ANNA UNIVERSITY CHENNAI
CHENNAI - 600 025

UNIVERSITY DEPARTMENTS

REGULATIONS 2012

CURRICULA AND SYLLABI FOR
I TO VIII SEMESTERS

B.E. PRINTING TECHNOLOGY
(FULL TIME)
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OBJECTIVES

• To enable all students of engineering and technology develop their basic communication skills in English.
• To give special emphasis to the development of speaking skills amongst the students of engineering and technology.
• To ensure that students use the electronic media such as internet and supplement the learning materials used in the classroom.
• To inculcate the habit of reading for pleasure.

UNIT I
Listening - Introducing learners to GIE - Types of listening - Listening to audio (verbal & sounds);
Speaking - Speaking about one’s place, important festivals etc. – Introducing oneself, one’s family / friend;
Reading - Skimming a reading passage – Scanning for specific information - Note-making;
Writing - Free writing on any given topic (My favourite place / Hobbies / School life, etc.) - Sentence completion - Autobiographical writing (writing about one’s leisure time activities, hometown, etc.);
Grammar - Prepositions - Reference words - Wh-questions - Tenses (Simple);
Vocabulary - Word formation - Word expansion (root words / etymology);
E-materials - Interactive exercises for Grammar & Vocabulary - Reading comprehension exercises - Listening to audio files and answering questions.

UNIT II
Listening - Listening and responding to video lectures / talks; Speaking - Describing a simple process (filling a form, etc.) - Asking & answering questions - Telephone skills – Telephone etiquette;
Reading – Critical reading - Finding key information in a given text - Sifting facts from opinions;
Writing - Biographical writing (place, people) - Lab descriptions (general/specific description of laboratory experiments) - Definitions - Recommendations;
Grammar - Use of imperatives - Subject-verb agreement;
Vocabulary - Compound words - Word Association;
E-materials - Interactive exercises for Grammar and Vocabulary - Listening exercises with sample telephone conversations / lectures – Picture-based activities.

UNIT III
Listening - Listening to specific task - focused audio tracks; Speaking - Role-play – Simulation - Group interaction - Speaking in formal situations (teachers, officials, foreigners);
Reading - Reading and interpreting visual material;
Writing - Jumbled sentences - Coherence and cohesion in writing - Channel conversion (flowchart into process) - Types of paragraph (cause
UNIT IV
Listening - Watching videos / documentaries and responding to questions based on them; Speaking - Responding to questions - Different forms of interviews - Speaking at different types of interviews; Reading - Making inference from the reading passage - Predicting the content of a reading passage; Writing - Interpreting visual materials (line graphs, pie charts etc.) - Essay writing – Different types of essays; Grammar - Adverbs – Tenses – future time reference; Vocabulary - Single word substitutes - Use of abbreviations & acronyms; E-materials - Interactive exercises for Grammar and Vocabulary - Sample interviews - film scenes - dialogue writing.

UNIT V
Listening - Listening to different accents, Listening to Speeches / Presentations, Listening to broadcast & telecast from Radio & TV; Speaking - Giving impromptu talks, Making presentations on given topics; Reading - Email communication - Reading the attachment files having a poem/joke/proverb - Sending their responses through email Writing - Creative writing, Poster making; Grammar - Direct and indirect speech; Vocabulary - Lexical items (fixed / semi fixed expressions); E-materials - Interactive exercises for Grammar & Vocabulary - Sending emails with attachment – Audio / video excerpts of different accents, - Interpreting posters

OUTCOMES:
Learners should be able to

- Speak clearly, confidently, comprehensibly, and communicate with one or many listeners using appropriate communicative strategies.
- Write cohesively and coherently and flawlessly avoiding grammatical errors, using a wide vocabulary range, organizing their ideas logically on a topic.
- Read different genres of texts adopting various reading strategies.
- Listen/view and comprehend different spoken discourses/excerpts in different accents

TEXT BOOKS

REFERENCE BOOKS:

EXTENSIVE READERS:

WEBSITE RESOURCES
1. www.uefap.com
2. www.eslcafe.com
3. www.listen-to-english.com
4. www.owl.english.purdue.edu
5. www.chompchomp.com

MA8151 MATHEMATICS – I
(Common to all branches of B.E. / B.Tech. Programmes in I Semester) 3 1 0 4

OBJECTIVES:
• To develop the use of matrix algebra techniques this is needed by engineers for practical applications.
• To make the student knowledgeable in the area of infinite series and their convergence so that he/ she will be familiar with limitations of using infinite series approximations for solutions arising in mathematical modeling.
• To familiarize the student with functions of several variables. This is needed in many branches of engineering.
• To introduce the concepts of improper integrals, Gamma, Beta and Error functions which are needed in engineering applications.
• To acquaint the student with mathematical tools needed in evaluating multiple integrals and their usage.

UNIT I MATRICES
Eigenvalues and Eigenvectors of a real matrix – Characteristic equation – Properties of eigenvalues and eigenvectors – Cayley-Hamilton Theorem – Diagonalization of matrices –
Reduction of a quadratic form to canonical form by orthogonal transformation – Nature of quadratic forms.

**UNIT II INFINITE SERIES**


**UNIT III FUNCTIONS OF SEVERAL VARIABLES**


**UNIT IV IMPROPER INTEGRALS**


**UNIT V MULTIPLE INTEGRALS**


TOTAL: 60 PERIODS

**OUTCOMES:**

- This course equips students to have basic knowledge and understanding in one field of materials, integral and differential calculus

**TEXT BOOKS:**


**REFERENCES:**

OBJECTIVE:
To introduce the basic physics concepts relevant to different branches of Engineering and Technology.

UNIT I  PROPERTIES OF MATTER  9

UNIT II  ACOUSTICS AND ULTRASONICS  9

UNIT III  THERMAL PHYSICS  9

UNIT IV  APPLIED OPTICS  9
Interference - Michelson interferometer: construction, working, determination of wave length and thickness - anti-reflection coating - air wedge and its application - Lasers - Einstein’scoefficients - CO2, Nd:YAG and semiconductor lasers - homo junction and hetero junction - construction and working - applications - Optical fibres - classification (index &
mode based) - principle and propagation of light in optical fibres - acceptance angle and numerical aperture - fibre optic communication system - active and passive sensors.

UNIT V SOLID STATE PHYSICS
Nature of bonding - growth of single crystals (qualitative) - crystal systems - crystal planes and directions - expressions for interplanar distance - coordination number and packing factor for simple structures: SC, BCC, FCC and HCP - structure and significance of NaCl, ZnS, diamond and graphite - crystal imperfections: point defects, dislocations and stacking faults - unit cell, Bravais space lattices - miller indices.

OUTCOMES:
• The students will have knowledge on the basics of physics related to properties of matter, optics, acoustics etc., and they will apply these fundamental principles to solve practical problems related to materials used for engineering applications.

TEXT BOOKS:

REFERENCES:

OBJECTIVES:
• To make the students conversant with basics of polymer chemistry.
• To make the student acquire sound knowledge of second law of thermodynamics and second law based derivations of importance in engineering applications in all disciplines.
• To acquaint the student with concepts of important photophysical and photochemical processes and spectroscopy.
• To acquaint the students with the basics of nano materials, their properties and applications.

UNIT I CHEMICAL THERMODYNAMICS
Second law: Entropy - entropy change for an ideal gas, reversible and irreversible processes; entropy of phase transitions; Clausius inequality. Free energy and work function: Helmholtz and Gibbs free energy functions; Criteria of spontaneity; Gibbs-Helmholtz equation; Clausius-Clapeyron equation; Maxwell relations – Van’t Hoff isotherm and isochore. Chemical potential; Gibbs-Duhem equation – variation of chemical potential with temperature and pressure.
UNIT II POLYMER CHEMISTRY

Introduction: Classification of polymers – Natural and Synthetic; Thermoplastic and Thermosetting. Functionality – Degree of polymerisation. Types and mechanism of polymerisation: Addition (Free Radical, cationic, anionic and living); condensation and copolymerisation. Properties of polymers: Tg, Tacticity, Molecular weight – weight average, number average and polydispersity index. Techniques of polymerisation: Bulk, emulsion, solution and suspension.

UNIT III KINETICS AND CATALYSIS


UNIT IV PHOTOCHEMISTRY AND SPECTROSCOPY


UNIT V NANO CHEMISTRY


OUTCOMES:

- The knowledge gained on polymer chemistry, thermodynamics, spectroscopy, phase rule and nano materials will provide a strong platform to understand the concepts on these subjects for further learning.

TEXT BOOKS:

REFERENCE BOOKS:

GE8151  COMPUTING TECHNIQUES  L T P C  3 0 0 3

OBJECTIVES:
The students should be made to:
• Learn the organization of a digital computer.
• Be exposed to the number systems.
• Learn to think logically and write pseudo code or draw flow charts for problems.
• Be exposed to the syntax of C.
• Be familiar with programming in C.
• Learn to use arrays, strings, functions, pointers, structures and unions in C.

UNIT I  INTRODUCTION  8

UNIT II  C PROGRAMMING BASICS  10

UNIT III  ARRAYS AND STRINGS  9

UNIT IV  FUNCTIONS AND POINTERS  9
UNIT V  STRUCTURES AND UNIONS

Introduction – need for structure data type – structure definition – Structure declaration – Structure within a structure - Union - Programs using structures and Unions – Storage classes, Pre-processor directives.

OUTCOMES:
At the end of the course, the student should be able to:

- Design C Programs for problems.
- Write and execute C programs for simple applications.

TEXTBOOKS

REFERENCES

GE8152  ENGINEERING GRAPHICS  L T P C
2 0 3 4

OBJECTIVES
To develop in students, graphic skills for communication of concepts, ideas and design of engineering products and expose them to existing national standards related to technical drawings.

Concepts and conventions (Not for Examination)  1
Importance of graphics in engineering applications – Use of drafting instruments – BIS conventions and specifications – Size, layout and folding of drawing sheets – Lettering and dimensioning.

UNIT I  PLANE CURVES AND FREE HAND SKETCHING  14
Basic Geometrical constructions, Curves used in engineering practices Conics – Construction of ellipse, parabola and hyperbola by eccentricity method – Construction of cycloid – construction of involutes of square and circle – Drawing of tangents and normal to the above curves, Scales: Construction of Diagonal and Vernier scales.
Visualization concepts and Free Hand sketching: Visualization principles – Representation of Three Dimensional objects – Layout of views- Free hand sketching of multiple views from pictorial views of objects

UNIT II       PROJECTION OF POINTS, LINES AND PLANE SURFACES          14
Orthographic projection- principles-Principal planes-First angle projection-Projection of points. Projection of straight lines (only First angle projections) inclined to both the principal planes - Determination of true lengths and true inclinations by rotating line method and trapezoidal method and traces Projection of planes (polygonal and circular surfaces) inclined to both the principal planes by rotating object method.

UNIT III     PROJECTION OF SOLIDS                                      14
Projection of simple solids like prisms, pyramids, cylinder, cone and truncated solids when the axis is inclined to one of the principal planes by rotating object method and auxiliary plane method.

UNIT IV     PROJECTION OF SECTIONED SOLIDS AND DEVELOPMENT OF SURFACES  14
Sectioning of above solids in simple vertical position when the cutting plane is inclined to the one of the principal planes and perpendicular to the other – obtaining true shape of section. Development of lateral surfaces of simple and sectioned solids – Prisms, pyramids cylinders and cones. Development of lateral surfaces of solids with cut-outs and holes

UNIT V    ISOMETRIC AND PERSPECTIVE PROJECTIONS                        15
Principles of isometric projection – isometric scale –Isometric projections of simple solids and truncated solids - Prisms, pyramids, cylinders, cones- combination of two solid objects in simple vertical positions and miscellaneous problems. Perspective projection of simple solids-Prisms, pyramids and cylinders by visual ray method and vanishing point method.

COMPUTER AIDED DRAFTING (DEMONSTRATION ONLY)                         3
Introduction to drafting packages and demonstration of their use.       TOTAL: 75 PERIODS

OUTCOMES:
On Completion of the course the student will be able to
- perform free hand sketching of basic geometrical constructions and multiple views of objects.
- do orthographic projection of lines and plane surfaces.
- draw projections and solids and development of surfaces.
- prepare isometric and perspective sections of simple solids.
- demonstrate computer aided drafting.

TEXT BOOK:
REFERENCES:

PUBLICATION OF BUREAU OF INDIAN STANDARDS:

SPECIAL POINTS APPLICABLE TO UNIVERSITY EXAMINATIONS ON ENGINEERING GRAPHICS:
1. There will be five questions, each of either or type covering all units of the syllabus.
2. All questions will carry equal marks of 20 each making a total of 100.
3. The answer paper shall consist of drawing sheets of A3 size only. The students will be permitted to use appropriate scale to fit solution within A3 size.
4. The examination will be conducted in appropriate sessions on the same day.
PH 8161  PHYSICS LABORATORY  L T P C  0 0 2 1
(Common to all branches of B.E. / B.Tech. Programmes)

OBJECTIVES:
• To introduce different experiments to test basic understanding of physics concepts applied in optics, thermal physics, properties of matter and liquids.

1. Torsional pendulum  Determination of rigidity modulus of wire and moment of inertia of disc
2. Non–uniform bending  Determination of young’s modulus
3. Lee’s disc  Determination of thermal conductivity of a bad conductor
4. Potentiometer  Determination of thermo e.m.f. of thermocouple
5. Air wedge  Determination of thickness of a thin sheet of paper
6. i. Optical fibre  Determination of Numerical Aperture and acceptance angle
    ii. Compact disc  Determination of width of the groove using laser
7. Acoustic grating  Determination of velocity of ultrasonic waves in liquids
8. Post office box  Determination of Band gap of a semiconductor
9. Spectrometer  Determination of wavelength using grating
10. Viscosity of liquids  Determination of co-efficient of viscosity of a liquid by Poiseuille’s flow

TOTAL : 30 PERIODS

OUTCOMES:
• The hands on exercises undergone by the students will help them to apply physics principles of optics and thermal physics to evaluate engineering properties of materials.

CY 8161  CHEMISTRY LABORATORY  L T P C  0 0 2 1
(Common to all branches of Engineering and Technology)

OBJECTIVES:
• To make the student to acquire practical skills in the determination of water quality parameters through volumetric and instrumental analysis.
• To acquaint the students with the determination of molecular weight of a polymer by vacometry.

1. Estimation of HCl using Na₂CO₃ as primary standard and Determination of alkalinity in
water sample.

2. Determination of total, temporary & permanent hardness of water by EDTA method.
3. Determination of DO content of water sample by Winkler’s method.
4. Determination of chloride content of water sample by argentometric method.
5. Estimation of copper content of the given solution by Iodometry.
6. Determination of strength of given hydrochloric acid using pH meter.
7. Determination of strength of acids in a mixture of acids using conductivity meter.
8. Estimation of iron content of the given solution using potentiometer.
9. Estimation of iron content of the water sample using spectrophotometer (1,10- phenanthroline / thiocyanate method).
10. Estimation of sodium and potassium present in water using flame photometer.
14. Determination of CMC.
15. Phase change in a solid.

TOTAL: 30 PERIODS

OUTCOMES:
- The students will be outfitted with hands-on knowledge in the quantitative chemical analysis of water quality related parameters

REFERENCE BOOKS

GE8161 COMPUTER PRACTICES LABORATORY L T P C
0 0 3 2

OBJECTIVES:
The student should be made to:
- Be familiar with the use of Office software.
- Be exposed to presentation and visualization tools.
- Be exposed to problem solving techniques and flow charts.
- Be familiar with programming in C.
- Learn to use Arrays, strings, functions, structures and unions.
LIST OF EXPERIMENTS:
1. Search, generate, manipulate data using MS office/ Open Office
2. Presentation and Visualization – graphs, charts, 2D, 3D
3. Problem formulation, Problem Solving and Flowcharts
4. C Programming using Simple statements and expressions
5. Scientific problem solving using decision making and looping.
6. Simple programming for one dimensional and two dimensional arrays.
7. Solving problems using String functions
8. Programs with user defined functions
9. Program using Recursive Function and conversion from given program to flow chart.
10. Program using structures and unions.

OUTCOMES:
At the end of the course, the student should be able to:
- Apply good programming design methods for program development.
- Design and implement C programs for simple applications.
- Develop recursive programs.

GE8162 ENGINEERING PRACTICES LABORATORY L T P C
(COMMON TO ALL BRANCHES OF B.E./B.TECH. PROGRAMMES) 0 0 3 2

OBJECTIVE
To provide exposure to the students with hands-on experience on various basic engineering practices in Civil, Mechanical, Electrical and Electronics Engineering.

GROUP – A (CIVIL & ELECTRICAL)

1. CIVIL ENGINEERING PRACTICE 12

PLUMBING
Basic pipe connections involving the fittings like valves, taps, coupling, unions, reducers, elbows and other components used in household fittings. Preparation of plumbing line sketches.
Laying pipe connection to the suction side of a pump – inlet.
Laying pipe connection to the delivery side of a pump – outlet.
Practice in mixed pipe connections: Metal, plastic and flexible pipes used in household appliances.
WOOD WORK
Sawing, planning and making common joints: T-Joint, Mortise and Tennon joint, Dovetail joint.
Study
Study of joints in door panels, wooden furniture
Study of common industrial trusses using models.

2. ELECTRICAL ENGINEERING PRACTICE
Basic household wiring using switches, fuse, indicator – lamp etc.,
Preparation of wiring diagrams
Stair case light wiring
Tube – light wiring
Study of iron-box, fan with regulator, emergency lamp

GROUP – B (MECHANICAL AND ELECTRONICS)

3. MECHANICAL ENGINEERING PRACTICE
WELDING
Arc welding of butt joints, lap joints, tee joints
Gas welding Practice.
Basic Machining
Simple turning, drilling and tapping operations.
Machine assembly Practice.

Study and assembling the following:
Centrifugal pump, mixies and air conditioners.
Demonstration on
(a) Smithy operations like the production of hexagonal bolt.
(b) Foundry operation like mould preparation for grooved pulley.

4. ELECTRONIC ENGINEERING PRACTICE
Soldering simple electronic circuits and checking continuity.
Assembling electronic components on a small PCB and testing.
Study of Telephone, FM radio, low-voltage power supplies.

TOTAL: 45 PERIODS

OUTCOMES:
• Ability to fabricate carpentry components and pipe connections including plumbing works.
• Ability to use welding equipments to join the structures
• Ability to fabricate electrical and electronics circuits
OBJECTIVES

• To make the students acquire listening and speaking skills meant for both formal and informal contexts
• To help them develop their reading skills by exposing them to different types of reading strategies
• To equip them with writing skills needed for academic as well as workplace situations
• To make them acquire language skills at their own pace by using e-materials and language lab component

UNIT I

Listening - Listening to informal conversations and participating; Speaking - Opening a conversation (greetings, comments on something, weather) - Turn taking - Closing a conversation (excuses, general wish, positive comment, thanks); Reading - Developing analytical skills, Deductive and inductive reasoning - Extensive reading; Writing - Effective use of SMS for sending short notes and messages - Using ‘emoticons’ as symbols in email messages; Grammar - Regular & irregular verbs - Active and passive voice; Vocabulary - Homonyms (e.g. ‘can’) - Homophones (e.g. ‘some’, ‘sum’); E-materials - Interactive exercise on Grammar and vocabulary – blogging; Language Lab - Listening to different types of conversation and answering questions.

UNIT II

Listening - Listening to situation based dialogues; Speaking - Conversation practice in real life situations, asking for directions (using polite expressions), giving directions (using imperative sentences), Purchasing goods from a shop, Discussing various aspects of a film (they have already seen) or a book (they have already read); Reading - Reading a short story or an article from newspaper, Critical reading, Comprehension skills; Writing - Writing a review / summary of a story / article, Personal letter (Inviting your friend to a function, congratulating someone for his success, thanking one’s friend / relatives); Grammar - modal verbs, Purpose expressions; Vocabulary - Phrasal verbs and their meanings, Using phrasal verbs in sentences; E-materials - Interactive exercise on Grammar and vocabulary, Extensive reading activity (reading stories / novels from links), Posting reviews in blogs - Language Lab - Dialogues (Fill up exercises), Recording students’ dialogues.

UNIT III

Listening - Listening to the conversation - Understanding the structure of conversations; Speaking - Conversation skills with a sense of stress, intonation, pronunciation and meaning - Seeking information – expressing feelings (affection, anger, regret etc.); Reading - Speed reading – reading passages with the time limit - Skimming; Writing - Minutes of meeting – format and practice in the preparation of minutes - Writing summary after reading the articles from the
journals - Format for the journal articles – elements of technical articles (abstract, introduction, methodology, results, discussion, conclusion, appendices, references) - Writing strategies; Grammar - Conditional clauses - Cause and effect expressions; Vocabulary - Words used as nouns and verbs without any change in the spelling (e.g. ‘rock’, ‘train’, ‘ring’); E-materials - Interactive exercise on Grammar & vocabulary - Speed Reading practice exercises; Language Lab - Intonation practice using EFLU materials – Attending a meeting and writing minutes.

UNIT IV
Listening - Listening to a telephone conversation, Viewing a model interview (face-to-face, telephonic and video conferencing) and observing the practices; Speaking - Role play practice in telephone skills - listening and responding, -asking questions, -note taking – passing on messages, Role play and mock interview for grasping the interview skills; Reading - Reading the job advertisements and the profile of the company concerned – scanning; Writing - Applying for a job – cover letter - résumé preparation – vision, mission and goals of the candidate; Grammar - Numerical expressions - Connectives (discourse markers); Vocabulary - Idioms and their meanings – using idioms in sentences; E-materials - Interactive exercises on Grammar & Vocabulary - Different forms of résumés- Filling up a résumé / cover letter; Language Lab - Telephonic interview – recording the responses - e-résumé writing.

UNIT V
Listening - Viewing a model group discussion and reviewing the performance of each participant - Identifying the characteristics of a good listener; Speaking - Group discussion skills – initiating the discussion – exchanging suggestions and proposals – expressing dissent/ agreement – assertiveness in expressing opinions – mind mapping technique; Reading - Note making skills – making notes from books, or any form of written materials - Intensive reading Writing - Types of reports – Feasibility / Project report – report format – recommendations / suggestions – interpretation of data (using charts for effective presentation); Grammar - Use of clauses; Vocabulary – Collocation; E-materials - Interactive grammar and vocabulary exercises - Sample GD - Pictures for discussion, Interactive grammar and vocabulary exercises - Pictures for discussion; Language Lab - Different models of group discussion

OUTCOMES:
Learners should be able to
• Speak convincingly, express their opinions clearly, initiate a discussion, negotiate, argue using appropriate communicative strategies.
• Write effectively and persuasively and produce different types of writing such as narration, description, exposition and argument as well as creative, critical, analytical and evaluative writing.
• Read different genres of texts, infer implied meanings and critically analyse and evaluate them for ideas as well as for method of presentation.
• Listen/view and comprehend different spoken excerpts critically and infer unspoken and implied meanings.
TEXT BOOKS:

REFERENCE BOOKS:

EXTENSIVE READERS:

WEB RESOURCES:
1. www.esl-lab.com
2. www.englishgrammar.org
3. www.englishclub.com
4. www.mindtools.com
5. www.esl.about.com

MA8251 MATHEMATICS II L T P C
(common to all branches of B.E. / B.Tech. Programmes in II Semester) 3 1 0 4

OBJECTIVES:
• To make the student acquire sound knowledge of techniques in solving ordinary differential equations that model engineering problems.
• To acquaint the student with the concepts of vector calculus needed for problems in all
engineering disciplines.

- To develop an understanding of the standard techniques of complex variable theory so as to enable the student to apply them with confidence, in application areas such as heat conduction, elasticity, fluid dynamics and flow of electric current.
- To make the student appreciate the purpose of using transforms to create a new domain in which it is easier to handle the problem that is being investigated.

**UNIT I**  DIFFERENTIAL EQUATIONS  9+3

Method of variation of parameters – Method of undetermined coefficients – Homogenous equation of Euler’s and Legendre’s type – System of simultaneous linear differential equations with constant coefficients.

**UNIT II**  VECTOR CALCULUS  9+3

Gradient and directional derivative – Divergence and Curl – Irrotational and Solenoidal vector fields – Line integral over a plane curve – Surface integral and volume integral - Green’s, Gauss divergence and Stoke’s theorems – Verification and application in evaluating line, surface and volume integrals.

**UNIT III**  ANALYTIC FUNCTION  9+3

Analytic functions – Necessary and sufficient conditions for analyticity - Properties – Harmonic conjugates – Construction of analytic function - Conformal mapping – Mapping by functions \( w = z + c, az, 1/z, z^2 \) - Bilinear transformation.

**UNIT IV**  COMPLEX INTEGRATION  9+3


**UNIT V**  LAPLACE TRANSFORMS  9+3


**TOTAL : 60 PERIODS**

**OUTCOMES:**

- The subject helps the students to develop the fundamentals and basic concepts in vector calculus, ODE, Laplace transform and complex functions. Students will be able to solve problems related to engineering applications by using these techniques.
TEXTBOOKS:

REFERENCES:

PH8205 PHYSICS FOR PRINTING TECHNOLOGY L T P C
3 0 0 3

OBJECTIVE:
The objective of this course is to introduce the essential principles of physics for printing technology applications.

UNIT I SURFACE TENSION
Surface tension - angle of contact - pressure difference across a liquid surface - excess pressure inside a liquid drop - shape of a liquid surface in a capillary tube - determination of surface tension by capillary tube method - bubble pressure method - Jaeger’s method - effect of temperature - examples of surface tension - dynamic surface tension - surfactants - tensiometer.
UNIT II VISCOSITY
Viscosity and coefficient of viscosity - streamline and turbulent flow - Reynold’s number - Poiseuille’s equation - Stoke’s law and terminal velocity - experimental determination of n Basic visco-elasticity - effect of temperature - measurement - visco-elastic flow - Newtonian and non-Newtonian fluids. Basic physical principles of ink-jet printer - ink droplet - ink gun (principles).

UNIT III MAGNETIC/OPTICAL DATA STORAGE TECHNIQUES
Introduction - magnetic material parameters - magnetic disk memories - optical data storage - phase change recording - magneto-optical data storage - Hi-tech involved in system development - capacity of CD in normal use - advantages of CD - holographic storage - construction of a hologram - reconstruction of a hologram - photorefractive storage.

UNIT IV OPTOELECTRONICS AND DISPLAY DEVICES

UNIT V OPTICAL IMAGE PROCESSING
Introduction to Fourier optics - Fourier transforming properties of lenses - analog optical information processing - Abbe-Porter experiment - optical filters - optical spatial light modulators - conversion of incoherent image into coherent image basics of digital image processing.

OUTCOMES:
- The students will have knowledge on the basics of physics related to properties of surface tension, viscosity, optical image processing etc., and they will apply these fundamental principles to solve practical problems related to materials used for engineering applications.

REFERENCES:
AIM
To impart knowledge on the Applied Chemistry topics important in Printing Engineering.

OBJECTIVES
The students should be conversant with
- Treatment of water for domestic and industrial purpose
- Applications of different kinds of Polymers, Lubricants and adhesives.
- Different kinds of alloys and powder metallurgy involving condensed systems.
- Principles and instrumentation of spectroscopic and microscopic analysis.

UNIT I    WATER TECHNOLOGY AND CORROSION  9
Water – Sources, properties, Characteristics imparted by impurities in water, significance of water quality parameters in terms of pH, conductivity, hardness, alkalinity, COD, BOD, iron, chloride and sulphate, Water treatment – Reverse Osmosis, ion exchange demineralization and zeolite processes; Corrosion - Types, Corossion control; Paints-constituents and their functions- mechanism of drying of an oil paint.

UNIT II    LUBRICANTS AND ADHESIVES  9
Lubricants and lubrication- functions- classification with examples- properties (viscosity index, flash and fire point, oiliness, carbon residue, aniline point, cloud and pour point)- greases (calcium based, sodium based, lithium based only)- solid lubricants- graphite and molybdenum sulphide. Adhesives – adhesive action – development of adhesive strength – physical and chemical factors influencing adhesive action – bonding process of adhesives –phenol formaldehyde resins, polyurethane, epoxy resins and urea formaldehyde.

UNIT III   POLYMERS, COMPOSITES AND FOAMS  9
UNIT IV    ALLOYS AND PHYSICAL METALLURGY


UNIT V    INSTRUMENTAL METHODS AND ANALYSIS


TOTAL : 45 PERIODS

OUTCOMES:
- Provides understanding of water technology applications for domestic and industrial purposes.
- Will gain a broad idea about commodity and specialty polymers, lubricants and adhesives.
- Is conversant with spectroscopic and microscopic techniques.

TEXT BOOKS:

REFERENCE BOOKS:
OBJECTIVE
To develop capacity to predict the effect of force and motion in the course of carrying out the
design functions of engineering

UNIT I  BASICS AND STATICS OF PARTICLES  9 + 3
Introduction – Units and Dimensions – Laws of Mechanics – Lami’s theorem, Parallelogram
and triangular Law of forces — Vectorial representation of forces – Vector operations of
forces -additions, subtraction, dot product, cross product – Coplanar Forces – rectangular
components – Equilibrium of a particle – Forces in space – Equilibrium of a particle in space
– Equivalent systems of forces – Principle of transmissibility .

UNIT II  EQUILIBRIUM OF RIGID BODIES  9 + 3
Free body diagram – Types of supports –Action and reaction forces –stable equilibrium –
Moments and Couples – Moment of a force about a point and about an axis – Vectorial
representation of moments and couples – Scalar components of a moment – Varignon’s
theorem – Single equivalent force -Equilibrium of Rigid bodies in two dimensions – Equilibrium
of Rigid bodies in three dimensions

UNIT III  PROPERTIES OF SURFACES AND SOLIDS  9 + 3
Centroids and centre of mass– Centroids of lines and areas - Rectangular, circular, triangular
areas by integration – T section, I section, - Angle section, Hollow section by using standard
formula –Theorems of Pappus - Area moments of inertia of plane areas – Rectangular, circular,
triangular areas by integration – T section, I section, Angle section, Hollow section by using
standard formula – Parallel axis theorem and perpendicular axis theorem –Principal moments
of inertia of plane areas – Principal axes of inertia-Mass moment of inertia –mass moment
of inertia for prismatic, cylindrical and spherical solids from first principle – Relation to area
moments of inertia.

UNIT IV  DYNAMICS OF PARTICLES  9 + 3
Displacements, Velocity and acceleration, their relationship – Relative motion – Curvilinear
of elastic bodies.

UNIT V  FRICTION AND ELEMENTS OF RIGID BODY DYNAMICS  9 + 3
Friction force – Laws of sliding friction – equilibrium analysis of simple systems with sliding
friction –wedge friction-. Rolling resistance -Translation and Rotation of Rigid Bodies – Velocity
and acceleration – General Plane motion of simple rigid bodies such as cylinder, disc/wheel
and sphere.

TOTAL: 60 PERIODS (L:45 + T:15)
OUTCOMES:
- ability to explain the differential principles applies to solve engineering problems dealing with force, displacement, velocity and acceleration.
- ability to analyse the forces in any structures.
- ability to solve rigid body subjected to dynamic forces.

TEXT BOOKS:

REFERENCES:

PT8201 PRINCIPLES OF PRINTING ENGINEERING AND TECHNOLOGY L T P C 3 0 0 3

OBJECTIVE
The students should be made to:
- Understand the roles and responsibilities of engineers in the development of the society.
- Learn the basics of graphic design.
- Be familiar with various printing processes and stages in printing workflow.

UNIT I PRINCIPLES OF ENGINEERING 9
Engineers as Problem Solvers - Past, Present and Future; Engineering Team; Careers in Engineering; Engineering, Technology, Distinction between Engineering and Technology, Sketching, Technical Writing Technical Reports, Data Representation and Presentation, Presentations; Design Process - Problem Identification, Design Brief, Problem Analysis, Information Gathering, Alternative Solutions and Optimization, Modeling, Testing and Evaluation, Presentation of Solution.
UNIT II    PRINCIPLES OF DESIGN  9
Basic concepts of designing, Creativity, steps in creativity; Typography; Visual ingredients of graphic design; Design consideration; Symbols and logos. Layout – purpose & advantages; layout styles; layout components; stages in preparing a layout; marking-up; Dummy, Case studies.

UNIT III    DESIGNING FOR MEDIA  9

UNIT IV    INTRODUCTION TO PRINTING PROCESSES  9
Types of process – Letterpress, Offset, Gravure, Flexography, Screen printing, Digital Printing Processes; Overview on image carrier preparation and finishing operations for different types of printing process

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

OUTCOMES:
Upon completion of the course, the student should be able to:
• Create layouts and designs for various print products.
• Learn the key identifying characteristics of each printing process.
• Comprehend the relationship between designer, customer and printer

TEXT BOOKS:

REFERENCE BOOKS:
OBJECTIVES:
- The students should be conversant with the analytical and preparative methods.
- To impart knowledge on the characterization of metallurgy and fuel efficiency methods.
- To teach the students about iodine value, aniline point and viscosity measurements.

List of Experiments:
1. Determination of Iodine value.
2. Determination of Acid value of resin.
3. Estimation of aniline point.
5. Determination of Fe in Iron Ore.
6. Determination of Ca in Limestone.
7. Identification of functional groups in organic compounds.
8. Identification of monomers in polymers.
10. Determination of TGA of polymeric sample.

TOTAL: 60 PERIODS

OUTCOMES:
- Will provide essential knowledge relevant to metallurgical processes and applications.
- Helps in identifying the functional groups in organic compounds.
- Is conversant with basics of thermal stability of polymeric samples.

REFERENCES:
OBJECTIVE:
To acquire skills on,
  • Designing using paint and brush
  • Sketching using pencil
  • Collage Art

Basic Design
1. Thumbnails and Rough sketches of logos
2. Thumbnails and Rough sketches of advertisements
3. Thumbnails and Rough sketches of lettering
4. Prepare layouts for magazine
5. Prepare layouts for newspaper
6. Prepare layouts for books
7. Prepare layouts for web publishing
8. To develop artworks and design print products using collage and paint
9. To develop a drawing folio and keep a sketch book as a record of ideas

Materials Required:
  • Set of HB & B black lead pencils
  • Set of poster colours
  • Set of Paint brushes

OUTCOMES:
Upon completion of the course, the student should be able to:
  • Create layout designs for books, newspaper and magazines
  • Understand the concepts of logos and symbols
  • Develop creative artworks

TOTAL: 30 PERIODS
OBJECTIVES:
• To introduce the effective mathematical tools for the solutions of partial differential equations that model physical processes;
• 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 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  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 – Classification of Partial Differential Equations - Solution of linear equations of higher order with constant coefficients – Linear non-homogeneous PDE.

UNIT II  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 III  APPLICATIONS OF PARTIAL DIFFERENTIAL EQUATION 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 IV  FOURIER TRANSFORM 9+3

UNIT V  Z – TRANSFORM AND DIFFERENCE EQUATIONS 9+3

TOTAL : 60 PERIODS

OUTCOMES
• The understanding of the mathematical principles on transforms and partial differential equations would provide them the ability to formulate and solve some of the physical problems of engineering.
TEXT BOOK:

REFERENCES:

CE8353 STRENGTH OF MATERIALS

OBJECTIVE:
To understand the stresses developed in bars, compounds bars, beams, shafts, cylinders and spheres.

UNIT I STRESS, STRAIN AND DEFORMATION OF SOLIDS

UNIT- II TRANSVERSE LOADING ON BEAMS AND STRESSES IN BEAM

UNIT- III TORSION
Torsion formulation stresses and deformation in circular and hollows shafts – Stepped shafts – Deflection in shafts fixed at the both ends – Stresses in helical springs – Deflection of helical springs, carriage springs.

UNIT- IV DEFLECTION OF BEAMS
Double Integration method – Macaulay’s method – Area moment Theorems for computation of slopes and deflections in beams - Conjugate beam and strain energy – Maxwell’s reciprocal theorems.
UNIT V  THIN CYLINDERS, SPHERES AND THICK CYLINDERS

Stresses in thin cylindrical shell due to internal pressure circumferential and longitudinal stresses and deformation in thin cylinders – spherical shells subjected to internal pressure – Deformation in spherical shells – Lame’s theory – Application of theories of failure.

OUTCOMES:
- Upon completion of this course, the students can able to apply mathematical knowledge to calculate the deformation behavior of simple structures.
- Critically analyse problem and solve the problems related to mechanical elements and analyse the deformation behavior for different types of loads.

TEXT BOOKS:

REFERENCES:

EC8352 ELECTRONICS ENGINEERING  L T P C
3 0 0 3

OBJECTIVES:
- To provide knowledge in the basic concepts of Electronics Engineering including semiconductors, transistors, electronic devices, signal generators and digital electronics.

UNIT I SEMICONDUCTORS AND RECTIFIERS
Classification of solids based on energy band theory, Intrinsic semiconductors, Extrinsic semiconductors – P-type and N-type, P-N junction, VI Characteristics of PN junction diode, Half and Full wave rectifiers, Zener effect, Zener diode, Zener diode Characteristics, Zener diode as a regulator.

UNIT II TRANSISTOR AND AMPLIFIERS
Bipolar junction transistors – CB, CE, CC configurations and characteristics, Biasing circuits – Fixed bias, Voltage divider bias, CE amplifier, Concept of feedback, Negative feedback, voltage series feedback amplifier, Current series feedback amplifier.
UNIT III    FET AND POWER ELECTRONIC DEVICES

FET – Configuration and characteristics, FET amplifier, Characteristics and simple applications of SCR, Diac, Triac and UJT.

UNIT IV    SIGNAL GENERATORS AND LINEAR ICs


UNIT V    DIGITAL ELECTRONICS

Boolean algebra, Logic Gates, , Half and Full adders, Decoder, Encoder, Multiplexer, Demultiplexer, Flip flops, Digital to Analog converters - R-2R and weighted resistor types, Analog to Digital converters - Successive approximation and Flash types.

TOTAL:45 PERIODS

OUTCOMES:

- ability to identify electronics components and use of them to design circuits.

TEXT BOOK:


REFERENCES:


EE8251    BASIC ELECTRICAL ENGINEERING AND MEASUREMENTS

AIM

To provide knowledge in the basic concepts of Electric Circuits, Electrical machines and Measurement techniques.
OBJECTIVE
To impart knowledge on
• Electric circuit laws
• Principle of Electrical Machines
• Various measuring instruments

UNIT I  ELECTRICAL CIRCUITS  9

UNIT II  ELECTRICAL MACHINES  9
Construction and Principle of operation DC machines- Characteristics of DC machines Construction and Principle of operation of single phase transformers, synchronous machines, three-phase and single-phase induction motors

UNIT III  MEASUREMENT AND INSTRUMENTATION  9
Classification of instruments – moving coil and moving iron meters – Induction type, dynamometer type wattmeters – Energy meter – Megger – Instrument transformers (CT & PT) –Wheatstone’s bridge for measurement of unknown resistance ,Maxwell’s bridge for unknown inductance and Schering Bridge for unknown capacitance

UNIT IV  TRANSUCERS  9
Classification of transducers, strain, RTD, thermocouples, Piezo-electric transducer, LVDT, Turbine and electromagnetic flow meters, level transducers ultrasonic and fiber optic transducers, type of sensors, elastic sensors, viscosity, moisture and pH sensors, Digital transducers, vibrating wire instruments like load cells, stress meter, etc.

UNIT V  SIGNAL CONDITIONING AND DISPLAY  9
Instrumentation amplifiers- Filters- A/D and D/A converters - Multiplexing and data acquisition - LED, LCD and CRT displays.

OUTCOMES:
• Upon Completion of this subject, the students can able to explain different types of electrical machines and their performance

TEXT BOOKS
REFERENCES

PT8301 IMAGING TECHNOLOGY

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

UNIT I INTRODUCTION TO TEXT COMPOSING

UNIT II LASER TYPESETTERS

UNIT III IMAGE ACQUISITION AND FILM PROCESSING

UNIT IV PLANNING & LAYOUT
Lithographic production – Introduction; planning layout – Information, type of work, Preparing the layout; Imposition schemes; Book work – Margin calculations, Methods, positive and
negative assembly; Planning softwares

UNIT V  PLATE CHEMISTRY & PROCESSING

Base materials & properties – Aluminium, Stainless steel, Copper, Chromium, Nickel, Poly masters and paper masters; Graining – types; Contact angle and wettability; Anodisation – Process; Plate chemistry – dichromated colloids, diazo, and photopolymer compounds, Thermal sensitive, Silver halide, Silver hybrid plates; Plate exposing unit; Light source – Types – advantages, disadvantages, Platesetters, Plates for digital imaging-, sensitivity, chemistry, mechanism of image formation and processing. Processless plates. Desensitizing process, gum, developing inks, lacquers and asphaltum, Quality Control Aids.

OUTCOMES:
At the end of the course, the student should be able to
- Understand the pre-press workflow
- Learn typography, image acquisition and halftone screening methods
- Create imposition schemes for book work and other printed products
- Understand the plate chemistry and platemaking process

TEXTBOOKS:

REFERENCES:
2. “Handbook of Modern Halftone Photography”, Perfect Graphic arts, Demarset, U.S.A.
CE8362  STRENGTH OF MATERIALS LABORATORY  L T P C  0 0 3 2

OBJECTIVES:
To study the properties of materials when subjected to different types of loading.

LIST OF EXPERIMENTS
1. Tension test on mild steel rod
2. Double shear test on metal
3. Torsion test on mild steel rod
4. Impact test on metal specimen (Izod and Charpy)
5. Hardness test on metals (Rockwell and Brinell Hardness Tests)
6. Deflection test on metal beam
7. Compression test on helical spring
8. Deflection test on carriage spring

TOTAL: 45 PERIODS

OUTCOMES:
- Ability to perform different destructive testing
- Ability to characteristic materials

REFERENCE:
1. Relevant Indian Standards

EC8361  ELECTRONICS ENGINEERING LABORATORY  L T P C  0 0 3 2

OBJECTIVES:
- Students should be able to verify the principles studied in theory by performing experiments in the laboratory

1. VI Characteristics of PN Junction and Zener Diodes.
2. Characteristics of CE configuration of Transistor.
4. Characteristics of FET.
5. Operational Amplifier Applications – Adder, Multiplier.
6. RC Oscillator
7. LC Oscillators
8. IC 555 Astable and Monostable multivibrators
9. Half and Full adders
10. RS, T and D FFs
11. BCD counter using IC 7490

TOTAL: 45 PERIODS

OUTCOMES:
- ability to use of diodes, transistors for rectifiers
- ability to use of operational amplifiers

EE8262 ELECTRICAL ENGINEERING LABORATORY

OBJECTIVES:
- Students should able to verify the principles studied in theory by performing experiments in the laboratory

1. Speed Control of DC Shunt Motor
2. Load Test on DC Shunt Motor
3. Study of starters
4. Swinburne’s Test
5. Load Test on DC Series Motor
6. Load Test on three Phase Alternator
7. Load Test on three Phase Induction Motor
8. Wheatstone’s Bridge
9. Load Test on single phase Induction Motor.
10. Load test on Single Phase Transformer.

TOTAL: 45 PERIODS

OUTCOMES
- Ability to perform speed characteristic of different electrical machine
OBJECTIVE:
To give hands on training on typesetting parameters in page layout using page making software and 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

OUTCOMES:
At the end of the course, the student should be able to:
- Learn the features of Pagination software
- Apply appropriate typographic styles based on job requirement
- Create page layouts for various jobs.
- Integrate text and graphics in a page

MA8352                  APPLIED STATISTICS    L T P C
                                   3 1 0 4

OBJECTIVE:
- The students will have a fundamental knowledge of the concepts of statistical inference and apply the tools in management problems.

UNIT I      TESTS OF SIGNIFICANCE  9+3
Sampling distributions - Tests for single mean, proportion and difference of means, proportions (large and small samples) - Tests for single variance and equality of variances - test for goodness of fit - Independence of attributes.

UNIT II     NON-PARAMETRIC TESTS  9+3
UNIT III DESIGN OF EXPERIMENTS
Completely randomized design - Randomized block design - Latin square design - 22 factorial design - Taguchi’s robust parameter design.

UNIT IV STATISTICAL QUALITY CONTROL
Control charts for variables - Control charts for attributes - Tolerance limits - Acceptance sampling by attributes.

UNIT V TIME SERIES

OUTCOMES:
At the end of the course, the student should be able to:
- Learn the features of Pagination software
- Apply appropriate typographic styles based on job requirement
- Create page layouts for various jobs.
- Integrate text and graphics in a page

TEXT BOOKS:

REFERENCES:

GE8351 ENVIRONMENTAL SCIENCE AND ENGINEERING
OBJECTIVES
To the study of nature and the facts about environment.
- To finding and implementing scientific, technological, economic and political solutions to environmental problems.
- To study the interrelationship between living organism and environment.
- To appreciate the importance of environment by assessing its impact on the human world; envision the surrounding environment, its functions and its value.
To study the dynamic processes and understand the features of the earth's interior and surface.
To study the integrated themes and biodiversity, natural resources, pollution control and waste management.

UNIT I ENVIRONMENT, ECOSYSTEMS AND BIODIVERSITY
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
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
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
conservation act – enforcement machinery involved in environmental legislation- central and state pollution control boards- Public awareness.

UNIT V  HUMAN POPULATION AND THE ENVIRONMENT  

TOTAL : 45 PERIODS

OUTCOMES:
Environmental Pollution or problems cannot be solved by mere laws. Public participation is an important aspect which serves the environmental Protection. One will obtain knowledge on the following after completing the course.

- Public awareness of environmental is at infant stage.
- Ignorance and incomplete knowledge has lead to misconceptions
- Development and improvement in std. of living has lead to serious environmental disasters

TEXT BOOKS

REFERENCE BOOKS

ME8452  MECHANICS OF MACHINES  
L T P C  3 0 0 3

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

UNIT I  KINEMATIC OF MECHANICS
UNIT- II  GEARS AND GEAR TRAINS

UNIT- III  FRICTION IN MACHINE ELEMENTS
Surface contacts – Sliding and Rolling friction – Friction drives – Friction in screw threads – Bearings and lubrication – Friction clutches – Belt and rope drives – Friction aspects in brakes – Friction in vehicle propulsion and braking.

UNIT IV  FORCE ANALYSIS

UNIT V  BALANCING AND VIBRATION

TOTAL: 45 PERIODS

OUTCOMES:
- Upon completion of this course, the students can able to apply fundamentals of mechanism for the design of new mechanisms and analyse them for optimum design.

TEXT BOOK:

REFERENCES:

**STANDARDS:**


**OBJECTIVE:**
The students should be made to:
- Learn the fundamental concepts of colour science, colour perception & measurement.
- Understand the colour reproduction techniques in printing.
- Appreciate the impact of variables on colour reproduction.
- Learn the concepts behind colour correction for print production.
- Be familiar with the basics of Colour Management System.

**UNITI COLOUR SCIENCE & MEASUREMENT**

Light, colour, Light sources, Sample, Observer, Colour vision, Colour matching experiment, Tristimulus values, Chromaticity diagram, Colour spaces – CIELAB, CIELUV, CIELCH, Munsell; Colour difference equations, Spectrophotometer, Viewing conditions and standards.

**UNITII PRINCIPLES OF COLOUR REPRODUCTION**

Additive and Subtractive colour theory, Colour Fusion, Colour originals for reproduction. Reproduction objectives, Image Acquisition – scanners, digital cameras; Colour separation techniques, Screen angles and moire patterns.
UNIT III  SPECTRAL SENSITIVITIES, INK & PAPER


UNIT IV  COLOUR CORRECTION & IMAGE ADJUSTMENTS

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

UNIT V  COLOUR MANAGEMENT


TOTAL: 45 PERIODS

OUTCOMES:
Upon completion of the course, the student should be able to:

- Evaluate colour originals and choose appropriate reproduction method.
- Apply suitable compensation in prepress while color separation.
- Evaluate colour and other print attributes.
- Discuss the importance of colour management.

TEXT BOOKS:

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

UNITI WORKFLOW
Workflow – editorial, pre-press, production; Automated workflow - components, File Preparation, Preflighting, Digital Imposition – preRIP, postRIP, OPI, Trapping, Postscript, PDF, CIP4 – JDF, JMF.

UNITII NETWORKING
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

UNITIII FILE FORMATS & COMPRESSION TECHNIQUES
File format – EPS, DCS, JPEG, GIF, TIFF, PNG, Comparison of file formats, Overview of Compression techniques - Lossy & lossless compression, RLE, Huffman compression, LZW, DCT, Wavelet, Fractal image encoding; Image quality evaluation

UNITIV DATABASE MANAGEMENT
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.

UNITV SECURITY ASPECTS

TOTAL: 45 PERIODS

OUTCOMES:
At the end of the course, the student should be able to:
- Learn the digital print production workflow
- Choose suitable file format for images based on publishing mode
- Understand the basics about networking, security and database management

TEXT BOOKS:
REFERENCES BOOKS:

PT8403 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

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

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

OUTCOMES:
Learners should be able to:
- Get the fundamental knowledge on paper and board.
- Know about the various sources of paper and board, manufacturing processes, properties and testing of papers.
- Follow the standards used for testing of paper and board.
- Rectify the paper related problems in printing.

TEXT BOOKS:

REFERENCE BOOKS:

PT8411  IMAGE DESIGN AND EDITING LABORATORY  L T P C
0 0 3 2

OBJECTIVES
The students should be made to:
- Learn the basics of graphic design and image editing software.
- Understand the concept and application of layers in design.
- Learn how to retouch and edit images

TOTAL: 45 PERIODS

OUTCOMES:
Upon completion of the course, the student should be able to:
- Design graphics for a wide range of media and applications.
- Edit and retouch graphics creatively.
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 and Half sheet film assembly
3. Planning for irregular images
4. 32,64,and 128 pages book work
5. Materials Requirement Planning
6. Study of planning softwares.
7. Exposure optimization and standardization Printing Down Frame
8. Direct ruling / Wipe-on plate processing and standardization
9. Study of CTP machine and job planning
10. Exercise in workflow software.

TOTAL : 45 PERIODS

OUTCOMES:
At the end of the course, the students should be able to:

- Design and plan any print jobs for the commercial press.
- Estimate the plate and paper requirements for the jobs
- Adapt to any automatic workflow software in the industries.
- Understand the variables in plate making and standardize plate preparation.

 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

UNIT II TIMING DIAGRAM AND PROGRAMMING
UNIT III PERIPHERALS AND INTERFACING
Basic interfacing concepts-8255 Programmable Peripheral Interface- interfacing memory-Programmable Interval Timer 8253,USART-8251,key board/Display interface-8279

UNIT IV 8051 MICROCONTROLLER
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

TOTAL :45 PERIODS

OUTCOMES:
- Upon completion of this course, the students will be able to understand the design, functioning and programming of microprocessors and other electrical and Electronics Circuits theoretically.

TEXT BOOKS:

REFERENCES:
OBJECTIVE:
• To introduce the fundamental knowledge in the types of packaging materials
• To impart knowledge in the selection of suitable material for various packaging applications.

UNIT I PLASTICS
Polymers, Plastics in packaging – types, advantages; Flexible and Rigid packaging – Properties, applications; Thermoplastic Materials, Food grade plastics, Thermoset Materials – properties, processing methods, applications; Recycling; Biodegradable and Eco friendly packaging - Advantages and disadvantages.

UNIT II WOOD, PAPER AND TEXTILE
Wood – Types, Materials, characteristic properties, application, Nature of wood, properties; Textile – Types of cloth, properties, application; Paper and Board – Types, Manufacturing, Properties, Specialty papers for Packaging, Folding board cartons and coated cartons, Corrugated Boards – Types, Applications, Specifications.

UNIT III GLASS AND METALS
Glass – Types, Properties, use, Chemistry, coatings, defects and application areas; Metals – Tin, Steel, Aluminium – Cans, drums, sheet – Materials, properties, treatment, coatings, recycling process; Foil – Materials, characteristics, decoration, lamination and metallization methods.

UNIT IV ANCILLARY MATERIALS
Label – types, materials, Label adhesives –Types, characteristic properties and uses; Collapsible tube – materials and properties. Closures and sealing – materials and properties; Cushioning Materials – properties and areas of application. Lacquers – properties, uses; Special additives for food grade films; Nano materials, Reinforcement – materials and properties.

UNIT V MATERIAL TESTING
Mechanical – Tensile, Tear burst, impact; barrier properties, WVTR test, Adhesion test, Optical – Gloss, haze and clarity; Chemical Resistance test – solvents and chemicals, Migration test, Plastic material identification test, solvent retention; Hardness and corrosion test for metals; Clarity and brittleness test for glass.

TOTAL: 45 PERIODS

OUTCOMES:
Learners should be able to
• Get the fundamental knowledge of the materials used for packaging.
• Know the selection of suitable packaging material for various applications.
• Follow the standards used for testing of packaging materials.
TEXT BOOKS:
2. S. Natarajan, M. Govindarajan, and B. Kumar “Fundamental of Packaging Technology” PHI, New Delhi, 2009

REFERENCE BOOKS:

PT8503 PRINTING INKS AND COATINGS L T P C 3 0 0 3

OBJECTIVES:
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 9
Colorants – Classification, preparation and properties; Inorganic – white and coloured, carbon black, metallic, ultramarine and fluorescent; organic - Diarylide yellow, Hansa yellow, Rhodamine, Lithol, Rubine; Dyestuffs and oils - Types, Preparation, Properties and uses; Resins – Natural Rosin and its derivatives and Gumarabic; Synthetic – Rosin modified fumaric, maleic and phenolic, alkyds, hydro carbons, polyamides, Polyvinyl, Epoxy resins, Acrylic resins, Ethyl Cellulose and Nitro cellulose; Varnishes - types; Additives – Properties and applications – Driers, Waxes, Antioxidants, plasticizers, wetting agents, defoaming agents and Antiskinning agents.

UNIT II PRINTING INKS FOR DIFFERENT PROCESSES 9
UNIT III  INK TEST AND MEASUREMENTS  9

UNIT IV  SPECIALITY INKS AND INK DRYING MECHANISMS  9
Water based inks; Ink jet printing inks; Radiation curable inks - IR, UV & EB – Raw materials, equipment used for drying; Security inks – Thermo chromic and Photo chromic; Ink drying mechanisms.

UNIT V  COATINGS  9
Coating types - Oil based, water based, UV and EB coatings and nano emulsions, Roller coatings and Hybrid coatings - constituents, properties.

OUTCOMES:
Learners should be able to
- Know the raw materials and properties used for the preparation of printing inks.
- Be familiar with the manufacturing process of Inks.
- Follow the standards used for testing of printing Inks.
- Rectify the problems related to printing inks on different printing process.
- Get adequate knowledge on special inks and different coating methods.

TEXT BOOKS:

REFERENCE BOOKS:
OBJECTIVE:

• To introduce the principles of offset
• To impart knowledge about the mechanisms of offset printing machines

UNIT I  PRINCIPLES OF OFFSET  6
Principles of lithography, wetting of a solid surface by a liquid before and after surface treatments. Emulsification of ink and fountain solution, fluid behaviour in a nip. Fundamental elements of offset printing machine.

UNIT II  SHEET FEEDING AND CONTROL  10
Sheet feeding requirements. Types of feeders, sheet controls, 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 III  PRINTING UNIT CONFIGURATION  12

UNIT IV  PRINTING BLANKETS, ROLLERS AND FOUNTAIN SOLUTION  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 V  PRINTING AND INLINE OPERATIONS  7

TOTAL: 45 PERIODS

OUTCOMES:
At the end of the course, the student should be able to:

• Understand the concepts of sheetfed offset printing machine design and its mechanisms
• Identify factors influencing print quality
• Troubleshoot print problems
TEXT BOOKS:

REFERENCE:

PT8511 COLOR REPRODUCTION LABORATORY LT PC 0032

OBJECTIVES:
The students should be made to:
- Understand the influence of device settings in image acquisition and learn the tonal and colour adjustments
- Understand colour management options in various stages of prepress workflow

1. Image acquisition from scanner and digital camera
2. File formats & Sampling
3. Tonal adjustment, Histogram analysis and equalization
4. Colour measurement and evaluation
5. Colour correction
6. Colour separation & proofing
7. Black Generation– UCR, GCR
8. Calibration and characterization of input & display device
9. Calibration and characterization of printer
10. Colour management in image editing softwares
11. Comparison of different quality standards

TOTAL: 45 PERIODS

OUTCOMES:
Upon completion of the course, the student should be able to:
- Preflight and export colour documents into PDF
- Generate profiles for different devices
- Create proofs by mapping to destination device gamut.
- Colour correct images and generate separations
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 8085 and 8051

TOTAL: 45 PERIODS

OUTCOMES:
Upon completion of this course, the students will be able to understand the design, functioning and programming of microprocessors and other electrical and Electronics Circuits practically.

OBJECTIVE:
To understand the controls, settings, mechanisms and have hands on training in Semiautomatic and Automatic printing machine.

1. Study of controls, operations and specifications of printing machines.
2. Feeder setting and Plate fixing
4. Study of various mechanisms and settings.
5. Single colour printing in automatic printing machine.
6. Roller and Cylinder pressure setting.
7. Study the effect of packing on print length.

OUTCOMES:
At the end of the course, the student should be able to:
- Operate a sheetfed offset press
- Understand process control parameters
- Standardize the machine and evaluate print quality

PT8601  ELECTRONIC PUBLISHING  L T P C
3 0 0 3

OBJECTIVE:
The student should be made to:
- Exposed to e-reader and Print On-demand concepts in publishing
- Learn the standards of different layout and Design concept various digital gadgets.
- Be exposed to different publishing and workflow software of e-publishing.
- Be familiar with online publishing models and digital rights management.

UNIT I  INTRODUCTION

UNIT II  PUBLISHING

UNIT III  WORKFLOW
Authors, Publishers, e Publishing Companies; Workflow – Receiving Jobs (FTP), Pre-editing, Copy editing, Proof reading, Graphics, Pagination, Quality Control, Output – Print, Proof, Web, Handheld devices(file formats); Workflow softwares, Publishing Management System: Publication representation; Publication environments; Publication node structure; Version management; Content objects & processing objects; Publication naming; Information sharing Hypertext and its principle.
NIT IV  SOFTWARES & TOOLS


UNIT V  EMERGING TRENDS

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

OUTCOMES:
At the end of the course, the students should be able to:

- Apply different layouts design for various digital gadgets.
- Choose proper software for web presentation and transformation language.
- Create and conceive different online publishing models.

TEXT BOOKS:


REFERENCE BOOKS:


PT8602  PRINT FINISHING  L T P C
3 0 0 3

OBJECTIVE:
To impart knowledge on various finishing operations, materials & equipments used for print finishing
UNIT I  BINDING MATERIALS
Overview of binding and finishing; Print finishing – classification; materials; JDF and MIS in bookbinding and print finishing, trends and developments in finishing operations; adhesives – types, manufacturing, theory of adhesion; prevention of deterioration; Production control, Network analysis and Quality control.

UNIT II  GUILLOTINES
Joggers; cutting – overview, work preparation; cutting machine – 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
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
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

TOTAL: 45 PERIODS

OUTCOMES:
At the end of the course, the student should be able to:
- Know the various materials used for print finishing applications
- Overall concepts on the operations used for print finishing operations
- In-depth knowledge on the mechanism and maintenance of the machines used in print finishing
- Apply different types of binding according to its application
- Manufacturing procedure of the materials and its quality control
TEXT BOOKS:

REFERENCE BOOKS
1. Ralph Lyman, “Binding and finishing”, GATF, 1993

PT8603 PRINT OPERATIONS MANAGEMENT

OBJECTIVE:
After this course the student should:

a. Understand the concepts of Scheduling and its importance in the printing Industry.
b. Should have complete knowledge of the various applications of inventory and project management with respect to the Printing Industry.

UNIT I INTRODUCTION
UNIT II SEQUENCING
Gantt chart, Algorithms for solving sequencing problems – Processing of N jobs through 2 machines, n jobs through 3 machines, n jobs on K machines, Assignments and transportation algorithms, Production Line Balancing

UNIT III INVENTORY MANAGEMENT
Definition & purpose, Inventory classification, EOQ, Materials handling & Warehousing.

UNIT IV MATERIALS & CAPACITY REQUIREMENT PLANNING
MRP, CRP–Concepts & applications, Aggregate planning & Master Scheduling, ERP– Concepts and systems.

UNIT V NETWORK MODELS

OUTCOMES:
At the end of the course, the students should be able to:
- Understand the operations of a printing press
- Apply various management concepts in managing a print establishment.
- Critically analyze the function of print organization and the print operations management concepts to solve management problems in a printing press.

TEXT BOOKS:

REFERENCE BOOK:

PT8604 WEB OFFSET TECHNOLOGY

OBJECTIVE:
To 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 PRESS CLASSIFICATION AND INFEED UNITS
Development, Classification – blanket-to-blanket, in-line, common impression; Job suitability
and factors to be considered for selection, presses – Full size, narrow web presses and continuous stationery; Roll stands; Automatic pasters – Zero speed and Flying pasters; Web pre-conditioners, infeed units, dancing roller types, design, tension control systems. Reel handling and storage; Requirements of paper-roll and web.

UNIT II PRINTING UNIT  
Printing Unit – plate cylinder, blanket cylinder, lock-up mechanisms, cylinder pressure and timing, unit configuration, webbing up options; Automatic webbing up device, control of fan out using buzzle wheels and air guns; web aligner concepts; Web break detectors & Severers; Cylinder drives; Circumferential and lateral movement of plate cylinder; Automatic register control system, concepts and design; Shaft less drives, automation in closed loop controls.

UNIT III INKING & DAMPENING SYSTEMS  

UNIT IV DRYING, CHILLING, FOLDING AND SHEETING UNITS  

UNIT V MAIL ROOM OPERATION  
Products, sizes, formats, sections, Pagination, single/double/quadruple production, speed, time schedules, conveyor system, counter stackers, wrapping requirements, strapping requirements. Bundle addressing, system and control, online trimmers, copy counting mechanisms, Programming and Telescopic conveyor for truck loading, copy storage system, Inserting, Diverters & Kickers

OUTCOMES:
At the end of the course, the student should be able to:
- Understand different configurations, components and mechanisms of a web offset machine
- Understand mailroom operations
- Understand issues related to runnability and printability

TEXT BOOKS:

REFERENCE BOOKS:

HS8561 EMPLOYABILITY SKILLS L T P C
(Common to all branches of Fifth or Sixth Semester B.E / B.Tech programmes) 0 0 2 1

OBJECTIVES:
• To enhance the employability skills of students with a special focus on Presentation skills, Group discussion skills and Interview skills
• To help them improve their soft skills, including report writing, necessary for the work-place situations
2. Creating effective PPTs – presenting the visuals effectively
3. Using appropriate body language in professional contexts – gestures, facial expressions, etc.
4. Preparing job applications - writing covering letter and résumé
5. Applying for jobs online - email etiquette
6. Participating in group discussions – understanding group dynamics - brainstorming the topic
7. Training in soft skills - persuasive skills – People skills - questioning and clarifying skills – mock GD
8. Writing Project proposals – collecting, analyzing and interpreting data / drafting the final report
9. Attending job interviews – answering questions confidently
10. Interview etiquette – dress code – body language – mock interview

TOTAL: 30 PERIODS

OUTCOME
• The students will have enough confidence to present themselves well using proper oral and written communication skills to any interview (or) discussion (or) presentation.

REFERENCE BOOKS:

EXTENSIVE READERS

WEB RESOURCES
1. www.humanresources.about.com
2. www.careerride.com

PT8611 CROSSMEDIA PUBLISHING LAB L T P C
0 0 3 2

OBJECTIVE:
The students should be made to:
- To understand various technologies in creating a website and
- Explore various style sheets to adapt for various gadgets
- Learn to include different media in websites.

1. HTML – Simple web page design
2. Scripting – Simple applet design
3. Introduction to XML and XSLT
4. Style sheet creation
5. Creating Data base & link
6. 2D animation
7. 3D animation
8. Audio & Video editing
9. Cross media designing
10. Tablet Publishing
11. Mini project

TOTAL: 30 PERIODS
OUTCOMES:
At the end of the course, the students should be able to:

- Design simple and dynamic web pages.
- Create complete website with database on back end.
- Create and embed the web page with many media
- Create style sheet for different gadgets.

PT8612 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. Programmable 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
1. Comb binding
2. Spiral binding
3. Wire-o-binding

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

TOTAL: 30 PERIODS

OUTCOMES:
At the end of the course, the student should be able to:

- Know various securing operations
- Overall concepts on various controls, operation and mechanisms of machines used in print finishing
• Prepare mechanical and loose-leaf bindings
• Prepare different types of cases used for binding
• Apply various securing operations to prepare book

PT8613 PRINT PRODUCTION LABORATORY L T P C 0 0 4 2

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

To produce various types of printed products like:
1. Office forms
2. Posters
1. Brochures
2. Book
3. Invitation/Greeting cards
4. Textile printing
5. Visiting Cards
6. Web publishing
7. Paperboard Package
8. POP displays

OUTCOMES:
At the end of the course, the students should be able to:
• Plan, estimate and design optimal job sequence for commercial printing.
• Produce innovative printed products going through all the stages of printing.
• Understand the practical difficulties in executing the printing job.
• Evaluate the prints as per quality standards.
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
Flexography – Basic principle, advantages, limitations, applications; Design considerations, screen angles, ink, substrates; Press types – stack, CI, inline, narrow web, wide web; Variations of press – coating, lamination, corrugated postprinting; environment & safety aspects

UNIT II  IMAGE CARRIER PREPARATION
Moulded rubber plates; Photopolymer plates – Sheet photopolymer, liquid photopolymer, Direct Imaged Plates, Plate considerations – plate handling, storage, wrap distortion, Ink & solvent compatibility, quality.

UNIT III  MOUNTING AND PROOFING
Plate mounting procedures, plate staggering, plate make ready; Manual Mounting, Video mounting, Sleeve mounting, Pin mounting, Proofing procedure.

UNIT IV  PRINTING PRESS
Printing station – fountain rollers, anilox rollers, doctor blades, plate cylinders, impression rollers; Roll mechanics, unwind equipment, infeed, substrate treatment, web tension control, web guiding, inking systems, drying systems, cooling rolls, rewind equipment, web viewers, automatic viscosity controls

UNIT V  QUALITY CONTROL

TOTAL: 45 PERIODS

OUTCOMES:
Upon completion of the course, the student should be able to:

- Prepare artworks and plates for flexographic printing.
- Understand the variables in flexographic printing process.
- Troubleshoot print problems
- Implement quality control in flexographic printing workflow

TEXT BOOKS:
REFERENCE BOOKS:

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<th>PT8702</th>
<th>GRAVURE AND SCREEN PRINTING</th>
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OBJECTIVE:
To impart knowledge on
1. The basic principles of Gravure printing process, cylinder preparation techniques & components of gravure printing unit.
2. The basic principles of Screen printing process, stencil preparation methods & types of presses.
3. Print problems & quality control in Gravure & screen printing process.

UNIT I   GRAVURE PROCESS AND IMAGE CARRIER PREPARATION

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 preparation techniques – diffusion etch process, direct transfer process, electromechanical, laser and electron beam engraving process.

UNIT II   GRAVURE PRINTING MACHINE

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

UNIT III  SCREEN PRINTING COMPONENTS

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; substrates and inks; screen printed products.
UNIT IV  STENCIL PREPARATION AND PRESSES  9
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

OUTCOMES:
At the end of the course, the student should be able to:
• Know the basic principles of gravure and screen printing
• Concepts on the image carrier preparation of gravure printing
• Prepare the image carrier for screen printing
• Knowledge on types of presses
• Knowledge on print problems and remedial measures in gravure and screen printing processes

TEXT BOOKS:

REFERENCE BOOKS:

PT8703  PACKAGING TECHNOLOGY  L T P C 3 0 0 3

OBJECTIVE:
• To understand the purpose of packaging design
• To study the different types of packaging process
• To understand the packaging testing methods

UNIT I  INTRODUCTION  6
Need for packaging, functions of packaging-types and selection of package, packaging hazards, interaction of package and contents, shelf life-estimation, Packaging materials-
selection criteria, Materials and machine interface, life cycle assessment

**UNIT II  PACKAGE DESIGN**

Package design, Package specification types of design, structural, graphics, Factors influencing design, fundamentals of graphic layout design, Package colour- Selection criteria-applications, Types of load, unit load - safe stacking load, elements and principles of design, Structural design – cans, bottles, folding cartons, corrugated boxes, CAD applications

**UNIT III  MANUFACTURING PROCESS**

Folding carton manufacturing – Cutting; creasing; die making-punching – Cartoning Machineries – types, flexible pouches forming machines, corrugated box manufacturing process, Rigid boxes manufacturing process, Drums – types, applications; Molded pulp containers; Three piece and two piece can; seam treatment types, Collapsible tubes, Flexible pouches forming machines; Metal foil packaging; bag making machinery-types; packaging line automation

**UNIT IV  SPECIALITY PACKAGING**


**UNIT V  PACKAGE TESTING**

Package Performance testing- test standards; drop test, inclined impact, Horizontal impact, vibration testing, stacking and compression test, corrugated board testing.

**OUTCOME:**

- After completing the course, students will have theoretical knowledge about packaging materials, types and manufacturing process.

**TEXT BOOKS:**


**REFERENCES BOOKS:**


PT8711  
INDUSTRIAL TRAINING  
L T P C  
0 0 3 2

OBJECTIVE:
The main objective of the Industrial Training is to experience and understand real life situations in industrial organizations and their related environments and accelerating the learning process of how student’s knowledge could be used in a realistic way.

DURATION:
The students have to undergo practical industrial training for four weeks (During Sixth Semester holidays) in recognized industrial establishments.

I. At the end of the training they have to submit a report with following information:
   1. Profile of the Industry
   2. Product range
   3. Organization structure
   4. Plant layout
   5. Processes/Machines/Equipment/devices
   6. Personnel welfare schemes
   7. Details of the training undergone
   8. Projects undertaken during the training, if any
   9. Learning points.

II. End Semester examination will be a Viva-Voce Examination.

TOTAL: 30 PERIODS

OUTCOME:
- Upon completing the course, students will have awareness about various new technologies and process involved in printing and packaging industries

PT8712  
PACKAGE DESIGN & TESTING LABORATORY  
L T P C  
0 0 3 2

OBJECTIVE:
- Become acquainted with the nature and impact of visual communications in packaging design
- To familiarize with the various graphic design and 3D Modeling software’s
To conduct various characterization tests for packaging materials

**EXERCISES:**
1. Design of folding cartons
2. Design of flexible pouches
3. Graphic Designing for metal cans & glass containers
4. Determination of tensile strength of packaging materials
5. Determination of compression strength of packages
6. Determination of stiffness of packaging materials
7. Determination of burst strength of packaging materials
8. Determination of gloss and haze of packaging materials
9. Determination of rub resistance of packaging materials
10. Determination of gas permeability of packaging materials

**SOFTWARE REQUIREMENTS**
1. Graphic Design Software
2. Structural Package Design Software
3. Vector Image Drawing Software

**Equipments:**
1. Universal Testing Machine
2. Burst Tester
3. Stiffness Tester
4. Gas permeability tester
5. Rubresistance tester
6. Glossmeter
7. Hazemeter

**OUTCOME:**
- At the end of course, the students will have practical knowledge about design software, creative innovative designs and use this in industry for package production for various products.
PROJECT WORK

OBJECTIVES:
To develop the ability to solve a specific problem right from its identification and literature review till the successful solution of the same. To train the students in preparing project reports and to face reviews and viva voce examination.

A Project topic must be selected by the students in consultation with their guides. The aim of the project work is to deepen comprehension of principles by applying them to a new problem which may be the design and fabrication of a device for a specific application, a research project with a focus on an application needed by the industry/society, a computer project, a management project or a design project.

The progress of the project is evaluated based on a minimum of three reviews. The review committee may be constituted by the Head of the Department. A project report is required at the end of the semester. The project work is evaluated jointly by external and internal examiners constituted by the Head of the Department based on oral presentation and the project report.

OUTCOME:
On Completion of the project work students will be in a position to take up any challenging practical problems and find solution by formulating proper methodology.

ADVERTISING TECHNIQUES

OBJECTIVE:
To Enable the student to understand
a. The concepts of Advertising.
b. Role of the media
c. Advertising Production and Business in detail

UNIT I INTRODUCTION
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 behavior. How marketing firms use consumer behavior, 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, Methods of Measuring Advertising Effectiveness.

UNIT III  ADVERTISING MEDIA AND MEDIA PLANNING
9
Media concept, structure of media, media characteristics, publication media, TV and Ratio, direct mail and POP, out of home advertising. Media planning concept, media decision tools, media plan, media plan strategy, media buying and scheduling. Internet and Mobile Phone Advertising.

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, visualization, 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

OUTCOMES:
At the end of the course, the student should be able to:
- Able to understand the principle of advertising.
- Analyze the functionary of an advertising agency
- To use the advertising production knowledge to create advertisements
- Develop media planning solutions

TEXT BOOKS:

REFERENCE BOOKS:
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
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
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
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
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
Software needs, manuscript formats and file management, editing tools, web design and publishing; copyright, 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

OUTCOMES:
At the end of the course, the students should be able to:
• Understand the responsibilities and functions of publishing house.
• Cognize the author publisher relationship and editor’s functions.
• Ascertain book distribution and apprehend copyright & agreement.

TEXT BOOKS:

REFERENCE BOOKS:

PT8003 COLOUR MANAGEMENT L T P C 3 0 0 3

OBJECTIVE:
• Understand the variables in colour reproduction workflow.
• Learn the fundamentals of colour management system.
• Resolve issues in colour workflows

UNIT I COLOUR MANAGEMENT 9
Need for colour management, device characteristics, closed and open loop colour control, Steps in CMS - calibration, characterization, conversion; International colour consortium – standards, profiles, profile types, profile structure, Color measurement, viewing conditions.

UNIT II CREATION OF PROFILES 9
Test targets, Devices, Calibration and characterization of scanner, digital camera, monitor, Press and Proofer; Issues, Profiling softwares

UNIT III CONVERSION 9
CMM, Gamut boundaries, Rendering Intent, Gamut mapping – influencing factors, algorithms
UNIT IV WORKFLOW
Colour Management workflows – RGB workflow, CMYK workflow, embedded workflow, assumed workflow, Internet workflow, Soft proofing, Hardcopy proofing, Colour management in software applications (Photoshop), Operating System

UNIT V ADVANCES IN COLOUR MANAGEMENT
Dynamic Device link profiles, Profile editing, profile quality, ECI, Colour appearance modeling, Case studies.

TOTAL: 45 PERIODS

OUTCOMES:
Upon completion of the course, the student should be able to:
- Create profiles for display, input and output devices.
- Apply appropriate color management settings in pre-press.
- Reproduce and match colour across various devices and software applications
- Understand advanced concepts in colour management

TEXT BOOKS:

REFERENCE BOOKS:
5. Phil Green, Lindsay MacDonald, “Colour Engineering”, John Wiley & Sons Ltd., 2002

PT8004 DIGITAL PRE-PRESS AND PRINTING
L T P C
3 0 0 3

OBJECTIVES:
Understand the principle of working of components of digital workflow

UNIT I IMAGE ACQUISITION
UNIT II  DIGITAL WORKFLOW
Receiving jobs, Pre-flighting, Scanning, File formats, JDF, XML, AdsML, PDF. Electronic trapping and imposition software.

UNIT III  DIGITAL PROOFING TECHNOLOGIES
Digital proofing – Need, Proofing technologies – Ink jet, Dye sublimation, Thermal Wax, Electro photography. Inks, Dyes, Toners, Quality and relative merits.

UNIT IV  IMAGE SETTERS AND PLATE SETTERS
Imagesetter – Types – Capstan, internal, external and virtual drum, light sources, raster image processors, screening technologies. Platesetters – Flat bed, internal, external drum geometries, chemical, thermal plates, light sources.

UNIT V  DIGITAL PRESSES
Direct imaging printing systems- once imageable, re-imageable masters, Comparison, inline finishing, applications, trends

TOTAL: 45 PERIODS

OUTCOMES:
At the end of the course, the student should be able to:
  • Process print jobs in digital workflow
  • Preflight and produce proofs
  • Create films and plates
  • Print jobs in digital press

TEXT BOOKS:

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

UNIT I AMPLITUDE MODULATION: TRANSMISSION AND RECEPTION 9
Principles of amplitude modulation - AM envelope, frequency spectrum and bandwidth, modulation index and percent modulation, AM power distribution, Low level AM modulator, medium power AM modulator, AM transmitters – Low level transmitters, high level transmitters, receiver parameters, AM reception – AM receivers – TRF, super heterodyne receiver, double conversion AM receivers.

UNIT II ANALOG AND PULSE MODULATION 9
Amplitude modulation – Modulation index – Frequency modulation – Phase modulation – DSB-SC, SSB, Vestigial side band. PAM, PWM, PPM, PCM.

UNIT III RADIATION AND PROPAGATION OF WAVES 9

UNIT IV DIGITAL COMMUNICATION 9

UNIT V COMMUNICATION SYSTEM 9
Radio communication – AM and FM transmitter and receiver – Microwave communications – Satellite communication – Fibre optic communication (block diagram representation). TDM and FDM, Cellular communication.

TOTAL: 45 PERIODS

OUTCOMES:
At the end of the course, the student should be able to:
- Understand the principle of electronic communication systems
- Identify components of a communication system

TEXT BOOKS:
REFERENCES:

PT8006 FINANCIAL MANAGEMENT FOR PRINTING

OBJECTIVE:
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 7
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 FOR PROCESSES 11
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 COST ANALYSIS 11
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; Depreciation, Return on Investment, Return On Capital Expenditure; Break even analysis – analysis, calculation of break even point, margin of safety, sensitivity analysis and profit graphs, Basics of Credit Management – AR, AP.

OUTCOMES:
At the end of the course, the student should be able to:
• Concepts on costing and pricing
• Knowledge on estimating the cost of different materials used in printing
• Calculate the composite machine hour rate (CMHR) for the machines used in printing
• Know the concepts on Investment analysis
• Knowledge on break even analysis and calculate breakeven point

TEXT BOOKS:

REFERENCE BOOKS:
1. “Cost Accounting for Printers”, Part I and Part II, British Printing Industries
2. Federation, 1982

PT8008 MASS COMMUNICATION 3 0 0 3

OBJECTIVE:
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 and Science reporting, Preparation of news copy for publication, Copy reading, Rewriting, Proof reading, Page making, Typography, Picture editing.

UNIT III WRITING 9
Newspaper feature and magazine, non-fiction writing, writing editorials, analytical articles, reviews, columns, commentaries & analysis.

UNIT IV BROADCAST JOURNALISM 9
Gathering & reporting news for ratio & 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

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.

OUTCOME:
At the end of the course, the student should be able to:
- Understand the various aspects of News report
- Analyze the functionary of Radio and Television Media
- Use the various tools and techniques for audio visual communication.

TEXT BOOKS

REFERENCE BOOKS

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

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

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

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

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.

UNIT V LEGAL ASPECTS

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

OUTCOMES:
At the end of the course, the student should be able to:

- Knowledge on the operations of newspaper and magazine companies
- Know the organizational structure
- Concepts on news and editing
- Concepts on writing for a magazine and newspaper
- Knowledge on production and workflow of newspaper and magazine companies

TEXT BOOKS

REFERENCE BOOKS
OBJECTIVE:
To provide an overview of the printing machinery maintenance and maintenance management.

UNIT I MAINTENANCE MANAGEMENT PERSPECTIVE


UNIT II TOTAL PLANNED MAINTENANCE

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


UNIT IV ERECTION AND TESTING

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

UNIT V RECONDITIONING AND REPLACEMENT THEORY

Repairs and reconditioning methods for various parts, roller copperising, re-rubberizing. Replacement models - Replacement policy, replacement of items, Determination of average life.

TOTAL: 45 PERIODS

OUTCOMES:
At the end of the course, the student should be able to:

- Understand the basic concepts of maintenance management
- Learn about the fundamentals of machine erection and testing
- Create a maintenance schedule based on criticality and economics
- Evaluate equipment effectiveness

TEXT BOOK

REFERENCE BOOKS

PT8011 QUALITY CONTROL IN PRINTING

OBJECTIVE:
To impart knowledge about implementing quality control in printing

UNIT I INTRODUCTION 8
Definition of Quality, its 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 standardization 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, ISO standards for process – ISO 12647-1,2 &3, Implementation and Guidelines – Case Study.

UNIT V QUALITY CONTROL INSTRUMENTATION 10
Process control instruments, devices and aids used for plate making and press room. Test forms, and elements for quality assurance. Press sheet control devices for colour printing. Minimum instrumentation necessary to produce a product consistent with the appropriate quality level.

TOTAL: 45 PERIODS

OUTCOMES:
At the end of the course, the student should be able to:

• Learn basics of implementing ISO standards
• Evaluate quality of incoming materials
• Identify instruments required for implementing quality
• Analyze the statistical data and establish process and wastage control

TEXT BOOKS:

REFERENCE BOOKS:

PT8012 SECURITY PRINTING L T P C 3 0 0 3

OBJECTIVE
• To get an understanding of various security features, materials and methods involved in Security Printing.
• To know the appropriate Printing Techniques for different applications.

UNIT I INTRODUCTION 9

UNIT II INKS 9
Types of security printing inks, features - metal revealable, migrating, heat reactive, erasable, fugitive, copy-protection, thermal chromic, coin reactive, bleeding, pen reactive, irreversible, visible infrared, penetrating, chemical reactive and optically variable ink (OVI) Introduction, UV Curing, Photo chromic inks, Monochromic Inks, Invisible Phosphorescent inks, Water Resistant Inks.

UNIT III SECURITY SUBSTRATES 9
Security Fibres, Planchettes, Fluorescent Hilites, Iridescent coating, Security threads, Holographic foil, Colour centred paper, Chemical reactive, chemically void, toner fused paper, visible security fibers, invisible fluorescent fibers and other security papers.
UNIT IV SECURITY PRINTING TECHNOLOGY

Water marking – Digital Watermark -Holograms - UV-visible Printing, rainbow printing, micro lines, guilloches, numbering, Line-printing, stamp embossing, hot-foil-embossing, embossing / punching, customer - designed hologram, blind red printing, solvent colors, multi color UV- fluorescence stitching thread, holographic foil or lamination of a page, Principles of Bar coding, Types of Coding EAN 13 Code, Code 39 ACA etc

UNIT V APPLICATIONS


TOTAL: 45 PERIODS

OUTCOMES:
At the end of the course, the student should be able to:

• Cognize the security features in printed products
• Develop security techniques as per the requirement
• Incorporate standards and specifications in security printing

TEXT BOOKS:

REFERENCES:
1. EIRI Board of Consultants and Engineers “Hand Book of Printing Technology” Engineers India Research Institute, New Delhi

UNIT I INTRODUCTION

Visual arts history from cave drawings to video painting, identifying and analyzing hidden languages in various media and cultures.
UNIT II PRINCIPLES OF VISUAL COMMUNICATION

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

UNIT IV PRINCIPLES OF DESIGN
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
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.

OUTCOME:
At the end of the course, the student should be able to:
- Understand and apply the principles of visual communication to various media.
- Create Design using the various visual communication theories.
- Apply Visual Communications in day to day usage.

TEXT BOOKS:

REFERENCE BOOKS:

MA8353 NUMERICAL METHODS

OBJECTIVES:
To provide the mathematical foundations of numerical techniques for solving linear system, eigenvalue problems, interpolation, numerical differentiation and integration and the errors associated with them; To demonstrate the utility of numerical techniques of ordinary and partial differential equations in solving engineering problems where analytical solutions are not readily available.

UNIT I SOLUTION OF EQUATIONS AND EIGENVALUE PROBLEMS
Solution of algebraic and transcendental equations - Fixed point iteration method – Newton-

UNIT II INTERPOLATION AND APPROXIMATION 9+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 – Least square method -Linear curve fitting.

UNIT III NUMERICAL DIFFERENTIATION AND INTEGRATION 9+3

UNIT IV INITIAL VALUE PROBLEMS FOR ORDINARY DIFFERENTIAL EQUATION 9+3

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.

TOTAL: 60 PERIODS

OUTCOMES:
- The students will have a clear perception of the power of numerical techniques, ideas and would be able to demonstrate the applications of these techniques to problems drawn from industry, management and other engineering fields.

TEXT BOOKS:

REFERENCES:
MA8356 PROBABILITY AND STATISTICS

OBJECTIVES:
• To make the students acquire a sound knowledge in statistical techniques that model engineering problems. The Students will have a fundamental knowledge of the concepts of probability.

UNIT I RANDOM VARIABLES 9+3
Discrete and Continuous random variables – Moments – Moment generating functions – Binomial, Poisson, Geometric, Uniform, Exponential, Gamma, Weibull and Normal distributions – Functions of a random variable

UNIT II TWO-DIMENSIONAL RANDOM VARIABLE 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 TESTS OF SIGNIFICANCE 9+3

UNIT IV DESIGN OF EXPERIMENT 9+3
Completely randomized design – Randomized block design – Latin square design - 2²-factorial design - Taguchi’s robust parameter design.

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

TOTAL: 60 PERIODS

OUTCOMES:
After successfully completing the course, students should be able to do the following:
• Use statistical methodology and tools in the engineering problem-solving process.
• Compute and interpret descriptive statistics using numerical and graphical techniques.
• Understand the basic concepts of probability, random variables, probability distribution, and joint probability distribution.
• Compute point estimation of parameters, explain sampling distributions, and understand the central limit theorem.

TEXT BOOKS:
GE8751 ENGINEERING ETHICS AND HUMAN VALUES  L T P C  
3 0 0 3

OBJECTIVES:
- To enable the students to create an awareness on Engineering Ethics and Human Values, to instill Moral and Social Values and Loyalty and to appreciate the rights of others.

UNIT I  HUMAN VALUES

UNIT II  ENGINEERING ETHICS

UNIT III  ENGINEERING AS SOCIAL EXPERIMENTATION
Engineering as Experimentation – Engineers as responsible Experimenters – Codes of Ethics – A Balanced Outlook on Law – The Challenger Case Study

UNIT IV  SAFETY, RESPONSIBILITIES AND RIGHTS

UNIT V  GLOBAL ISSUES

TOTAL: 45 PERIODS

OUTCOMES:
- Upon completion of the course, the student should be able to apply ethics in society, discuss the ethical issues related to engineering and realize the responsibilities and rights in the society

TEXTBOOK
REFERENCES:

WEB SOURCES:
1. www.onlineethics.org
2. www.nspe.org
3. www.globalethics.org
4. www.ethics.org

MG8654 TOTAL QUALITY MANAGEMENT

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

OBJECTIVES
- To understand 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

UNIT II TQM PRINCIPLES
Quality statements - Customer focus –Customer orientation, Customer satisfaction, Customer complaints, Customer retention - Continuous process improvement – PDCA cycle, 5s, Kaizen - Supplier partnership – Partnering, Supplier selection, Supplier Rating.

UNIT III TQM TOOLS & TECHNIQUES I

UNIT IV TQM TOOLS & TECHNIQUES II 9

UNIT V QUALITY SYSTEMS 9

TOTAL : 45 PERIODS

OUTCOMES:
- The student would be able to apply the tools and techniques of quality management to manufacturing and services processes.

TEXT BOOK:

REFERENCE BOOKS:

IE8071 HUMAN RESOURCE 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
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

TOTAL: 45 PERIODS

OUTCOMES:
• To understand the process of effective Human Resource Management.

TEXT BOOKS:

REFERENCES:

ME8075 ENERGY CONSERVATION IN INDUSTRIES L T P C 3 0 0 3

OBJECTIVES:
At the end of the course, the student is expected to
• understand and analyse the energy data of industries
• carryout energy accounting and balancing
• conduct energy audit and suggest methodologies for energy savings and
• utilisethe available resources in optimal ways

UNIT I INTRODUCTION 8

UNIT II ELECTRICAL SYSTEMS 12
UNIT III  THERMAL SYSTEMS

UNIT IV  ENERGY CONSERVATION IN MAJOR UTILITIES
Pumps, Fans, Blowers, Compressed Air Systems, Refrigeration and Air Conditioning Systems – Cooling Towers – D.G. sets

UNIT V  ECONOMICS
Energy Economics – Discount Rate, Payback Period, Internal Rate of Return, Net Present Value, Life Cycle Costing –ESCO concept

TOTAL: 45 PERIODS

OUTCOMES:
Upon completion of this course, the students can able to analyse the energy data of industries.
• Can carryout energy accounting and balancing
• Can suggest methodologies for energy savings

TEXT BOOK:

REFERENCES:

ME8076  ENTERPRENEURSHIP DEVELOPMENT

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 I  ENTREPRENEURSHIP
UNIT II  MOTIVATION
Major Motives Influencing an Entrepreneur – Achievement Motivation Training, self Rating, Business Game, Thematic Apperception Test – Stress management, Entrepreneurship Development Programs – Need, Objectives.

UNIT III  BUSINESS

UNIT IV  FINANCING AND ACCOUNTING

UNIT V  SUPPORT TO ENTREPRENEURS

TOTAL: 45 PERIODS

OUTCOMES:
• Upon completion of the course, students will be able to gain knowledge and skills needed to run a business successfully.

TEXT BOOKS:

REFERENCES:

ME8081  RELIABILITY CONCEPTS IN ENGINEERING  L T P C
3 0 0 3

OBJECTIVE:
To impart knowledge in reliability concepts, reliability estimation methods and reliability improvement methods
UNIT I RELIABILITY CONCEPT
Reliability definition – Reliability parameters- f(t), F(t) and R(t) functions- Measures of central tendency – Bath tub curve – A priori and posteriori probabilities of failure – Component mortality - Useful life.

UNIT II LIFE DATA ANALYSIS

UNIT III RELIABILITY ESTIMATION
Series parallel configurations – Parallel redundancy – m/n system – Complex systems: RBD approach – Baye’s method – Minimal path and cut sets - Fault Tree analysis – Standby system.

UNIT IV RELIABILITY MANAGEMENT

UNIT V RELIABILITY IMPROVEMENT

TOTAL : 45 PERIODS

OUTCOMES:
• Upon successful completion of this course, the students can able to apply the concept for reliable component production

REFERENCES:
OBJECTIVES:
At the end of this course the students are expected to understand the general issues relating to nanotechnology and nanofabrication.

• Methods for production of Nanoparticles
• Characteristic techniques of Nanomaterials

UNIT I  INTRODUCTION TO NANOMATERIALS  9

UNIT II  SYNTHESIS OF NANOMATERIALS  12

UNIT III  CHARACTERISATION OF NANOMATERIALS  9

UNIT IV  APPLICATIONS OF NANOMATERIALS  9
Applications in Mechanical, Electronics engineering industries – Use of nanomaterials in automobiles, aerospace, defense and medical applications – Metallic, polymeric, organic and ceramic nanomaterials.

UNIT V  NANO FABRICATION AND MACHINING  9
LIGA, Ion beam etching, Molecular manufacturing techniques – Nano machining techniques – Top/Bottom up Nano fabrication techniques - Sub micron lithographic technique, conventional film growth technique, Chemical etching, Quantum materials.

TOTAL: 45 PERIODS
OUTCOME:
At the end of this course
- The student will be able to produce nanomaterials using various techniques
- Use this knowledge to characterize nanomaterials
- Use this knowledge to fabricate nano-scaled products

TEXT BOOKS:
2. Ashby M.F., Ferreira P.J. and Schodek D.L., “Nanomaterials, Nanotechnologies and

REFERENCES:
   Private Limited, New Delhi, 2009.

MF8079 TOTAL PRODUCTIVE MAINTENANCE L T P C
3 0 0 3

OBJECTIVE:
- To teach the students basic concepts of Total Productive Maintenance. Expose the
  students to the objectives, maintenance models, group activities, logistics, condition
  monitoring and implementation of Total Productive Maintenance.

UNIT I MAINTENANCE CONCEPTS 9
Introduction - Objectives and functions – Productivity, Quality, Reliability and Maintainability
(PQRM) - Terotechnology – Reliability Centered Maintenance - Predictive Maintenance
- Condition Based Maintenance – maintainability prediction – availability and system
effectiveness- maintenance costs – maintenance organization.

UNIT II MAINTENANCE MODELS 9
Minimal repair – As Good As New policy – maintenance types – balancing PM and breakdown
maintenance- PM schedules: deviations on both sides of target values – PM schedules:
functional characteristics – replacement models.

UNIT III TOTAL PRODUCTIVE MAINTENANCE 9
Zero breakdowns – Zero Defects and TPM – maximizing equipment effectiveness –
Autonomous maintenance program – five pillars of TPM – TPM small group activities – TPM
organization – Management Decision – Educational campaign – Creation of Organizations –
Establishment of basic policies and goals – Formation of master plan - TPM implementation.

UNIT IV MAINTENANCE LOGISTICS


UNIT V ONLINE MONITORING


OUTCOMES

- Implementation the concept of total productive maintenance to the industries
- Effectively use the total productive maintenance for online monitoring of processes

TEXT BOOKS:


REFERENCES:

OBJECTIVE:
The students should be made to:
- Understand the basic concepts and nuances of 3D Printing Technology

UNIT I INTRODUCTION
Introduction; Design considerations – Material, Size, Resolution, Process; Modelling and viewing - 3D; Scanning; Model preparation – Digital; Slicing; Software; File formats

UNIT II PRINCIPLE

UNIT III INKJET TECHNOLOGY
Printer - Working Principle, Positioning System, Printhead, Printbed, Frames, Motion control; Printhead Considerations – Continuous Inkjet, Thermal Inkjet, Piezoelectric Drop-On-Demand; Material Formulation for jetting; Liquid based fabrication – Continuousjet, Mulitjet; Powder based fabrication – Colorjet;

UNIT IV LASER TECHNOLOGY
Light Sources – Types, Characteristics; Optics – Deflection, Modulation; Material feeding and flow – Liquid, powder; Printing machines – Types, Working Principle, Build Platform, Printbed Movement, Support structures;

UNIT V INDUSTRIAL APPLICATIONS
Product Models, manufacturing – Printed electronics, Biopolymers, Packaging, Healthcare, Food, Medical, Biotechnology, Displays; Opensource; Future trends;

OUTCOMES:
Upon completion of the course, the student should be able to:
- Learn 3D printing workflow
- Understand the basic types of 3D Printing, materials used and their applications
- Select appropriate method for designing and modeling applications

TEXT BOOK

REFERENCES
OBJECTIVE:
The students should be made to:
- Understand the basic concepts of managing digital content.

UNIT I DIGITAL MEDIA
Overview of multimedia contents, Content acquisition & development, Product development & design- Designing Publications, Designing content Components, Digital Media Storage, Marketing (Circulation management, Single copy sales), Pricing, Distribution – crossmedia, file download security and sharing.

UNIT II DIGITAL ASSET MANAGEMENT
DAM Components, Functions, Relationships with other systems, including ERP, DCM, ECM, DMM, WCM, CMS, CRM and DRM, Metadata, cataloguing, indexing and retrieval- standards for production and content description, Accounting for Authors, Accounting for Acquisition sources.

UNIT III CONTENT PROTECTION TECHNIQUES
Encryption, steganography, watermarking, robustness and implementation, considerations, examples of media protection schemes, CCS, CGMS, HDCP, Type of contents, copyrights, patents, trade marks, trade secrets, licensing agreements, web posting policies, copyright and patent laws, fair uses, privacy regulations, piracy, DMCA, ISP obligations and liabilities,

UNIT IV DIGITAL RIGHT MANAGEMENT
Digital right models, transactions, types of rights and licenses, DRM system architecture, content server, license server, secure platform. Digital Millennium Copyright Act

UNIT V CURRENT ISSUES AND DEVELOPMENT
Copyright laws, balance between rights enforcement and fair uses, changing landscape in content distributions, recent enforcement cases. Security Applications-OS, Network, Web page, Online transactions.

OUTCOMES:
Upon completion of the course, the student should be able to:
- Understand the principles of digital media dissemination and distribution process.
- Learn about Content Management System and intellectual property rights.

TEXTBOOKS:

RESOURCES:
OBJECTIVES:

- To provide students an exposure to disasters, their significance and types.
- To ensure that students begin to understand the relationship between vulnerability, disasters, disaster prevention and risk reduction
- To gain a preliminary understanding of approaches of Disaster Risk Reduction (DRR)
- To enhance awareness of institutional processes in the country and
- To develop rudimentary ability to respond to their surroundings with potential disaster response in areas where they live, with due sensitivity

UNIT I  INTRODUCTION TO DISASTERS

Definition: Disaster, Hazard, Vulnerability, Resilience, Risks – Disasters: Types of disasters – Earthquake, Landslide, Flood, Drought, Fire etc - Classification, Causes, Impacts including social, economic, political, environmental, health, psychosocial, etc.- Differential impacts- in terms of caste, class, gender, age, location, disability - Global trends in disasters: urban disasters, pandemics, complex emergencies, Climate change- Dos and Don'ts during various types of Disasters.

UNIT II  APPROACHES TO DISASTER RISK REDUCTION (DRR)

Disaster cycle - Phases, Culture of safety, prevention, mitigation and preparedness community based DRR, Structural- nonstructural measures, Roles and responsibilities of- community, Panchayati Raj Institutions/Urban Local Bodies (PRIs/ULBs), States, Centre, and other stakeholders- Institutional Processess and Framework at State and Central Level- State Disaster Management Authority(SDMA) – Early Warning System – Advisories from Appropriate Agencies.

UNIT III  INTER-RELATIONSHIP BETWEEN DISASTERS AND DEVELOPMENT

Factors affecting Vulnerabilities, differential impacts, impact of Development projects such as dams, embankments, changes in Land-use etc.- Climate Change Adaptation- IPCC Scenario and Scenarios in the context of India - Relevance of indigenous knowledge, appropriate technology and local resources.

UNIT IV  DISASTER RISK MANAGEMENT IN INDIA

Hazard and Vulnerability profile of India, Components of Disaster Relief: Water, Food, Sanitation, Shelter, Health, Waste Management, Institutional arrangements (Mitigation, Response and Preparedness, Disaster Management Act and Policy - Other related policies, plans, programmes and legislation – Role of GIS and Information Technology Components in Preparedness, Risk Assessment, Response and Recovery Phases of Disaster – Disaster Damage Assessment.

UNIT V  DISASTER MANAGEMENT: APPLICATIONS AND CASE STUDIES AND FIELD WORKS

Landslide Hazard Zonation: Case Studies, Earthquake Vulnerability Assessment of Buildings and Infrastructure: Case Studies, Drought Assessment: Case Studies, Coastal Flooding: Storm Surge Assessment, Floods: Fluvial and Pluvial Flooding: Case Studies; Forest Fire: Case Studies, Man Made disasters: Case Studies, Space Based Inputs for Disaster Mitigation and Management and field works related to disaster management.

TOTAL: 45 PERIODS
OUTCOMES:
The students will be able to
- Differentiate the types of disasters, causes and their impact on environment and society
- Assess vulnerability and various methods of risk reduction measures as well as mitigation.
- Draw the hazard and vulnerability profile of India, Scenarios in the Indian context, Disaster damage assessment and management.

TEXTBOOK:

REFERENCES
1. Govt. of India: Disaster Management Act , Government of India, New Delhi, 2005

GE8073 HUMAN RIGHTS L T P C
3 0 0 3

OBJECTIVES:
- To sensitize the Engineering students to various aspects of Human Rights.

UNIT I

UNIT II

UNIT III
Theories and perspectives of UN Laws – UN Agencies to monitor and compliance.

UNIT IV
Human Rights in India – Constitutional Provisions / Guarantees.
UNIT V


TOTAL : 45 PERIODS

OUTCOME :
• Engineering students will acquire the basic knowledge of human rights.

REFERENCES: