

PREPRESS, COLOUR MANAGEMENT AND ELECTRONIC PUBLISHING

Prepress and Imaging Technology:

Graphic Design; Branding; Package Design and Development; Typography; Text encoding; Font – Types, Rendering, Management; Proof reading; Raster and vector images; Image acquisition devices; Image quality and file formats; Digital Prepress workflow – Stages, Automation, Standards; Tone reproduction - Halftone Principles, Screening Technologies; Imaging Devices – Principle, Components, types, quality control; Densitometry – instruments, standards.

Colour reproduction and Management:

Colour science; Colour spaces; Colour Measurement – Instruments and Standards; Colour Reproduction – Principles, Originals, Color separation, Effect of Substrate, ink and printing system; Colour Matching; Proofing; Colour Control; Color Management Principles; Profile creation and editing; Colour conversion; Press standardization and ISO standards; Colour Management Workflows.

Electronic publishing:

Digital Media; Book Publishing; Web Publishing; Software and Tools for cross media publishing; Conventional and XML Workflow; Website Design and Maintenance; Network Security; Database Management; Digital Asset Management; Digital Rights Management.

Security Printing:

Features, Inks, Substrates, Printing Technologies, Applications.

PRINTING TECHNOLOGIES

OFFSET PRINTING

Principle of lithographic printing – oil and water repulsion; sheet fed and web offset presses configuration; components of offset press – plate cylinder, blanket cylinder, impression cylinder; plate materials and plate making methods – conventional and CTP plates; dampening systems – continuous and intermittent; inking systems and ink transfer; blanket types and packing; sheet transport and delivery systems; register control; quality control parameters, limitations and applications of offset printing.

FLEXOGRAPHIC PRINTING

Principle and working of flexographic printing; press configurations – central impression (CI), stack press and inline press; components of flexo press – anilox roller, doctor blade, plate cylinder, impression cylinder; photopolymer plates – materials, plate making processes and mounting; anilox roller selection parameters, cell geometry and line screen; flexographic inks – water based, solvent based and UV inks; substrates for flexographic printing; drying systems; print defects and troubleshooting; quality control parameters in flexography.

GRAVURE PRINTING

Principle of gravure printing and direct image transfer; gravure cylinder construction and engraving methods – chemical etching, electromechanical engraving and laser engraving; doctor blade mechanism and ink transfer; gravure inks and solvents; drying systems and web handling; gravure press configurations; advantages and limitations of gravure printing; applications in packaging, publications and decorative printing; quality control parameters.

SCREEN PRINTING

Principle of stencil printing; types of screen printing – flatbed, rotary screen and cylinder press; screen materials – silk, polyester and stainless steel mesh; mesh count and tension; stencil preparation – direct, indirect and capillary film methods; squeegee types and parameters; screen printing inks and substrates; drying and curing methods; applications in textiles, electronics, packaging and specialty printing; quality control parameters.

DIGITAL PRINTING

Principles of digital printing and non-impact printing technologies; major digital printing processes – electrophotography (laser printing), inkjet printing and thermal printing; print heads and drop generation methods – thermal and piezoelectric inkjet; digital workflow and RIP (Raster Image Processing); color management in digital printing; substrates and ink types; advantages, limitations and applications in variable data printing and short run production.

3D PRINTING

Introduction to additive manufacturing; principles of layer-by-layer fabrication; types of 3D printing technologies – FDM, SLA, SLS and inkjet based 3D printing; materials used in 3D printing and quality control parameters.

PRINTING AND PACKAGING MATERIALS

PAPER AND BOARD TECHNOLOGY

Raw Materials & Processing, Paper and paperboard Manufacturing, Paper and board coating, De-Inking-methods, recycling, Environmental aspects and certification, Properties – Structural, physical, optical, chemical and mechanical. Paper and Paper Board Related Problems in Printing.

PACKAGING MATERIALS

Polymers, Biodegradable and Eco friendly polymers used in flexible and rigid packaging – types, Properties, applications and recycling. Wood and Textile packaging materials - Types, Applications, Specifications. Glass and Metals - Materials, properties, treatment, coatings, recycling process. Ancillary Materials used in packaging. Material Testing and national/International Standards.

INKS AND COATINGS

Raw Materials, Ink Formulation and Manufacturing - resin types and selection criteria, Speciality Inks and Ink Drying Mechanisms, Coatings and Surface Modification, Ink Testing and Measurements, End use applications and Standards on environmental concerns

PACKAGING TECHNIQUES AND PROCESSES

Introduction – Types, selection criteria, lifecycle assessment. Package design – Aesthetic and functional value. Graphic design - Specification, Tools, colour - Selection criteria – Applications. Structural design – cans, bottles, folding cartons, corrugated boxes, CAD application

PRINT FINISHING

Binding Materials, Print Finishing Workflow, Controls, Operations and Mechanisms of various Print Finishing Equipment's. Guillotines, Folding/Creasing theories and mechanism, Gathering and Securing Operation. Miscellaneous Finishing Operation and Automation in Binding. Quality Control

HEALTHCARE PACKAGING

Basics of Pharmaceutical Packaging and Process, Basics of Medical Device Packaging and Materials, Package Sterilization Methods, Package Validation and its Testing, National/International Standards & Compliance.

PRINTING AND PACKAGING MANAGEMENT

TOTAL QUALITY MANAGEMENT (TQM)

Quality concepts and evolution of quality management; Dimensions of product and service quality; TQM philosophies and frameworks-Quality gurus and contributions-Deming, Juran, Crosby; Leadership and strategic planning for quality; Customer satisfaction models; Continuous improvement practices -Kaizen, 5S, PDSA, Six Sigma; Quality Management Systems- ISO 9001, ISO 14001, TPM, Cost of Quality

COST ESTIMATION

Role of costing in printing and packaging industries; Elements of cost - Material, labour, machine, overheads, administration; Cost estimation methods for printing processes; Machine Hour Rate (MHR) and Batch Hour Rate (BHR); Break-even analysis and pricing strategies; Estimation of paper, ink, power, and finishing costs

PRINCIPLES OF MANAGEMENT

Functions of management- Planning, organizing, staffing, directing, controlling; Organizational structures in printing industries; Facility location and factory layout; Production planning and scheduling; Inventory control and EOQ; Introduction to ERP, PERT, and CPM

MARKETING & ADVERTISING MANAGEMENT

Marketing concepts and environment; Market segmentation, targeting, and positioning; Consumer and industrial buyer behavior; Product life cycle and branding; Marketing mix decisions -Pricing, promotion, distribution, logistics; Advertising concepts and scope; Advertising planning and budgeting; Media planning and selection -Print, electronic, and digital media; SEO, SEM, social media advertising

MACHINERY MAINTENANCE & ENTREPRENEURSHIP DEVELOPMENT

Maintenance concepts in printing machinery; Types of maintenance- Preventive, predictive, breakdown; Maintenance of mechanical, electrical, pneumatic systems; Lubrication systems and fault diagnosis; Entrepreneurial mindset and innovation;

Business models and startup ecosystem; Funding sources and legal aspects;
Human resource management for entrepreneurs.