

ANNA UNIVERSITY : : CHENNAI 600 025

UNIVERSITY DEPARTMENTS

R - 2008

III TO VIII SEMESTERS CURRICULUM AND SYLLABI

B.E. PRINTING TECHNOLOGY

SEMESTER – III

CODE NO.	COURSE TITLE	L	T	P	C
<b>THEORY</b>					
MA9211	<u>Mathematics – III</u>	3	1	0	4
ME9211	<u>Mechanics of Machines</u>	3	1	0	4
CE9213	<u>Strength of Materials</u>	3	0	0	3
EE9211	<u>Electrical Drives and Control</u>	3	0	0	3
PT9201	<u>Designing and Planning for Print Production</u>	3	0	0	3
PT9202	<u>Imaging Technology</u>	3	0	0	3
<b>PRACTICAL</b>					
PT9203	<u>Printing Design Laboratory</u>	0	0	3	2
CE9214	<u>Strength of Materials Laboratory</u>	0	0	3	2
EE9212	<u>Electrical Engineering &amp; Measurements Laboratory</u>	0	0	3	2
PT9204	<u>Imaging Technology Laboratory</u>	0	0	3	2
	<b>TOTAL</b>	<b>18</b>	<b>2</b>	<b>12</b>	<b>28</b>

SEMESTER – IV

CODE NO.	COURSE TITLE	L	T	P	C
<b>THEORY</b>					
MA9262	<u>Numerical Methods</u>	3	1	0	4
ME9261	<u>Machine Design</u>	3	1	0	4
PT9251	<u>Sheetfed Offset Technology</u>	3	0	0	3
PT9252	<u>Flexographic Printing</u>	3	0	0	3
PT9253	<u>Colour Reproduction</u>	3	0	0	3
PT9254	<u>Offset Platemaking</u>	3	0	0	3
<b>PRACTICAL</b>					
PT9255	<u>Offset Platemaking Laboratory</u>	0	0	3	2
PT9256	<u>Colour Reproduction Laboratory</u>	0	0	3	2
PT9257	<u>Printing Machine Laboratory</u>	0	0	3	2
	<b>TOTAL</b>	<b>18</b>	<b>2</b>	<b>9</b>	<b>26</b>

### SEMESTER – V

CODE NO.	COURSE TITLE	L	T	P	C
<b>THEORY</b>					
PT9301	<u>Printing Inks</u>	3	0	0	3
PT9302	<u>Packaging Technology</u>	3	0	0	3
PT9303	<u>Digital Data Handling</u>	3	0	0	3
PT9304	<u>Print Finishing</u>	3	0	0	3
PT9305	<u>Web Offset Technology</u>	3	0	0	3
	Elective - I	3	0	0	3
<b>PRACTICAL</b>					
PT9306	<u>Packaging Technology Laboratory</u>	0	0	3	2
PT9307	<u>Technical Seminar</u>	0	0	2	0
PT9308	<u>Print Finishing Laboratory</u>	0	0	3	2
PT9309	<u>Image Design &amp; Editing Laboratory</u>	0	0	3	2
	<b>TOTAL</b>	<b>18</b>	<b>0</b>	<b>11</b>	<b>24</b>

### SEMESTER – VI

CODE NO.	COURSE TITLE	L	T	P	C
<b>THEORY</b>					
MG9361	<u>Financial Management</u>	3	0	0	3
ME9352	<u>Microprocessor and Microcontroller</u>	3	0	0	3
PT9351	<u>Electronic Publishing</u>	3	0	0	3
PT9352	<u>Paper and Board</u>	3	0	0	3
PT9353	<u>Cost Estimation for Printing</u>	3	0	0	3
	Elective - II	3	0	0	3
<b>PRACTICAL</b>					
ME9358	<u>Microprocessor and Microcontroller Laboratory</u>	0	0	4	2
PT9354	<u>Multimedia Laboratory</u>	0	0	4	2
GE9371	<u>Communication Skills and soft Skills Laboratory</u>	0	0	2	1
	<b>TOTAL</b>	<b>18</b>	<b>0</b>	<b>10</b>	<b>23</b>

### SEMESTER – VII

CODE NO.	COURSE TITLE	L	T	P	C
<b>THEORY</b>					
GE9261	<u>Environmental Science and Engineering</u>	3	0	0	3
PT9401	<u>Packaging Materials</u>	3	0	0	3
PT9402	<u>Scheduling &amp; Planning for print Production</u>	3	0	0	3
PT9403	<u>Gravure and Screen Printing</u>	3	0	0	3
	Elective – III	3	0	0	3
	Elective – IV	3	0	0	3
<b>PRACTICAL</b>					
PT9404	<u>Print Production Laboratory</u>	0	0	8	4
PT9405	<u>Industrial Training*</u>	0	0	*	1
PT9406	<u>Comprehension</u>	0	0	2	1
	<b>TOTAL</b>	<b>18</b>	<b>0</b>	<b>10</b>	<b>24</b>

## SEMESTER – VIII

CODE NO.	COURSE TITLE	L	T	P	C
<b>THEORY</b>					
	Elective – V	3	0	0	3
	Elective – VI	3	0	0	3
<b>PRACTICAL</b>					
PT9451	<u>Project Work</u>	0	0	12	6
<b>TOTAL</b>		<b>6</b>	<b>0</b>	<b>12</b>	<b>12</b>

**TOTAL CREDIT: 190**

### LIST OF ELECTIVES FOR B.E. PRINTING TECHNOLOGY

#### ELECTIVES – I

CODE NO.	COURSE TITLE	L	T	P	C
PT9021	<u>Visual Communication</u>	3	0	0	3
PT9022	<u>Mass Communication</u>	3	0	0	3
PT9023	<u>Newspaper and Periodical Publishing</u>	3	0	0	3
PT9024	<u>Book Publishing</u>	3	0	0	3
PT9025	<u>Advertising techniques</u>	3	0	0	3
PT9026	<u>Colour Management</u>	3	0	0	3
PT9027	<u>Printing Machinery Maintenance</u>	3	0	0	3
PT9028	<u>Quality Control in Printing</u>	3	0	0	3
PT9029	<u>Security Printing</u>	3	0	0	3
PT9071	<u>Packaging Materials and Technology</u>	3	0	0	3
EC9021	<u>Electronic Communication</u>	3	0	0	3
GE9021	<u>Professional Ethics in Engineering</u>	3	0	0	3
GE9022	<u>Total Quality Management</u>	3	0	0	3
GE9023	<u>Fundamentals of Nano Science</u>	3	0	0	3
IE9023	<u>Human Resources Management</u>	3	0	0	3
PT9031	<u>Information System Analysis and Design</u>	3	0	0	3
IE9035	<u>Supply Chain Management</u>	3	0	0	3
MG9072	<u>Entrepreneurship Development</u>	3	0	0	3
MA9261	<u>Probability and Statistics</u>	3	1	0	3
ME9035	<u>Measurements and control</u>	3	0	0	3
ME9303	<u>Hydraulics and Pneumatics</u>	3	0	0	3
MF9022	<u>Non – Destructive Testing</u>	3	0	0	3
MF9401	<u>Operations Research</u>	3	0	0	3
MG9073	<u>Marketing Management</u>	3	0	0	3

**AIM**

To facilitate the understanding of the principles and to cultivate the art of formulating physical problems in the language of mathematics.

**OBJECTIVES**

- To introduce Fourier series analysis which is central to many applications in engineering apart from its use in solving boundary value problems
- To acquaint the student with Fourier transform techniques used in wide variety of situations in which the functions used are not periodic
- To introduce the effective mathematical tools for the solutions of partial differential equations that model physical processes
- To develop Z- transform techniques which will perform the same task for discrete time systems as Laplace Transform, a valuable aid in analysis of continuous time systems

**UNIT I      FOURIER SERIES****9+3**

Dirichlet's conditions – General Fourier series – Odd and even functions – Half-range Sine and Cosine series – Complex form of Fourier series – Parseval's identity – Harmonic Analysis.

**UNIT II      FOURIER TRANSFORM****9+3**

Fourier integral theorem – Fourier transform pair-Sine and Cosine transforms – Properties – Transform of elementary functions – Convolution theorem – Parseval's identity.

**UNIT III      PARTIAL DIFFERENTIAL EQUATIONS****9+3**

Formation – Solutions of first order equations – Standard types and Equations reducible to standard types – Singular solutions – Lagrange's Linear equation – Integral surface passing through a given curve – Solution of linear equations of higher order with constant coefficients.

**UNIT IV      APPLICATIONS OF PARTIAL DIFFERENTIAL EQUATIONS****9+3**

Method of separation of Variables – Solutions of one dimensional wave equation and one-dimensional heat equation – Steady state solution of two-dimensional heat equation – Fourier series solutions in Cartesian coordinates.

**UNIT V      Z – TRANSFORM AND DIFFERENCE EQUATIONS****9+3**

Z-transform – Elementary properties – Inverse Z-transform – Convolution theorem – Initial and Final value theorems – Formation of difference equation – Solution of difference equation using Z-transform.

**L: 45, T: 15, TOTAL: 60 PERIODS**

**TEXT BOOK**

1. Grewal, B.S. "Higher Engineering Mathematics", Khanna Publications (2007)

**REFERENCES**

1. Glyn James, "Advanced Modern Engineering Mathematics, Pearson Education (2007)
2. Ramana, B.V. "Higher Engineering Mathematics" Tata McGraw Hill (2007).
3. Bali, N.P. and Manish Goyal, "A Text Book of Engineering 7<sup>th</sup> Edition (2007) Lakshmi Publications (P) Limited, New Delhi.

**OBJECTIVES:**

- To understand the principles in the formation of mechanisms and their kinematics.
- To understand the effect of friction in different machine elements.
- To analyse the forces and toques acting on simple mechanical systems
- To understand the importance of balancing and vibration.

**UNIT I KINEMATIC OF MECHANICS 10**

Mechanisms – Terminology and definitions – kinematics inversions of 4 bar and slide crank chain – kinematics analysis in simple mechanisms – velocity and acceleration polygons – Analytical methods – computer approach – cams – classifications – displacement diagrams - layout of plate cam profiles – derivatives of followers motion – circular arc and tangent cams.

**UNIT II GEARS and GEAR TRAINS 9**

Spur gear – law of toothed gearing – involute gearing – Interchangeable gears – Gear tooth action interference and undercutting – nonstandard teeth – gear trains – parallel axis gears trains – epicyclic gear trains – automotive transmission gear trains.

**UNIT III FRICTION 8**

Sliding and Rolling Friction angle – friction in threads – Friction Drives – Friction clutches– Belt and rope drives – brakes – Tractive resistance.

**UNIT IV FORCE ANALYSIS 9**

Applied and Constrained Forces – Free body diagrams – static Equilibrium conditions –Two, Three and four members – Static Force analysis in simple machine members –Dynamic Force Analysis – Inertia Forces and Inertia Torque – D’Alembert’s principle –superposition principle – dynamic Force Analysis in simple machine members.

**UNIT V BALANCING AND VIBRATION 9**

Static and Dynamic balancing – Balancing of revolving and reciprocating masses – Balancing machines – free vibrations – Equations of motion – natural Frequency – Damped Vibration – bending critical speed of simple shaft – Torsional vibration – Forced vibration – harmonic Forcing – Vibration solation.

**L+ T = 45 + 15 = 60 PERIODS**

**TEXT BOOKS**

1. Ambekar A.G., “Mechanism and Machine Theory” Prentice Hall of India, New Delhi, 2007
2. Shigley J.E., Pennock G.R and Uicker J.J., “Theory of Machines and Mechanisms”, Oxford University Press, 2003

**REFERENCES**

1. Thomas Bevan, “Theory of Machines”, CBS Publishers and Distributors, 1984.
2. Ghosh.A, and A.K.Mallick, “Theory and Machine”, Affiliated East-West Pvt. Ltd.,New Delhi, 1988.
3. Rao.J.S. and Dukupatti R.V. “Mechanisms and Machines”, Wiley-Eastern Ltd.,New Delhi, 1992.
4. John Hannah and Stephens R.C., “Mechanics of Machines”, Viva Low PricesStudent Edition, 1999.
5. V.Ramamurthi, Mechanisms of Machine, Narosa Publishing House, 2002.
6. Robert L.Norton, Design of Machinery, McGraw-Hill, 2004.

## STANDARDS

IS 2458:2001, Vocabulary of Gear Terms – Definitions related to Geometry.

IS 3756: 2002, Method of Gear Correction – Addendum modification for External cylindrical gears with parallel axes.

IS 5267: 2002 Vocabulary of Gear Terms – Definitions Related to Worm Gear Geometry.

IS 12328: Part 1: 1988 Bevel Gear Systems Part -1 Straight Bevel Gears.

IS12328: 1988 Bevel Systems Part – 2 Spiral Bevel Gears.

**CE9213**

**STRENGTH OF MATERIALS**

**L T P C**

**3 0 0 3**

### **UNIT I STRESS, STRAIN AND DEFORMATION OF SOLIDS 8**

Rigid bodies and deformable solids – Tension, Compression and Shear Stresses – Deformation of simple and compound bars – Thermal stresses – Elastic Constants – Volumetric strains – Stresses on inclined planes – Principal stresses and principal planes – Mohr's circle of stress.

### **UNIT II TRANSEVERSE LOADING ON BEAMS AND STRESSES IN BEAMS 13**

Beams – types transverse loading on beams – Shear force and bending moment in beams – Cantilevers – Simply supported beams and over – hanging beams. Theory of simple bending - bending formula – bending stress distribution – Load carrying capacity – Proportioning of sections – Flitched beams – Shear stress distribution.

### **UNIT III TORSION 5**

Stresses and deformation in circular and hollow shafts – Stepped shafts – Shafts fixed at the both ends – Stresses in helical springs – Deflection of helical springs.

### **UNIT IV DEFLECTION OF BEAMS 10**

Double Integration method – Macaulay's method – Area moment theorems for computation of slopes and deflections in beams – Conjugate beam and energy method – Maxwell's reciprocal theorems.

### **UNIT V THIN CYLINDERS, SPHERES AND THICK CYLINDERS 9**

Stresses in thin cylindrical shell due to internal pressure circumferential and longitudinal stresses – deformation in thin cylinders – spherical shells subjected to internal pressure – deformations in spherical shells - Lamé's theory – application of theories of failure

**TOTAL : 45 PERIODS**

## TEXTBOOKS

1. Rajput.R.K. "Strength of Materials" S.Chand & co Ltd. New Delhi 1996
2. Jindal U.C. "Strength of Materials" Asian Books Pvt Ltd, New Delhi 2007

## REFERENCES

1. Egor.P.Popov "Engineering Mechanics of Solids" Prentice Hall of India, New Delhi 1997
2. Subramanian R. "Strength of Materials" Oxford University Press, Oxford Higher Education series ,2007
3. Hibbeler , R.C, "Mechanics of materials", Pearson Education, Low price Edition,2007

**AIM**

To provide knowledge in the area of electrical drives and their control techniques

**PREREQUISITE**

Basic Electrical Engineering

**OBJECTIVES**

To impart knowledge on

- Basics of electric drives
- Different speed control methods
- Various motor starters and controllers
- Applications

**UNIT I INTRODUCTION****9**

Fundamentals of electric drives – advances of electric drive-characteristics of loads – different types of mechanical loads – choice of an electric drive – control circuit components: Fuses, switches, circuit breakers, contactors. Relay – control transformers.

**UNIT II SPEED CONTROL OF DC MACHINES****9**

DC shunt motors – Speed Torque characteristics - Ward Leonard method, DC series motor – series parallel control – solid state DC drives – Thyristor bridge rectifier circuits- chopper circuits.

**UNIT III SPEED CONTROL OF AC MACHINES****9**

Induction motor – Speed torque Characteristics – pole changing, stator frequency variation - slip-ring induction motor – stator voltage variation - Rotor resistance variation, slip power recovery – basic inverter circuits- variable voltage frequency control.

**UNIT IV MOTOR STARTERS AND CONTROLLERS****9**

DC motor starters : using voltage sensing relays, current sensing relays and time delay relays - wound rotor induction motor starters – starters using frequency sensing relays - DOL-starter and auto transformers starter.

**UNIT V HEATING AND POWER RATING OF DRIVE MOTORS****9**

Load diagram, over load capacity, insulating materials, heating and cooling of motors, service condition of electric drive – continuous, intermittent and short time – industrial application.

**TOTAL : 45 PERIODS****TEXT BOOKS**

1. N.K De and P.K Sen 'Electric Drives' Prentice Hall of India Private Ltd, 2002.
2. Vedam Subramaniam 'Electric Drives' Tata McGraw Hill, New Delhi, 2007
3. V.K Mehta and Rohit Mehta 'Principle of Electrical Engineering' S Chand & Company, 2008

**REFERENCES**

1. S.K Bhattacharya Brinjinder Singh 'Control of Electrical Machines' New Age International Publishers,2002.
2. John Bird 'Electrical Circuit theory and technology' Elsevier, First Indian Edition, 2006.

**OBJECTIVE**

To impart knowledge on various printing processes, designing, layout and planning for print production. This introductory course will provide an overview to printing.

**UNIT I                  INTRODUCTION TO PRINTING PROCESSES                  12**

Types of process – Letterpress, Offset, Gravure, Flexography, Screen printing and Non-impact printing processes; Introduction to image carrier preparation for different types of printing process.

**UNIT II                  PRINCIPLES OF DESIGN                  6**

Basic concepts of designing, Creativity, steps in creativity; Typography; Visual ingredients of graphic design; Design consideration; Symbols and logos.

**UNIT III                  DESIGN LAYOUT                  6**

Layout – purpose & advantages; layout styles; layout components; stages in preparing a layout; marking-up; Dummy, Case studies.

**UNIT IV                  DESIGNING FOR MEDIA                  12**

Designing for Newspapers, Booklets, Magazines, Business publications, Banners & Posters, Advertising, Transit, Interactive, Web and Maps. Case studies.

**UNIT V                  DESIGN MANAGEMENT & PRODUCTION PLANNING                  9**

Relationship between designer, customer and printer; selection and co-ordination of production process; Limitation of printing process, binding, finishing and ancillary processes on design; selection and specification of ink, paper and other materials; production strategy.

**TOTAL : 45 PERIODS**

**TEXT BOOKS**

1. David A. Lauer, Stephen Pentak, "Design Basics", 6<sup>th</sup> Edition, Wadsworth, 2005
2. Poppy Evans and Mark A. Thomas, ' Exploring the Elements of Design', Delmar Publishers, 2004
3. Robin McAllister, "Design for Production", Delmar Publishers, 1997.

**REFERENCES**

1. Albert C. Book, C. Dennis Schick, "Fundamentals of Copy and Layout", Crain Books, 1984
2. Roger Walton, Keith Gillies, Lindsey Heppell, "Graphic Design", Ebury Press, 1987
3. Pamela Mortimer, "Document Design Primer", GATF, 2003
4. Helmutt Kipphan, "Handbook of Print Media", Springer, Heidelberg, 2000
5. T. M. Adams, D.D. Faux and L. T. Ricber, "Printing Technology", Delmar Publications Inc., 1996



**OBJECTIVE:**

To impart knowledge on laser typesetters, film processing, scanners, imagesetters, also give elaborate study of typographic parameters.

**UNIT I INTRODUCTION TO TEXT COMPOSING 9**

Printer's measurement system. Type series, Family, Typographic Parameters. Copy mark-up, Casting off, Copy editing. Proof reading marks. House style, Text composing techniques: Electrical & electronic typewriters, Word Processors. Early Phototypesetting Systems and Devices, storage of Master fount, Character coding, Digitization. Founts – outline, truetype, opentype, PS.

**UNIT II LASER TYPESETTERS 9**

Laser source: Helium Neon, Argonion, Violet Laser diodes, Choice and Selection of laser, Principles of typesetters and printers, Modulation. Direct laser modulation, Acousto-optic modulation. Deflection methods – Mechanical deflectors. Holographic deflectors, Solid state deflectors, Polygon Scanning, Facet tracing optics and Scan-end detection mechanism. Speed and resolution of laser typesetters.

**UNIT III ORIGINALS AND FILM PROCESSING 9**

Originals for reproduction, Line reproduction, Halftone reproduction, Theories of dot formation. Action of light, Types of films – Development theory, variant in development, sensitometry, Transmission densitometer. Lens and lens aberrations.

**UNIT IV IMAGE ACQUISITION 9**

Scanner types – Drum, flatbed, Dynamic range, Resolution, Storage, File formats. Digital Camera – Principles, mechanism, types, resolution, memory, software. Computer requirements.

**UNIT V IMAGESETTER AND PRINTERS 9**

Imagesetters –Types – Capstan, internal, external and virtual drum, light sources, Raster image processors, Screening Technologies. Non-Impact printing – Inkjet, dye-sub, thermal wax, electro photography.

**TOTAL : 45 PERIODS**

**TEXTBOOKS**

1. Alan Holmes, "Electronic Composition", Emblem Books Ltd., 1984.
2. J. Michael Adams, David Faux and Loyds J. Reiber, "Printing Technology", III Edn. Delmer (PuB).
3. Helmut Kipphan (Ed.) "Handbook of Print Media", 2001.

**REFERENCES**

1. James Craig, "Phototypesetting A Design Manual", Wetson-Gu Publication, New york, 1978.
2. Les Health and Ian Faux, "Phototypesetting", SITA Ktd., 1978.
3. "Handbook of Modern Halftone Photography", Perfect Graphic arts, Demarset, U.S.A.
4. Phil Green, "Understanding digital colour", Blueprint, 1995
5. David Bergsland, "Printing in a digital world", DImar Publishers 1997.
6. Frank Cost, "Pocket guide to digital Printing", Delmar Publishers, 1997.
7. T.E. Schildgen, "Pocket guide to colour with digital application", Delmar Publishers. 1998.

**OBJECTIVE:****To acquire skills on,**

- Designing using paint and brush
- Sketching using pencil
- Collage Art

**1. Basic Design**

To create Thumbnails and Rough sketches of logos, advertisements, lettering, etc., freehand using pencil

**2. Types of Layouts**

To prepare the various types of layouts using different themes, with poster colours and pencil

To develop artworks and design print products using collage and paint

**3. Colour Drawing**

To draw what is seen using colour, texture and thereby create portrait and figures

To develop a drawing folio and keep a sketch book as a record of ideas

**TOTAL : 45 PERIODS**

**OBJECTIVE:**

To study the properties of materials when subjected to different types of Loading.

1. Tension test on mild steel rod.
2. Double shear test on metals.
3. Torsion test on mild steel rod.
4. Impact test on metal specimen.
5. Hardness test on metals.
6. Compression test on helical spring.
7. Deflection test on carriage spring.

**TOTAL : 45 PERIODS**

**EE9212 ELECTRICAL ENGINEERING & MEASUREMENTS LABORATORY**    **L T P C**  
**0 0 3 2**

**AIM:**

To provide the practical knowledge and control methods of electrical machines

**OBJECTIVE:**

To impart practical knowledge on

- Characteristic of different machines
- Method of speed control of machines
- Measurement of various electrical parameters

1. Study of DC & AC Starters
2. Study of Transducers
3. Wheatstone Bridge and Schering Bridge
4. ADC and DAC Converters
5. Speed Control of DC Shunt Motor
6. Load Test on DC Shunt Motor
7. OCC & Load Characteristics of DC Shunt Generator
8. Load Test on Single-Phase Transformer
9. Load Test on Three-Phase Induction Motor
10. Load Test on Single-Phase Induction Motor.

**TOTAL : 45 PERIODS**

**PT9204**                                    **IMAGING TECHNOLOGY LAB**                                    **L T P C**  
**0 0 3 2**

**OBJECTIVE:**

To give hands on training on typesetting parameters in page layout using page making software also familiarization of scanner and graphic software.

**1. Word Processing Software**

- a. Basic typesetting formats

**2. Pagemaking Software**

- a. Basic non-illustrated document preparation
- b. Multiple Column Work
- c. Tabular column & Table editing
- d. Integration of text and Graphics
- e. Tag/style formatting
- f. Page Imposition

**3. Scanner**

- a. Introduction to scanner – scanning

**4. Graphics software**

- a. Free hand Drawing

**TOTAL : 45 PERIODS**

**UNIT I SOLUTION OF EQUATIONS AND EIGENVALUE PROBLEMS 10 +3**

Solution of algebraic and transcendental equations - Fixed point iteration method – Newton - Raphson method- Solution of linear system of equations - Gauss Elimination method – Pivoting - Gauss-Jordan methods – Iterative methods of Gauss-Jacobi and Gauss-Seidel - Matrix Inversion by Gauss-Jordan method - Eigenvalues of a matrix by Power method and by Jacobi's method.

**UNIT II INTERPOLATION AND APPROXIMATION 8 + 3**

Interpolation with unequal intervals - Lagrange interpolation – Newton's divided difference interpolation – Cubic Splines - Interpolation with equal intervals - Newton's forward and backward difference formulae.

**UNIT III NUMERICAL DIFFERENTIATION AND INTEGRATION 9 + 3**

Approximation of derivatives using interpolation polynomials - Numerical integration using Trapezoidal, Simpson's 1/3 and Simpson's 3/8 rules – Romberg's method - Two point and three point Gaussian quadrature formulae – Evaluation of double integrals by Trapezoidal and Simpson's rules.

**UNIT IV INITIAL VALUE PROBLEMS FOR ORDINARY DIFFERENTIAL EQUATIONS 9 + 3**

Single step-methods - Taylor's series method - Euler's method - Modified Euler's method - Fourth order Runge-Kutta method for solving first and second order equations - Multi-step methods - Milne's and Adams-Bashforth predictor-corrector methods for solving first order equations.

**UNIT V BOUNDARY VALUE PROBLEMS IN ORDINARY AND PARTIAL DIFFERENTIAL EQUATIONS 9 + 3**

Finite difference methods for solving two-point linear boundary value problems. Finite difference techniques for the solution of two dimensional Laplace's and Poisson's equations on rectangular domain – One dimensional heat-flow equation by explicit and implicit (Crank Nicholson) methods - One dimensional wave equation by explicit method.

**L : 45 T : 15 TOTAL : 60 PERIODS**

**TEXT BOOKS**

1. Grewal, B.S. and Grewal, J.S., " Numerical methods in Engineering and Science", 6<sup>th</sup> Edition, Khanna Publishers, New Delhi, 2004.
2. Sankara Rao, K. "Numerical methods for Scientists and Engineers", 3<sup>rd</sup> Edition Prentice Hall of India Private Ltd., New Delhi, 2007.

**REFERENCES**

1. Chapra, S. C and Canale, R. P. "Numerical Methods for Engineers", 5<sup>th</sup> Edition, Tata McGraw-Hill, New Delhi, 2007.
2. Gerald, C. F. and Wheatley, P. O., "Applied Numerical Analysis", 6<sup>th</sup> Edition, Pearson Education Asia, New Delhi, 2006.
3. Brian Bradie, "A friendly introduction to Numerical analysis", Pearson Education Asia, New Delhi, 2007.

**OBJECTIVES:**

- To familiarize the various steps involved in the Design Process
- To understand the principles involved in evaluating the shape and dimensions of a component To satisfy functional and strength requirements.
- To learn to use standard practices and standard data.
- To learn to use catalogues and standard machine components

**UNIT I STEADY STRESSES AND VARIABLE STRESSES IN MACHINE MEMBERS 9**

Introduction to the design process – factor influencing machine design, selection of materials based on mechanical properties – Preferred numbers, fits and tolerances – Direct, Bending and torsional stress equations – impact and shock loading – calculation of principle stresses for various load combinations, eccentric loading – Design of curved beams – crane hook and ‘C’ frame – Factor of safety – theories of failure – stress concentration – design for variable loading – Soderberg, Goodman and Gerber relations.

**UNIT II DESIGN OF SHAFTS AND COUPLINGS 10**

Design of solid and hollow shafts based on strength, rigidity and critical speed – Design of keys, key ways and splines – Design of crankshafts – Design of rigid and flexible couplings.

**UNIT III DESIGN OF TEMPORARY AND PERMANENT JOINTS 9**

Threaded fasteners – Design of bolted joints including eccentric loading, Knuckle joints, Cotter joints – Design of Welded joints, riveted joints for structures – theory of bonded joints.

**UNIT IV DESIGN OF ENERGY STORING ELEMENTS 8**

Design of various types of springs, optimization of helical springs – rubber springs – Design of flywheels considering stresses in rims and arms, for engines and punching machines.

**UNIT V DESIGN OF BEARINGS AND MISCELLANEOUS ELEMENTS 9**

Sliding contact and rolling contact bearings – Design of hydrodynamic journal bearings, McKee’s Eqn., Sommerfield Number, Raimondi & Boyd – Selection of Rolling Contact bearings – Design of Seals and Gaskets – Design of Connecting Rod.

**L : 45 T : 15 TOTAL : 60 PERIODS**

**NOTE:** (Use of P S G Design Data Book is permitted in the University examination)

**TEXT BOOKS**

1. Shigley J.E. and Mischke C.R., “Mechanical Engineering Design”, Sixth Edition, Tata McGraw Hill, 2003.
2. Bhandrari V.B, “Design of Machine Elements”, Second Edition, Tata McGraw-Hill Book Co., 2007.

**REFERENCES**

1. Sundararajamoorthy T.V, Shanmugam N, “Machine Design”, Anuradha Publications, Chennai.
2. Orthwein W, “Machine Component Design”, Jaico Publishing Co, 2003.
3. Ugural A.C, “Mechanical Design – An Integral Approach”, McGraw-Hill Book Co, 2004.
4. Spotts A.F., Shoup T.E, “Design and Machine Elements” Pearson Education, 2004.

## STANDARDS

IS 10260: Part I: 1982 Terms, definitions and classification of Plain bearings Part 1 : Construction.

IS10260: Part I: 1982 Terms, definitions and classification of Plain bearings Part 2 : Friction and Wear.

IS 10260: Part I: 1982 Terms, definitions and classification of Plain bearings Part 3 : Lubrication.

**PT9251**

**SHEET FED OFFSET TECHNOLOGY**

**L T P C**

**3 0 0 3**

### OBJECTIVE:

To make students to understand the sheet fed offset printing process. To make them understand the various mechanisms and settings involved in a sheet fed offset printing machine.

### **UNIT I PRINCIPLES OF OFFSET AND SHEET FEEDING 10**

Principles of lithography, wetting of a solid surface by a liquid, emulsification of ink and fountain solution, fluid behaviour in a nip. Basic configuration of offset machine. Sheet feeding and controls: Types of feeders, sheet control, drives, suction head mechanism, double sheet and no sheet detectors, side lays and front lays. Non-stop feeders. Sheet insertion and transfer systems, working principle, relative merits.

### **UNIT II PRINTING UNIT CONFIGURATION 12**

Cylinders: Various configurations, design, requirements, plate and blanket clamping mechanisms, pressure setting, packing, print length variation, equal diameter, true rolling principles. Cylinder drives. Sheet transfer and reversal systems, perfecting, delivery grippers, settings, quick delivery mechanisms. Anti set-off spray device. Feeders, delivery and other system components for metal printing .

### **UNIT III BLANKETS, ROLLERS 10**

Blanket types, requirements, manufacture, performance attributes. Rollers, types, properties, behavior. Basic inking and dampening system configuration. Fountain solution requirements, composition, re-circulation system and dosing units, Ink/water balance.

### **UNIT IV PRINTING AND INLINE OPERATIONS 7**

Make-ready operations, multi colour printing, automatic plate fixing, computer controls in printing, automatic blanket wash, roller wash systems. Spot varnishing, coating, numbering. Dryers. Print problem identification and quality control.

### **UNIT V DIGITAL PRESSES 6**

Direct imaging printing systems- once imageable, re-imageable masters, imaging principles, relative merits and emerging trends.

**TOTAL : 45 PERIODS**

### TEXT BOOKS

1. John MacPhee, "Fundamentals of Lithographic Printing Vol.I Mechanics of Printing", GATF, 1998.
2. A.S.Porter, "A Manual of Lithographic Press Operation", Lithographic Training Services.

## REFERENCES

1. W.R.Durrant. R.E. Witeworth and C.W.Meacock, "Machine Printing", Focal Press, London.
2. Frank Cost, "Pocket guide to digital Printing," Delmar Publishers, 1997.
3. T.E.Schildgen, "Pocket guide to colour with digital application", Delmar Publishers, 1998.
4. David Bergsland, "Printing in a digital world", Delmar Publishers, 1997.
5. Michael Limburg, "Gutenberg goes digital", Blue Print, 1955.
6. Anton & Peter Kammermeter, "Scanning & Printing," Focal press, 1992.
7. Robin McAllister, "Scanning & Image manipulation", Delmar Publishers, 1997.
8. Robin McAllister, "Colour", Delmar Publishers, 1997.
9. Phil Green, "Understanding digital colour", Blueprint, 1995.

**PT9252**

**FLEXOGRAPHIC PRINTING**

**L T P C  
3 0 0 3**

## OBJECTIVE

To introduce the basic principles of flexographic printing process, plate preparation & mounting methods, parts of a flexographic press and maintenance & quality control in flexo press.

### **UNIT I INTRODUCTION 9**

Basic principles – design considerations, plate preparation, plate mounting, press, ink, substrates; Basic Press construction, Press types, Printing station - fountain rollers, anilox rollers, doctor blades, plate cylinders, impression rollers.

### **UNIT II IMAGE CARRIER PREPARATION 9**

Moulded rubber plates; Photopolymer plates - Sheet photopolymer, liquid photopolymer, Direct Imaged Plates, Plate considerations - plate handling, storage, wrap distortion, Ink & solvent compatibility.

### **UNIT III MOUNTING AND PROOFING 9**

Plate mounting procedures, plate staggering, plate make ready; Manual Mounting, Video mounting, Sleeve mounting, Pin mounting, Proofing procedure.

### **UNIT IV PRINTING PRESS 9**

Roll mechanics, unwind equipment, infeed, substrate treatment, web tension control, inking systems, drying systems, cooling rolls, in line laminating, rewind equipment, rotary die cutting/sheeting, Pressroom Practices

### **UNIT V MAINTENANCE AND QUALITY CONTROL 9**

Maintenance - press, mounting and proofing machines; quality control at press side, control of incoming materials, Wastage control, Troubleshooting.

**TOTAL : 45 PERIODS**

## TEXT BOOKS

1. "Flexography : Principles & Practices", 5th Edition, FTA, 2000.
2. "FIRST: Flexographic Image Reproduction Specifications & Tolerances", 3<sup>rd</sup> Edition, FTA, 2003.

## REFERENCES

1. Frederick R.Boyle, "The Flexo Environment", Foundation of Flexographic Technical Association, 2002.
2. Anthony White, "High Quality Flexography", Pira reviews of Printing, Pira International, 1992.
3. Donna C.Mulvihill, "Flexography Primer", GATF Press, 1991.
4. Helmut Kipphan, "Handbook of Print Media", Springer Verlag, 2001
5. J.Michael Adams David, Fauz, Llyod, J.Rieber, "Printing Technology", 3rd Edition, Delmar Publishers, 1988

**PT9253**

**COLOUR REPRODUCTION**

**L T P C  
3 0 0 3**

### **OBJECTIVE:**

This course imparts the fundamental concepts of Colour Science & measurement and gives an overview of colour reproduction techniques. It gives an exposure to in-depth exploration of issues involved in color reproduction in print media and concepts behind image adjustment techniques. It also introduces the basic concepts of Color Management Systems.

### **UNIT I COLOUR SCIENCE & MEASUREMENT 9**

Light, colour, Additive and Subtractive colour theory, Attributes of colour, Tristimulus values, Chromaticity diagram, CIELAB, Colour spaces, Colour difference, Spectrophotometer

### **UNIT II PRINCIPLES OF COLOUR REPRODUCTION 9**

Image Acquisition, Colour originals for reproduction. Reproduction objectives, Colour reproduction – photography, printing, display devices; Colour printing - Colour separation techniques, Screen angles and moire patterns.

### **UNIT III COLOUR CORRECTION & IMAGE ADJUSTMENTS 9**

Properties of coloured inks, Masking and its principles, Balanced inks, Jones Diagram, Gray balance, Masking equations, Neugebauer equation, Look Up Table, Image Adjustments - Colour correction, White point & Black point, Colour cast removal, USM, Black printer, UCR, GCR, UCA.

### **UNIT IV SPECTRAL SENSITIVITIES, INK & PAPER 9**

Light Source, color filter, photographic emulsion. Optics of ink film - first surface reflection, multiple internal reflections. Additivity and Proportionality rules.

### **UNIT V COLOUR MANAGEMENT 9**

Colour Management – Need, Open loop, Closed loop, Calibration, Characterization, Conversion, ICC, Profiles, Rendering intent, Gamut mapping. Digital proofing – Need & issues, Viewing conditions

**TOTAL : 45 PERIODS**



## TEXT BOOKS

1. John A.C. Yule, "Principles of colour reproduction applied to photomechanical reproduction, Colour photography and ink, paper and other related industries", John wiley & Sons, U.K.
2. Phil Green, "Understanding Digital Color", 2<sup>nd</sup> edition, GATF Press, 1999.

## REFERENCES

1. R.W.G. Hunt, "Reproduction of Colour in Printing, T.V. & Photography", Fountain Press, 1981.
2. Gary Field, " Color and its Reproduction", 3<sup>rd</sup> edition, GATF Press, 2004
3. Berns R S, "Billmeyer & Saltzman 's Principle of Colour Technology", 3<sup>rd</sup> Edition, Wiley, 2000
4. J.Michael Adams David, Fauz, Llyod, J.Rieber, "Printing Technology", 3rd Edition, Delmar Publishers, 1988.
5. Abhay Sharma, "Understanding Colour Management", Thomson Delmar, 2004.

**PT9254**

**OFFSET PLATEMAKING**

**L T P C  
3 0 0 3**

## OBJECTIVE

To understand the process of Offset Plate making in general. To make them aware of different materials, and equipments used to make a quality offset plate.

### **UNIT I IMAGE PLANNING 8**

Lithographic production – Introduction; planning layout – Information, type of work, Environment and working conditions, Preparing the layout; Imposition schemes; Book work – Margin calculations, Methods; Planning materials, tools, equipment, light tables.

### **UNIT II METHODS OF IMAGE PLANNING AND ASSEMBLY 8**

Direct ruling to plate – Metal keys, Burnout masks, Paper templates; Hand assembly – Negative assembly to Golden rod, Golden rod with plastic interleave, Peelable membrane substrates; Conventional positive assembly, Pin register systems; Planning softwares – Features.

### **UNIT III PLATE CHEMISTRY, COATING AND PROCESSING 12**

Base metals – Aluminium, Zinc, Stainless steel, Copper, Chromium, Nickel and their properties, Poly masters, paper masters. Graining – types; Contact angle and wettability; Anodisation – Process; Light sensitive materials – dichromated colloids, diazo, and photopolymer compounds; Type of plates – Albumin, Deep-etch, Multi metal, Wipe-on, PS positive and negative working plate chemistry, exposing, processing chemicals, procedures; Plate exposing unit; Light source – Types – advantages, disadvantages; Automatic plate processing machine– Design, method of use; Desensitizing process, gum, developing inks, lacquers and asphaltum. Waterless plates, performance characteristics; Electrophotographic plates – types, processing and use; Reflex plate making; Diffusion transfer plates. Plate handling and storage.

### **UNIT IV COMPUTER TO PLATE SYSTEMS 10**

Computer to Plate Workflow. C-t-P plate making systems- Internal drum, External drum, Flat bed, Ink jet, Multi purpose systems. Plates for digital imaging- Tehrmal sensitive,

Photopolymer, Silver halide, Silver hybrid plates, sensitivity, chemistry, mechanism of image formation and processing. Processless plates. Digital plate control wedge.

## **UNIT V            QUALITY CONTROL**

**7**

Quality Control – Importance; Quality aids – Star target, Dot gain scale, Stouffer gauge, Graduated halftone percentage scale, UGRA Plate control wedge, GATF standard offset colour control bar, Brunner control system, Dotmeter.

**TOTAL : 45 PERIODS**

### **TEXT BOOKS**

1. A.L.Gatehouse and K.N.Roper, “Modern Film Planning and Platemaking”, 2<sup>nd</sup> Edition, SITA Limited, 1983.
2. R.M.Adams II & F.J.Romano, “Computer-to-Plate – Automating and Printing Industry”, 2<sup>nd</sup> Edition, GATF Press, 1999.

### **REFERENCES**

1. Ian Faux, “Modern Lithography”, SITA Ltd., 1982.
2. Lithographer’s Manual, GATF.
3. Bob Thompson, “Printing Materials”, Science & Technology, PIRA International, 1998.

**PT9255**

## **OFFSET PLATEMAKING LABORATORY**

**L T P C**  
**0 0 3 2**

### **OBJECTIVE:**

To provide hands on training to make imposition schemes and to expose plates using quality control aids.

1. Types of planning and layout preparation
2. Sheet work film assembly
3. Halfsheet work film assembly
4. Planning for irregular images
5. Film assembly for colour work
6. Study of exposing processing and punching systems.
7. Exposure optimization and standardization
8. Repeatability tests on Printing down frame
9. Wipe-on plate processing and standardization.

**TOTAL : 45 PERIODS**

**PT9256**

## **COLOR REPRODUCTION LABORATORY**

**L T P C**  
**0 0 3 2**

### **OBJECTIVES**

- To do colour separation & colour correction using image editing softwares
- To implement colour management system.

1. Introduction to image editing softwares
2. Scanning different types of originals using flatbed scanner (Also analyse the relationship between no. of gray levels & resolution)
3. File formats & Sampling
4. Tonal adjustment, Histogram analysis and equalization

5. Colour adjustments
6. Color separation of given original & proofing
7. Black Generation– UCR, GCR
8. Calibration and characterization of scanner & display device
9. Calibration and characterization of printer
10. Color management in image editing softwares

**TOTAL : 45 PERIODS**

**PT9257**

**PRINTING MACHINE LABORATORY**

**L T P C  
0 0 3 2**

**OBJECTIVE:**

To understand the controls, settings, and mechanisms of an offset machine and take prints.

1. Study of controls, operations and specifications of printing machines.
2. Single colour print in small offset machine.
3. Study of various mechanisms and settings.
4. Single colour print in big format machine.
5. Cylinder pressure setting.
6. Single colour print in modern offset machine.
7. Effect of packing on print length.
8. Two and four colour print in offset machine.
9. Four colour print in offset machine.
10. Densitometric measurements.

**TOTAL : 45 PERIODS**

**PT9301**

**PRINTING INKS**

**L T P C  
3 0 0 3**

**OBJECTIVE:**

To study the raw materials, properties, manufacturing processes, testing, problems related to printing inks used for different printing processes and special inks.

**UNIT I RAW MATERIALS - COLORANTS AND OILS 9**

Colorants – Pigments Classification, Preparation and properties, Inorganic – white and coloured. Carbon black, Metallic, Ultramarine and Fluorescent; organic – Diarylide yellow, Hansa yellow, Rhodamine, Lithol, Rubine, Rubine Toner, Phthalocyanine blue & green. Alkali blue, Benzidine orange, Toluidine red and Lake red C; Dyestuffs - Acid, basic, solvent and disperse dyes, Preparation and Properties and uses; Oils – drying, semi drying and non drying oils, Preparation, Properties and uses.

**UNIT II RAW MATERIALS – BINDERS, SOLVENTS AND ADDITIVES 9**

Resins – Natural Rosin and its derivatives and Gumarabic; Synthetic – Rosin modified fumaric, maleic and phenolic, pure phenolic, Alkyds, hydro carbons, polyamides, Polyvinyl, Ketone, Nitro Cellulose, Ethyl Cellulose, Epoxy resins, Acrylic resins and Varnishes - types; Solvents – Aliphatic & aromatic hydrocarbons, alcohols, esters, glycols & ketones; Additives – Properties and applications – Driers, Waxes, Antioxidants, plasticizers, wetting agents, defoaming agents and Antiskinning agents.

**UNIT III            CONSTITUENTS AND MANUFACTURING OF DIFFERENT INKS            9**

Ink composition for major printing process. Paste Inks – Single roll mill, Ball mill, Triple roll mill, Twin horizontal Mixture, Z-arm stirrer; Liquid Inks – Ball mill, Bead mill and attritor, Flow chart for ink manufacturing – weighing, mixing, grinding, testing and packing.

**UNIT IV            PROPERTIES, TESTING AND INK RELATED PROBLEMS            9**

Viscosity, Tack, Colour, Gloss, Rub resistance, Length, Drying Characteristic, and Fineness of grind gauge, light fastness, Standards on environmental concerns, end use applications, Ink problems related to printing processes – causes and remedies.

**UNIT V            SPECIAL INKS AND INK DRYING MECHANISMS            9**

Water based inks, Security inks, Radiation curable inks - IR, UV & EB – Raw materials, equipment used for drying. Ink drying mechanisms

**TOTAL : 45 PERIODS**

**TEXT BOOKS**

1. R.H.Leach, “The Printing Ink Manual”, 5th Edn., Chapman & Hall, London, 2002.
2. Ronald E.Tood, “Printing Inks – Formulation, Principles, Manufacture and Quality Control Testing”, PIRA International 1996.

**REFERENCES**

1. Cliffwoof, “A Manual for Flexographic Inks”, Fishbum Printing Ink Co.Ltd.,Watford.
2. Charles Finley, “Printing Paper and Ink”, Delmar Publishers, 1997.
3. Nelson R.Eldred, “What the Printer should Know about inks”, 3rd Edition GATF Press, 2001.
4. Bob Thompson, “Printing materials Science and Technology”, 2nd edition, 2004.

**PT9302**

**PACKAGING TECHNOLOGY**

**L T P C**

**3 0 0 3**

**OBJECTIVE:**

To study the fundamentals, designs in packaging, manufacturing process, testing of packaging and specialty packaging in detail.

**UNIT I            FUNDAMENTALS OF PACKAGING            6**

Definition, historical background, functions of packaging types and selection of package, packaging hazards, interaction of package and contents, shelf life estimation, materials and machine interface, life cycle assessment

**UNIT II            PACKAGE DESIGN            7**

Fundamentals, factors influencing design, consumer, research and sales promotion through package design, graphic design, Structural design – cans, bottles, folding cartons, corrugated boxes, bar codes and tags.

**UNIT III            MANUFACTURING PROCESS            12**

Folding carton manufacturing -Cutting; creasing; die making punching –cartooning Machineries – types, flexible pouches forming machines, corrugated box manufacturing process, Rigid boxes manufacturing process, Drums – types of drums, moulded pulp

containers; three piece and two piece can; seam treatment – types, Collapsible tube; metal foil packaging; bag making machinery – multiwall, tube forming; robots used in packaging.

**UNIT IV SPECIALITY PACKAGING 13**

Aerosol packaging, shrink and stretch wrapping, blister packaging, anti-static packaging, aseptic packaging, oven able package; Cosmetic packaging, confectionery packaging, hardware packaging, textile packaging, food packaging; child resistant and health care packaging, chub packaging, electrostatic discharge protective packaging, export packaging, lidding, medical packaging, modified atmospheric packaging, RFID in packaging.

**UNIT V PACKAGE TESTING 7**

Testing – bursting, tear, tensile; drop test - inclined impact, Horizontal impact, bridge impact, vibration Test, stacking and compression test, corrugated board testing, hot track method, layer gauge method,

**TOTAL : 45 PERIODS**

**TEXT BOOKS**

1. Bill Stewart, "Packaging Design Strategies", Pira International Ltd, 2nd Edition 2004.
2. F.A. Paine, "Fundamentals of Packaging", Brookside Press Ltd., London, 1990.
3. Aaron L.Brody & Kenneth S.Marsh, "Encyclopedia of Packaging Technology", John Wiley Interscience Publication, II Edition, 1997.

**REFERENCES**

1. Walter Stern, "Handbook of Package Design Research", Wiley Interscience, 1981.
2. Paine, "Packaging Development", PIRA International, 1990.
3. Arthur Hirsch, "Flexible Food Packaging", Van Nostor and Reinhold, New York, 1991.
4. E.P.Danger, "Selecting Colour for Packaging", Grover Technical Press, 1987.
5. Susan E.M.Salke & et al, Plastics Packaging, Hansar, 2nd edition 2004.

**PT9303**

**DIGITAL DATA HANDLING**

**L T P C  
3 0 0 3**

**OBJECTIVE:**

To provide exposure to the basic components of digital print production workflow like networking, file formats, Database management & security issues.

**UNIT I WORKFLOW 9**

Workflow - types, Automated workflow - components, File Preparation, Preflighting, Digital Imposition – preRIP, postRIP, OPI, Trapping, Postscript, PDF, Metadata – JDF, XML.

**UNIT II NETWORKING 9**

Data transmission fundamentals, Communication media, Data interfaces, Concepts and principles of computer networks, PAN, LAN, WAN, MAN, Network Topologies, Network protocols – FTP, TCP/IP, Network Node components – Hubs, Bridges, Routers, Gateways, Switches, Internet – principles, Client/Server model

**UNIT III FILE FORMATS & COMPRESSION TECHNIQUES 9**

File format – EPS, DCS, JPEG, GIF, TIFF, PNG, Comparison of file formats, Compression techniques, Lossy & lossless compression, RLE, Huffman compression, LZW, DCT, Wavelet, Fractal image encoding, Image quality evaluation, Audio compression, Video Compression

**UNIT IV DATABASE MANAGEMENT 9**

Database, Types, Database Management, Database Languages, Query processing, Data storage, Backup & recovery, Distributed databases, Data Warehousing, Data Mining, Security issues, Access Control, Digital Asset Management

**UNIT V SECURITY 9**

Security in Operating Systems, Principles of Network Security, Cryptography, Fire walls, Intrusion Detection Systems, Secure Email, Digital Rights Management

**TOTAL: 45 PERIODS**

**TEXT BOOKS**

1. Helmut Kipphan, "Handbook of Print Media", Springer Verlag, 2001
2. Phil Green, "Understanding Digital Color", 2nd edition, GATF Press, 1999.

**REFERENCES**

1. Mani Subramanian, " Network Management: Principles & Practice", Addison Wesley, 1999
2. Sanjiv Purba, "Handbook of Data Management", Viva Books Private Ltd., 1999
3. Douglas E. Comer, "Computer Networks & Internets", 2nd Edition, Pearson Publications, 1999
4. Larry L. Pearson, Bruce S. Davie, "Computer Networks: A Systems Approach", Third Edition, Morgan Kauffman Publishers Inc., 2003
5. Abraham Silberschatz, Henry F. Korth, S.Sudharshan, "Database System Concepts", Fourth Edition, Tata McGraw Hill, 2002
6. Charles B. Pfleeger, Shari Lawrence Pfleeger, "Security in Computing", Third Edition, Pearson Education, 2003

**PT9304**

**PRINT FINISHING**

**L T P C  
3 0 0 3**

**OBJECTIVE:**

To impart knowledge on various finishing operations and materials & equipments used for print finishing

**UNIT I BINDING MATERIALS 7**

Overview of binding and finishing; Print finishing – classification; materials; preparation and treatment of covers; adhesives – types, manufacturing, theory of adhesion; miscellaneous materials; prevention of deterioration; trends and developments in finishing operations; Quality control

**UNIT II GUILLOTINES 10**

Joggers; cutting – overview, work preparation; cutting – parts, types of motion; Principles of single knife guillotines, semi-automatic and automatic programming systems, three knife trimmers; operation, mechanism and maintenance of guillotines; various adjustments;

operational procedure of sensors and hydraulic systems; problems and remedies during cutting.

**UNIT III FOLDING 10**

Principles of folding, types of folding for sheet and web, methods of feeding and delivery; folding production line, folding terminology, folding diagram, folding scheme; problems involving folding; mechanism, operation and adjustment of folding machines; additional features – fold gluing, perforators, creasers and slitters.

**UNIT IV GATHERING AND SECURING OPERATION 9**

Principles of gathering, types of machines, feeders, delivery, inline production; Securing – types, characterization; stitching – wire and thread; adhesive binding; sewing – types, feeders and delivery; mechanical and loose leaf binding; materials, styles, purpose of each method.

**UNIT V MISCELLANEOUS FINISHING OPERATION AND AUTOMATION IN BINDING 9**

Edge treatment – characterization, edge staining, bookmark, rounding, backing, headband, edge treatment operation in production lines; case making – characterization, producing book covers, case making, casing in, inserting jackets; principles and operation of embossing, foil stamping, die-cutting, coating, indexing, round cornering, poly-bagging, preventing transit marking; lamination – types; materials handling and mailing; Production control, Network analysis

**TOTAL : 45 PERIODS**

**TEXT BOOKS**

1. Helmut Kipphan, "Handbook of Print Media", Springer, Heidelberg, 2000
2. G. Martin, "Finishing Process in Printing", Focal press Ltd., Britain, 1980

**REFERENCES**

1. Ralph Lyman, "Binding and finishing", GATF, 1993
2. T. J. Tedesco, "Binding, Finishing and Mailing: The Final World", GATF press, Pittsburgh, 1999.
3. Arthur W. Johnson, "The practical guide to Craft Book Binding", Thames and Hudson, 1985
4. Arthur W. Johnson, "Book Binding", Thames and Hudson, 1984
5. T. M. Adams, D.D. Faux and L. T. Ricber, "Printing Technology", Delmar Publications Inc., 1996

**PT9305 WEB OFFSET TECHNOLOGY L T P C  
3 0 0 3**

**OBJECTIVE**

To make the students understand the reel feeding mechanisms, web tension controls, dampening and inking systems, registering mechanisms and settings involved in a web offset printing machine.

**UNIT I PRESSCLASSIFICATION AND INFEED UNITS 12**

Development. Classification: blanket-to-blanket, in-line, common impression. Full size and narrow web presses. Job suitability and factors to be considered for selection, presses for producing continuous stationery. Roll stands. Automatic pasters: zero speed and flying paster. Web pre-conditioners, infeed units, dancer types, dancer system design, tension

control systems. Automatic webbing up device, control of fan out using buzzle wheels, and web aligner concepts. Web break detectors. Reel handling and storage. Requirements of paper-roll and web.

**UNIT II PRINTING UNIT 10**

Printing Unit – plate cylinder, blanket cylinder, lock-up mechanisms, plate bending machines, cylinder pressure and timing, unit configuration, webbing up options. Cylinder drives, Circumferential and lateral movement of plate cylinder. Automatic register control system concepts and design. Shaft less drives.

**UNIT III INKING & DAMPENING SYSTEM 9**

Inking system: requirements, design concepts, requirements, metering, roller train design, form rollers, heat generation, ghosting. Roller setting. Dampening system: requirements, types, metering methods, column control. Ink agitators, automatic ink pumping systems. Keyless inking, dahlgren damping, spray, brush dampeners. Test forms. Print quality, measurement and control systems. Web offset printing problems, solutions and paper waste control.

**UNIT IV DRYING, CHILLING, FOLDING AND SHEETING UNITS 10**

Dryers: need, types, construction and working. Silicone coating, Chilling units, construction. Operational care and maintenance. Folders, types and delivery. Former and its adjustment, R.T.F., nip rollers, turner bars, bay windows, side and cut off margin controls. Kickers, markers, perforators, slitters, operation and maintenance. Sheeting device and mechanism.

**UNIT V MAIL ROOM OPERATION 4**

Products, sizes, formats, sections, Pagination, single/double/quadruple production, speed, time schedules, conveyor system, counter stackers, wrapping requirements, strapping requirements. Bundle addressing, system control, Programming and Telescopic conveyor for truck loading, copy storage system, Inserting.

**TOTAL : 45 PERIODS**

**TEXT BOOKS**

1. W.R.Durrant, "Web Control : A Handbook for the Web Printer", 1997.
2. Edward J.Kelly, David B.Crouse and Robert R.Supansic, "Web Offset Press Operating", GATF Press, USA, 1982.

**REFERENCES**

1. David B.Crouse, "Web Offset Press Troubles", GATF Press,1984.
2. John MacPhee, "Fundamentals of Lithographic Printing Vol.I Mechanics of Printing", GATF Press, 1998.
3. Helmutt Kipphan, "Handbook of Print Media", Springer, Heidelberg, 2000

**PT9306**

**PACKAGING TECHNOLOGY LABORATORY**

**L T P C  
0 0 3 2**

**OBJECTIVE**

To impart practical knowledge on

- Design concepts for various carton making, testing of packaging materials and to study the controls, operations and mechanisms of various packaging machines



## **I. DESIGN AND CARTON MAKING**

1. Parallel Tuck-in
2. Reverse Tuck-in
3. Auto lock Bottom
4. Multiple ups
5. Creative Design

## **II. STUDY OF VARIOUS CONTROLS, OPERATIONS AND MECHANISMS OF**

1. Die cutting machine
2. Box stitching machine

## **III. PREPARATION OF BOX MAKING**

## **IV. TESTS ON PACKAGING AND PACKAGING MATERIALS**

1. Tensile strength
2. Compression
3. Rub proof ness
4. Burst Strength

**TOTAL : 45 PERIODS**

**PT9307**

**TECHNICAL SEMINAR – I**

**L T P C  
0 0 2 0**

This course is introduced to enrich the communication and presentation skills of the student on technical and other relevant topics. In this course, a student has to present technical papers on recent advances in engineering /technology to be evaluated by staff.

**PT 9308**

**PRINT FINISHING LABORATORY**

**L T P C  
0 0 3 2**

### **OBJECTIVE**

To impart practical knowledge on

- Various securing operations, case making and to study the controls, operations and mechanisms of various print finishing equipments.

## **I STUDY OF VARIOUS CONTROLS, OPERATION AND MECHANISMS OF**

1. Cutting Machine
2. Folding Machine
3. Perfect Binding Machine
4. Wire Stitching Machine
5. Lamination Machine (Wet and Dry types)

## **II MECHANICAL AND LOOSE LEAF BINDING**

6. Comb binding
7. Spiral binding
8. Wire-o-binding

### III PREPARATION OF

1. End Papers
2. Case Bound
3. Perfect Bound
4. Saddle and Side stitch Binding

**TOTAL : 45 PERIODS**

**PT9309**

### **IMAGE DESIGN AND EDITING LABORATORY**

**L T P C**  
**0 0 3 2**

1. Introduction to graphic software and scanning
2. Illustrator tools
3. Creating an image using illustrator
4. Image editing and separation in illustrator
5. Introduction to Photoshop and tools
6. Photoshop layers
7. Photoshop retouching and colour corrections
8. Masking in Photoshop
9. Photoshop special effect
10. Four Colour separation using Photoshop

**TOTAL: 45 PERIODS**

**MG9361**

### **FINANCIAL MANAGEMENT**

**L T P C**  
**3 0 0 3**

#### **OBJECTIVES**

- To know about basic financial terminologies
- To enable an Engineer/Technologist to get a complete knowledge on various Investment & financial decisions and financial models

#### **UNIT I FINANCIAL ANALYSIS 8**

Finance function – Statements of financial information – Balance Sheet – Profit and Loss Account – Funds flow statement – Cash flow statement – Ratio analysis.

#### **UNIT II COST ANALYSIS 8**

Cost concepts – Marginal costing and profit planning – Break Event Analysis – Decision Involving alternative choice – Budgetary Control.

#### **UNIT III VALUATION & INVESTMENT DECISION 8**

Valuation and bonds – shares – Present value and bonds, Preference share – Equity share – Pay back Period – Discounted Payback – Accounting Rate of Return – Net present value – Internal Rate of Return – Modified Internal Rate of Return.

**UNIT IV FINANCIAL DECISION 8**

Cost of Capital – Cost of equity, debt, Preference – Optimal capital budget – Source of long term finance – Raising long term finance – Capital structure – Traditional theory – MM theory – Capital structure planning.

**UNIT V DIVIDEND DECISION 13**

Dividend policy – Dividend decision – Form of dividends – Gordon's Model – Water's Model – Corporate dividend behaviour – Working Capital Management : Concepts of working capital – Determinants – Estimating needs – Cash management – Credit Management.

**TOTAL: 45 PERIODS**

**TEXT BOOKS**

1. Prasanna Chandra, Financial Management, Theory and Practice, Tata McGraw Hill, New Delhi, 6th Ed. 2004.
2. I.M. Pandey, Financial Management, Vikas Publishing House Pvt. Ltd., 8th Ed, 2004, New Delhi (7th Report).

**REFERENCES**

1. Dr.S.N. Maheshwari, Financial Management, Principles & Practice, Sulthan Chand & Son, New Delhi, 2004.
2. James C. Van Hrone & John M. Wachowicz Ja, Fundamentals of Financial management , Prentice Hall India Pvt. Ltd., Eastern Economy Edition, New Delhi 2004, 11th Edition.
3. Brigham Eugene F., Ehahardt Michael C., Financial Management – Theory & Practice, Cengage Learning India, New Delhi, 2006.
4. M.Y. Khan & P.K. Jai, Financial Management, Text, Problems & Cases, Tata McGraw Hill, 4th Edition, 2004.

**ME9352 MICROPROCESSOR AND MICROCONTROLLER L T P C  
3 0 0 3**

**OBJECTIVE**

To impart knowledge on 8085 Microprocessor and 8051 Microcontroller and its applications. In addition the basic concepts and programming of 8085 Microprocessor and 8051 Microcontroller are introduced which are very much required in the emerging field of automation.

**UNIT I 8085 MICROPROCESSOR 10**

Introduction-Architecture of 8085-Pin Configuration-Addressing Modes-Instruction set.

**UNIT II TIMING DIAGRAM AND PROGRAMMING 8**

Instruction cycle-machine cycle-T states and Timing diagram of 8085- Calculation of instruction cycle timings- Assembly Language Programming using 8085 instructions.

**UNIT III PERIPHERALS AND INTERFACING 12**

Basic interfacing concepts-8255 Programmable Peripheral Interface- interfacing input keyboards- interfacing output display-interfacing memory-A/D and D/A Converters Interfacing.

**UNIT IV 8051 MICROCONTROLLER 9**

Introduction- Architecture of 8051- Pin configuration- Ports- External Memory- counters and Timers- Serial and Parallel Data I/O- Interrupts – Assembly language programming.

**UNIT V APPLICATIONS using Intel 8085 and 8051** **6**  
Temperature Control- Stepper Motor Control- Traffic Light Controller. Measurement and speed control of DC motor.

**TOTAL: 45 PERIODS**

**TEXT BOOKS**

1. Ramesh Gaonkar, "Microprocessor Architecture, Programming and Applications with 8085", Wiley Eastern, 1998.
2. Kenneth J.Ayala, "The 8051 Microcontroller, Architecture, Programming and applications", Thomson Delmar Learning, Indian Edition, 2007.

**REFERENCES**

1. M.A. Mazidi and J.C. Mazidi, "The 8051 Microcontroller and Embedded systems", Pearson Education, 2006.
2. Douglas V.Hall, "Microprocessors and Interfacing, Programming and Hardware", Tata McGraw Hill, 1999.
3. L.A. Levental, "Introduction to microprocessors Software and Hardware Programming", Prentice Hall Inc, 1978.
4. Aditya, P.Mathur, "Introduction to Microprocessors Software", Tata McGraw Hill, 1983
5. P.K.Ghosh and P.R.Sridhar, "Introduction to Microprocessors for Engineers and Scientists", Prentice Hall of India, 2001.

**PT9351 ELECTRONIC PUBLISHING** **L T P C**  
**3 0 0 3**

**OBJECTIVE**

To impart knowledge on application of electronic publishing in various areas, basic workflow followed in electronic publishing, softwares & tools needed and the emerging trends.

**UNIT I INTRODUCTION** **9**

Internet, WWW, Web2.0, Broadband, Print OnDemand, eBook, eJournals, eNewspaper, internet advertising, Digital libraries, eReaders – eInk, Epaper, Electronic Publishing- Advantages, Issues.

**UNIT II PUBLISHING** **9**

Areas of publishing – Legal, STM, Book Publishing – Manuscript, Anatomy of a book, Layout & Design, Journal Publishing - Layout & Design, Web Publishing - Layout & Design, Accessibility, usability, standards, Publishing on Handheld devices - Layout & Design. Reference database – PUBMED etc. Index – author, volume, keyword.

**UNIT III WORKFLOW** **9**

Authors, Publishers, ePublishing Companies; Workflow – Receiving Jobs (FTP), Preediting, Copy editing, Proof reading, Graphics, Pagination, Quality Control, Output – Print, Proof, Web, Handheld devices; Workflow softwares, File management – File Naming conventions, Storage, Metadata, Searching, Digital Asset Management, Repurposing, PDFX/3 workflow.

**UNIT IV SOFTWARES & TOOLS** **9**

Conventional workflow, XML workflow, STM Typesetting softwares, Pagination softwares, Image manipulation softwares, Markup languages – fundamentals, Presentation technologies - (HTML, CSS, WML, XSL/XSL-FO), Representation technologies (XML, DTD,

W3C XML Schema, DSDL), Transformation technologies (SAX, DOM, XSLT), Scripting languages (ASP, Perl), Unicodes for non-English characters.

**UNIT V EMERGING TRENDS 9**

Future publishing Models, Digital Rights Management, Business models in Internet, Marketing, Recent trends

**TOTAL: 45 PERIODS**

**TEXT BOOKS**

1. Harold Henke, "Electronic Books and ePublishing: A Practical Guide for Authors", 1st edition, Springer, 2001.
2. Helmut Kipphan, "Handbook of Print Media", Springer Verlag, 2001

**REFERENCES**

1. William E Kasdorf, "The Columbia Guide to Digital Publishing", Columbia University Press, 2003
2. Cady & McGregor, "Mastering the Internet" , 2nd edition, Business Promotion Bureau Publications, 1996
3. Deitel & Deitel, Neito, Sadhu, "XML How to Program", Pearson Education Publishers, 2001
4. Eric Ladd, Jim O' Donnel, "Using HTML 4, XML and Java", Prentice Hall of India - QUE, 1999
5. Scot Johnson, Keith Ballinger, Davis Chapman, "Using Active Server Pages", Prentice Hall of India, 1999.

**PT9352**

**PAPER AND BOARD**

**L T P C  
3 0 0 3**

**OBJECTIVE**

To impart knowledge on manufacturing processes, properties and testing of paper and board used for different printing processes and paper related problems in printing.

**UNIT I RAW MATERIALS & PROCESSING 9**

Sources, kinds of cellulose fibres – Pulping – Mechanical, Thermo-mechanical and Chemical processes – Bleaching techniques – Stock preparation – Beating & refining – Fillers, Sizing, Dyeing – Non-fibrous additives and consistency.

**UNIT II PAPER AND BOARD MANUFACTURING 9**

Paper making machines, Head boxes and inlets, Forming Section, Press and dryer section, wires, felts, automation; Calendaring – types. Board manufacturing – cylinder machines.

**UNIT III PAPER AND BOARD COATING & CLASSIFICATION 9**

Paper and board coating – Pigments, binders and additives – Techniques. Main classes of paper and board; paper and board sizes; paper requirement for different printing processes; paper handling, de-Inking; recycling; end-use.

**UNIT IV PAPER AND BOARD PROPERTIES 12**

Structural – Formation, 2-sidedness, grain direction; Physical – GSM, caliper, bulk, porosity, smoothness, dimensional stability, curl, moisture content and relative humidity, Cobb tester,

Optical -Gloss, brightness, colour, opacity; Chemical – pH, ash content; Mechanical - Tensile, burst, tear, internal bonding, fold endurance, stiffness, pick resistance, absorbency.

**UNIT V PAPER PROBLEMS IN PRINTING 6**

Fluff, hickey, picking, piling, slurring and doubling, curl, chalking set-off, mottle, poor ink drying, show through, strike through mis-register, static electricity, blistering, web break.

**TOTAL : 45 PERIODS**

**TEXT BOOKS**

1. Lawrence H.Wilson, "What the printer should know about paper", GATF Press, Third Edition, 2000.
2. Kenneth W.Britt, "Handbook of Pulp and Paper Technology" CBS Publishers, 1984.

**REFERENCES**

1. Lothar Gottsching & Heikki Pakarinen, "Paper making Science and Technology", Book-7, Fapet OY Publishing, 2000.
2. Charles Finley, "Printing Paper and Ink", Delmar Publisher, 1997.
3. Bob Thompson, "Printing materials Science and Technology", Pira International Publications 2nd edition, 2004.
4. J.P.Casey (Ed.), "Pulp and Paper Chemistry and Chemical and Technology", Vol.I to IV, Wiley Interscience, 1983.

**PT9353 COST ESTIMATION FOR PRINTING L T P C  
3 0 0 3**

**OBJECTIVES**

To impart Knowledge on

- Basic concepts of costing, pricing, estimating and investment analysis
- Estimating cost of printing materials and different processes for various print jobs

**UNIT I COSTING AND PRICING 7**

Costing systems - cost; profit; price; functions of costing; costing models; types of costing - marginal costing, job costing, budgeting costing; types of budgets; budgetary control; sales forecasts and budgets for printing and allied industries; relationship between cost control and budgetary control.

**UNIT II ESTIMATING 5**

Cost estimating, price estimating, estimator needs; procedure for selling, estimating, pricing, and quoting for printing; estimating methods; production planning; computerized estimating.

**UNIT III ESTIMATING PRINTING MATERIALS AND PROCESS 12**

Paper- sheet and web; ink; toners; pre-press; machine printing - sheet-fed offset, web offset, flexography, gravure, screen printing, digital printing; post press; e-publishing.

**UNIT IV PRINT COSTING 12**

Classification of cost; elements of cost; costing of direct materials; costing of machine operations; costing of manual operations; costing - typesetting, scanning, plate-making, printing, binding and finishing operations.

**UNIT V INVESTMENT ANALYSIS****9**

Time value of money, compound value, present value, annuities, pay back method, average rate of return and internal rate of return method; break even analysis - analysis, calculation of break even point, margin of safety, sensitivity analysis and profit graphs.

**TOTAL: 45 PERIODS****TEXT BOOKS**

1. Hugh Speirs, "Print Estimator's Handbook", 2<sup>nd</sup> edition, Pira International Ltd., 2004
2. Don Merit, "Printing Estimating Primer", GATF Press, 2000
3. Philip K. Ruggles, "Printing Estimating", Fourth edition, Delmar Publishers, 1996

**REFERENCES**

1. "Cost Accounting for Printers", Part I and Part II, British Printing Industries Federation, 1982
2. K. S. Venkataraman and K. S. Balaraman, "Estimating Methods and Cost Analysis for Printers", Ramya Features and Publications, 1987
3. Dipl.-Ing. B. D. Mendiratta, "Printer's Costing and Estimating", Printing India Publications Pvt. Ltd., 1999.
4. Hugh M. Speirs, "Print Estimators - The Handbook", BPIF, 1996.
5. N. D. Vohra, "Quantitative Techniques in Management", Tata McGraw Hill Publishing Company Limited, 1990

**ME9358 MICROPROCESSOR AND MICRO CONTROLLER LABORATORY L T P C  
0 0 4 2****OBJECTIVE:**

To impart knowledge and hands on training in 8085 processor and 8051 microcontroller to perform functions such as arithmetic operation and interfacing.

1. Study of 8085 Microprocessor and 8051 Microcontroller trainer kits and identifying the components.
2. 8085 and 8051 Assembly language programs
  - i) Arithmetic operation
  - ii) Ascending/descending order and finding largest/ smallest number in an array.
3. 8085 and 8051 Assembly Language Program for code conversion
  - i) BCD to binary
  - ii) binary to BCD
4. 8051 Assembly Language Program for timer operations.
5. Interfacing of 8 bit A/D and D/A converters using 8085 and 8051
6. Stepper motor interface using 8085 and 8051
7. Display unit interface with 8051 and 8051

**TOTAL : 60 PERIODS**

- To Impart knowledge on Creating movies in software like flash and Director using animation, special effect, text, graphics, audio and video. Editing of audio and video.
1. Components of Multimedia
  2. Multimedia softwares
  3. Story board, Slide and Theatre Metaphase
  4. Creating presentations using Text, Pictures Graphics, Audio and Video
  5. Adding special effects to presentations
  6. Animation
  7. Interactivity
  8. Authoring

**TOTAL : 60 PERIODS**

### AIM

To enhance the overall capability of students and to equip them with the necessary Communication Skills and Soft Skills that would help them excel in their profession.

### OBJECTIVES

- To equip students of engineering and technology with effective speaking and listening skills in English.
- To help them develop their soft skills and interpersonal skills, which will make the transition from college to workplace smoother and help them excel in their job.
- To enhance the performance of students at Placement Interviews, Group Discussions and other recruitment exercises.

### 1. PC based session

#### A. Career Lab (15 periods) Viewing and discussing audio-visual materials

1. **Resume / Report Preparation / Letter Writing:** (3)  
Letter writing – Job application with Resume - Project report - Email etiquette.
2. **Presentation skills:** (3)  
Elements of effective presentation – Structure of presentation - Presentation tools – Body language.
3. **Soft Skills:** (3)  
Time management – Stress management – Assertiveness – Negotiation strategies, Psychometrics - Analytical and logical reasoning.
4. **Group Discussion:** (3)  
Group discussion as part of selection process, Structure of group discussion – Strategies in group discussion – Mock group discussions.
5. **Interview Skills:** (3)  
Kinds of interviews – Interview techniques – Corporate culture – Mock interviews.

**TOTAL: 45 PERIODS**



## II. Class Room Session

1. **Resume / Report Preparation / Letter writing:** Students prepare their Own resume and report. (9)
  2. **Presentation Skills:** Students make presentations on given topics. (12)
  3. **Group Discussion:** Students participate in group discussions. (12)
  4. **Interview Skills:** Students participate in Mock Interviews (12)
- Note:** Classroom sessions are practice sessions.

### REFERENCES

1. Prakash P, **Verbal and Non-Verbal Reasoning**, Macmillan India Ltd., 2<sup>nd</sup> Edition, New Delhi, 2004.
2. John Seely, **The Oxford Guide to Writing and Speaking**, Oxford University Press, New Delhi 2004.
3. Paul V Anderson, **Technical Communication**, Thomson Wadsworth , 6<sup>th</sup> Edition, New Delhi, 2007.
4. Edgar Thorpe and Showick Thorpe, **Objective English**, Pearson Education, 2<sup>nd</sup> Edition, New Delhi 2007.
5. David Evans, **Decision maker**, CUP, 1997

### LAB REQUIREMENT

1. Teacher console and systems for students.
2. English Language Lab Software
3. Tape recorders

**GE9261 ENVIRONMENTAL SCIENCE AND ENGINEERING**  
**(Common to all branches)**

**L T P C**  
**3 0 0 3**

### AIM

The aim of this course is to create awareness in every engineering graduate about the importance of environment, the effect of technology on the environment and ecological balance and make them sensitive to the environment problems in every professional Endeavour that they participates.

### OBJECTIVE

At the end of this course the student is expected to understand what constitutes the environment, what are precious resources in the environment, how to conserve these resources, what is the role of a human being in maintaining a clean environment and useful environment for the future generations and how to maintain ecological balance and preserve bio-diversity. The role of government and non-government organization in environment managements.

### UNIT I ENVIRONMENT, ECOSYSTEMS AND BIODIVERSITY 14

Definition, scope and importance of environment – need for public awareness - concept of an ecosystem – structure and function of an ecosystem – producers, consumers and decomposers – energy flow in the ecosystem – ecological succession – food chains, food webs and ecological pyramids – Introduction, types, characteristic features, structure and function of the (a) forest ecosystem (b) grassland ecosystem (c) desert ecosystem (d) aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) – Introduction to

biodiversity definition: genetic, species and ecosystem diversity – biogeographical classification of India – value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values – Biodiversity at global, national and local levels – India as a mega-diversity nation – hot-spots of biodiversity – threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts – endangered and endemic species of India – conservation of biodiversity: In-situ and ex-situ conservation of biodiversity.

Field study of common plants, insects, birds

Field study of simple ecosystems – pond, river, hill slopes, etc.

## **UNIT II ENVIRONMENTAL POLLUTION 8**

Definition – causes, effects and control measures of: (a) Air pollution (b) Water pollution (c) Soil pollution (d) Marine pollution (e) Noise pollution (f) Thermal pollution (g) Nuclear hazards – soil waste management: causes, effects and control measures of municipal solid wastes – role of an individual in prevention of pollution – pollution case studies – disaster management: floods, earthquake, cyclone and landslides.

Field study of local polluted site – Urban / Rural / Industrial / Agricultural.

## **UNIT III NATURAL RESOURCES 10**

Forest resources: Use and over-exploitation, deforestation, case studies- timber extraction, mining, dams and their effects on forests and tribal people – Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems – Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies – Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies – Energy resources: Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources. case studies – Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification – role of an individual in conservation of natural resources – Equitable use of resources for sustainable lifestyles.

Field study of local area to document environmental assets – river / forest / grassland / hill / mountain.

## **UNIT IV SOCIAL ISSUES AND THE ENVIRONMENT 7**

From unsustainable to sustainable development – urban problems related to energy – water conservation, rain water harvesting, watershed management – resettlement and rehabilitation of people; its problems and concerns, case studies – role of non-governmental organization- environmental ethics: Issues and possible solutions – climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, case studies. – wasteland reclamation – consumerism and waste products – environment production act – Air (Prevention and Control of Pollution) act – Water (Prevention and control of Pollution) act – Wildlife protection act – Forest conservation act – enforcement machinery involved in environmental legislation- central and state pollution control boards- Public awareness.

## **UNIT V HUMAN POPULATION AND THE ENVIRONMENT 6**

Population growth, variation among nations – population explosion – family welfare programme – environment and human health – human rights – value education – HIV / AIDS – women and child welfare – role of information technology in environment and human health – Case studies.

**TOTAL : 45 PERIODS**

### **TEXT BOOKS**

1. Gilbert M.Masters, 'Introduction to Environmental Engineering and Science', 2<sup>nd</sup> edition, Pearson Education (2004).
2. Benny Joseph, 'Environmental Science and Engineering', Tata McGraw-Hill, New Delhi, (2006).

## REFERENCES

1. R.K. Trivedi, 'Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards', Vol. I and II, Enviro Media.
2. Cunningham, W.P. Cooper, T.H. Gorhani, 'Environmental Encyclopedia', Jaico Publ., House, Mumbai, 2001.
3. Dharmendra S. Sengar, 'Environmental law', Prentice hall of India PVT LTD, New Delhi, 2007.
4. Rajagopalan, R, 'Environmental Studies-From Crisis to Cure', Oxford University Press (2005)

PT9401

PACKAGING MATERIALS

L T P C  
3 0 0 3

## OBJECTIVE:

To study the materials used for packaging and their properties and testing.

### UNIT I PLASTICS 12

Polymers – introduction, types, polymerization techniques; Plastics in packaging – advantages, types – flexible and rigid packaging – Materials – Polyethylene, Polypropylene, Polyethylene terephthalate, polyvinyl chloride, polyamides, polystyrene, ionomers, Nitrile polymers and cellulose derivatives. Phenol formaldehyde, Urea formaldehyde, polyesters, Epoxy resins, polyurethanes, polycarbonate – preparation, properties; processing technology, applications, recycling, biodegradable materials.

### UNIT II WOOD, PAPER AND TEXTILE 12

Wood – Boxes, barrels, pallets, baskets, sacks – types, characteristic properties, Nature of wood, properties; Textile – Types of cloth, properties, and areas of application; Paper and Board – Folding box board, solid and corrugated fibreboard cartons – Materials, processing – properties. Wrapping and multi wall papers, bags, sacks – Materials, properties, application area. Laminating papers, recycling process.

### UNIT III GLASS AND METALS 8

Glass – Chemistry, properties, manufacturing, coatings, defects and application areas; Metals – Tin, Steel, Aluminium – Cans, drums, sheet – Materials, properties, treatment, coatings, manufacturing process, recycling process; Foil – Materials, characteristics, decoration, lamination and metallisation methods.

### UNIT IV ANCILLARY MATERIALS 7

Labelling materials – Types of labels – Material properties. Label adhesives – characteristic properties and uses. Collapsible tube – materials and properties. Closures and sealing – materials, method of manufacturing, Cushioning Materials – properties and areas of application. Lacquers – properties, uses; Special additives for food grade films; Reinforcement – materials and properties.

### UNIT V MATERIAL TESTING 6

Mechanical – Tensile, tear, burst, impact, compression test, Elongation, barrier properties, WVTR test, Adhesion test; Optical – Gloss, haze and clarity; Chemical – Resistance test – solvents and chemicals, solubility test, burning test, solvent retention; Hardness and corrosion test for metals; Clarity and brittleness test for glass.



## REFERENCE

1. U.K.Srivastava, G.V.Shenory & S.C.Sharma, "Quantitative techniques for Managerial decisions", New Age international (P) Ltd., Publishers – Formerly Wiley Eastern Ltd., 2001.

**PT9403**

**GRAVURE AND SCREEN PRINTING**

**L T P C  
3 0 0 3**

## OBJECTIVES

To impart knowledge on

- The basic principles of Gravure printing process, cylinder preparation techniques & components of gravure printing unit.
- The basic principles of Screen printing process, stencil preparation methods & types of presses.
- Print problems & quality control in Gravure & screen printing process

### **UNIT I GRAVURE PROCESS AND IMAGE CARRIER 12**

Process characteristics, cylinder construction – design, balancing, copper plating and polishing; reuse of cylinder; well formation; film positives; cylinder layout and film assembly; cross line screen, image carrier techniques – diffusion etch process, direct transfer process, electromechanical and laser cutting process.

### **UNIT II GRAVURE PRINTING UNITS 9**

Doctor blade assembly – conventional, reverse angle, holder, loading, doctor and backup blades; oscillation, positioning; impression rollers - types, loading, deflection; electrostatic assist impression system; Inking system – types; Press design – types; in feed coating, out feed coating and laminating, inline solvent less laminating, inline converting operations; power transmission system.

### **UNIT III SCREEN PRINTING COMPONENTS 7**

Process characteristics; essential components; Screen fabrics – types, fabric terminology, fabric selection; frames – types; fabric tension characteristics; tension measurement; squeegees – types, techniques, selection, maintenance and blade sharpening; screen printed products and substrates

### **UNIT IV STENCIL PREPARATION AND PRESSES 10**

Stencil types - Direct stencil, indirect stencil, capillary film – stencil preparation; stencil selection; presses – graphic presses, textile presses, and container printing; dryers – types.

### **UNIT V PRINT PROBLEMS AND QUALITY CONTROL 7**

Print problems and remedies; quality control aids; maintenance; health and safety issues; waste disposal and environmental safeguards.

**TOTAL: 45 PERIODS**

## TEXT BOOKS

1. "Gravure: Process and Technology", Gravure Education Foundation, 2003
2. Kaj Johansson, Peter Lundberg, Robert Ruberg, "A Guide to Graphic Print Production", Wiley, 2002

## REFERENCES

1. Harry B. Smith, "Modern Gravure Technology", Pira reviews of Printing, Pira International, 1994
2. Samuel B. Hoff, "Screen Printing – A Contemporary Approach", Delmar Publishers, 1997.
3. Ingram, Samuel, "Screen Printing Primer", GATF press, 2nd Edition, 1999.
4. William Appleton, "Screen Printing", PIRA International, 1994.
5. NIIR Board, "Screen Printing Technology Handbook", Asia Pacific Business Press Inc., 2004

**PT9404**

**PRINT PRODUCTION LABORATORY**

**L T P C**  
**0 0 8 4**

### OBJECTIVE

- To integrate the knowledge acquired in previous theory & practical courses & implement them by producing printed products.

To produce the following products:

1. Office forms
2. Posters
3. Brochures
4. Book
5. Invitation / Greeting cards
6. Textile printing
7. Visiting publishing
8. Paperboard Package
9. POP displays

**TOTAL : 45 PERIODS**

**PT9405**

**INDUSTRIAL TRAINING**

**L T P C**  
**0 0 \* 1**

Students will undergo industrial training for a period of 4 weeks during the earlier Semester vacations. After completion of the training period the students will submit a report. There will be a presentation at the end of the training and grades will be awarded.

\* 4 weeks of Industrial training; 2 weeks each during the 2nd & 3rd year summer vacations

**PT9406**

**COMPREHENSION**

**L T P C**  
**0 0 2 1**

Comprehension is to provide an opportunity for the students to revise the subjects they have undergone during the four years of their course. The students shall comprehend the subjects assigned to him/her by the faculty in-charge and discussions will be carried out during the class hours. Internal marks will be awarded based on their presentation and answering capabilities. Objective type questions covering the entire syllabi will be set for the end semester examination.

**TOTAL : 30 PERIODS**

**PT9451**

**PROJECT WORK**

**L T P C  
0 0 12 6**

The objective of Project work is to enable the students to work in convenient groups of not more than four members in a group on a project involving some design and fabrication work or theoretical and experimental studies related to the respective engineering discipline. Every project work shall have a guide who is a member of the faculty of the University. Twelve periods per week shall be allotted in the time table for this important activity and this time shall be utilized by the students to receive directions from the guide, on library reading, laboratory work, computer analysis or field work as assigned by the guide and also to present in periodical seminars or viva to review the progress made in the project. Each student shall finally produce a comprehensive report covering background information, literature survey, problem statement, project work details, estimation of cost and conclusions. This final report shall be in typewritten form as specified in the guidelines. The continuous assessment and semester evaluation will be based on the regulation.

**PT9021**

**VISUAL COMMUNICATION**

**L T P C  
3 0 0 3**

**OBJECTIVES:**

To Enable the student to

- Understand the Importance of Visual Communication
- Understand the vehicles of visual communication and its analysis.
- Understand the applications of visual communication

**UNIT I INTRODUCTION**

**6**

Visual arts history, from cave drawings to video painting, identifying and analysing hidden languages in various media and cultures.

**UNIT II PRINCIPLES OF VISUAL COMMUNICATION**

**11**

Psychology of human vision, How the eye and brain process image, Visual grammar, Colour form, Depth and movement, Visual theories, Perception, Semiotics, Visual story creation.

**UNIT III VISUAL ANALYSIS**

**9**

Visual persuasion and propaganda, visual image analysis, stereotypes and the media, Ethics of visual story telling.

**UNIT IV PRINCIPLES OF DESIGN**

**9**

Balance, Emphasis, Simplicity, Repetition, Rhythm, Proportion, Unity, Variety, The application of design principles in creating visual images. Case studies.

**UNIT V APPLICATION OF VISUAL COMMUNICATION**

**10**

Overview of print, Photography, Video and audio media, Study of techniques and methods of applying visual communication in newspapers, magazines, video, internet, advertising and public relations. Analysis of a visual event – film, TV, photo exhibit, advertisements, etc. Case studies.

**TOTAL : 45 PERIODS**

**TEXT BOOKS**

1. Paul Martin Lester, "Visual Communication: Images with Messages", 3<sup>rd</sup> Edition, Thomson/Wadsworth, Belmont, California, 2003.
2. Kosternics, Charles and David Roberts, "Designing Visual Language", 2<sup>nd</sup> Edition, Allyn & Bacon, 1999.

**REFERENCES**

1. Horn, Robert, "Visual Language", Macro UV Publishers, 1999.
2. Gregg Beryman, "Notes on Graphic Design & Visual Communication", Crisp Publications, 1990.
3. Gunther R. Krers, Theo Van Ceeuwen, Routledge, Gunther R.Grers, "Reading Images The Grammer of Visual Design", Routledge Publishers, 1995.

**PT9022**

**MASS COMMUNICATION**

**L T P C**  
**3 0 0 3**

**OBJECTIVES**

To enable the student to understand

- The concepts of verbal and non-verbal communication
- The concepts of journalism

**UNIT I INTRODUCTION**

**9**

Verbal and non-verbal communication, personal communication and mass communication, theories, principles and techniques of communication, history and role of mass media in society.

**UNIT II NEWS REPORTING AND EDITING**

**9**

Fundamentals of reporting, news gathering, evaluation, news writing & newsroom procedures, Depth reporting, Trend reporting, Investigative reporting, Economic & science reporting, Preparation of news copy for publication, Copyreading, Rewriting, Proof reading, Page making, Typography, Picture editing.

**UNIT III WRITING**

**9**

Newspaper feature & magazine, non-fiction writing, writing editorials, analytical articles, reviews, columns, commentaries & analysis.

**UNIT IV BROADCAST JOURNALISM**

**9**

Gathering & reporting news for radio & television, The structure, functions and administration of a news and public affairs department in a broadcast station. Radio/ TV station management.

**UNIT V AUDIO-VISUAL COMMUNICATION**

**9**

Audio-visual aids & techniques, use of non-projected and projected aids as black boards, Charts, Graphs, etc. Film appreciation, principles and techniques of various types of communication research.

**TOTAL : 45 PERIODS**

**TEXT BOOKS**

1. Denis McQuail, "Mass Communication Theory: An Introduction to Theories of Mass Communication", 5<sup>th</sup> Edition, Melvin L.De Fluer, Sandra Bale-Rokeach, Sage Publications, 1999.
2. Stanley J.Baran, Dennis K.Davis, "Mass Communication Theory: Foundations, Ferment and Future", 3<sup>rd</sup> Edition, Wadsworth Publishing, 2002.



## REFERENCES

1. Jennings Bryant, Dolf Zillmann, "Media Effects: Advances in Theory and Research, 2<sup>nd</sup> Edition, Lea Publishers, 2002.
2. Melvin L. Deflear, Sandra Bale-Rokeach, "Theories of Mass Communication", 5<sup>th</sup> Edition, Allyn & Bacon Publishers, 1999.
3. Arthur Asa Berger, "Essentials of Mass Communication Theory", SAGE Publications, 1995.

**PT9023**

**NEWSPAPER AND PERIODICAL PUBLISHING**

**L T P C  
3 0 0 3**

## OBJECTIVE

This course provides a detailed knowledge on the operations of newspaper and magazine companies, including their organizational structure, management functions, editorial process, production workflows and the legal issues.

### **UNIT I            NEWSPAPER ORGANISATION & MANAGEMENT            9**

Organizational structure & functions - Owner, editorial organization, management, Incoming materials, financial aspects, Production, advertising, distribution and promotion. The role of copy editors, city editors, news editors, editorial cartoonist, artists, Sunday editor, sports editor, business editor, journalist & reports; editorial responsibilities.

### **UNIT II            NEWS AND EDITING            11**

Basic determinants of News; Impact, unusual and prominent; Additional determinants of news; Conflict, proximity, timeliness, currency, gathering the news, sources of news; Beat system, interviewing, wire services, syndicate, news writing, copy preparation, features & reviews, editorial and opinion column, sports, photo production; Editing - manuscript editing, creative and substantive editing, technical editing.

### **UNIT III           PERIODICAL PUBLISHING            6**

Types of magazines, Difference between writing for a magazine & newspaper, structure of a magazine's editorial department & roles, Designing a layout for magazine, story design, page design, web design; Redesigning.

### **UNIT IV           PRODUCTION & WORKFLOW            11**

Manuscript from editorial organization: Layout & design, composition; Advertisements, Digital Newsroom, Archival of news; Press & web publishing workflows, RSS, Distributed production workflow; Press, Paper, Finishing; Off-prints and re-prints; Semi-commercial printing.

### **UNIT V            LEGAL ASPECTS            8**

The press and the law libel, defence against libel, mitigation & damages, Digital Rights Management, Watermarking, Readership strategies & trends, Distribution model for newspapers & magazines, Future developments

**TOTAL: 45 PERIODS**

## TEXT BOOKS

1. Daryl R. Moen, "Newspaper Layout & Design: A Team Approach ",Iowa State Press, 2000
2. Carter Nancy M. , "The Computerization of Newspaper Organizations", University Press of America , 2002

## REFERENCES

1. Melvin Mencher, "Basic News Writing", Wm.C.Brown Company Publishers, Dubuque, Iowa, 1983.
2. William L.Rivers, "News Editing in the 80's", Wadsworth Publishing Company, Belmont, California, 1983.
3. Helmut Kiphhan, "Handbook of Print Media", Springer Verlag, 2001
4. William L.Rivers, "Magazine Editing in the 80's", Wadsworth Publishing Company, Belmont, California, 1983.
5. Robert H.Bohle, "From News to Newsprint", Prentice Hall Inc., 1992
6. James E. Pollard, "Principles Of Newspaper Management", Mcgraw-Hill Book Company, Inc, 1937

**PT9024**

**BOOK PUBLISHING**

**L T P C  
3 0 0 3**

## OBJECTIVE

- To impart knowledge on Areas of publishing, editorial process, production management, distribution methods and legal aspects involved in book publishing

### **UNIT I PUBLISHING ORGANISATION 7**

Areas of publishing – general publishing, educational publishing, professional publishing and reference publishing; Publishing house – the role of commissioning editor, the desk editor, the designer, the production manager, the sales/marketing manager, the publishing manager.

### **UNIT II EDITORIAL PROCESS AND DEVELOPMENT 9**

Copy editing, Page makeup, Proofs; the book editor – multipurpose functions; Discussion with author, editing educational material, decision making role; editorial technique – style sheet, reference aids; the author and his manuscript – unsolicited manuscripts, author – publisher, professional guides and societies, the literary agency, author publisher relationship, writing textbooks for children.

### **UNIT III PRODUCTION & ESTIMATING IN BOOK PUBLISHING 10**

Pre-production planning, manuscript, layout & design, imposition, composition, anatomy of books; printing techniques; production process; technical aspects of production; Quality control – proofing stage; financial aspects; first copy cost, manufacturing cost, overheads; economics of publishing – net book, non-net book, variation in price, published price of the book.

### **UNIT IV PROMOTION CHANNELS, DISTRIBUTION OUTLETS AND SALES TECHNIQUES 10**

Direct promotion techniques, mail order advertising, subscription books, direct mail promotion, library purchases, export and import of books, publishers and booksellers catalogues, publicity campaign, paperback distribution, the central book clearing house, economics of distribution, the role of booksellers, book marketing council, book development council.

**UNIT V DIGITAL PUBLISHING AND LEGAL ASPECTS OF BOOK PUBLISHING 9**

Software needs, manuscript formats and file management, editing tools, web design and publishing; copy right, types of agreement between author and publishers, agreement of sale of translation rights, illustration and artwork agreement, the outright sale of the copyright, profit sharing agreement, the royalty system, commission agreement.

**TOTAL: 45 PERIODS**

**TEXT BOOKS**

1. D. Raghavan, "An introduction to Book Publishing", Institute of Book Publishing, New Delhi, 1988.
2. John P. Dessauer, "Book Publishing", R.R. Bowker Company, New York & London, 1981.

**REFERENCES**

1. Roy Paul Nelson, "Publication Design", Wm.C.Brown Company Publishers, Dubuque, Iowa, 1983
2. Charles Clark, "Publishing Agreement", George Allen & Unwin, London, 1984
3. "British Production Practice", 2nd Edition, Publishers Association, British Printing Industries Federation, 1984
4. Hugh Williamson, "Methods of Book design", Yale University Press, 1983
5. John Peacock, "Book Production", Blueprint, 1995

**PT9025 ADVERTISING TECHNIQUES L T P C  
3 0 0 3**

**OBJECTIVES:**

To Enable the student to understand

- The concepts of Advertising.
- Role of the media
- Advertising Production and Business in detail

**UNIT I INTRODUCTION 9**

Advertising concept, development and scope of advertising, economic and social roles of advertising, legal aspects of advertising, major institutions involved in advertising. Meaning of consumer behaviour. How marketing firms use consumer behaviour, characteristics of advertising communications, achieving desired responses, stimulating attention and facilitating retention, human needs as a basis for appeals. Role of printing presses in advertising.

**UNIT II ADVERTISING PLANNING 9**

Factors involved in advertising planning decision making, basis for advertising objectives, Dagmar model, Marginal analysis, Methods of advertising appropriation.

**UNIT III ADVERTISING MEDIA AND MEDIA PLANNING 9**

Media concept, structure of media, media characteristics, publication media, TV and Radio, direct mail and POP, out of home and other media. Media planning concept, media decision tools, media plan, media plan strategy, media buying and scheduling. Advertising on the Internet.

**UNIT IV ADVERTISING PRODUCTION 9**

Copy concept, copy structure, essentials of a copy, creative approaches and styles, copy testing criteria, types of copy testing, validity and reliability of copy test. Advertising design, layout, visualisation, principles of advertising design, contribution of visual elements, what to picture, how to choose colour, test of a good layout, production of print advertising, production of TV/Radio commercials.

**UNIT V ADVERTISING BUSINESS AND COORDINATION 9**

Historical development, advertising agencies, special service groups. Coordination with personal selling and distribution channels, cooperative advertising and public relation, advertising and product management. Advertising campaign concept, planning and execution of campaign, evaluation of the campaign.

**TOTAL : 45 PERIODS**

**TEXT BOOKS**

1. David A.Aaker, Rajeev Batra, John G.Myers, "Advertising Management", Prentice Hall Inc., 1999.
2. Maurice I.Mandell, "Advertising", Prentice Hall Inc., 1999.

**REFERENCES**

1. Leon G.Schiffman and Leslie Lajar Konar, "Consumer Behaviour", Prentice Hall Inc., 1996.
2. Loudon, Della Bitta, "Consumer Behaviour Concepts and Application", McGraw Hill, 1996.
3. Wells, Burnett & Moriarty, "Advertising: Principles & Practice", Prentice Hall Inc., 2002.

**PT9026 COLOUR MANAGEMENT L T P C  
3 0 0 3**

**OBJECTIVE**

To give an insight into the advanced concepts of Colour management & an overview of various color management workflows.

**UNIT I COLOUR SCIENCE 9**

Light, Colour, Source, Object, Observer, Color spaces, Colour difference, Colour Measurement - Spectrophotometer, Colorimeter, Instrument calibration & limitation.

**UNIT II COLOUR MANAGEMENT 9**

Need for colour management, device characteristics, closed and open loop colour control, calibration, characterization, conversion, International colour consortium.

**UNIT III PROFILES 9**

Profile Structure, Creating scanner, digital camera, computer monitor, printer (Press and Proofer profiles, calibration, gamut, fluorescence, Profile quality, Profile editing, Profiling softwares

**UNIT IV CONVERSION 9**

CMM, Gamut boundaries, Rendering Intent, Gamut mapping – influencing factors, algorithms, Colour appearance models

**UNIT V            WORKFLOW****9**

Colour Management workflows – RGB workflow, CMYK workflow, embedded workflow, assumed workflow, Internet workflow, Soft proofing, Hardcopy proofing, Colour management in applications(Photoshop), Operating System

**TOTAL: 45 PERIODS****TEXT BOOKS**

1. Abhay Sharma, "Understanding Colour Management", Thomson Delmar, 2004.
2. Adams R.M. & Weisberg J.B., "GATF Practical Guide to Colour Management", 2nd. Ed. GATF Press, 2000.

**REFERENCES**

1. Green P., "Understanding Digital Colour", 2nd. Ed. GATF Press, 1999.
2. Berns R.S, "Billimeyer & Saltzman's Principles of Colour Technology", 3rd Ed. Wiley, 2000.
3. Bruce Fraser, Chris Murphy, & Fred Bunting, "Real World Color Management", 2<sup>nd</sup> Edition, Peachpit Press
4. Mark D.Fairchild, "Color Appearance Models", Second Edition, John Wiley & Sons Ltd., 2005
5. Phil Green, Lindsay MacDonald, "Colour Engineering", John Wiley & Sons Ltd., 2002

**TECHNICAL LITERATURE ON WEB**

1. [www.color.org](http://www.color.org)
2. [www.apple.com/colorsync](http://www.apple.com/colorsync)

**PT9027****PRINTING MACHINERY MAINTENANCE****LT P C  
3 0 0 3****AIM:**

To provide an overview of the printing machinery maintenance and maintenance management

**UNIT I            MAINTENANCE MANAGEMENT PERSPECTIVE****9**

Objectives and functions, Problems and challenges, Organisation, Maintenance methods, Criticality determination, Categorization, Economic aspects of maintenance, Engineering trends.

**UNIT II            TOTAL PLANNED MAINTENANCE****9**

System components, documentation, facility register, records. safety related issues. Spare parts management. Maintenance schedules and control system. Inspection and lubrication, purpose, lubricants, lubricating systems.

**UNIT III            TOTAL PRODUCTIVE MAINTENANCE****9**

Six big losses, measuring the losses. Evaluating equipment effectiveness. Prepress maintenance, Press maintenance, Printing and allied equipment maintenance. Electrical components maintenance: Motors, Electric brakes. Mechanical components maintenance: Bearings, Clutches, Drives.

**UNIT IV            ERECTION AND TESTING****9**

Foundation requirements, Condition based maintenance: Condition monitoring, Techniques, Vibration analysis, Thermography, Non destructive testing methods and diagnostic instruments.

**UNIT V RECONDITIONING AND REPLACEMENT THEORY 9**  
Repairs and reconditioning methods for various parts, roller comprising, re-rubberizing. Replacement policy, replacement of items, Determination of average life.

**TOTAL : 45 PERIODS**

**TEXT BOOKS**

1. Venkataraman.K, "Maintenance Engineering and Management", Printice-Hall of India Private Limited., 2007.
2. P.Goplakrishnan, A.K.Banerji, "Maintenance and Spare Parts Management", Printice-Hall of India, 1977.

**REFERENCES**

1. H.P.Garg, "Industrial Maintenance", S.Chand & Company Ltd., 1990.
2. Kenneth E.Rizzo, "Total Production Management", Second Edn., GATF Press.
3. N.D.Vohra, "Quantitative Techniques in Management", Tata McGraw – Hill Publishing Co. Ltd.
4. Herschell L. Apfelberg, "Maintaining Printing Equipment", GATF Press.
5. Lidley R.Higgins.P.E., L.C.Morrow, "Maintenance Engineering", Handbook, McGraw – Hill Publishing Co. Ltd.

**PT9028 QUALITY CONTROL IN PRINTING L T P C  
3 0 0 3**

**AIM:**

To impart knowledge about implementing quality control in printing

**UNIT I INTRODUCTION 8**  
Definition of quality, Quality control, it's meaning and purpose. Setting up a quality control programme and establishing necessary procedures, economic consideration. Management responsibility. Quality systems and ISO 9000.

**UNIT II STATISTICAL QUALITY CONTROL 7**  
Fundamental Statistical methods, tools such as control charts and sampling methods, control chart techniques and interpretation, selection and collection of data, interpretation of data and statistical inference.

**UNIT III MATERIALS CONTROL 5**  
Establishing clear specifications and standardisation of materials to be purchased. Inspection and testing of incoming materials as part of quality control, importance of proper handling and maintenance of records of performance of materials, Sampling.

**UNIT IV PROCESS CONTROL 15**  
Need for establishing clearly meaningful job specifications and acceptable tolerance limits, process variability and measures of variability, establishing in process inspection and control procedures for every production department, developing of quality monitoring checklists for all processes, checklists of definable and measurable attributes of products, waste and spoilage reduction as part of quality control.

**UNIT V QUALITY CONTROL INSTRUMENTATION 10**  
Paper and board testing instruments, Ink testing instruments, process control instruments, devices and aids used in camera, darkroom, stripping department, plate room and press

room. Press sheet control devices for colour printing. Minimum instrumentation necessary to produce a product consistent with the appropriate quality level.

**TOTAL : 45 PERIODS**

## **REFERENCES**

1. Miles Southworth & Donna Southworth, "Quality and Productivity in the Graphic Arts, Graphic Arts Publishing Company, 1990.
2. Douglas C.Montgomery, "Introduction to Statistical Quality Control", John Wiley, 1985.
3. Brian Rothery, ISO 9000, "Productivity & Quality", Publishing Private Ltd., 1992.
4. Kelvin Tritton, "Colour Control for Lithography", PIRA International, 1992.
5. Mortimer, A., "Colour Reproduction in Printing Industry", PIRA International, 1991.
6. Ken Holmes, "Implementing ISO 9000", 2<sup>nd</sup> Edition, PIRA International, 1995.
7. Phil Green, "Quality Control for Print Buyers", Blue Print, 1992.
8. Casey, J.P. (Ed), "Pulp & Paper Chemistry and Chemical Technology", Vol.II, Wiley Interscience, 1983.
9. Ronald E.Todd, "Printing Inks – Formulation Principles, Manufacture and Quality Control Testing Procedures", PIRA International, 1994.
10. Apfelberg H.L., Apfleberg M.J., "Implementing Quality Management in Graphic Arts", GATF, 1995.

**PT9029**

**SECURITY PRINTING**

**L T P C  
3 0 0 3**

### **AIM**

To understand the different technologies involved in security printing

### **UNIT I CURRENCY PRINTING**

**9**

Creation & Graphics, Making of a bank note, Application of Computers in Designing Currency, Signatures & numbering, Manufacturing of bank notes, Paper specifications, Watermark & Other Protective devices, Digital Watermark Currency Circulation & Bank maintenance, special issues counterfeiting.

### **UNIT II CHEQUE PRINTING, NUMBERING AND BAR CODING**

**9**

Introduction, Pre-Encoding, Printing Tolerance, Testing Equipment, E13B Characters, RBI Specifications, Principles of Cheque Design, and Numbering with MICR Ink on Rotary presses, Trouble Shooting, Modulus Systems, Weighed & Unweighted. Introduction, Principles of Bar coding, Types of Coding EAN 13 Code, Code 39 ACA etc. Typical Bar Code Machines & Print Wheels, Scanners and their functions.

### **UNIT III COMPUTER FORMS**

**9**

Paper Characteristics, Form Construction & Specification, Form Label Combination Intelligent Electronic Forms, Form Automation, Form Manufacturing & Printing.

### **UNIT IV HOLOGRAMS, CREDIT CARDS & PASSPORTS**

**9**

Introduction, Manufacturing process, Holographic Recording & Master Origination, Finishing Process, Types of Holograms, Security Holograms, Click Holograms, Sterograms, Anigram etc..Introduction, Materials Used of Specifications, Embossing, Magnetic Strip Recording and Specifications, Manufacturing Techniques.

**UNIT V SECURITY INKS & COATING 9**  
Introduction, UV Curing, Light tell Photo chromic inks, Monochromic Inks, Invisible Phosphorescent inks, Water Resistant Inks.

**TOTAL: 45 PERIODS**

**TEXT BOOK**

1. Martin Monestics, "The Art of Paper Currency", Quarlet Books Ltd.,1983

**REFERENCES**

1. Leibigner, "Numbering Machines & Systems", Company Leibigner Numbering Systems.
2. William H.Erdei, "Barcode - Design, Printing & Quality Control", McGraw Hill Inc.,1998.
3. R.Narayanan, "Computer Stationery & MICR – Cheque Production" , Association for Research & Development in Printing, 1998.
4. <http://www.printuniversity.org>.
5. <http://www.printingforall.virtualave.net>
6. <http://www.creedengineers.com>

**PT9071 PACKAGING MATERIALS & TECHNOLOGY L T P C**  
**3 0 0 3**

**OBJECTIVE:**

To study the fundamentals of packaging, manufacturing process, packaging materials and package testing.

**UNIT I FUNDAMENTALS OF PACKAGING 6**

Definition, functions of packaging, types and selection of package, Packaging hazards, interaction of package and contents, materials and machine interface, Environmental and recycling considerations - life cycle assessment Package Design - Fundamentals, factors influencing design, stages in package development, graphic design, Structural design – simulation softwares

**UNIT II PACKAGING MATERIALS 11**

Major Plastic packaging materials viz. Polyolefins, Polystyrene, Polyvinylchloride, Polyesters, Polyamides (Nylons), Polycarbonate and newer materials such as High Nitrile Polymers, Polyethylene Napthalate (PEN), Nanomaterials, biodegradable materials – properties and applications, recycling; Wood, Paper, Textile, Glass, Metals - Tin, Steel, aluminum, Labelling materials, Cushioning Materials – properties and areas of application.

**UNIT III CONVERSION TECHNOLOGY 12**

Extrusion – Blown film, cast film, sheet, multilayer film & sheet, Lamination, Injection moulding, Blow moulding, Thermoforming; Cartoning Machinery, Bottling, Can former, Form Fill and Seal machines, Corrugated box manufacturing machineries, Drums – types of drums, moulded pulp containers, Closures, Application of Robotics in packaging. Surface treatment for printing, Printing processes – offset, flexo, gravure and pad printing

**UNIT IV SPECIALITY PACKAGING 9**

Aerosol packaging, Shrink and Stretch wrapping, Blister packaging, Anti-static packaging, Aseptic packaging, Active packaging, Modified Atmospheric Packaging, Ovenable package; Cosmetic packaging, Hardware packaging, Textile packaging, Food packaging; Child resistant and Health care packaging, Export packaging, Lidding, RFID in packaging.



**UNIT V TESTING 7**

Package Testing – Drop test, Impact test, Vibration Test, Stacking and Compression test, Packaging Materials Testing: Mechanical – Tensile, tear burst, impact, compression test, Elongation, barrier properties - WVTR test, Adhesion test, Optical – Gloss, haze and clarity; Chemical Resistance test – solvents and chemicals, solubility test, burning test, solvent retention; Hardness and corrosion test for metals; Clarity and brittleness test for glass

**TOTAL : 45 PERIODS**

**TEXT BOOKS**

1. Aaron L.Brody & Kenneth S.Marsh, “Encyclopedia of Packaging Technology”, John Wiley Interscience Publication, II Edition, 1997.
2. F.A. Paine, “Fundamentals of Packaging”, Brookside Press Ltd., London, 1990.
3. A.S.Athayle, “Plastics in Flexible Packaging”, Multi-tech Publishing Co., First Edition, 1992.

**REFERENCES**

1. Mark J.Kirwan, “Paper and Paperboard Packaging Technology”, Blackwell Publishing, 2005
2. “Handbook of Package Design Research”, Water stem Wiley Intrascience, 1981.
3. Paine, “Packaging Development”, PIRA International, 1990.
4. Arthur Hirsch, “Flexible Food Packaging”, Van Nostor and Reinhold, New York, 1991.
5. E.P.Danger, “Selecting Colour for Packaging”, Grover Technical Press, 1987.
6. Susan E.M.Selke & et al, Plastics Packaging, Hansar, 2nd edition 2004.
7. Bill Stewart, “Packaging Design Strategies”, Pira International Ltd, 2nd Edition 2004.
8. Gunilla Johnson, “Corrugated Board Packaging”, PIRA International, 1993

**EC9021 ELECTRONIC COMMUNICATION L T P C  
3 0 0 3**

**OBJECTIVE:**

To impart knowledge of basic communication system, noise, modulation, wave propagation, digital communication and working of transmitters and receivers.

**UNIT I INTRODUCTION TO COMMUNICATION SYSTEMS 10**

Information – Transmitter – Channel Noise – Receiver – Need for Modulation – External noise – Atmospheric noise – Extra terrestrial noise – Industrial noise – Internal noise – Thermal agitation noise – Soft noise – Transit time noise – Miscellaneous noise – Signal to noise ration – Noise figure.

**UNIT II ANALOG AND PULSE MODULATION 10**

Amplitude modulation – Modulation index – Frequence modulation – Phase modulation – DSB-SC, SSB, Vestigial side band. Information in a communication system – Coding – Noise in a information carrying channel. PWM, PPM, PCM.

**UNIT III RADIATION AND PROPAGATION OF WAVES 6**

Fundamental of EM waves – Propagation – Ground waves – Sky wave propagation – Ionosphere – Space waves – Tropospheric scatter.

**UNIT IV DIGITAL COMMUNICATION 9**

Emergence of data communication systems – Characteristics of data transmission circuits – Band width requirement – Data transmission rate – Noise – Cross talk – Echo suppressors –

Distortion – Equaliser – Digital codes. Voice and video digitization. Leased line – ISDN – Broadband.

**UNIT V COMMUNICATION SYSTEMS 10**

Radio communication – AM and FM transmitter and receiver – Microwave communications – Satellite communication – Fibre optic communication (block diagram representation). TDM and FDM.

**TOTAL : 45 PERIODS**

**TEXT BOOKS**

1. Schoenbeck, "Electronics Communication – Modulation and Transmission", 2<sup>nd</sup> Edition, Prentice Hall India, 1999.
2. George Kennedy, "Electronics Communication Systems", Tata Mc Graw Hill Publishing Co. Ltd., 1995.

**REFERENCES**

1. Roddy and Coolem, "Electronics and Communication", 4<sup>th</sup> Edition, Prentice Hall, 1999.
2. Roy Blake, "Electronic communication systems", Thomson – Delmar, 2005.
3. Luuis E. Frenzel Jr., "Principles of Electronic Communication System", McGraw Hill, 2002.
4. William Schweber, "Electronic Communication System", Prentice-Hall of India, 2005.
5. B.P. Lathi, "Modern Digital and Analog Communication System", Oxford University press, 2003.

**GE9021 PROFESSIONAL ETHICS IN ENGINEERING L T P C  
3 0 0 3**

**AIM**

To sensitize the engineering students on blending both technical and ethical responsibilities.

**OBJECTIVES**

- Identify the core values that shape the ethical behavior of an engineer.
- Utilize opportunities to explore one's own values in ethical issues.
- Become aware of ethical concerns and conflicts.
- Enhance familiarity with codes of conduct.
- Increase the ability to recognize and resolve ethical dilemmas.

**UNIT I ENGINEERING ETHICS 9**

Senses of 'Engineering Ethics' – Variety of moral issues – Types of inquiry – Moral dilemmas – Moral Autonomy – Kohlberg's theory – Gilligan's theory – Consensus and Controversy – Professions and Professionalism – Professional Ideals and Virtues – Uses of Ethical Theories.

**UNIT II ENGINEERING AS SOCIAL EXPERIMENTATION 9**

Engineering as Experimentation – Engineers as responsible Experimenters – Research Ethics - Codes of Ethics – Industrial Standards - A Balanced Outlook on Law – The Challenger Case Study

**UNIT III ENGINEER'S RESPONSIBILITY FOR SAFETY 9**

Safety and Risk – Assessment of Safety and Risk – Risk Benefit Analysis – Reducing Risk – The Government Regulator's Approach to Risk - Chernobyl Case Studies and Bhopal

**UNIT IV RESPONSIBILITIES AND RIGHTS 9**  
Collegiality and Loyalty – Respect for Authority – Collective Bargaining – Confidentiality – Conflicts of Interest – Occupational Crime – Professional Rights – Employee Rights – Intellectual Property Rights (IPR) - Discrimination

**UNIT V GLOBAL ISSUES 9**  
Multinational Corporations – Business Ethics - Environmental Ethics – Computer Ethics - Role in Technological Development – Weapons Development – Engineers as Managers – Consulting Engineers – Engineers as Expert Witnesses and Advisors – Honesty – Moral Leadership – Sample Code of Conduct

**TOTAL: 45 PERIODS**

**TEXT BOOKS**

1. Mike Martin and Roland Schinzinger, “Ethics in Engineering”, McGraw Hill, New York (2005).
2. Charles E Harris, Michael S Pritchard and Michael J Rabins, “Engineering Ethics Concepts and Cases”, Thompson Learning, (2000).

**REFERENCES**

1. Charles D Fleddermann, “Engineering Ethics”, Prentice Hall, New Mexico, (1999).
2. John R Boatright, “Ethics and the Conduct of Business”, Pearson Education, (2003)
3. Edmund G Seebauer and Robert L Barry, “Fundamentals of Ethics for Scientists and Engineers”, Oxford University Press, (2001)
4. Prof. (Col) P S Bajaj and Dr. Raj Agrawal, “Business Ethics – An Indian Perspective”, Biztantra, New Delhi, (2004)
5. David Ermann and Michele S Shauf, “Computers, Ethics and Society”, Oxford University Press, (2003)

**GE9022 TOTAL QUALITY MANAGEMENT L T P C**  
**3 0 0 3**

**AIM**

To provide comprehensive knowledge about the principles, practices, tools and techniques of Total quality management.

**OBJECTIVES**

- To under the various principles, practices of TQM to achieve quality
- To learn the various statistical approaches for quality control.
- To understand the TQM tools for continuous process improvement.
- To learn the importance of ISO and Quality systems.

**UNIT I INTRODUCTION 9**

Introduction - Need for quality - Evolution of quality - Definition of quality - Dimensions of manufacturing and service quality - Basic concepts of TQM - Definition of TQM – TQM Framework - Contributions of Deming, Juran and Crosby – Barriers to TQM.

**UNIT II TQM PRINCIPLES 9**

Leadership – Strategic quality planning, Quality statements - Customer focus – Customer orientation, Customer satisfaction, Customer complaints, Customer retention - Employee involvement – Motivation, Empowerment, Team and Teamwork, Recognition and Reward,

Performance appraisal - Continuous process improvement – PDSA cycle, 5s, Kaizen - Supplier partnership – Partnering, Supplier selection, Supplier Rating.

**UNIT III TQM TOOLS & TECHNIQUES I 9**

The seven traditional tools of quality – New management tools – Six-sigma: Concepts, methodology, applications to manufacturing, service sector including IT – Bench marking – Reason to bench mark, Bench marking process – FMEA – Stages, Types.

**UNIT IV TQM TOOLS & TECHNIQUES II 9**

Quality circles – Quality Function Deployment (QFD) – Taguchi quality loss function – TPM – Concepts, improvement needs – Cost of Quality – Performance measures.

**UNIT V QUALITY SYSTEMS 9**

Need for ISO 9000- ISO 9000-2000 Quality System – Elements, Documentation, Quality auditing- QS 9000 – ISO 14000 – Concepts, Requirements and Benefits – Case studies of TQM implementation in manufacturing and service sectors including IT.

**TOTAL: 45 PERIODS**

**TEXT BOOK**

1. Dale H.Besterfield, et al., “Total Quality Management”, Pearson Education Asia,Third Edition, Indian Reprint (2006).

**REFERENCES**

1. James R. Evans and William M. Lindsay, “The Management and Control of Quality”, 6<sup>th</sup> Edition, South-Western (Thomson Learning), 2005.
2. Oakland, J.S. “TQM – Text with Cases”, Butterworth – Heinemann Ltd., Oxford, 3<sup>rd</sup> Edition, 2003.
3. Suganthi,L and Anand Samuel, “Total Quality Management”, Prentice Hall (India) Pvt. Ltd.,2006.
4. Janakiraman,B and Gopal, R.K, “Total Quality Management – Text and Cases”, Prentice Hall (India) Pvt. Ltd., 2006.

**GE9023**

**FUNDAMENTALS OF NANOSCIENCE**

**L T P C  
3 0 0 3**

**AIM**

To make the students understand the importance , relevance and potentialities of this emerging field of study.

**OBJECTIVES**

- Study the basic nano technology and nano science.
- Understand interdisciplinary nature of this field.
- Understand the importance role of physics, chemistry, biology.
- Recognize that the rules of nano science are fundamentally different than those we experience.
- Study the basic fabrication strategies of nano science.

**UNIT I INTRODUCTION 10**

Nanoscale Science and Technology- Implications for Physics, Chemistry, Biology and Engineering-Classifications of nanostructured materials- nano particles- quantum dots, nanowires-ultra-thinfilms-multilayered materials. Length Scales involved and effect on

properties: Mechanical, Electronic, Optical, Magnetic and Thermal properties. Introduction to properties and motivation for study (qualitative only).

**UNIT II PREPARATION METHODS 10**

Bottom-up Synthesis-Top-down Approach: Precipitation, Mechanical Milling, Colloidal routes, Self-assembly, Vapour phase deposition, MOCVD, Sputtering, Evaporation, Molecular Beam Epitaxy, Atomic Layer Epitaxy, MOMBE.

**UNIT III PATTERNING AND LITHOGRAPHY FOR NANOSCALE DEVICES 5**

Introduction to optical/UV electron beam and X-ray Lithography systems and processes, Wet etching, dry (Plasma /reactive ion) etching, Etch resists-dip pen lithography

**UNIT IV PREPARATION ENVIRONMENTS 10**

Clean rooms: specifications and design, air and water purity, requirements for particular processes, Vibration free environments: Services and facilities required. Working practices, sample cleaning, Chemical purification, chemical and biological contamination, Safety issues, flammable and toxic hazards, biohazards.

**UNIT V CHARECTERISATION TECHNIQUES 10**

X-ray diffraction technique, Scanning Electron Microscopy - environmental techniques, Transmission Electron Microscopy including high-resolution imaging, Surface Analysis techniques- AFM, SPM, STM, SNOM, ESCA, SIMS-Nanoindentation

**TOTAL : 45 PERIODS**

**TEXT BOOKS**

1. A.S. Edelstein and R.C. Cammearata, eds., "Nanomaterials: Synthesis, Properties and Applications", Institute of Physics Publishing, Bristol and Philadelphia, 1996.
2. N John Dinardo, "Nanoscale charecterisation of surfaces & Interfaces", 2<sup>nd</sup> Edition, Weinheim Cambridge, Wiley-VCH, 2000

**REFERENCES**

1. G Timp (Editor), "Nanotechnology", AIP press/Springer, 1999
2. Akhlesh Lakhtakia (Editor), "The Hand Book of Nano Technology, Nanometer Structure", Theory, Modeling and Simulations", Prentice-Hall of India (P) Ltd, New Delhi, 2007.

**IE9023 HUMAN RESOURCES MANAGEMENT L T P C  
3 0 0 3**

**OBJECTIVE**

To introduce the basic principles of group dynamics and associated concepts required for Human resource management in organizations

**UNIT I INDIVIDUAL BEHAVIOR 9**

Personality –Types –Influencing Personality – Learning Process, Attribute –Perception – Motivation Theories

**UNIT II GROUP BEHAVIOR 9**

Group Organization, Group Dynamics, Emergence of Informal Leader, Leadership Styles-theories, Group decision making, Inter personal Relations, Communication -Team.

**UNIT III DYNAMICS OF ORGANIZATIONAL BEHAVIOR 9**  
Organizational Climate, the Satisfactory –Organizational change –the Change Process & Change Management.

**UNIT IV HUMAN RESOURCES PLANNING 9**  
Requirements of Human Resources –HR audit, Recruitment-Selection-Interviews

**UNIT V HUMAN RESOURCES DEVELOPMENT 9**  
Employee Training-Career Development-Performance Appraisal - Compensation-safety and Health-Employee Relation-Management Development.

**TOTAL: 45 PERIODS**

**TEXT BOOKS**

1. Stephen R. Robbins, “Organizational Behavior”, PHI, 1998.

**REFERENCES**

1. David A. Decenzo & Stephen R. Robbins, “Personnel/Human Resources Management”, PHI, 1997.
2. Fred Lutherans, “Organizational Behavior”, Oxford University Press, 2000.

**PT9031 INFORMATION SYSTEMS ANALYSIS AND DESIGN L T P C**  
**3 0 0 3**

**OBJECTIVE**

To impart knowledge on the basics of systems analysis and design required for developing application software in a given environment.

**UNIT I 6**  
Information and Management - types of information, Examples of Information systems, Information Systems analysis overview, Information gathering - sources

**UNIT II 10**  
System Requirements specifications, Feasibility analysis, Data flow diagrams – logical and physical DFDs, Process specification methods, Decision tables

**UNIT III 12**  
Logical database design – ER model, Normalizing relations; Data input methods; Database Management Systems – database design, Object oriented systems modeling

**UNIT IV 8**  
Designing outputs, Security of Information systems, E-commerce

**UNIT V 9**  
System design example: Document and data flow diagrams, Feasibility of the system, System specifications, Database design, Control, audit and test plan

**TOTAL: 45 PERIODS**

**REFERENCES**

1. V. Rajaraman, Analysis and Design of Information Systems, PHI, 2004
2. Jeffrey L Whitten et al, Systems Analysis and Design Methods, McGrawHill, 2003

**IE9035**

**SUPPLY CHAIN MANAGEMENT**

**L T P C  
3 0 0 3**

**OBJECTIVE**

To cover the basics of supply chain concepts, associated networks, tools and techniques required for evaluating various supply chain processes .

**UNIT I STRATEGIC 5**  
Objective, decision phases, process views, examples, strategic fit, supply chain drivers and metrics

**UNIT II SUPPLY CHAIN NETWORKS 10**  
Distribution networks, Facility networks and design options, Factors influencing, Models for facility location and capacity allocation, Transportation networks and design options, Evaluating network design decisions

**UNIT III MANAGING DEMAND AND SUPPLY IN A SUPPLY CHAIN 10**  
Predictable variability in a supply chain, Economies of scale and uncertainty in a supply chain – Cycle and safety Inventory, Optimum level of product availability, Forward Buying, Multi-echelon cycle inventory

**UNIT IV SOURCING AND PRICING IN A SUPPLY CHAIN 10**  
Cross-Functional drivers, Role of sourcing in a supply chain, Logistics providers, Procurement process, Supplier selection, Design collaboration, Role of Pricing and Revenue Management in a supply chain

**UNIT V INFORMATION TECHNOLOGY AND COORDINATION IN A SUPPLY CHAIN 10**  
The role of IT in supply chain, The supply chain IT frame work, Customer Relationship Management, Supplier relationship management, Future of IT in supply chain, E-Business in supply chain, Bullwhip effect – Effect of lack of co-ordination in supply chain, Building strategic partnerships, CPFR

**TOTAL : 45 PERIODS**

**TEXT BOOK**

1. Sunil Chopra and Peter meindl, "Supply Chain Management , Strategy, Planning, and operation", PHI, Third edition,2007

**REFERENCES**

1. Jeremy F.Shapiro, "Modeling the supply chain", Thomson Duxbury ,2002
2. James B.Ayers, "Handbook of Supply chain management", St.Lucle press, 2000.

**MG9072**

**ENTREPRENEURSHIP DEVELOPMENT**

**L T P C  
3 0 0 3**

**OBJECTIVE:**

Study of this subject provides an understanding of the scope of an entrepreneur, key areas of development, financial assistance by the institutions, methods of taxation and tax benefits, etc.





**UNIT II TWO-DIMENSIONAL RANDOM VARIABLES 9 + 3**  
Joint distributions – Marginal and Conditional distributions – Covariance – Correlation and Linear regression – Transformation of random variables- Central limit theorem (for independent and identically distributed random variables).

**UNIT III TESTING OF HYPOTHESIS 9 + 3**  
Sampling distributions - Tests for single mean, Proportion, Difference of means (large and small samples) – Tests for single variance and equality of variances –  $\chi^2$ -test for goodness of fit – Independence of attributes.

**UNIT IV DESIGN OF EXPERIMENTS 9 + 3**  
Completely randomized design – Randomized block design – Latin square design -  $2^2$  - factorial design.

**UNIT V STATISTICAL QUALITY CONTROL 9 + 3**  
Control charts for measurements ( $\bar{X}$  and R charts) – Control charts for attributes (p, c and np charts) – Tolerance limits - Acceptance sampling.

**L: 45, T: 15, TOTAL : 60 PERIODS**

#### **TEXT BOOKS**

1. J. S. Milton and J.C. Arnold, “ Introduction to Probability and Statistics”, Tata McGraw Hill, 4th edition, 2007 (For units 1 and 2).
2. R.A. Johnson and C.B. Gupta, “Miller and Freund’s Probability and Statistics for Engineers”, Pearson Education, Asia, 7th edition, 2007 (For units 3, 4 and 5).

#### **REFERENCES**

1. J.L. Devore, “Probability and Statistics for Engineering and the Sciences”, Thomson Brooks/Cole, International Student Edition, 7th edition, 2008.
3. R.E. Walpole, R.H. Myers, S.L. Myers, and K Ye, “Probability and Statistics for Engineers and Scientists”, Pearson Education, Asia , 8th edition, 2007.
4. S.M. Ross, “Introduction to Probability and Statistics for Engineers and Scientists, 3<sup>rd</sup> edition, Elsevier, 2004.
5. M.R. Spiegel, J. Schiller and R.A. Srinivasan, “Schaum’s Outlines Probability and Statistics”, Tata McGraw Hill edition, 2004.

**ME9035**

**MEASUREMENTS AND CONTROL**

**L T P C  
3 0 0 3**

#### **OBJECTIVES**

- To understand the principle and use of sensors for measurement of different parameters.
- To understand the concept of feedback control systems and their applications.

**UNIT I MEASUREMENTS 9**  
General concepts - Units and standards - Measuring instruments - sensitivity, readability, range accuracy, precision - static and dynamic response - repeatability hysteresis - systematic and random errors - correction - calibration.

**UNIT II INSTRUMENTS 9**

Transducer, Modifying (intermediate) and Terminal stages - Mechanical and electrical transducers - preamplifiers - charge amplifiers - filters - attenuators - D' Arsonval CRO - Oscillographs - records - micro processor based data logging, processing and output.

**UNIT III PARAMETERS FOR MEASUREMENT 9**

Dimension, displacement velocity, acceleration, impact - Force, torque, power - strain-pressure - humidity- temperature - flow-Time, frequency and phase angle - noise and sound level. Radio tracer techniques - Flow visualization - shadow-graph interferometer, Schlieren, Laser doppler anemometer.

**UNIT IV AUTOMATIC CONTROL SYSTEMS 9**

Basic elements - feedback principle implication of measurements - Error detectorsfinal actuating elements - Two position, multiposition, floating, pro-portional controls- relays - servo amplifiers - servo motors - mechanical, Electrical, magnetic, electronic, hydraulic, pneumatic systems.

**UNIT V APPLICATION OF CONTROL SYSTEMS 9**

Governing of speed kinetic and process control- pressure, temperature, fluid level, flow-thrust and flight control - photo electric controls.

**TOTAL : 45 PERIODS**

**TEXT BOOKS**

1. E.O.Doeblin, "Measurement Systems, Application and Design", Mc Graw Hill International Edition, 4<sup>th</sup> Ed., 1990.
2. I.J.Nagarath and M.Gopal, "Control Systems Engineering", John wiley & Sons, 2<sup>nd</sup> Ed., Ch.1-4, 1982.

**REFERENCES**

1. J.P.Holman and N.J.Gajda Jr., "Experimental Methods for Engineers", Mc Graw Hill International Edition, 5<sup>th</sup> Ed., 1989.
2. T.G.Beckwith and N.L.Buck, "Mechanical Measurements", Addison Wesley Pub, Co., 1969.
3. W.H.Bureau, "What the printer should know about paper", GATF, 1983.
4. J.P.Casey, "Ed. Pulp and Paper, Chemistry & Chemical Technology", Vol. Wiley Interscience Publication, 1981.

**ME9303**

**HYDRAULICS AND PNEUMATICS**

**L T P C  
3 0 0 3**

**OBJECTIVE:**

This course will give an appreciation of the fundamental principles, design and operation of hydraulic and pneumatic machines, components and systems and their application in recent automation revolution.

**UNIT I FLUID POWER PRINCIPLES AND FUNDAMENTALS (REVIEW) 3**

Introduction to Fluid power- Advantages and Applications- Fluid power systems – Types of fluids- Properties of fluids Basics of Hydraulics – Pascal's Law- Principles of flow – Work, Power and Torque. Properties of air– Perfect Gas Laws.



- UNIT I LIQUID PENETRANT AND MAGNETIC PARTICLE INSPECTION 9**  
Liquid penetrant systems - processing cycles - inspection of surface defects - Generation of Magnetic fields - Magnetic particle inspection equipments - Demagnetization - Applications and limitations.
- UNIT II RADIOGRAPHY 11**  
Production of x-rays - Characteristic rays and white ray - Tube current and Voltage - Sources of 8 rays - Half life period - Penetrating power - Absorption of x and y rays - Radiation contrast and film contrast - exposure charts - pentameters and sensitivity - Safety.
- UNIT III EDDY CURRENT INSPECTION 7**  
Eddy current production - Impedance concepts - inspection of magnetic materials - inspection of non magnetic materials - influences of various parameters - Advantages and limitations.
- UNIT IV ULTRASONIC TESTING 10**  
Production of ultrasonic waves - Different types of waves - Normal beam inspection - Angle beam inspection - thickness measurements - Applications.
- UNIT V RECENT TECHNIQUES 8**  
Non destructive inspection– Instrumentation for non destructive testing – Principles of holography - Principle of acoustic emission – Applications of holographic techniques – advantages and limitations – Other techniques..

**TOTAL : 45 PERIODS**

**TEXT BOOK**

1. Barry Hull and Vernon John, "Non Destructive Testing", Mac Millan, 1988.

**REFERENCES**

1. Americal Society of Metals, Metals Hand Book, 9th Edition, Volume 11, (1980)
2. Birchan.D, "Non Destructive Testing", Oxford University Press, 1977
3. Proceedings of the 10th International Acoustic Emission Symposium, Japanese Society for Non Destructive Inspection, Sendai, 1990.
4. Holler,P., "New Procedures in Non Destructive Testing" Springer Verlag , 1983.

**MF9401**

**OPERATIONS RESEARCH**

**L T P C**

**3 0 0 3**

**OBJECTIVE:**

To provide knowledge and training in using optimization techniques under limited resources for the engineering and business problems.

**UNIT I LINEAR MODELS 15**  
The phase of an operation research study – Linear programming – Graphical method – Simplex algorithm – Duality formulation – Sensitivity analysis.

**UNIT II TRANSPORTATION MODELS AND NETWORK MODELS 8**  
Transportation Assignment Models –Traveling Salesman problem Networks models – Shortest route – Minimal spanning tree – Maximum flow models – Project network – CPM and PERT networks – Critical path scheduling – Sequencing models.

**UNIT III INVENTORY MODELS 6**  
Inventory models – Economic order quantity models – Quantity discount models – Stochastic inventory models – Multi product models – Inventory control models in practice.

**UNIT IV QUEUEING MODELS 6**  
Queueing models - Queueing systems and structures – Notation parameter – Single server and multi server models – Poisson input – Exponential service – Constant rate service – Infinite population – Simulation.

**UNIT V DECISION MODELS 10**  
Decision models – Game theory – Two person zero sum games – Graphical solution – Algebraic solution – Linear Programming solution – Replacement models – Models based on service life – Economic life – Single / Multi variable search technique – Dynamic Programming – Simple Problem.

**TOTAL : 45 PERIODS**

**TEXT BOOK**

1. H.A. Taha, Operations Research, Prentice Hall of India, 2003, Sixth Edition.

**REFERENCES**

1. Shennoy, Srivastava, Operation Research for Management, Wiley Eastern, 1994.
2. M.J.Bazara, Jarvis, H. Sherali, Linear Programming and Network Flows, John Wiley, 1990.
3. Philip and Ravindran, Operations Research, John Wiley, 1992.
4. Hillier and Libebberman, Operations Research, Holden Day, 1986.
5. Frank,S. Budnick, Dennis, McLeavy, Principles of Operations Research for Management, Richard D Irwin, 1990.
6. Tulsian and Vishal Pasdey – Quantitative Techniques Pearson – Asia 2002.

**MG9073 MARKETING MANAGEMENT L T P C  
3 0 0 3**

**OBJECTIVE**

Marketing Management deals with newer concepts of marketing principles like strategic marketing concepts, segmentation, pricing, advertisement and strategic formulation. This will enable a student to take up marketing as a professional career.

**UNIT I CONCEPTS IN MARKETING 9**  
Definition, Marketing Process, Dynamics, Needs, Wants and Demands, Marketing Concepts, Environemnt, Mix, Types, Philosophies, Selling vs Marketing, Consumer Goods, Industrial Goods, Product, Hierarchy.

**UNIT II BUYING BEHAVIOUR AND MARKET SEGMENTATION 9**  
Cultural, Demographic factors, Motives, Types, Buying Decisions, Segmentation factors, Demographic, Psycho graphic and Geographic Segmentation, Process, Patterns.

**UNIT III PRODUCT PRICING AND MARKETING RESEARCH 9**  
Objectives, Pricing, Decisions and Pricing Methods, Pricing Management, Introduction, Uses, Process of Marketing Research.

**UNIT IV          MARKETING PLANNING AND STRATEGY FORMULATION          9**

Components of a Marketing Plan, Strategy Formulation and the Marketing Process, Implementation, Portfolio Analysis, BCG, GEC Grids.

**UNIT V          ADVERTISING, SALES PROMOTION & DISTRIBUTION          9**

Characteristics, Impact, Goals, Types, Sales Promotion – Point of purchase, Unique Selling Propositions, Characteristics, Wholesaling, Retailing, Channel Design, Logistics, Modern Trends in Retailing, Modern Trends, e-Marketing.

**TOTAL : 45 PERIODS**

**TEXT BOOKS**

1. Govindarajan. M, "Marketing management – concepts, cases, challenges and trends", Prentice hall of India, second edition 2007.
2. Philip Kotler & Keller, "Marketing Management", Prentice Hall of India, XII edition, 2006.

**REFERENCES**

1. Donald S. Tull and Hawkins, "Marketing Research", Prentice Hall of India-1997.
2. Philip Kotler and Gary Armstrong "Principles of Marketing" Prentice Hall of India, XII Edn, 2000.
3. Ramasamy and Nama kumari, "Marketing Environment: Planning, implementation and control the Indian context", 1990.
4. Czinkota&Kotabe, "Marketing management", Thomson learning, Indian edition 2007
5. Adrain palmer, " Introduction to marketing theory and practice", Oxford university press IE 2004.
6. Steven J.Skinner, "Marketing", All India Publishers and Distributes Ltd. 1998.