Employment and Income, Offering Quality products at fair price, Environmental Protection, Fair Trade Practices, Fulfilling all national obligations under various Laws, Safeguard the health and well-being of customers; A Look at Social Performance of Business. Economic Responsibilities of Business.

**References:**

Business Ethics Concepts & Cases - **Sadhri Sorab**

# ADVERTISING AND MULTIMEDIA (PT -311G)

**Note**: Examiner will set nine questions in total. Question one will be compulsory. Question one will have 6 parts of 2.5 marks each from all units and remaining eight questions of 15 marks each to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each unit.

## Unit-I

**Advertisement**

A.Definition, concept, types, principle, objectives, promotion, publicity, propaganda, target audiences, psychology, Product, design, packaging. Message, language,creativity visualization and campaign. B.Layout, scripts, writing.

## Unit-II

**Advertisement Budgeting**
Methods, determining and appropriation.
**Advertisement Research**
Research methods, sampling, data analysis and representation, surveys, attitudinal research.

## Unit-III

**Media Planning**
Budgeting, allocation of budget, calculating cost of media, media mix. Types of media. Readership, viewership (target audience), OTS, TRP, circulation.
**Advertisement Agency**
Structure and function, choosing advertisement agency, advertisement law.

## Unit-IV

**Advertisement and Computers**
Introduction, role of computers in advertisement, animation, application of software's like Photoshop, CorelDraw, quark-express etc. **Public Relations**
Definition, concept and role of public relations in public and corporate sector. Tools of public relations including internet. Image building and public relation campaigns. Marketing-Mix and promotional mix

**References:**


1. Advertising Theory & Practice - **Chunawalla, Kumar, Sethia, Subramanian, Suchak**.
2. The Concept of Marketing-By Philip Kotler
3. Advertising and Promotion-By Belch & Belch

## REPRODUCTION TECHNOLOGY LAB. (PT-313G)

1. Setting of Camera.
2. Line negative and positive preparations.
3. Half tone negative and positive preparations
4. Bromide Positive preparations.
5. Exposing difficult line originals; use of filters
6. Finding B.D.R. and main exposure time of contact screen.
7. S.D. calculations and S.D. setting and contrast control with glass screen.
8. Line negative making with density range compensation, use of log Equations.
9. Highlight compensation with log exposure formula.
10. Contrast control with contact screens.
11. Use of CC filters with magenta contact screen.
12. Contrast control with supplementary exposures.
13. Line and half tone combination.
14. Fake color reproduction and introduction to direct and indirect color separation methods.

## GRAVURE LAB. (PT-315)

1. Study of various Gravure printing machine configurations.
2. Study of various components of a Gravure printing machine.
3. Pre-make ready in Gravure Printing Process.
4. Plate preparation/ Cylinder preparation. 5.Make-ready in Gravure Printing Process.
6. Study of feeding unit of a Sheet-fed/ Web-fed Gravure printing machine.
7. Single and Multi color printing by using Gravure Printing Process.
8. Printing on different substrates by using Gravure Printing Process.
9. Study of delivery unit of a Sheet-fed/ Web-fed Gravure printing machine.
10. Cylinder setting in a Gravure printing machine.
11. Check the practical problems in a Gravure printing process.

## OFFSET TECHNOLOGY – I LAB. (PT-317G)

1. Study of various controls and operations.
2. Study of the various mechanisms.
3. Study of the lubrication system.
4. Setting the feeder, feed board, lays and delivery.
5. Setting the water and ink rollers and fixing the plate.
6. Single colour printing.
7. Two colour printing.
8. Four colour printing.
9. Effect of ink and water on the print quality-use of densitometer.
10. Effect of impression pressure on print quality-use of feeder gauge.
11. Effect on colour sequence on print quality-transparaency and opacity of inks.
12. Ink trapping and back trapping- effect of tack, printing speed, ink film thickness.
13. Printing a second colour on a printed sheet problems involved and overcoming them, adjustment of lays, change of packing etc.
14. Identification of printing faults in the given samples-reasons and remedical actions.
15. Mixing of process inks to the shade for a given colour patch-effect of paper and ink film thickness.

## PRINTING IMAGE GENERATION-I(PT-319)

1. Comparative study of various materials and equipments used in Image Generation Department.
2. Preparation of pre-sensitized plate,
3. Preparation of letter set plates.
4. Layout preparation:
5. Study of gripper margin and registration processes, 6.Positioning of images for plate making,
7. Masking techniques.
8. Page makeup -folders, pamphlets, journals/magazines, newspaper, book work.
9. Layout preparation - Single page layout, 2 page layout, 4 page layout, 8 page layout, 16 page layout, 32 page layout, 64 page layout for work & turn, work & tumble, work & twist.

## INDUSTRIAL TRAINING (PT 321G)

Students will undergo for 4 weeks Industrial Training in vacation after 4th Semester

# PRINTING MANAGEMENT (PT 302G)

**Note**: Examiner will set nine questions in total. Question one will be compulsory. Question one will have 6 parts of 2.5 marks each from all units and remaining eight questions of 15 marks each to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each unit.

## Unit-I

Business Environment – Printing Industry in India & Abroad. Impact of globalization & IT.

Management –Nature scope and importance of Management, Functions of Management – Scientific, Management, CPM & PERT (Introduction).

## Unit-II

Production and operations Management – Locations and Layout of plant, Maintenance management. Quality assurance, Total quality management (TQM), ISO.

Marketing management – Marketing and its functions, distribution channels, salesmanship and advertising.

## Unit-III

Human resource management: Manpower planning – recruitment, selection, Training performance appraisal Wage and salary administration.

Financial Management, Nature, Scope objectives and functions of Financial Management.

## Unit-IV

Work flow and organizational structure in a printing press.

Cost Accounting: Cost concept, cost sheet, B.E.P.analysis, cost reduction and cost control.

Depreciation - Introduction to different methods and their comparison.

**References:**


1. T.A. Saifuddin – Management aspects of printing industry by Nirmal Sadanadn Publishers, Mumbai, Ist edition.
2. G.G. Field- Printing Production Management by Graphic Arts Publishing, 1996.
3. Balaraman – PMCA by Ramaya Features & publications, 1987.
4. Mendiratta B.D. – Estimating & Costing by Print Trade Publications, 1999-2000.
5. Ruggles – Printing Estimating Principles and Practices by Delmer Publication 1985.

(1.) Maintenance Engineering Handbook

(2.) Lindley R. Higging, Mc Graw Hill International Edition.

(3.) Operator's Manually by GATF.

6. R.D. Aggarwal-Organisation and Management-Tata McGraw Hill Publishing Ltd., New

# PRINT FINISHING (PT304G)

**Note**: Examiner will set nine questions in total. Question one will be compulsory. Question one will have 6 parts of 2.5 marks each from all units and remaining eight questions of 15 marks each to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each unit.

## Unit-I

**Introduction:**

Bindery In The New Millennium, Latest Developments in Print Finishing. Organization and Workshop Layout. Importance Of Book Binding. Growths Factors In Print Finishing. Book Binding Tools- Forwarding Tools, Finishing Tools. Binding Room Equipments- Laying Press, Standing Press, Sewing Frame, Glue Pot, Board Cutting. Book Binders Materials & Quality Control. British Standard Paper Sizes. International Paper Sizes. Ra & Sra Sizes. Advantages Of ISO Paper Sizes. Board - Kinds Of Boards. Reinforcing Materials. Securing Materials, Covering

Materials, Adhesives- Factors Governing The Choice Of Adhesives, Use Of Adhesives In Print Finishing, Effect Of

Wet Adhesives. Theories Of Adhesives. Principles Of Adhesives. Solvent Based Adhesives, Water Based Adhesives, Pressure Sensitive Adhesives. Types Of Adhesives. Adhesion- Physical, Specific. Miscellaneous Material.

## Unit-II

**Structure Of A Book:**

Physical Parts Of a Hard Bound Book. Operations Of Ideal full Cloth Binding Production-Pre- Forwarding Operations, Forwarding Operations, Finishing Operations. Jogging, Counting, Cutting, Slitting, Trimming. Folding Binders Aids, Characteristics Of Printed Sheet, Planning Imposition, Folding Schemes. Hand Folding- Folding To Paper, Folding To Print, Lump Folding, Puckering, Advantages & Limitations Of Hand Folding. Machine Folding - Knife Principles, Buckle Principle, Combination Of Knife & Buckle. Folding & Machine Direction. Advancements & Developments On Folding Machine, Folding Machine Paper Feeders, Tips For Smoother Folding. Tipping - In/ Attachment Of Plates. Gathering - Single Sheet Gathering, Collating - Collating Marks. Insetting - Make Up Of Insetted Work. Inserting.

**Securing Methods:**

Wire Stitching - Saddle Stiching, Side Stiching, Stabbing. Thread Sewing - Letterpress Binding, & Stationery Binding. Saddle Sewing, Side/Flat Sewing, French Sewing, Sewing On Tapes, Sewing On Cords, Sewing Two Sections On, Whip Sewing, Stub-Binding. Adhesive Binding/Perfect Binding - Advantages. Quality Control In Adhesive Binding. Lay-Flat Adhesive Binding. Mechanical Binding - Loose Leaf Binding - Traditional Styles Used. Spiral Binding. Wire ‘O’ Binding, Plastic Comb Binding. Case Binding. -Stages In Sheet Fed, Stages In Reel Fed, Case Making, Stages in casing-in. Ring Binding - Inter Screw, Ring Metal - Types, Loose Leaf Ring Binding. Ring Shapes. Burst Binding, On Demand Booklet Binding. Preflight In The Bindery. Publishers Binding. Magazine Binding & Book Binding.

## Unit-III

**End Papers:**

Purposes, Kinds of end Rapers, Quality of Paper Required for Pasting End Papers. Pressing, Gluing The Spine, Smashing the Spine, trimming the Book Edges, Rounding- Advantages, Rounding M/C. Backing - Backing M/C. Lining - Advantages. Head-Tail Bands, Caps, Book Marker. Method Of Attaching Head & Tail Bands. Covering - Covering Styles. Pasting Down, Pressing, Inspection.

**Finishing Processes:**

Cover Decoration & Other Processes. Print Finishing Operations - Embossing & Debossing, Blind Embossing, Gold Blocking /Foil Stamping. Die Printing. Thermography, Velvet Printing, Marbling, Varnishing, Graining,

Laminating, Gumming, Gluing, Punching, Perforating, Drilling. Label Puching, Appliqué. Edge Decoration -

Requirement, Colouring The Edges, Marbling Edges, Edge Guilding. Round Corner Cutting. Numbering - Folio Numbering, Double Numbering, Duplicate Numbering. Principle of Rotary Numbering. Skip Numbering, Automatic Numbering. Kindes of Indexes. Ruling - Principle Of Pen & Disk Ruling M.C. Ruling Terms. Banding & Lacing, Poly Bagging, Mailing, Creasing, Bundling, Tacketing. Ultra Violet Curing & Infra Red Curing.

## Unit-IV

**Binding & Finishing Machines:**

Study Of Various Modern Machines. Modern Guillotines - Single Knife Guillotines. Three Knife Trimmers. Knife Grinding M/C. Gold Blocking/Foil Stamping M/C. Wire Stitching M/C. Straw Board Cutter. Laminating M/C - Small Laminating M/C. Pouch Laminating M/C. Tunnel Laminating M/C. Tipping M/C. Smashing M/C. Back

Gluing M/C. Roller Gliding M/C. Inline Rounding M/C. Lining M/C. Modern Lining M/C. Cloth Cutting M/C. Foil Blocking M/C. Rotary Blocking M/ C. Casing In M/C. Case Making M/C. Box Waste Disposal Process. Box & Carton Manufacturing Process. Adhesive binding machine.

**References:**

Binding And Finishing - Ralph Lyman Binding And Finishing Part-1 - B.D.Mendiratta

Binding Finishing Mailing - T.J.Tedesco Introduction to Printing & Finishing - Hugh Speirs Finishing Process in Printing - A.G.Martin.

# PRINTING SUBSTRATES (PT 306G)

**Note**: Examiner will set nine questions in total. Question one will be compulsory. Question one will have 6 parts of 2.5 marks each from all units and remaining eight questions of 15 marks each to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each unit.

## Unit-I

**Paper:**

Introduction, Paper fibres &pulps paper performance, strengths and durability, absorbency, dimensional stability. Fibre structure- cellulose, hemi celluloses and lignin, Paper manufacture - Stage1 - pulp preparation, mechanical pulp, refiner mechanical pulp, thermo mechanical pulp, chemical processes-sulfate or Kraft process, sulfite process, combined chemical & mechanical process. Bleaching: Stage 2- stock preparation, non fibrous additives, fillers or loading. Stage 3- refining the pulp, pulp freeness, refiners, pulp cleaning. Paper manufacturing process - paper making machine. Wet-end, Head box and slice. Fiber orientation. Angular flow. MD: CD ratio. Wire section. Forming wires. Press and drier sections. Calendaring and Finishing- Hard calendaring, soft nip calendaring, super calendaring, machine glazing, paper coatings. Performance requirements for pigment - coated papers and boards.

## Unit-II

**Recycled paper:**

Introduction:- recycling process, fiber preparation- screening, centrifugal cleaning, flotation, washing, deinking plant function, continuous drum pulped, prescreening and cleaning, primary flotation, cleaning, fine screening, thickening, dispersing, brightness control, washing, thickening and storage. Deinking chemistry. Bleaches - Hydrogen peroxide, Oxygen & Ozone bleaching, reductive bleaching agents, chelating agents, sodium silicate, cataloes enzyme, agglomerating chemicals, surfactants. Biodegradation of surfactants, dispersants and the principles of washing.

## Unit-III

**Choosing a suitable paper:**

Characteristics of paper. Printing process requirement. Paper varieties for printing. Printing defects associated with paper. Reel defects. Testing methods. Measurement and calculations: Paper sizes. Influence of moisture and RH on paper and boards. Paper storage – Requirement. Methods. Variables affecting paper storage. Print quality achievable on different types of paper. Paper properties and printing problems-Introduction, printability, runnability. Surface and directional properties of paper & board-substance, caliper, bulk, compressibility, surface smoothness/ roughness, air permeance, static and dynamic friction. Surface strength and internal bond strength - picking, fluffing, splitting. Strength properties - stiffness, folding endurance, bursting strength, tear resistance. Optical properties - gloss, brightness, whiteness, yellowness and tint indices, fluorescence, opacity.

## Unit-IV

**Introduction to Non Paper substrates.**

Surface preparation, plastics-properties. Metalized films - Aluminium foil, Foil laminations. Advantages, limitations. Future in Printing.

**References:**

Printing materials science & technology - **Bob Thompson-PIRA**
Advances in printing science & technology Vol.24 - **J. Anthony Bristow**
Hand book of Print & Production - **Micheal Barnard, John Peacock**
Introduction to Printing Technology - **Hugh M.Speirs**

# PRINTING INK TECHNOLOGY (PT 308G)

**Note**: Examiner will set nine questions in total. Question one will be compulsory. Question one will have 6 parts of 2.5 marks each from all units and remaining eight questions of 15 marks each to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each unit.

## Unit-I

**Printing Inks**

Introduction, solvent based inks, water based ink, ingredients in Ink- pigments- properties, types, carbon black, inorganic pigments, organic pigments, physical characteristics of organic pigments. Vehicles- vehicles for liquid inks, vehicles for paste inks, UV curing vehicles. Additives - driers, extenders, anti oxidants, waxes. Oils- vegetable drying oils, semi drying oils, non drying oils. Drying mechanisms - physical drying mechanisms, absorption drying, evaporation drying, chemical drying systems, oxidation polymerization drying, radiation drying and curing, microwave drying, infrared drying. Viscosity - Newtonian flow, units of viscosity, viscosity & temperature, factors influencing viscosity, simple low viscosity inks, complex high viscosity inks. **Unit-II**

**Ink requirements for printing processes –** offset, letterpress, flexography, gravure, screen printing. Optical properties of ink films, rheology and ink transfer requirements, ink distribution and transfer on the press, method for the direct measurement of ink setting on coated paper. Printing Ink manufacturing machines & equipments. Paste inks - single roll mill, twin roll mill, triple roll mill, ball mill, twin horizontal mixer, unit-roll mill, high speed stirrer milling. Liquid inks - ball mill, pearl mill, sand mill, bead mill, shot mill. Trends and developments in ink manufacturing process.

## Unit-III

**Radiation curing**

Introduction, radiation curing inks, ink cure considerations, chemistry of uv curing-photo initiation, propagation, termination. Cationic curing, electron beam curing.

## Unit-IV

**Security Inks**

Range of security inks, special security features - fluorescence, phosphorescence, reflected by improved filters, magnetism, security printing inks for cheques-penetrating L/p inks, water fugetive inks, inks reacting with pen evadicators, red-ox reagents, inks reacting with solvents, invisible reactive inks, carbonizing inks. Security inks conformity tests and Q.C.tests-tests for chemical resistance, light fastness, rub resistance test, crumpling resistance test, grinding control, colour control, control of the rheological properties, control of drying time, control of various specific properties. Environmental considerations in security printing.

**References:**

Printing materials science & technology - **Bob Thompson-PIRA**
Advances in printing science & technology Vol.24 - **J. Anthony Bristow**
Hand book of Print & Production - **Micheal Barnard, John Peacock** Introduction to Printing Technology - **Hugh M.Speirs**. SIGPA - 1987

## PRINTING IMAGE GENERATION - II (PT 310G)

**Note**: Examiner will set nine questions in total. Question one will be compulsory. Question one will have 6 parts of 2.5 marks each from all units and remaining eight questions of 15 marks each to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each unit.

### Unit-I

**Driography**- Outline, system, structure, processing and use, precautions.
**Toray waterless plates** – outline, structure, processing and use, advantages and disadvantages.
Role of photopolymer in Image formation – Raised and Recessed.
Diffusion processes – Reflex and Projection plates.
Electro photography – Introduction, process, toner transfer theory, Equipment.
Water soluble photosensitive resin plates – introduction, characteristics, structure, processing, image reproductively.
Laser plate making – introduction, system outline, system performance, implifications.
Computer-to-plate: – Thermal plate, Polyester plate.
Surface preparation for screen

### Unit-II

**Image carriers for flexography:**
Introduction. Thickness of flexographic plates. Photopolymer flexographic plates Advantages of photo polymer plates. Disadvantages of photo polymer plates. Solid photo polymer plates. Photo initiators and photo sensitizers. Washout solvents. Liquid photo polymer plates. Base material for photo polymer plates. Rubber flexoplates, photo engravings, duplicate plates. Rubber plate making process – Advantages of rubber plates, disadvantage of rubber plates. Photo polymer plate making process sheet photo polymer plate making, liquid photo polymer plate making. Letter press plates – Introduction, photo polymer letterpress plates.

### Unit-III

**Gravure image carrier:**
Methods of cylinder preparation – diffusion etch, direct transfer, electromechanicalprocess, laser cutting, Well formation- lateral hard dot wells, direct contact wells, conventional gravure wells. Cylinder design – part of gravure cylinder, forms of gravure cylinder- integral shaft, mandrel. Copper plating and polishing. Reuse of cylinders. Ballard shell cylinders. Cylinder layout and film assembly. Carbon printing – Tissue lay down and development, staging and etching. Cylinder proofing – soft copy proofs, single sheet proofing system, direct digital proof, Diazo chrome proofs, overlay proofs. Chemical engraving methods-advantages, disadvantages.

## Unit-IV

**Digital Image Carriers:**

Image generation of a Digital Offset Machine. Basics of other digital image carriers.

1. Auto plate processor.
2. Troubleshooting for plates.
3. Quality control aids for plate making.

**References:**


1. A. L. Gatehouse; Manual for film planning and plate making; roper – GATF Publication, 1983 edition.
2. Lithographers manual – GATF seventh edition.
3. Paul J.Hartsuch Chemistry for the Graphic Arts, GATF, 1983 edition.
4. Lan Faux, Modern lithography, MacDonald & Evans Publication, 1973. Edition.
5. W.R. Durrant Printing – A guide to systems and their uses, Heinemann Professional Publishing, 1989 edition.
6. D.C. Mulvihill Flexo Primer, GATF & Foundation of FTA 1985 editon.

# OFFSET TECHNOLOGY - II (PT 312G)

**Note**: Examiner will set nine questions in total. Question one will be compulsory. Question one will have 6 parts of 2.5 marks each from all units and remaining eight questions of 15 marks each to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each unit.

## Unit-I

. **Development and growth of web offset presses**

Full size and mini web presses ; four basic types of web offset presses specially used for newspaper and magazine production in single and multicolor Factors to be considered for selecting the press.

**Components of web offset press**

Infeed, tension control Pre-conditioners, drier and chill rolls, folders, sheeters and winders, Adjustment, operation and maintenance of the major components.

**Inking systems and dampening systems for web offset**

Conventional and non-conventional dampening systems, UV inks and setting systems Causes and correction of ink-related problems Properties and requirements of heat set inks

## Unit-II

**Web Control**

Roll stands and automatic pasters, Detection of web breaks and control of tension, Web Flutter, causes and correction of misregister Control of fan out, Side lay, cut-off, web-toweb and ribbon control.

**Auxiliary equipment**

Various types of in-built and optional equipment availability for web-offset and their uses; equipment essentially needed for newspaper & magazine production. **Plate and blankets**

Various types used for web-offset their characteristics, merits and demerits for specific work, Cylinder pressures and Printing Make-ready.

## Unit-III

**Web-paper**

Properties and requirements of paper used for web offset Printability, Care and handling of rolls. **Dry Offset**

Why dry-offset; advantages and disadvantages Comparative study of dry offset, letterset and lithographic offset processes, difference between dry offset and letterset machines and inks job suitability.

**Driography or Waterless lithography**

Description of the process, Method of producing image and non-image areas Importance of the correct formulation of waterless lithographic inks.

**Introduction to types of drives used in web offset machines**

**Brief introduction to control panels of the web offset machines.**

## Unit-IV

**Folders**

Introduction, folding principles, parts of folder, combination folder, ribbon folder, double-former folder, the mechanics of folding process of jaw fold, chopper fold mechanism. Operation of collect cylinder, press folders, double former pre-folder, flow folders, insert folders.

**Inline Finishing**

Introduction, gluers, paster wheels, re-moisterable pattern gluers, segmented gluers, envelope pattern gluers, backbone gluers. Pattern perforating and numbering unitssheeters, variable rotary cutters. Auxiliary Equipments -Remote control console, Plate scanners, scanning densitometer, closed-loop system, web pre conditioners, sheet cleaners, ink agitators, water coded ink oscillators, fountain solution recirculation systems, fountain solution mixers, refrigerating fountain solution, automatic blanket washers, side lay sensors, web break defectors, re moisturizers-liquid applicator system, roller applicators systems, antistatic devices, Imprinters, Perfectos, cutoff controls, stroboscope, synchroscope, counters-Denex laser counter, stub counter.

**References:**

Web offset press operating- **David B. Crouse**
Offset M/c II - **C. S. Mishra**
Manual for Lithography Press Operation - **A. S. Porter**

## PRINT FINISHING LAB. (PT 314G)

1. Preparation of the following types of books.

I. Quarter bound a/c books by - French sewing method, Tape sewing method, Cord sewing method, Saddle sewing method, Side sewing method, Whip sewing method. II. Half bound a/c books by - French sewing method, Tape sewing method, Cord sewing method, Saddle sewing method, Side sewing method, Whip sewing method.

III. Full bound a/c books by - French sewing method, Tape sewing method, Cord sewing method, Saddle sewing method, Side sewing method, Whip sewing method.

2. Preparation of Writing board.

3. Preparation of Photo Album.

4. Preparation of Receipt books with numbers in duplicate & triplicate.

5. Preparation of Cheque books with 25 leaves.

6. Preparation of following type of Mechanical binding - Spiral wire binding, Wire 'O' binding, Ring binding.

7. Preparation of files of following designs - Loose leaf file - *single piece*, Loose leaf file - *Two piece tab binder*, Loose leaf guard file - *Boards joined with spine strip*, Court case file, Portfolio - *Closed file to keep confidential loose sheets*.

8. Preparation of these types of End papers - *Single End paper, Double or Inserted End paper, Made end paper, Cloth joint end paper, Zig Zag end paper, Cloth joint Zig Zag end paper.*

9. Preparation of telephone directory with Indexes and Tabs.

10. Study of various controls, operations and mechanisms of the following machines: Folding machine, Guillotine machine, Cutter and Creaser, Varnishing machine, Laminating machine, Sewing & Stitching machine, Miscellaneous machine.

11. Binding of case bound, publishers binding. Book-emphasis will be given on decoration.

12. Print finishing operation to be conducted - Gold blocking, Embossing, Edge decoration, Thermography, Marbling, Velvet printing, Rubber printing, Die printing, Pouch lamination.

13. Repairing of old books.

14. Study of Pen ruling, Disk ruling, UV curing processes.

## PRINTING INK TECHNOLOGY LAB. (PT 316G)

1. Various samples of Paper and their study.
2. Different samples of Inks and their study.
3. Light fastness test.
4. Machine Direction and Cross Direction of paper.
5. Effect of Humidity and Temperature on paper.
6. Ink tackiness Test.
7. Printed samples of different printing processes and their study.
8. Ink Viscosity Test.
9. Introduction to various chemicals used in printing. 10. Consumables and miscellaneous used in printing.

## PRINTING IMAGE GENERATION LAB. –II (PT 318G)

1. Drawing layout for different jobs.
2. Assembling negatives for single colour jobs and two colour jobs.
3. Assembling positives for single colour and two colour jobs.
4. Assembling positives for four colour jobs.
5. Preparing wipe-on plates. 6.Preparing albumin plates.
7. Preparing deep-etch plates.
8. Preparing pre-sensitized plates.

## OFFSET TECHNOLOGY - II LAB. (PT 320G)

1. Premake ready operations.
2. Make ready operations.
3. Multicolour job printing.
4. Trouble shooting during printing.
5. Study of electronic panel.
6. Blanket and plate cylinder setting.
7. Damping roller setting.
8. Inking roller setting.
9. Study of Web-breaks.
10. Operations of Folding machine.