Bachelor of Technology (Printing Technology)

B.Tech. (Ptg.)
4 YEARS PROGRAMME

CREDIT BASED SYSTEM
wef JULY 2006

Department of Printing Technology,
Guru Jambheshwar University of Science and Technology, Hisar
Haryana - 125001
# B.TECH. (PRINTING TECHNOLOGY)  
## SCHEME OF STUDIES & EXAMINATIONS  
### wef 2006-2007

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<tr>
<th>S. No.</th>
<th>Semester</th>
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**Total Credits**  
200

**Note:**  
1. Students are allowed to use single memory, programmable scientific calculator during examination for all subjects in B.Tech.  
2. Teacher will conduct practical in group of 20-22 students
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<tr>
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<tr>
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### B. Tech. (Printing Technology) 2\textsuperscript{nd} YEAR (3\textsuperscript{rd} Semester)

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<tbody>
<tr>
<td>PT 301</td>
<td>INTRODUCTION TO PRINTING PROCESSES</td>
<td>L 3 T 1 P 4</td>
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<td>PT 302</td>
<td>TECHNOLOGY OF TYPOGRAPHY &amp; TYPESETTING</td>
<td>L 3 T 1 P 4</td>
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<tr>
<td>PT 303</td>
<td>PRINTER’S SCIENCE</td>
<td>L 3 T 3 P 3</td>
<td>3</td>
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<td>PT 304</td>
<td>COMPUTER APPLICATION IN PRINTING</td>
<td>L 3 T 1 P 4</td>
<td>3.5</td>
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<tr>
<td>PT 305</td>
<td>THEORY OF PRINTING MACHINES</td>
<td>L 3 T 1 P 4</td>
<td>3.5</td>
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<tr>
<td>PT 306</td>
<td>DIGITAL ELECTRONIC CIRCUITS</td>
<td>L 3 T 3 P 3</td>
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<td>PT 307</td>
<td>PRINTING PROCESS LAB.</td>
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<td>PT 308</td>
<td>TYPOGRAPHY &amp; TYPESETTING LAB.</td>
<td>L 3 T 3 P 3</td>
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<td>PT 309</td>
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Note: Students will undergo for 4 weeks industrial training in vacation after 4\textsuperscript{th} semester and it will be evaluated in 5\textsuperscript{th} semester.

### B. Tech. (Printing Technology) 2\textsuperscript{nd} YEAR (4\textsuperscript{th} Semester)

<table>
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<td>PT 402</td>
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<td>PT 403</td>
<td>FLEXOGRAPHY</td>
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<td>PT 404</td>
<td>PRINTING MATERIALS</td>
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<td>PT 405</td>
<td>ELECTRONIC COMPOSITION</td>
<td>L 3 T 3 P 4</td>
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<tr>
<td>PT 406</td>
<td>ELECTRICAL MACHINES AND ITS UTILISATION IN PRINTING</td>
<td>L 3 T 3 P 3</td>
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<td>PT 407</td>
<td>ELECTRONIC COMPOSITION LAB.</td>
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<td>PT 408</td>
<td>FLEXOGRAPHY LAB.</td>
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<td>PT 409</td>
<td>GRAPHIC DESIGN LAB.</td>
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<td>PT 410</td>
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### GURU JAMBHESHWAR UNIVERSITY, HISAR

SCHEME OF STUDIES & EXAMINATIONS

### B. Tech. (Printing Technology) 3\textsuperscript{rd} YEAR (5\textsuperscript{th} Semester)

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<td>PT 501</td>
<td>REPRODUCTION TECHNOLOGY</td>
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<td>PT 502</td>
<td>GRAVURE TECHNOLOGY</td>
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<td>PT 503</td>
<td>OFFSET TECHNOLOGY – I</td>
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<td>PT 504</td>
<td>PRINTING IMAGE GENERATION-I</td>
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<td>PT 505</td>
<td>PRINT MEDIA ETHICS</td>
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<td>PT 506</td>
<td>ADVERTISING AND MULTIMEDIA</td>
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<td>REPRODUCTION TECHNOLOGY LAB.</td>
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<td>GRAVURE LAB.</td>
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**B. Tech. (Printing Technology) 3rd YEAR (6th Semester)**

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<td>PT 602</td>
<td>PRINT FINISHING</td>
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<td>PT 603</td>
<td>PRINTING SUBSTRATES</td>
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<td>PT 604</td>
<td>PRINTING INK TECHNOLOGY</td>
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<td>PT 605</td>
<td>PRINTING IMAGE GENERATION-II</td>
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<td>PT 606</td>
<td>OFFSET TECHNOLOGY - II</td>
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<td>PT 607</td>
<td>PRINT FINISHING LAB.</td>
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<td>PT 608</td>
<td>PRINTING INK TECHNOLOGY LAB.</td>
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<td>PT 609</td>
<td>PRINTING IMAGE GENERATION LAB.</td>
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<td>OFFSET TECHNOLOGY - II LAB.</td>
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Note: Students will undergo for 6 weeks industrial training in vacation after 6th semester and it will be evaluated in 7th semester.
### B. Tech. (Printing Technology) 4th YEAR (7th Semester)

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<td>PT 702</td>
<td>QUALITY CONTROL</td>
<td>L:3 T:3 P:3</td>
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<td>PT 703</td>
<td>COLOUR SEPARATION TECHNIQUES</td>
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<td>PT 705</td>
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<td>CONTINUOUS STATIONARY &amp; SECURITY PRINTING</td>
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<td>PT 707</td>
<td>QUALITY CONTROL LAB.</td>
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<td>PT 708</td>
<td>COLOUR SEPARATION LAB.</td>
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<td>PT 709</td>
<td>SEMINAR</td>
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<td>PT 802</td>
<td>PRINTING MACHINERY MAINTENANCE</td>
<td>L:3 T:3</td>
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<td>PT 803</td>
<td>NEWS PAPER TECHNOLOGY</td>
<td>L:3 T:1 P:4</td>
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<td>PT 804</td>
<td>PRINTER’S COSTING AND ESTIMATING</td>
<td>L:3 T:1 P:4</td>
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<td>DIGITAL PRINTING</td>
<td>L:3 T:1 P:4</td>
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<td>PT 806</td>
<td>PRINTING PLANT LAYOUT</td>
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The course aims at inculcating a minimum level of language proficiency among students of Engineering and Technology. The purpose is to sensitize them to the nuances of English and its applications for various communication needs.

**SYLLABUS**

**COURSE CONTENT:**

**Semantics:** Synonyms, Antonyms, Homophones, Homonyms, Form and function of words

**Syntax:** Sentence structures, Verb patterns and their usage

**Phonetics:** Basic Concepts – Vowels, Consonants, Phonemes, Syllables; Articulation of Speech Sounds – Place and Manner of Articulation; Transcription of words and simple sentences, using International Phonetic Alphabet.

**Comprehension:** Listening and Reading comprehension – Note taking, Reviewing, Summarising, Interpreting, Paraphrasing and Précis Writing.

**Composition:** Descriptive, Explanatory, Analytical and Argumentative Writing – description of simple objects like instruments, appliances, places, persons, principles; description and explanation of processes and operations; analysis and arguments in the form of debate and group discussion

**Text:** *English for Students of Science* by A. Roy and P.L. Sharma (Orient Longman)

Chapters for Study:

i) "The year 2050" by Theodore J. Gordon.
ii) "The Mushroom of Death" by A. Bandhopadhyay.
iii) "The Discovery" by Herman Ould.

The prescribed text will be used as a case study for various components of the syllabus.

**TEXT BOOKS:**

2. *Spoken English for India* by R.K. Bansal and J.B. Harrison, Orient Longman.

**SUGGESTED READING:**

1. *English Grammar, Composition and Correspondence* by M.A. Pink and S.E. Thomas, S. Chand and Sons Pvt. Ltd., Delhi.
8. *Reading Between the Lines* by McRae, Foundation Books (Cambridge University Press), Delhi.

**SCHEME OF EXAMINATION:**

There will be seven questions in all covering all the units, except Unit VII which (besides other modes of internal evaluation) is for internal assessment only.

All questions will be compulsory and will have sufficient internal choice.

**Unit-I:** 15 Marks

The question will be set so as to evaluate the following: Usage of the words given, Changing the grammatical quality and function of the words, One word Substitutes, synonyms, antonyms, homophones, homonyms.
Unit-II: 20 Marks

There will be one question having different parts. The question should test students’ knowledge of sentence structures and verb patterns. The question can be in the nature of ‘Do as directed’, ‘Tracing and rectifying structural Errors’, ‘Elucidating patterns through sentences and vice-versa’, ‘Changing the word-order’, ‘Synthesizing the sentences’ and ‘Completing the sentences’, etc.

Unit-III: 15 Marks

There will be two questions from this Unit. Question one will be in the nature of short notes testing the basic concepts and articulation of speech sounds. The second question would require transcription of individual words and simple sentences.

Unit-IV: 15 Marks

Comprehension and Interpretation of a passage given (Literary or non-literary, newspaper article, story, extract from a speech etc.), will be judged for its vocabulary, general understanding and interpretation of the content in the form of question answer exercise, culling out important points, suggesting a suitable topic/title, summarising and précis writing etc.

Unit-V: 15 Marks

The question will require the definition, description, analysis, explanation of various objects and processes. Besides, a topic of contemporary relevance may be given for writing a paragraph in any one of the writing forms prescribed in the unit.

Unit-VI: 20 Marks

There will be two questions from the text prescribed. The first question will evaluate the comprehension of the text through short answer questions or a long answer question.

The second question will judge the linguistic aspect of the text such as using a particular word in its various syntactic forms like noun, adjective, verb etc.; matching the lists of words and their explanation; providing opposite/similar meanings, adding suffixes and prefixes etc.
MATH-101-E          Mathematics-I  (BTech. Ptg.  1st  Sem)

SYLLABUS

Part-A

**Infinite series**: Convergence and divergence, Comparison, D' Alembert's ratio, Integral, Raobes, Logarithmic and Cauchy root tests, Alternating series, Absolute and conditional convergence.

**Applications of Differentiation**: Taylor's and Maclaurin's series, Asymptotes, Curvature Asymptotes.

**Partial Differentiation & its Applications**: Functions of two or more variables; partial derivatives, Total differential and differentiability, Derivatives of composite and implicit functions, Jacobians, Higher order partial derivatives.

**Homogeneous functions**, Euler's theorem, Taylor's series for functions of two variables (without proof), maxima-minima of function of two variables, Lagrange's method of undetermined multipliers, Differentiation under integral sign.

Part-B

**Applications of Single & Multiple Integration**: Applications of single integration to find volume of solids and surface area of solids of revolution. Double integral, change of order of integration, Double integral in polar coordinates, Applications of double integral to find area enclosed by plane curves and volume of solids of revolution.

**Triple integral**, volume of solids, change of variables, Beta and gamma functions and relationship between them.

**Vector Calculus**: Differentiation of vectors, scalar and vector point functions. Gradient of a scalar field and directional derivative, divergence and curl of a vector field and their physical interpretations. Integration of vectors, line integral, surface integral, volume integral, Green, Stoke's and Gauss theorems (without proof) and their simple applications.

TEXT BOOKS :


REFERENCE BOOKS :


Note: Examiner will set eight questions, taking four from Part-A and four from Part-B. Students will be required to attempt five questions taking at least two from each part.

SYLLABUS

PART-A

PHYSICAL OPTICS
Interference: Division of wave front-Fresnel's biprism, Division of amplitude–Newton's rings, Michelson interferometer, applications.
Diffraction: Difference between Fraunhofer and Fresnel diffraction. Fraunhofer diffraction through a slit. Plane transmission diffraction grating, its dispersive and resolving powers.
Polarization: Polarised and unpolarized light, double refraction; Nicol prism, quarter and half wave plates, Polarimetry; Biquartz and Laurent's half-shade polarimeters, Simple concepts of photoelasticity.

LASER
Spontaneous and stimulated emissions, Laser action, characteristics of laser beam-concepts of coherence, He-Ne and semiconductor lasers (simple ideas), applications.

FIBRE OPTICS
Propagation of light in fibres, numerical aperture, single mode and multi mode fibres, applications.

PART-B

WAVE AND OSCILLATIONS
Simple concepts of Harmonic Oscillator, resonance, quality factor. E.M. wave theory-review of basic ideas, Maxwell's equations, simple plane wave equations, simple concepts of wave guides and co-axial cables, Poynting vector.

DIELECTRICS
Molecular theory, polarization, displacement, susceptibility, dielectric coefficient, permittivity & various relations between these, Gauss's law in the presence of a dielectric, Energy stored in an electric field.
Behaviour of dielectrics in a.c. field-simple concepts, dielectric losses.

SPECIAL THEORY OF RELATIVITY
Michelson-Moreley experiment, Lorentz transformations, variation of mass with velocity, mass energy equivalence.

NUCLEAR PHYSICS
Neutron Cross-section, Nuclear fission, Moderators, Nuclear reactors, Reactor criticality, Nuclear fusion. Interaction of radiation with matter-basic concepts, radiation detectors-ionisation chamber, G.M. Counter, Scintillation and solid state detectors, cloud chamber and bubble chamber.

TEXT BOOKS:
1. Physics of the Atom - Wehr, Richards & Adair (Narosa)
2. Perspectives of Modern Physics - Arthur Beiser (TMH)
3. Modern Engineering Physics – A.S. Vasudeva (S. Chand)

REFERENCE BOOKS:
1. Electricity and Magnetism – F.W. Sears (Narosa)
3. A Text Book of Optics – Brij Lal & Subramanyam

Note: The Examiners will set eight questions, taking four from each part. The students will be required to attempt five questions in all selecting at least two from each part. All questions will carry equal marks.
SYLLABUS

Unit-1:
Thermodynamics - Second law, concept of Entropy, Entropy change for an ideal gas, free energy and work functions, Free energy change, Chemical Potential, Gibb's Helmholtz equation, Clausius - Clapeyron equation, Related numerical problems with above topics.

Unit-2:
Phase-Rule - Terminology, Derivation of Gibb's Phase Rule Equation, One Component System (H₂O System), Two Components systems, Eutectic system (Pb-Ag), system with congruent m.pt. (Zn-Mg), systems with incongruent m.pt. (Na-K), Applications of above Systems.

Unit-3:

Unit-4:
Water and its treatment : Part II – Treatment of water for domestic use, coagulation, sedimentation, filtration and dis-infection, water softening, Ion-exchange process, mixed bed demineralisation, Desalination (reverse osmosis) (electrodialysis).

Unit-5:
Corrosion and its prevention - Galvanic & concentration cell, Dry and wet corrosion, Electrochemical theory of corrosion, Galvanic corrosion, pitting corrosion, water-line corrosion, differential aeration corrosion, stress corrosion, factors affecting corrosion, Preventive measures (proper design, Cathodic protection, protective coatings).

Unit-6:
Lubrication and Lubricants - Friction, mechanism of lubrication, classification and properties of lubricants, Additives for lubricants, synthetic lubricants, Greases – Preparation & properties (consistency, drop point) and uses.

Unit-7:
Polymers and Polymerization - Organic polymers, polymerisation, various types of polymerisation, effect of structure on properties of polymers, preparation properties and technical applications of thermo-plastics (PVC,PVA), thermosets (PF,UF), and elastomers (SBR,GR-N), Silicones, Introduction to polymeric composites.

Unit-8:
Analytical Methods - Thermal methods, Principle, method and application of Thermogravimetric analysis, Differential thermal analysis and Differential scanning calorimetry, (Experimental details are excluded), Spectroscopic methods, Spectrophotometry, interaction of E.M. radiations with a molecule and origin of spectrum, spectroscopic, techniques-vibrational and electronic spectroscopy (Experimental details are excluded), conductometric titration, elementary discussion on Flame-photometry.

NOTE:
Eight questions are to be set with a fair weightage of all the units. The candidates will be required to attempt five questions in all.

TEXT BOOKS:
1. Engineering Chemistry, P.C. Jain, Monica Jain (Dhanpat Rai & Co.).

REFERENCE BOOKS:
1. Instrumental methods of Chemical Analysis, MERITT & WILLARD (East-West Press).
EE-101-E       Electrical Technology (B Tech. Ptg. 1st Sem)

SYLLABUS

UNIT 1. D.C. CIRCUITS:
Ohm’s Law, Kirchoff’s Laws, D.C. Circuits, Nodal and Loop methods of analysis.

UNIT 2. A.C. CIRCUITS:
Sinusoidal signal, instantaneous and peak values, RMS and average values, phase angle, polar & rectangular, exponential and trigonometric representations; R, L and C components, behaviors of these components in A.C. circuits. Concept of complex power, power factor.

TRANSIENT RESPONSE:
Transient response of RL, RC and RLC Circuits with step input.

UNIT 3. NETWORK THEOREMS:
Thevenin’s theorem, Norton’s theorem, superposition theorem, maximum power transfer theorem, Reciprocity theorem, Tellegen’s theorem, Milman's theorem. Star to Delta & Delta to Star transformation.

UNIT 4. SERIES AND PARALLEL A.C. CIRCUITS:
Series and parallel A.C. circuits, series and parallel resonance, Q factor, cut-off frequencies and bandwidth.

UNIT 5. THREE PHASE CIRCUITS:
Phase and line voltages and currents, balanced star and delta circuits, power equation, measurement of power by two wattmeter method, Importance of earthing.

UNIT 6. TRANSFORMERS:
Principle, construction & working of transformer, Efficiency and regulation.

UNIT 7. ELECTRICAL MACHINES:
Introduction to D.C. Machines, Induction motor, Synchronous machines.

UNIT 8. MEASURING INSTRUMENTS:
Voltmeter, Ammeter, Watt meter, Energy meter.

TEXT BOOKS:
1. Basic Electrical Engg (2nd Edition) : Kothari & Nagarath, TMH
2. Electrical Technology (Vol-I) : B.L Theraja & A K Theraja, S.Chand

REFERENCE BOOKS:
1. Electrical Engineering Fundamentals : Deltoro, PHI
2. Network Analysis : Valkenburg, PHI

NOTE: Eight questions are to be set in all by the examiner taking at least one question from each unit. Students will be required to attempt five questions in all.
EE-101-E  Electrical Technology (B Tech. Ptg. 1st Sem)

SYLLABUS

UNIT1. D.C. CIRCUITS:
   Ohm’s Law, Kirchoff’s Laws, D.C. Circuits, Nodal and Loop methods of analysis.

UNIT2. A.C. CIRCUITS:
   Sinusoidal signal, instantaneous and peak values, RMS and average values, phase angle, polar & rectangular, exponential and trigonometric representations; R, L and C components, behaviors of these components in A.C. circuits. Concept of complex power, power factor.

TRANSIENT RESPONSE:
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NOTE: Eight questions are to be set in all by the examiner taking at least one question from each unit. Students will be required to attempt five questions in all.

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SYLLABUS

Unit I Various types of projections, First and Third angle systems of orthographic projections. Projection of Points in different quadrants.

Unit II Projections of Straight Lines – parallel to one or both reference planes, contained by one or both planes, perpendicular to one of the planes, inclined to one plane but parallel to the other planes, inclined to both the planes, true length of a line and its inclination with reference planes, traces of a line.

Unit III Projections of Planes – parallel to one reference plane, inclined to one plane but perpendicular to the other, inclined to both reference planes.

Unit IV Projections of Polyhedra Solids and Solids of Revolution - in simple positions with axis perpendicular to a plane, with axis parallel to both planes, with axis parallel to one plane and inclined to the other, Projections of sections of Prisms, Pyramids, Cylinders and Cones. True shape of section. Development of surfaces of various solids.

Unit V Isometric projections - introduction, isometric scale, Isometric views of plane figures, prisms, pyramids and cylinders.

Unit VI Orthographic drawings of Bolts and Nuts, Bolted Joints, Screw threads, Screwed Joints.

Unit VII Free Hand Sketching - Orthographic Views from Isometric, Views of Simple Machine Components such as Brackets, Bearing Blocks, Guiding Blocks and Simple Couplings.

Note: Some simple exercises may be attempted with AUTOCAD.

Text Book

Reference Books
SYLLABUS

LIST OF EXPERIMENTS
1. Determination of Ca$^{++}$ and Mg$^{++}$ hardness of water using EDTA solution.
2. Determination of alkalinity of water sample.
3. Determination of dissolved oxygen (DO) in the given water sample.
4. To find the melting & eutectic point for a two component system by using method of cooling curve.
5. Determination of viscosity of lubricant by Red Wood viscometer (No. 1 & No. 2).
6. To determine flash point & fire point of an oil by Pensky - Marten's flash point apparatus.
7. To prepare Phenol-formaldehyde and Urea formaldehyde resin.
8. To find out saponification No. of an oil.
10. Determination of concentration of KMnO$_4$ solution spectrophotometrically.
11. Determination of strength of HCl solution by titrating it against NaOH solution conductometrically.
12. To determine amount of sodium and potassium in a given water sample by flame photometer.
13. Estimation of total iron in an iron alloy.

Note: At least ten experiments are to be performed by the students.

SUGGESTED BOOKS:
1. A Text Book on Experimental and Calculation - Engineering Chemistry, S.S. Dara, S. Chand & Company (Ltd.)
LIST OF EXPERIMENTS

1. To verify KCL and KVL.
2. To verify Thevenin’s & Norton’s Theorems.
3. To Verify maximum power transfer theorem in D.C. Circuit & A.C circuit.
4. To verify reciprocity & Superposition theorems.
5. To study frequency response of a series R-L-C circuit and determine resonant frequency & Q-factor for various Values of R,L,C.
6. To study frequency response of a parallel R-L-C circuit and determine resonant frequency & Q-factor for various values of R,L,C.
7. To perform direct load test of a transformer and plot efficiency Vs load characteristic.
8. To perform direct load test of a D.C. shunt generator and plot load voltage Vs load current curve.
9. To plot V-curve of a synchronous motor.
11. To study various type of meters.
13. Measurement of power in a 3 phase system by two watt meter method.

NOTE: 1. At least 10 experiments are to be performed by students in the semester.
2. At least 7 experiments should be performed from the above list, remaining three experiments may either be performed from the above list or designed and set by the concerned institution as per the scope of the syllabus of EE-101-E.
The experiments in 1st semester will be based mainly upon optics, electrostatics, wave and oscillations which are the parts of the theory syllabus of 1st semester.

1. To find the wavelength of sodium light by Newton's rings experiment.
2. To find the wavelength of sodium light by Fresnel's biprism experiment.
3. To find the wavelength of various colours of white light with the help of a plane transmission diffraction grating.
4. To find the refractive index and Cauchy's constants of a prism by using spectrometer.
5. To find the wavelength of sodium light by Michelson interferometer.
6. To find the resolving power of a telescope.
7. To find the pitch of a screw using He-Ne laser.
8. To find the specific rotation of sugar solution by using a polarimeter.
9. To compare the capacitances of two capacitors by De'sauty bridge and hence to find the dielectric constant of a medium.
10. To find the flashing and quenching potentials of Argon and also to find the capacitance of unknown capacitor.
11. To study the photoconducting cell and hence to verify the inverse square law.
12. To find the temperature co-efficient of resistance by using platinum resistance thermometer and Callender and Griffith bridge.
13. To find the frequency of A.C. mains by using sonometer.
14. To find the velocity of ultrasonic waves in non-conducting medium by piezo-electric method.

RECOMMENDED BOOKS:
1. Advanced Practical Physics – B.L. Worshnop and H.T. Flint (KPH)

Note: Students will be required to perform atleast 10 experiments out of the list in a semester.
HUM-102-E  Communication Skills In English (B Tech. Ptg.  2nd  Sem)

SYLLABUS

This course is designed for the students of Engineering and Technology who need English for specific purposes in specific situations. It aims at imparting the communication skills that are needed in their academic and professional pursuits. This is achieved through an amalgamation of traditional lecture-oriented approach of teaching with the task based skill oriented methodology of learning.

COURSE CONTENT:

Unit-I
Communicative Grammar: Spotting the errors pertaining to nouns, pronouns, adjective and adverbs; Concord - grammatical concord, notional concord and the principle of proximity between subject and verb.

Unit-II
Lexis: Idioms and phrases; Words often confused; One-Word Substitutes; Formation of words (suffixes, prefixes and derivatives); Foreign Words (A selected list)

Unit-III
Oral Communication
Part-A: Introduction to principal components of spoken English – Word-stress patterns, Intonation, Weak forms in English
Part-B: Developing listening and speaking skills through various activities, such as (a) role play activities, (b) Practising short dialogues (c) Group discussion (d) Debates  (e) Speeches (f) Listening to news bulletins  (g) Viewing and reviewing T.V. programmes etc.

Unit-IV
Written Communication:
Developing reading and writing skills through such tasks/activities as developing outlines, key expressions, situations, slogan writing and theme building exercises
Reading verbal and non-verbal texts-like cartoons, Graphs and tabulated data etc.

Unit-V (For Internal Evaluation Only):

Book Review – Herein the students will be required to read and submit a review of a book (Literary or non-literary) of their own choice. This will be followed by a presentation of the same in the class

Unit-VI
Technical Writing:
(a) Business Letters, Format of Business letters and Business letter writing
(b) E-mail writing
(c) Reports, Types of Reports and Format of Formal Reports
(d) Press Report Writing

SUGGESTED READING:

1. Language in Use (Upper intermediate Level), Adrian Doff Christopher Jones, Cambridge University Press
5. The sounds of English, Veena Kumar, Makaav Educational Software, New Delhi.

SCHEME OF EXAMINATION:

All questions will be compulsory and will cover all the aspects of the syllabus except unit V. There will be sufficient internal choice.

Unit-I: 20 Marks
Questions No. 1 will require the students to carefully read the sentences given and trace the errors, if any, and then supply the correct alternatives/answers.

Unit-II: 20 Marks
Question No. 2 may have four or five parts testing knowledge of different items of vocabulary.

Unit-III: 20 Marks
Question No. 3 will have two parts of 10 marks each from part A and B of the unit. Part A will have content words, form words and sentences for stress marking, transcription and intonation marking respectively. Part B will test students’ speaking skills through various oral tasks and activities - debate, group discussion and speech - in written form only.

Note: Speaking and listening skills will primarily be tested orally through internal assessment.

Unit-IV: 20 Marks
Question No. 4 may have many parts. The questions will be framed to test students' composition skills on the elements prescribed in the unit. For example, the students may be required to develop a hypothetical situation in a dialogue form, or to develop an outline, key expression, graph etc.

**Unit-V is for internal assessment only.**

**Unit-VI: 20 Marks**

Question No. 5 may have two parts. While the one part may require the students to frame either a press/news report for the print media or write the given business letter, or e-mail a message, the second part will have a theory question on the format of formal report and business letter.
MATH-102-E  Mathematics-II (BTech. Ptg.  2\textsuperscript{nd}  Sem)

SYLLABUS

Part-A
Matrices & its Applications: Rank of a matrix, elementary transformations, elementary matrices, inverse using elementary transformations, normal form of a matrix, linear dependence and in dependence of vactors, consistency of linear system of equations, linear and orthogonal transformations, eigen values and eigen vectors, properties of eigen values, Cayley - Hamilton theorem and its applications.

Part-B

Part-C
Laplace Transforms and its Applications: Laplace transforms of elementary functions, properties of Laplace transforms, existence conditions, transforms of derivatives, transforms of integrals, multiplication by t\(^n\), division by t. Evaluation of integrals by Laplace transforms. Laplace transform of Unit step function, unit impulse function and periodic function. Inverse transforms, convolution theorem, application to linear differential equations and simultaneous linear differential equations with constant coefficients.


TEXT BOOKS:
1. Advanced Engg. Mathematics F Kreyszig

REFERENCE BOOKS:

Note: Examiner will set eight questions, taking two from Part-A, three from Part-B and three from Part-C. Students will be required to attempt five question taking atleast one from each part.
PHY-102-E : Physics-II (B.Tech. Ptg. 2nd Sem)

SYLLABUS

PART-A

CRYSTAL STRUCTURE
- Space Lattice, unit cell and translation vectors, Miller indices, simple crystal structure, Bonding in solids,
- Experimental x-ray diffraction method, Laue method, powder Method, Point defects in solids, Elementary idea of quarks and gluons.

QUANTUM PHYSICS
- Difficulties with Classical physics, Introduction to quantum mechanics-simple concepts, discovery of Planck's constant, Group velocity and phase velocity, Schroedinger wave equations - time dependant and time independent Schroedinger equations, Elementary ideas of quantum statistics.

FREE ELECTION THEORY
- Elements of classical free electron theory and its limitations, Drude’s Theory of Conduction, quantum theory of free electrons, Fermi level, Density of states, Fermi-Dirac distribution function, Thermionic emission, Richardson's equation.

PART-B

BAND THEORY OF SOLIDS
- Origin of energy bands, Kronig, Penney Model (qualitative), E-K diagrams, Brillouin Zones, Concept of effective mass and holes, Classification of solids into metals, Semiconductors and insulators, Fermi energy and its variation with temperature. Hall effect and its Applications.

PHOTOCONDUCTIVITY AND PHOTOVOLTAICS
- Photoconductivity in insulating crystals, variation with illumination, effect of traps, applications of photoconductivity, photovoltaic cells and their characteristics.

MAGNETIC PROPERTIES OF SOLIDS
- Atomic magnetic moments, orbital diamagnetism, Classical theory of paramagnetism, ferro magnetism - molecular fields and domains.

SUPER CONDUCTIVITY
- Introduction (experimental survey), Meissner effect, London equation.

TEXT BOOKS:
1. Introduction to Solid State Physics (VII Ed.) – Charles Kittel (John Wiley).
2. Quantum Mechanics – Powell and Crasemann (Oxford & IBH)

REFERENCE BOOKS:

Note: The Examiners will set eight questions, taking four from each part. The students will be required to attempt five questions in all selecting at least two from each part. All questions will carry equal marks.
SYLLABUS

Unit-1: An Overview of Computer System: Anatomy of a digital Computer, Memory Units, Main and Auxiliary Storage Devices, Input Devices, Output Devices, Classification of Computers. Radix number system: Decimal, Binary, Octal, Hexadecimal numbers and their inter-conversions; Representation of information inside the computers.


Unit-3: Internet basics: Introduction to the basic concepts of Networks and Data Communications, How Internet works, Major features of internet, Emails, FTP, Using the internet.


Unit-5: C Programming language: C fundamentals, formatted input/ output, expressions, selection statements, loops and their applications; Basic types, arrays, functions, including recursive functions, program organization: local and external variables and scope; pointers & arrays.

Unit-6: Strings: strings literals, string variables, I/O of strings, arrays of strings; applications. Preprocessor: preprocessor directives, macro definition, conditional compilation; Structures, Unions and Enumerations: Structure variables and operations on structures; Structured types, nested array structures; unions; enumeration as integers, tags and types. Declaration: Declaration syntax, storage classes, types qualifiers, declarators, initializers. Program Design: modules, information hiding, abstract data types, difference between C & C++, Low level programming: Bitwise operators, Bit fields in structures, other low level techniques.

Unit-7: Standard library: Input / output; streams, file operations, formatted I/O, character I/O, line I/O, block, string I/O, Library support for numbers and character data, error handling:

Text Books:
- Using Information Technology, 5th Ed, Brian K Williams & Stacey C. Sawyer, 2003, TMH
- The C Programming Language by Dennis M Ritchie, Brian W. Kernigham, 1988, PHI.

Reference Books:
- Information technology, Dennis P. Curtin, Kim Foley, Kunal Sen, Cathleen Morin, 1998, TMH
- Theory and problem of programming with C, Byron C Gottfried, TMH
- Teach yourself all about computers by Barry Press and Marcia Press, 2000, IDG Books India.

Note: 8 questions will be set by the examiner (at least 2 questions from unit-1 to 4, 2 each from unit –5& 6, and one from unit-7). The students will be required to attempt 5 questions in all.
ME 103 E (Manufacturing Process) B. Tech. Ptg. 2nd Semester

SYLLABUS

Unit I

Unit II

Unit III
Foundry: Introduction to Casting Processes, Basic Steps in Casting Process, Pattern, Types of Patterns, Pattern Allowances, Risers, Runners, Gates, Moulding Sand and its composition, Sand Preparation, Molding Methods, Core Sands and Core Making, Core Assembly, Mold Assembly, Melting (Cupola) and Pouring, Fettling, Casting Defects and Remedies.

Unit IV

Unit V

Unit VI

Unit VII
Plant Layout, Objectives of Layout, Types of Plant Layout and their Advantages.

Text Books:

Reference Books:

Note: Eight questions will be set by the examiner, taking at least one question from each unit. Students will be required to attempt five questions.
ME- 101 E  Elements of Mechanical Engineering (B Tech. Ptg. 2nd Sem)

SYLLABUS

Unit I  Properties of Steam & Boilers:
Formation of steam at constant pressure, Thermodynamics properties of steam, Condition of steam, Steam tables, Measurement of dryness fraction by throttling calorimeter, Classification of boilers, Comparison of water and fire tube boilers mounting and accessories with their functions, Constructional and operational details of Cochran and Babcock and Wilcox boilers, Problems.

Unit II  Steam Turbines and Condensers:
Classification of turbines, Working principle of impulse and reaction turbine, Compounding of impulse turbine, Comparison of impulse and reaction turbines, Types of condensers, Cooling ponds and cooling towers, Condenser and vacuum efficiencies.

Unit III  I.C. Engines and Gas Turbines:
Introduction, Classification, Constructional details and working of two-stroke and four-stroke diesel and petrol engines, Otto, Diesel and Dual cycles, Working principle of gas turbine, Constant pressure gas turbine cycle.

Unit IV  Water Turbines, Pumps and Hydraulic Devices:
Introduction, Classification, Construction details and working of Pelton, Francis and Kaplan turbines, Specific speed and selection of turbines, Classification of water pumps and their working, Hydraulic jack and lift.

Unit V  Simple Lifting Machines:

Unit VI  Power Transmission Methods and Devices:
Introduction to Power transmission, Belt drive, Rope drive, Chain drive, Pulley, Gear drive, Types of gears, Gear train, Clutches, Types and function of clutches, Types and function of brakes, Power measurement by dynamometer, Types of dynamometers.

Unit VII  Stresses and Strains:
Introduction, Concept & types of Stresses and strains, Poison’s ratio, stresses and strains in simple and compound bars under axial loading, Stress-strain diagrams, Hooks law, Elastic constants & their relationships, Principle stresses & strains and principal-planes, Mohr’s circle of stresses. Numerical problems.

Unit VIII  Bending Moment & Shear Force:
Definitions, SF and BM diagrams for cantilever and simply supported beam. Calculation of maximum SF, BM and point of contra-flexure under the loads of (i) concentrated load (ii) uniformly distributed load (iii) combination of concentrated and uniformly distributed loads. Problems.

Text Books:

Reference Books:

NOTE: In the semester examination, the examiner will set eight questions, at least one question from each unit. The students will be required to attend only 5 questions.
LIST OF EXPERIMENTS

1. To study Cochran & Babcock & Wilcox boilers.
2. To study the working & function of mountings & accessories in boilers.
3. To study 2-Stroke & 4-Stroke diesel engines.
4. To study 2-Stroke & 4-Stroke petrol engines.
5. To calculate the V.R., M.A. & efficiency of single, double & triple start worm & worm wheel.
6. To calculate the V.R., M.A. & efficiency of single & double purchase winch crabs.
7. To find the percentage error between observed and calculated values of stresses in the members of a Jib crane.
8. To draw the SF & BM diagrams of a simply supported beam with concentrated loads.
9. To study the simple & compound screw jacks and find their MA, VR & efficiency.
10. To study the various types of dynamometers.
11. To the constructional features & working of Pelton/Kaplan/Francis.
12. To prepare stress-strain diagram for mild steel & cast iron specimens under tension and compression respectively on a Universal testing machine.
13. To determine the Rockwell / Brinell / Vickers hardness no. of a given specimen on the respective machines.

Note:
1. Total ten experiments are to be performed in the Semester.
2. At least seven experiments should be performed from the above list. Remaining three experiments should be performed as designed & set by the concerned Institution as per the scope of the syllabus.
SYLLABUS

LIST OF EXPERIMENTS

The experiments in Second semester will be based upon electricity, Magnetism, Modern Physics and Solid State Physics which are the parts of theory syllabus.

1. To find the low resistance by carey - Foster's bridge.
2. To find the resistance of a galvanometer by Thomson’s constant deflection method using a post office box.
3. To find the value of high resistances by Substitution method.
4. To find the value of high resistances by Leakage method.
5. To study the characteristics of a solar cell and to find the fill factor.
6. To find the value of e/m for electrons by Helical method.
7. To find the ionisation potential of Argon/Mercury using a thyratron tube.
8. To study the variation of magnetic field with distance and to find the radius of coil by Stewart and Gee's apparatus.
9. To study the characteristics of (Cu-Fe, Cu-Constantan) thermo couple.
10. To find the value of Planck's constant by using a photo electric cell.
11. To find the value of co-efficient of self-inductance by using a Rayleigh bridge.
12. To find the value of Hall Co-efficient of semi-conductor.
13. To study the V-I characteristics of a p-n diode.
14. To find the band gap of intrinsic semi-conductor using four probe method.
15. To calculate the hysteresis loss by tracing a B-H curve.

RECOMMENDED BOOKS:

1. Advanced Practical Physics – B.L. Worshnop and H.T. Flint (KPH)

Note: Students will be required to perform atleast 10 experiments out of the list in a semester.
SYLLABUS

Representative programming problems:-

1. Write a program to find the largest of three numbers. (if-then-else)
2. Write a program to find the largest number out of ten numbers (for-statement)
3. Write a program to find the average mail height & average female heights in the class (input is in form of sex code, height).
4. Write a program to find roots of quadratic equation using functions and switch statements.
5. Write a program using arrays to find the largest and second largest no. out of given 50 nos.
6. Write a program to multiply two matrices
7. Write a program to read a string and write it in reverse order
8. Write a program to concatenate two strings
9. Write a program to sort numbers using the Quicksort Algorithm.
11. Write a program to check that the input string is a palindrome or not.

Note: At least 5 to 10 more exercises to be given by the teacher concerned.
ME- 107 E  Workshop Practice(BTech. Ptg. 2nd Sem)

SYLLABUS

List of Experiments / Jobs

1. To study different types of measuring tools used in metrology and determine least counts of vernier calipers, micrometers and vernier height gauges.

2. To study different types of machine tools (lathe, shape or planer or slotter, milling, drilling machines)

3. To prepare a job on a lathe involving facing, outside turning, taper turning, step turning, radius making and parting-off.

4. To study different types of fitting tools and marking tools used in fitting practice.

5. To prepare lay out on a metal sheet by making and prepare rectangular tray, pipe shaped components e.g. funnel.

6. To prepare joints for welding suitable for butt welding and lap welding.

7. To perform pipe welding.

8. To study various types of carpentry tools and prepare simple types of at least two wooden joints.

9. To prepare simple engineering components/shapes by forging.

10. To prepare mold and core assembly, to put metal in the mold and fettle the casting.

11. To prepare horizontal surface/vertical surface/curved surface/slots or V-grooves on a shaper/planner.

12. To prepare a job involving side and face milling on a milling machine.

NOTE : 1. At least ten experiments/jobs are to be performed/prepared by students in the semester.

2. At least 8 experiments/jobs should be performed/prepared from the above list, remaining two may either be performed/prepared from the above list or designed & set by the concerned institution as per the scope of the syllabus of Manufacturing Processes and facilities available in the Institute.

INTRODUCTION TO PRINTING PROCESSES (PT-301)
1. **History**: Brief history of printing in the Western Countries and in India from the time of Gutenberg’s invention of movable type. A brief survey of the evolution of printing processes and methods from a craft to the present day sophisticated technology.

2. **Brief Introduction of Printing Industry in India**: Scope and total printing capacity. Participation at international level


4. **Printing Processes**: Introduction to printing processes, basic principles, characteristics, identification and applications of letterpress, flexography, lithography and offset, gravure, screen printing etc. General principles of printing Surface preparation for these processes. Modes of taking impressions. Suitability & limitations of various processes of printing.

5. **Letter Press Printing Machines**: Introduction to letter press printing machines, classification of letterpress printing machines, types of platen, cylinder and rotary machines; their mechanical and operational features and uses; merits and demerits.

6. **Rollers**: Different kinds of printing machine rollers, their types, manufacture, care and maintenance.

7. **Running Defects**: Common printing faults, causes and their remedies.


**Recommended Book**:

1. Letter Press Printing Part 1, 2, By C.S. Misra
2. Printing Technology By Adams, Faux, Rieber
3. Screen Printing Review By Babett Magee
4. Screen Printing By John Stephens

**PRINTING PROCESS LAB. (PT 307)**

1. Identification of different tools & equipments used in letterpress.
2. Schematic diagram of different Printing Processes.
4. Schematic diagram of different letter press Printing Machines.
6. Study of various types of screen materials.
7. Screen stretching techniques.
8. Operating of automatic machine.
10. Multi color printing of visiting cards, greeting cards, letter heads, certificates, invitations, folders, cover pages, photographs.
12. Screen printing on Irregular Surfaces - Bottles, Ceramics, Glass.
13. Screen printing on printed circuit boards (PCB)
14. Screen Reclamatio
3. Dimensions of printing types.
5. Physical structures of printing types, their characteristics.
6. Design features and design principles of printing types, fundamental and finishing strokes of types.
7. Classification of printing types based on serifs, point sizes, cases, faces, series, families, etc.
8. Identification of printing types, principles of size and design identification.
9. Suitability of different types for different processes and publications.
10. Calculations relating to type sizes and dimensions of printing pages.
11. A brief account of the work and role of the type-setting department within a printing press. The transformation from hand-setting to phototype-setting.
12. House Style, Good and bad copy; methods of casting off; methods of copy mark-up and copy preparation procedures Reader's marks; word breaks; proofing stages.
13. Composing Tools and Equipment, Basic composing tools for hand composition, spacing material; locking-up devices; proofing presses, kinds of rules.
15. Planning of composition department, Floor plan and arrangement of equipment.

**Recommended Books:**

1. Theory & practice of composition By A.C. Goel
3. Letter Press Printing Part 1, 2, By C.S. Mishra
4. Printing Technology By Adams,Faux,Riber
5. Art & Production By N.N. Sarkar

**TYPOGRAPHY & TYPESETTING LAB. (PT308)**

1. Block Lettering & Numbering (Normal Types).
2. Italics Types (75 Degree Angle) Lettering & Numbering.
3. Four-line Principle (Drawing).
4. Physical (features) parts of the type (Structural Diagram).
5. Fundamental strokes.
6. Finishing strokes & their identification.
7. Introduction to various fonts & their drawing characteristics.
8. Newspaper/Magazine Clippings of different point sizes.
   (Paste them on Practical Note-book & draw the same).
9. Draw different cases, faces, series & families etc.
10. Draw types with different X - heights, contrasts, serifs, Beak & Terminals.
11. Study of Type case, Composing stick and various materials and equipments used in composing room.

PRINTER'S SCIENCE (PT303)

3. Introduction to Organic compounds, Carbon compound, Aromatic compound Diazo compound, Organic Solvents with specific name used in printing Science mainly.
4. Introduction of Photo chemistry
5. Humidity - Relative humidity, measurement, control by air conditioning.
6. Surface characteristics in printing - Surface tension, contact angles, capillary action, interfacial tension, measurement of contact angle, Hydrophobic and hydrophillic, surface water and ink interaction.
8. Photometry - Introduction, solid angle, definitions of luminous flux, luminous intensity, illumination power, intensity of illumination of a surface, brightness or luminance of a surface, laws of illumination - inverse square law and lambert's cosine law, types of photometers, photovoltaic photometer.
10. Effect of light on different plate and film coatings, adhesives & Ink - films, Light fasteness and print characteristics.
11. Introduction and brief study of process cameras, contact printer and safe light and process chemicals.

RECOMMENDED BOOKS :
1. Optics by Brij Lal and Subrahmaniam
2. Optics by Ajay Ghatak
3. Engineering Chemistry by Jain and Jain

COMPUTER APPLICATION IN PRINTING (PT304)
1. Personal computers – Labeling standards – software applications, utilities, operating systems. Linking hardware and software, device interfaces, BIOS, device drivers.
2. Motherboard components – nomenclature, technology, Microprocessor – basics, Memory – RAM, ROM, DRAM, EDO, SDRAM (only usage and speca basis) BIOS. BIOS compatibility, Expansion slots, parallel serial port power supply SMPS – specialization, Bus- AT bus, PCI, ISA bus.
4. Display devices – CRT displays – display adapter CGA, VGA SVGA- Resolutions (application oriented discussion)

5. Input /Output devices Keyboard, mouse, scanners, printers, dot matrix, ink jet, laser, CCD Camera, Grabber Card.

6. Introduction to DTP, trends in printing technology, usage of computers in printing. DTP printing technology Introduction to DTP software’s, Use of Text tool Adobe, Photoshop Corel Draw.

7. Story editing, formatting. Working with graphics: using different graphic tools importing graphics working with colour, table editing. Desk Top Publishing Hardware, Macintosh, Cost estimation of DTP. Electronic Image, BMP, TIFF, GIF file formats. Image compression

Recommended Books :
1. Hardware Bible : Winn IL Roch Techmedia.
2. Desk Top Typography : Quarkx Press

COMPUTER APPLICATION IN PRINTING LAB. (PT309)

1. Introduction to Computer Terminologes.
2. Use of different Hardware devices.
4. DTP and its features.
5. Softwares used in Printing.
6. Page set-up with different sizes and margins.
7. Preparation of Text rich documents.
8. Different kinds of Scanners, their working and uses.
10. Modifications and Editing of Illustrations and Text.
THEORY OF PRINTING MACHINES (PT305)

1. Fluctuating loads and stress concentration, reduction of stress concentration effect. Fluctuating stress, endurance limit, notch sensitivity.

2. Cams and Followers:
   Types of cams and followers, analysis of motion, determination of cam profiles, followers for cams with specified contours

3. Kinematics linkages and levers:
   Classification of linkage systems, study of typical kinematics systems used in machines.

4. Gears:
   Spur and helical gears, Terminology, types, selection criteria, tooth form, strength of teeth, minimum number of teeth, formative number of teeth, applications. Worm and bevel gears: Terminology, strength, applications.

5. Power Transmission Devices.

6. Machine drawings:
   Drawing of complete drive for printing machine. Specification for fits, tolerances and materials. Miscellaneous drawings of spur, helical and bevel gears etc.

7. Introduction to Computer Aided Design.

Recommended Books:
(1) Thomas Bearn, The theory of Machine CBS Publisher and Distributors Delhi.

(2) Anthony Esposito and J. Rober Thrower Machine Design II edition

(3) Joseph E. Shigley, John Vickev Theory of Machine & Mechanisms
   McGraw Hill International Boom company.

(4) Khurmi, Gupta; Theory of Machine S. Chand Publisher New Delhi.
Introduction to digital electronics in the field of printing.

Logic Gates and Boolean Algebra:
Boolean constant and variable, OR, AND, NOT, NAND, and NOR gates, truth tables, Boolean expressions, Boolean algebra. De Morgan’s theorems. Realisation of Boolean expressions using universal gates.

Combinational Logic Circuits:
Simplification of Boolean expression and realization using logic gates, sum of products and product of sums, Karnaugh map & variable, minimization of Boolean expressions using Karnaugh map, don’t care conditions, variable entered mapping, minimization using variable entered maps.

Numbering Systems & Binary Arithmetic:
Introduction. Symbolic number systems, Positional number system, Integer Binary numbers - Binary digital computers, Binary number system, Conversions between decimal and binary numbers, Hexadecimal numbers, Conversion between Hexadecimal, Binary & Decimal numbers. Fractional binary numbers - Converting binary fractions to decimal, Converting Hexadecimal fractions to decimal, Converting decimal fractions to Binary and Hexadecimal. Number System Notation. Binary Addition and Subtraction - Signed binary numbers, Complementary numbers, Two’s complement mathematics. Binary multiplication & division. Binary codes - Character codes, Numeric codes, other binary codes, Error correction & detection codes.

Arithmetic Circuits:
EXOR and EXNOR gates, half adder, full adder, full subtractor, adder-subtractor, look ahead and carry.

Data Processing Circuits:
Multiplexers, demultiplexers, decoders, BCD to decimal decoder, seven segment decoder, encoders, decimal to BCD encoder, parity generators and checkers.

Flip-Flops:

Sequential Logic Circuits:
Comparison between combinational and sequential logic circuits, shift registers, SISO, SIPO, PISO and PIPO shift registers, ring counter, Jhonson counter.

Counters:
Ripple counters, up counter, down counter, up-down counter, synchronous counters, mod number, mod-3, mod-5 and mod-10 counters, shift counters.

D/A and A/D Converters:

Digital Camera and Digital Scanner.

Recommended Books:
1. Digital Electronics – Malvino.
5. Digital Fundamentals - Floyd.
6. An Engineering approach to digital design - Fletcher.
1. Introduction to “Graphic Design” : What is design, Graphic design, printer’s design.

2. Fundamentals of design : line, tone, value, weight, texture, shape, size, space, etc. Principles of design- balances, proportion, rhythm, unity, contrast, simplicity, fitness.

3. Colour theory: dimension of colour, colour schemes, colour symbolism, emotional effects of colour.

4. Division of design: natural, conventional, decorative, geometrical and abstract.

6. Type: Methods of type arrangement, classification of typeface of font designing.

7. Printing planning: rough layout, comprehensive, artwork, type of originals, sizing, mashing and cropping.

8. Design management: Definitions in advertising art, modern art abstract art, applied art, advertising, publicity, public relations, sale promotion, sales manager


10. Selection of an appropriate printing process for printing of a job.

11. What is 3D? Visualizing three dimensional effects, from 2D drawings.


13. Understanding of scale and sense of proportion.

**Recommended Books :-**

1. The Designer’s Handbook by Alistair Campbell
2. Design & Technology by Van No strand

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**GRAPHIC DESIGN LAB. (PT407)**

1. Stationary and small sales literature.
2. Direct mail.
3. Folders - Single fold & Double fold.
5. Label designing- 2 and 4 colours
6. Introduction to computers, various software’s used for designing purpose – Demonstration (Manipulation of same design)
7. Logo designing on computers.
8. Colour and colour matching.
10. Knowledge of different computer commands.
11. Color wheel

DESIGN & PLANNING FOR PRINT PRODUCTION (PT402)

Introduction:
Importance of a good design. Impact of a design on various target audience. Relationship between design and sale of a product. Graphic designer and his role. Elements and Principles of design.

Basic design and letter forms:
Visual ingredients of graphic design, point, line, graphic space, shape, texture, color, scale, balance and contrast. Use of computers in designing. Introduction to some designing
softwares. Suitability of a design for printing technique and paper surface. Legibility and readability, Monograms and trademarks.

Images in design:
The relationship between type, illustration and Photography. Types of images. Selection and assessment of originals, photographs, sketches, paintings. Factors to be considered for preparation of a design.

Design management:
Relationship of a design studio with production and sales departments of a press. Control and checking of artwork at all stages, employment of free-lance artists, designers and photographers. The advertising agency, its structure and its services.

Design process:

Production planning:
Selection and co-ordination of production processes. Consideration of composition methods. Limitations of binding, finishing and ancillary processes affecting design. Selection and specification of ink, paper and other materials in relation to design specifications and to the production process.

Reference Books:
Fundamentals of Copy & Layout - A. C. Book(Ac) Sohick(Cd)
Production for the Graphic Designer. – Craig.
How to brief designs & buy print. - Muray(Ray).
 Principle of CAD.- Rooney J. & Steadman P.
Advertisement Management. - David A. Akar & John G. Myers.
Analysis of Electronic Circuit - Jal Baker.
Copy Preparation. - Leon O Chus & Pen Min Lin C. A.

FLEXOGRAPHY (PT403)

Introduction to Flexography:
Definition. flexographic printing, flexographic market, flexographic products, growth potential, Advantages of flexography, Press development. Mechanical principles of flexography - Fountain roll, Anilox roll, plate cylinder, impression cylinder.

Flexographic printing plates:

The Printing press:

Mounting and Proofing:

Flexography and Barcoding:
Barcode structures. Types. Verifying/Analyzing printed barcodes. UPC and flexographic printing. UDC film masters and printing capability tests. The shipping container symbol (SCS). SCS shipping contain Barcode printing.

Beyond the Horizon- Tomorrows Flexography:

Recommended Books:
Flexography principles and practices - Foundation of flexographic technical association.

FLEXOGRAPHY LAB. (PT408)
1. Introduction and familiarizing flexo machine and other related elements.
2. Preparation of rubber plates.
3. Preparation of i.liquid photo polymer plates, ii.sheet photo polymer plates.
4. Registering and plate mounting on flexo plate cylinder.
5. Make ready procedures a flexo machine.
6. Printing i.single color, ii.two color, iii.four color.
7. Studying of 6 color and 8 color flexomachines.
PRINTING MATERIALS (PT404)

Metals

Type of metals and characteristics of metals used for type alloys for foundry types, hot metal composition and stereotypes. Physical and chemical properties of aluminium, zinc, copper, nickel, chromium, magnesium in relation to printing applications.

Photographic Materials

Main kinds of films and photographic papers used in graphic origination. Films positives, mainbase, stripping, thickness, right and wrong reading, negatives; paper positive materials. Developers,Reducers, Intensifiers.

Light Sensitive Materials

Various sensitized materials, used and relationship with processes. Silver halide emulsions-classification according to speed, contrast and spectral sensitivity, characteristics and gamma value curve.
Paper and Ink

Fibrous and Non-fibrous materials used in paper and board manufacturing. General characteristics and requirements of printing inks formulations pigments, vehicles, varnishes, solvents, agents.

Adhesives

Classes and characteristics of adhesives used in binding and warehouse work and their range of applications Selection for specific purpose.

Miscellaneous Materials

Book binding materials Different types of rubber used in printing. Use of leather, cloth, rexine, threads, tapes, stitching wire, metal foils and covering materials used for binding and print finishing.

Materials Handling


Managing Printers Materials Resources:

Material management overview, materials management duties, purchasing function, materials management links with other areas, inspection & quality control, materials storage and buildings, materials identification and location, stock records, material handling equipment, training, stock and inventory control, waste materials, presentation and disposal, packing and dispatch of materials.

Recommended Books :-

Printing Surface Praparation by C. S. Mishra

ELECTRONIC COMPOSITION (PT405)

Elements in copy preparation:


Typesetting methods:


Desk Top Publishing:
Introduction, Origin, components of DTP, applications of DTP. Benefits of DTP.


Digital Fonts:
Tex, Meta font, True type fonts, Post Script Type 1, Bitmapped fonts, Adobe type manager, The real source cheap type, multiple master, Quick draw GX, Transferring fonts, Font manipulation software, Vector & Bitmap text and Graphic creation, Raster Image Processing, Digital O/P, Creation of type for digital system, Future trends and developments.

Reference Books :
Typesetting-Composition-Geoff, Barlow
Word Processor to Printed Page - Micheal Card
Digital Typography-Donald E.Knuth
Introduction to Prepress - High Speirs
Introduction to Printing Technology - Hugh Speirs
Composition and Typography Today - Mendiratta,B.D.
Hand Book of Typography - Kailas Takle.
Guide to DTD-James Cavuoto
Printin Technology - Adams
Printing in a Digital World – David Bergsland

ELECTRONIC COMPOSITION LAB. (PT409)

1. Familiarising with key board.
2. M.S.Word – Justification works, column work, single column, double column, fonts & type style changing, copy & cut & paste command, wordart.
3. Page Maker – Designing of visiting cards, page makeup of pampllets, page make up of advertisments, folders, journals, book work. Picture and text manipulation, Table work setting, tabular work setting.
4. Photo Shop – Introduction, Picture editing, scanning the picture, converting image formats, resizing the images.
5. Coreldraw – working principles, desiging and practicing.
**ELECTRICAL MACHINES AND ITS UTILISATION IN PRINTING (PT406)**

1. **D.C. Generator**: Construction; types, series, shunt, compound E.M.F. equation, Building up of E.M.F. in shunt generator, Significance of residual magnetism, Generation characteristics.

2. **D.C. Motor**: types, Principles of operation, Significance of back e.m.f., Torque equation, Torque-speed characteristics of series, shunt and compound motors, speed control of d.c. motors by armature resistance, Flux control and thyristor control method applications.


6. **Electrolytic Processes**: Introduction, Electrolyted, ionisation, Definition of various terms used in electrolysis, Faradays’ laws of electrolysis, Extraction of metals, Refining of metals, electrodeposition, power supply for electrolytic processes.

Distribution and control of light: Reflection, Refraction, Diffusion, Applications of directional controlled lighting, Production of coloured light, subtractive coloured light, Production with the discharge lamps, coloured reflectors, Lighting calculations: Plane angle, solid angle, solid angle in terms of plane angle.


10. Consideration and selection of electric motor for different industrial drives.

Recommended Books:-

Industrial Training (PT-410)

Students will undergo for 4 weeks Industrial Training after exams in summer vacation

REPRODUCTION TECHNOLOGY (PT501)

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

2. Difficult line originals: Line originals with colour; line originals with fine lines screen; line originals with fluorescence effect.

3. Contact photography - Spreads and chokes.

4. Line separation from black and white art work.

5. Evaluation of line negative.

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


9. Auxiliary or supplementary exposures: Contrast control with supplementary exposures. (a) Flash exposure - Deciding the basic flash exposure, for contact screens Exposure calculations. (b) No-screen exposure-calculations.

10. Line and halftone combination

11. Evaluation of halftone negative

13. Mechanism of vision and theories of colour-vision.


15. Colour separation:
   a) FAKE colour reproduction
   b) Filters - Colour separation filters and other filters; Overlap in the filters. Wide band and Narrow cut Filters factors and filter ratios.
   d) Study of quality control aids, gray scale, set of colour control patches; Register marks; Register - punch, pin-bars etc.

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

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

Recommended Books:

Line photography - Karl Davis Robinson.
Halftone Photography - Erwin Jaffe.
Small Offset Preparation & Process - Les Crawhurst
Printing Technology - Adams, Faux, Rieber.
Reproduction Systems - V. S. Raman.
REPRODUCTION TECHNOLOGY LAB. (PT507)

1. Setting of Camera.
2. Line negative and positive preparations.
3. Half tone negative and positive preparations.
5. Exposing difficult line originals; use of filters.
7. S.D. calculations and S.D. setting and contrast control with glass screen.
8. Line negative making with density range compensation, use of log Equations.
10. Contrast control with contact screens.
11. Use of CC filters with magenta contact screen.
12. Contrast control with supplementary exposures.
13. Line and half tone combination.
14. Fake colour reproduction and introduction to direct and indirect colour separation methods.
GRAVURE TECHNOLOGY (PT502)

Gravure:


Gravure Press and its components:


Gravure Substrates:

Recommended Books:

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

GRAVURE LAB. (PT508)

1. Study of various Gravure printing machine configurations.
2. Study of various components of a Gravure printing machine.
11. Check the practical problems in a Gravure printing process.

OFFSET TECHNOLOGY – I (PT503)

Basic principles in planographic printing:

Inking system:

Dampening system:

Printing unit:

**Process of printing operation:**
Pre makeready, make ready, inspection of press sheets, control of press function during press run - maintaining the inking system, maintaining the dampening system, the feeder, the delivery. Colour sequence in two colour and multicoulor operations. Printability & runnability. Wet-on-wet printing. Wet-on-dry printing. Direct imaging presses. Quality control during the press run - Densitometry, colour control bars, press room lighting and standard viewing conditions, plate scanner. Printing unit problems. Proof press - requirements & advantages, progressive proof.

**Recommended Books :-**
- Manual For Lithographic Press Operation - **A. S. Porter**
- Modern Lithography
- Introduction to Printing Technology - **Hugh M Speirs.**
- Sheetfed Press Operation - **GATF.**
- Offset Technology – **C.S.Mishra.**
- Lithographers Manual
- Lithographic Technology - **Erwin A Dennis, Olusegun Odesina.**
OFFSET TECHNOLOGY – I LAB. (PT509)

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


Screen printing, Heat transfer printing, Collotype:


Planographic plates:

working plates- additive presensitized plates, subtractive diazo PS plates, photo polymer presensitized plates, aqueous developable plates, driographic plates, multimetal plates. Producing a multimetal plate. Types- bimetalic, trimetalic. Projection-speed negative plates. Positive working lithographic plates- Presensitized plates, Electrostatic plates. Baking of positive plate Process of making deep etch plate - counter etching, exposing, developing, deep etching, cleaning the image areas, stopping out unwanted areas, copperizing the image areas on aluminum plate, applying non blinding lacquer applying deep etch developing ink, remaining the gum stencil, desensitizing, gumming up, putting the plate under asphaltum, removing and adding work. Health and safety in deep-etch plate making.

**Recommended Books:-**

  Arts - Dr. Nelson R. Eldred.
- Offset Plate Making - Robert F. Reed.
- Operating - Lloyd P. Dejidas.
- Flexography Premier - Donna C. Mulvihill.
  Peck.
- Gravure Process And Technology –GAA.
- Litho Plate - BPIF.
  Chemistry for Graphic Arts
  Printing Technology 3rd
  Sheetfed Offset Press
  Stripping - Harold L.
  Selecting The Right Litho Plate - BPIF.
PRINT MEDIA ETHICS (PT505)

Morality and ethics:
Introduction. Types of ethics, Nature of Ethics, Objective of ethics, Business Ethics, Business Ethics and Profits; Relationship between Business & Ethics - The Unitarian View, The Separatist View, The Integration View. Nature of Ethics in Business; Characteristics of Business Ethics; Need for Business Ethics; Arguments against Business Ethics, An example of Ethical business Practice, Discussion Situation 1; Discussion Situation 2; Discussion Situation 3; Ethical Practice in Management; Evolution of Business Ethics as a field of study.

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

Electronic Property and Copyright:

Work life in Indian Philosophy:

Attitudes, Beliefs & Life Positions:

Overview of the Ethical Value System:

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

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

**Recommended Books:**

ADVERTISING AND MULTIMEDIA (PT 506)

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

Advertisment Budgeting
Methods, determining and appropriation.

Advertisment Research
Research methods, sampling, data analysis and representation, surveys, attitudinal research.

Media Planning
Budgeting, allocation of budget, calculating cost of media, media mix. Types of media. Readership, viewership (target audience), OTS, TRP, circulation.

Advertisment Agency
Structure and function, choosing advertisment agency, advertisment law.

Advertisment and Computers
Introduction, role of computers in advertisment, animation, application of softwares like photoshop, coreldraw, quark-express etc.

Public Relations

Marketing-Mix and promotional mix

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

INDUSTRIAL TRAINING (PT 511)
Students will undergo for 4 weeks Industrial Training in vacation after 4th Semester

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


9. Depreciation - Introduction to different methodes and their comparison.

Recommended Books :-


   (1.) Maintenance Engineering Handbook
   (3.) Operator’s Manually by GATF.


PRINT FINISHING (PT602)

Introduction:


**Structure Of A Book:**

**Securing Methods:**

**End Papers:**

**Finishing Processes:**

**Binding & Finishing Machines:**

**Recommended Books :-**
- Binding And Finishing - Ralph Lyman
- Binding And Finishing Part-1 - B.D.Mendiratta
- Binding Finishing Mailing - T.J.Tedesco
- Introduction to Printing & Finishing - Hugh Speirs
PRINT FINISHING LAB. (PT607)

I. Preparation of the following types of books.

II. Preparation of Writing board.

III. Preparation of Photo Album.

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

V. Preparation of Cheque books with 25 leaves.

VI. Preparation of following type of Mechanical binding - Spiral wire binding, Wire ‘O’ binding, Ring binding.

VII. Preparation of files of following designs - Loose leaf file - single piece, Loose leaf file - Two piece tab binder, Loose leaf guard file - Boards joined with spine strip, Court case file, Portfolio - Closed file to keep confidential loose sheets.
VIII. Preparation of these types of End papers - Single End paper, Double or Inserted End paper, Made end paper, Cloth joint end paper, Zig Zag end paper, Cloth joint Zig Zag end paper.

IX. Preparation of telephone directory with Indexes and Tabs.

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

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

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

XIII. Repairing of old books.

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

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PRINTING SUBSTRATES (PT603)

Paper:

Recycled paper:
Introduction, recycling process, fibre preparation- screening, centrifugal cleaning, flotation, washing, deinking plant function, continuous drum pulper, prescreening and cleaning, primary flotation, cleaning, fine screening, thickening, dispersing, brightness control, washing,

Choosing a suitable paper:

Introduction to Non Paper substrates.

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

PRINTING INK TECHNOLOGY (PT604)

Printing Inks

Radiation curing
Introduction, radiation curing inks, ink cure considerations, chemistry of uv curing-photo initiation, propagation, termination. Cationic curing, electron beam curing.
Security Inks
Range of security inks, special security features - fluorescence, phosphorescence, reflected by improved filters, magnetism, security printing inks for cheques-penetrating L/p inks, water fugitive inks, inks reacting with pen evadicators, red-ox reagents, inks reacting with solvents, invisible reactive inks, carbonizing inks. Security inks conformity tests and Q.C. tests - tests for chemical resistance, light fastness, rub resistance test, crumpling resistance test, grinding control, colour control, control of the rheological properties, control of drying time, control of various specific properties. Environmental considerations in security printing.

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

PRINTING INK TECHNOLOGY LAB. (PT608)
1. Various samples of Paper and their study.
2. Different samples of Inks and their study.
3. Lightfastness test.
5. Effect of Humidity and Temperature on paper.
6. Ink tackiness Test.
7. Printed samples of different printing processes and their study.
8. Ink Viscosity Test.
9. Introduction to various chemicals used in printing.
10. Consumables and miscellaneous used in printing.

PRINTING IMAGE GENERATION - II (PT605)
1. Driography- Outline, system, structure, processing and use, precautions.
2. Toray waterless plates – outline, structure, processing and use, advantages and disadvantages.
9. Surface preparation for screen

Image carriers for flexography:

Gravure image carrier:

Digital Image Carriers:
1. Auto plate processor.
2. Troubleshooting for plates.
3. Quality control aids for plate making.

Recommended Books:

PRINTING IMAGE GENERATION LAB. (PT609)
1. Comparative study of various materials and equipments used in Image Generation Department.
2. Preparation of pre-sensitized plate,
4. Layout preparation:
5. Study of gripper margin and registration processes,
6. Positioning of images for plate making,
7. Masking techniques.
1. Drawing layout for different jobs.
2. Assembling negatives for single colour jobs and two colour jobs.
3. Assembling positives for single colour and two colour jobs.
4. Assembling positives for four colour jobs.
5. Preparing wipe-on plates.
6. Preparing albumin plates.
7. Preparing deep-etch plates.
8. Preparing pre-sensitized plates.
OFFSET TECHNOLOGY - II (PT606)

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

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

3. Inking systems and dempening systems for web offset
   Conventional and non-conventional dempening systems. UV inks and setting systems. Causes and correction of ink-related problems. Properties and requirements of heat set inks.

4. Web Control

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

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

7. Web-paper
   Properties and requirements of paper used for web offset. Printability, Care and handling of rolls.

8. Dry Offset

9. Driography or Waterless lithography
Description of the process, Method of producing image and non-image areas Importance of the correct formulation of waterless lithographic inks.

10. **Introduction to types of drives used in web offset machines**
11. **Brief introduction to control pannels of the web offset machines.**
12. **Folders**
   Introduction, folding principles, parts of folder, combination folder, ribbon folder, double-former folder, the mechanics of folding process of jaw fold, chopper fold mechanism. Operation of collect cylinder, press folders, double former prefolder, flow folders, insert folders.
13. **Inline Finishing**

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

**OFFSET TECHNOLOGY - II LAB. (PT610)**
1. Premake ready operations.
2. Make ready operations.
3. Multicolour job printing.
4. Trouble shooting during printing.
5. Study of electronic panel.
6. Blanket and plate cylinder setting.
7. Damping roller setting.
8. Inking roller setting.
ENTREPRENEURSHIP DEVELOPMENT (PT701)

Entrepreneurship: A Perspective: Recognition of the need for entrepreneurship and self-employment development, Entrepreneurship spirits, Significance of entrepreneur in Economic Development, Scope and trends of small enterprises, Small business/enterprise-the driving force for national growth, Types of small enterprises, Economic, social and psychological need for entrepreneurship, characterization, qualities and pre-requisites of entrepreneur, Selection of a potential entrepreneur, Identifying & Evaluating Business opportunities.

Quick Start Method: Methods and Procedures to start and expand one’s own business, life cycle of new business, Franchises, creating your own franchise, Multilevel marketing schemes, Buying an existing business.


Forms of Ownership: Different forms of ownership-sole proprietyship, partnership, joint stock company, Selling, Selling your venture, planning for succession, Valuation of a business, Responsibility of a good employer, Risk management, What risks does your business face?

Instructional Models: Govt. support to new enterprise, incentives, sources of finance. Entrepreneurship Development Centre, Role of Govt. and promotional agencies in entrepreneurship development, Entrepreneurship development programmes, Role of various institutions in developing entrepreneurship in India.

Recommended Books:
- Entrepreneurship Development - Colombo Plan Staff College for Technician Education.
QUALITY CONTROL (PT702)

1. **Introduction**
   Definition of Quality, Quality control, its meaning and purpose setting up a Quality Control Programme, and establishing necessary System and procedures, economic consideration.

2. **Management Consideration**
   Quality Control as an attitude and management tool, management's responsibility, organization and personnel functions, getting everybody involved. Total Quality Control.
   Quality Control procedures and methods.
   Different shapes of quality control.

3. **Materials Control**
   Establishing clear specifications and standardization of materials to be purchased - particularly paper, ink, plates, blankets and rollers, Inspection and testing of incoming materials as part of quality control; importance of proper handling and maintaining records of performance of materials Sampling and sampling plans.

4. **Establishing Quality control programme in different departments of Printing organization.**

5. **Quality Control Instrumentation**
   Paper and paper board testing instruments for testing printability, print quality and end-use requirements, Ink testing instruments for testing optical and working properties and end-use requirements Process control instruments, devices and aids used in the galley and dark-room, striping department, plateroom and press room for specific processes and for general purposes Press sheet control devices used for production of multi-colour printing jobs Basic principles of these instruments and devices how they function and what they measure, minimum instrumentation necessary to produce a product consistent with the appropriate quality level.

6. **Introduction to ISO:9000 and ISO:14000 series.**

**Recommended Books:**
1. W.H. Banks, Inks, Plates and Print Quality, Pergamon Press
QUALITY CONTROL LAB. (PT707)

1. Paper testing checking grain direction.
2. Tensile strength of paper, burst strength of paper.
3. Substance, caliper, porosity test, cobb sizing value test.
4. Tearing testing of paper, brightness test of paper.
5. Operating test, gloss test, lighting color filter sensor.
6. G.S.M.testing, folding endurance.
7. Moisture contents test, ash contents test.
8. Hot air oven tester, absorbing test.
9. Pick strength, humidity control test, room temp testing.
10. Ink film thickness test.
11. Investigation of pigment properties.
12. Investigation of solvent properties.
14. Test a printed sheet - proof printing and measurement of colour using spectro photometer, resistance testing of prints.
15. Measurement of ink film thickness
COLOUR SEPARATION TECHNIQUES (PT703)

1. Introduction to colour
   Basic colour theory, additive and subtractive colours, process colours, application of the colour theory to colour reproduction. Overview of colour reproduction from original to printing.

2. Choosing a Transparency for Reproduction
   Exposure level, colour balance, memory colours; grainers, contrast; highlight retouched original transparency, evaluation the transparency.

3. Colour Reproduction
   Essential requirements of cameras, lens, illuminations filters and half tone screen for colour reproduction work. Tone and colour controls. Gray scale and colour control patches the ink/paper/colour interaction. Measurement and control of colour printing. Using the densitometers.

4. Colour Separating methods
   Basic principles of colour separation. Direct separation method and Indirect colour separation method, procedure followed for each method. Methods and procedures followed for making the black printer negative for the indirect method, for making continuous tone positives and the making of final screened negatives and positives establishing a colour reproduction procedure.

5. Colour correction
   Objectives of colour correction; Hand correction, Purposes and procedure followed; retouching techniques; correcting colours, tones and shades given inks and paper. Dot etching, purposes and procedure, flat etching, staging and etching, local reduction, blending; Masking; purposes of masking types of maskings; their clarification and uses; Electronic colour separation and correction.

6. Colour proofing
   Press proofing methods and various pre-press proofing systems; uses and limitations of prepress sheet. Interpreting pre press proofs and predicting, press results. Control devices for proofing systems.

7. Planning for colour work


Recommended Books :-
COLOUR SEPARATION LAB. (PT708)

2. Making of own colour control patches.
3. Gray Scale (Drawing).
4. Drawings spectrophotometer curve by using spectro densitometer.
5. How to make colour separation negative of a four colored original by using Electronic colour separation system. (Scanning).
7. Colour Correction by using photography masking.
8. Six Colour Wheel.
11. Preparation of originals for separation - reflection type and transparency.
12. Demonstration of various masking methods using reflection copy, by OHP/ Slides, video etc.
13. Exposing tonal correction mask, making UCR mask/GCR mask etc.
14. Comparison of camera separation and scanned separation.
15. Cut out and mixing jobs.
16. Use of different Quality Control Aids. New developments in Electronic Imposition & DTP etc.
COMPUTER GRAPHICS IN PRINTING (PT704)

Basic Concept:

Animation:
Conventional animation, computer assistance animation, interpolation, simple animation effects, animation languages - Linear-list notations, general purpose languages, graphical languages, Methods of controlling animation- full explicit control, procedural control, constraint-based system, tracking live action, actors, kinematics and dynamics, physically based animation. Basic rules of animation. Problems peculiar to animation. Summary.

Basics of Digital image processing:

1. Introduction to computer graphics, scope and limitations
2. Coreldraw, Different facilities available, working in coreldraw environment.
3. Introduction to illustrator-simple lines, stylish lines, drawing and filling of images, gradation tools, blenders pattern with a difference, filling rectangular and non rectangular shapes of pallets and colour, system matrices, justifying text and application of path finders.
4. Introduction to photoshop-how you can differentiate it from illustrator, different types of the formats, their compatability to different software, introduction of tool box, uses of different filters, masking and working on images, creating a presentation using software.
5. Quark express : Pagemake up, formatting and editing in the software.
6. Flash: Introduction of 2-D animations, study of tool box, menu bar, how you can use them in your industry, how you can create different effects like moving on selected path, masking of images, etc.

**Recommended Books:**
- Computer graphics principles & practice 2nd edition - *Van Dam, Foley, Fiener Hughes.*
- Computer graphics - *Hearn & Backer.*
- Procedural elements for computer graphics - *David F. Rogers.*
- Digital imaging techniques (Block I)
- Digital Imaging techniques (Block II)
- Digital image processing - *Gonzalez, Woods, Chanda,*
- Digital image processing and analysis - *Majumdar*
- Digital image processing and computing - *Schalkoff*
BOOK PUBLISHING (PT705)

1. Book Publishing
   Definition and concept, parts of a book, basic steps in book publishing, 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 sale/marketing manager, the publicity manager, the warehouse or distribution department, the accounts department, the management.

2. Press Organization
   Hierarchy - editorial organization, mechanical aspects of organization - composition, printing, basic operations, business aspects of organization, flowcharts of staff in organization, Circulation and Advertisement departments, distribution channels.

3. Production & Estimating in Book Publishing

4. Marketing and Distribution in Book Publishing

5. Editorial Organization in Publishing
   The editorial functions in newspapers, journals, magazines and books.

6. Legal Aspects in Book Publishing
   Copyright, types of agreement between author and publishers the outright sale of the copyright, profit sharing agreement, the royalty system, commission agreements. The press and the law-libel, defence against libel, mitigation & damages.

7. Introduction to Booking and Circulation methods used in publishing houses.

8. Subsidy in the Publication of Books
   Importance and need of subsidy in the publication of books. Salient features of the subsidy scheme. Procedure of getting subsidy.
Introduction:
- Trends in the Computer Forms stationery - Demands for the computer forms.

Designing of Computer forms:
- Basic designs of various types of forms for input and output - Fan fold forms, Computer letters and Mailers. Computer envelopes, Snap-out-forms, Tags and labels, Computer envelope, MICR cheques etc., Typography - designing of forms with computer based machines etc.,

Paper used for the Production of forms:
- Specifications, requirements, storage conditions, etc., Carbon papers - varieties, specifications and manufacturing process.

Manufacture of computer forms:
- Different types of Web-Offset Printing Presses. Construction and configuration -on-line operations such as numbering, perforating, sprocket hold punching and Zig-Zag folding etc.,

Finishing Machines for computer forms:
- Different types of collators - Roll to Roll -Roll to pack and pack to pack-Programmableouters for continuous web-MICR cheque binding system. Machines used for packing and Despatch.

Principles of stochastic screening:

Practical experiences with offset litho printing:

Recommended Books:
- Forms for the 80’s. How to design and produce them - Gar Raines.
- Stochastic Screening - Kelvin Tritton.
Each student will prepare a seminar report and will present in the examination on the selected topic under the guidance of seminar guide (faculty member).

INDUSTRIAL TRAINING (PT 711)

Students will undergo six-weeks industrial training in vacation after sixth semester.
Basics of Packaging:
Introduction, Function of a package, Factors influencing design of a package, Computer
Aided Package Design, Packaging Cycle, Product Package Relationship, Product life curve,
Elements of Package Design, Classification of Packaging - Flexible package types, Rigid package
types. Hazards on package - Mechanical, Climatic, Biological and other hazards. Markings on
package - Handling marks, routing marks, information marks. Tests on Package - Mechanical test
- Drop test, Vibration test, Compression test, Inclined impact test, Rolling test, Climatic tests -

**Packaging Media:**
Effect of moisture on wood, preservation of wood, advantages. Boards-types, paper-types. Glass- properties, advantages, types, basic approaches to designing a bottle, thermal shock test, pressure test, impact test, density test. Plastics-BOPP, HDPE, LDPE, LLDPE, PVC, PP, PET, Polyolefins, Cellulosics, Polymides, advantages, functions & applications. Tests on plastics, Metals - functions, uses. Aluminium foils - Manufacturing of foil, properties, applications, methods of laminating foil to film or paper.

**Carton Production:**

**Innovative Packaging Techniques/Processes:**

**Future Trends:**

**Recommended Books:**
Packaging design and performance - Frank Paine
Advances in plastic packaging technology - John Briston.
Packaging design an introduction - Laszlo Roth.
Packaging Technology - Volume I - IIP
Packaging Technology - Volume II - IIP
Packaging Technology - Volume III - IIP

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**PACKAGING LAB. (PT807)**
1. Designing and preparation of various flexible packages.
2. Designing and preparation of various rigid packages.
3. Preparation of Jigged die & unit die for a package design.
4. Study and operation of various packaging machines.
5. Manufacturing of various types of corrugated boards.
6. Cutting, creasing and building up corrugated boxes.
7. Designing & preparation of various designs of paper bags.
8. Testing of raw materials like wood, paper, plastic.
9. Test conducted on Cartons, Corrugated packages, wooden packages.
1. **Drive and Control Systems**

   Transmission systems such as AC and DC motors, belt, chain, gear, cranks, connecting rods, paul and ratchet mechanisms, Hydraulic, Pneumatic, Electrical, Electronics and mechanical controls.

2. **Erecting and Testing**

   Equipment needed for erection - selection of location and environmental conditions - erection procedure for various prepress printing
and finishing equipments and machinery - loading and transport of raw materials and printed product with respect to layout design - commissioning.

3. Repairs and Reconditioning

- Principles of reconditioning - repair methods for various parts - Roler copperising and rerubberising - ebonite covering damping and inking systems - paper transport systems and feeder head.

4. Cylinders, Bushes and Bearings

- Cylinder construction - testing run out and taper - cylinder bearing supports - eccentric bushes - removal and fixing of bushes - changing of oil seals maintenance of bushes and bearings.

5. Maintenance procedures

- Need and importance of maintenance - Definition, types, Maintenance policies - Maintenance organization - Maintenance of pumps and compressor - Lubricants, their types and Characteristics, Lubricating methods - Central lubrication with return oil Manual lubricating Greases, oils, Greases, oils, grades - preventive maintenance, break down maintenance.


Recommended Books :-

1. Electrical Engg. By B.L. Thareja Part I & II
2. Theory of Machines By Khurmi & Gupta S.Chand Publisher New Delhi

NEWS PAPER TECHNOLOGY ( PT 803)

Introduction to Newspaper organization

- Newspaper Hierarchy - editorial organization, sources of news; mechanical aspects of newspaper organization - composition, printing the newspaper, basic operations - business aspects of newspaper organization, flow charts of staff in newspaper organization, Circulation and Advertisement departments, distribution channels.


Basics of Design

Newspaper layout & designing

Flow of stories into a newspaper office

Editorial Organization Newspaper Publishing
Sources of news wire services, syndicates. The role of copy editors, city editors, news editors, editorial cartoonist, artists, sunday editors, sports editor, business editor, journalist & reporters, Information to a printer by editor.

Recommended Books:
- News Reporting and writing - Melvin Mecher
- The Journalist; Handbook - M. V. Kamath
- Editing; A Handbook for Journalists - TJS George
- Telling Stories, Taking Risks - Klement/Mataline
- Journalism in India - R. Parthasarathy
- Headlines and Deadlines - Baskette, Floyd

NEWS PAPER LAB. (PT 808)
1. Introduction to type of Web Presses as per the configuration & end products.
2. Study of various units & their setting.
3. Study of pre-make ready & makeready operations.
4. Printing single & multicolour jobs.
5. Introduction to Digital presses & their working.
Printing Company Organization:

Printing management, principles, functions, Organizational criteria, Skills requirements, Types of business, Printing company management structures, Management team responsibilities, Business plan, Management styles, Management decisions, Communications, Print marketing and sales.

Human Resource Management Concepts:

HRM for printing, employment policy, evaluation of skills requirements for printing occupations, recruitment, job evaluation, staff appraisal, motivation training, human resources factors that limit productivity, staff flexibility. Manning and training requirements, States of industry, Analysis and development of human resources strategy. Management personal skills and development, job satisfaction through involvement.

Estimating:

Purpose and functions of estimating from printer point of view & customers point of view. Difference between costing & estimating. Qualifications of an estimator, working environment, estimators tools, estimating paper - selection of paper, allowance for waste,
allowance for trimming, weight of loose sheets, weight of a reel of paper. Estimating
Ink consumption formula, Ink allowance for spoilage. Estimating binding
materials - Board requirement, estimating covering materials, estimating sewing thread,
estimating stitching wire, estimating adhesives. Terms and conditions-approved by
AIFMD. Estimate Form and Computer Aided Estimating.

Costing:

Job costing, its need and procedures. Elements of cost and their method of recovery.

Recommended Books:
- Principles of Accounting - B. S. Raman
- Cost Accounting - B. R. Bhar
- Print Management - Derek Porter
- Printer's Costing & Estimating - B. D. Mendiratta
- Management Aspect of Printing Industry - T. A. Saifuddin.
- Printing Estimating Principle & Practice - Philip Kent Ruggles
- Print Production Management - Gray G. Field
- Principles of Applied Costing for Printing Industry - K. S. Venkataraman.

DIGITAL PRINTING (PT805)

Digital Documents

Introduction to Digital Printing fundamentals Pixel image, Digital image, Digitazation, Half
toning colour reproduction, colour jumps, resolution and its qualities.

ACquiring

Scanning of different original, Selection of technology of Programme. Transfer of Digital
Photographs.

Documentation

Image file formats

TIFF, EPS JPEG files text files and past description languages.

Digital Printing Processes

Silver faldire, Phermal, INkjet, electrostatic processes.

Rendering Typeline Art and images.

Colour management

Introduction and future, Characterizing input and output device use of CIELAB, CMS

Market & Applications:

Database Marketing’s Role:


Networking:


Recommended Books :

Digital Printing -
On Demand Printing - Howard M. Fenten, Frank J. Romano

PRINTING PLANT LAYOUT (PT806)

Site Selection:


Plant Layout:

Objectives of good plant layout, principles of plant layout, importance of plant layout, situations in which layout problem may arise, factors influencing plant layout, Methods of plant and factory layout-operation process chart, flow process chart, flow diagrams, string diagrams, machine data cards, templates three dimensional models, correlation chart, travel chart, load path matrix method. Types of plant layout -product layout or live layout - process layout or functional layout-combination layout - static layout or fixed position layout. Symptoms of bad layout. flow pattern-line flow, L type flow, circular flow, U type flow, S or inverted S combination of U and line flow pattern. Characteristics and place of application. Factors governing flow patterns: Combination of line flow and S type of pattern. Combination of line flow and circular type. Processing upwards. Retraction type, Inclined flow. Workstation design-Storage Space requirements.

Plant layout procedure:

Accumulate basic data, Analysis and coordinate basic data, decide the equipment and machinery required, Select the material handling system, sketch plan of the plot for making factory building. Determine a general flow pattern. Design the individual workstation. Assemble the individual layout into the total layout calculate storage space required. Make flow diagrams In work stations and allocate them to areas on plot plan, Plan and locate service areas, make
master layout. Check final layout, Get official approval of the final layout, install the approved layout.

**Factory Building (Press Building):**

**Plant layout-An analytical approach:**

**Recommended Books :**
- Facility layout and location - Richard L. Francis, John A. White.
- Computer Aided Production Management - Mahapatra
- Production and Operations Management - Michelmann Oakland, Lockyer
- Practical Plant Layout - Herold B. Maynard
- Industrial Engineering Management System - Dr. S. Dalela, Dr. Mansoor Ali
- Industrial Engineering & Management - O. P. Khanna
- Industrial Engineering and Production Management - M. Mahajan.

**PROJECT (PT 810)**
Project will be an innovative working model of machine/equipments used in Printing Industry with required modifications and will be demonstrated during examination with the help of project report by a group of maximum ten students under the guidance of project guide (Faculty member)