

**440 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

S. No.	Semester	Credits
1.	I	24
2.	II	27
3.	III	24.5
4.	IV	24.5
5.	V	25
6.	VI	25
7.	VII	25
8.	VIII	25
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

**GURU JAMBHESHWAR UNIVERSITY, HISAR
SCHEME OF STUDIES & EXAMINATIONS**

B. Tech. (Printing Technology) 1st YEAR (1st Semester)

CODE	Subject	L	T	P	CREDIT
HUM-101-E	Essentials of Communication	3	1	-	3.5
MATH-101-E	Mathematics –I	3	2	-	4.0
PHY-101-E	Physics-I	3	1	-	3.5
CH-101-E	Chemistry	3	1	-	3.5
EE-101-E	Electrical Technology	3	1	-	3.5
ME-105-E	Engineering Graphics & Drawing	1	-	4	3.0
CH-103-E	Chemistry Lab	-	-	2	1.0
EE-103-E	Electrical Technology Lab	-	-	2	1.0
PHY-103-E	Physics Lab	-	-	2	1.0
TOTAL					24.0

B. Tech. (Printing Technology) 1st YEAR (2nd Semester)

CODE	Subject	L	T	P	CREDIT
HUM-102-E	Communication Skills in English	3	1	-	3.5
MATH-102-E	Mathematics –II	3	2	-	4.0
PHY-102-E	Physics-II	3	1	-	3.5
CSE-101-E	Fundamentals of computers & programming	3	1	-	3.5
ME-103-E	Manufacturing processes	4	-	-	4.0
ME-101-E	E.M.E	3	1	-	3.5
ME-109-E	E.M.E Lab	-	-	2	1.0
PHY-104-E	Physics Lab	-	-	2	1.0
CSE-103-E	Computer Lab	-	-	2	1.0
ME-107-E	Workshop practice	-	-	4	2.0
TOTAL					27.0

B. Tech. (Printing Technology) 2nd YEAR (3rd Semester)

Course No.	Course Title	Teaching schedule				Credit
		L	T	P	Total	
PT 301	INTRODUCTION TO PRINTING PROCESSES	3	1		4	3.5
PT 302	TECHNOLOGY OF TYPOGRAPHY & TYPESETTING	3	1		4	3.5
PT 303	PRINTER'S SCIENCE	3			3	3
PT 304	<i>COMPUTER APPLICATION IN PRINTING</i>	3	1		4	3.5
PT 305	<i>THEORY OF PRINTING MACHINES</i>	3	1		4	3.5
PT 306	DIGITAL ELECTRONIC CIRCUITS	3			3	3
PT 307	PRINTING PROCESS LAB.			3	3	1.5
PT 308	TYPOGRAPHY & TYPESETTING LAB.			3	3	1.5
PT 309	COMPUTER APPLICATION IN PRINTING LAB.			3	3	1.5
	TOTAL					24.5

B. Tech. (Printing Technology) 2nd YEAR (4th Semester)

Course No.	Course Title	Teaching schedule				Credit
		L	T	P	Total	
PT 401	GRAPHIC DESIGN	3	1		4	3.5
PT 402	DESIGN & PLANNING FOR PRINT PRODUCTION	3	1		4	3.5
PT 403	FLEXOGRAPHY	3	1		4	3.5
PT 404	<i>PRINTING MATERIALS</i>	3			3	3
PT 405	<i>ELECTRONIC COMPOSITION</i>	3	1		4	3.5
PT 406	ELECTRICAL MACHINES AND ITS UTILISATION IN PRINTING	3			3	3
PT 407	ELECTRONIC COMPOSITION LAB.			3	3	1.5
PT 408	FLEXOGRAPHY LAB.			3	3	1.5
PT 409	GRAPHIC DESIGN LAB.			3	3	1.5
PT 410	INDUSTRIAL TRAINING					
	TOTAL					24.5

Note: Students will undergo for 4 weeks industrial training in vacation after 4th semester and it will be evaluated in 5th semester

GURU JAMBHESHWAR UNIVERSITY, HISAR SCHEME OF STUDIES & EXAMINATIONS

B. Tech. (Printing Technology) 3rd YEAR (5th Semester)

Course	Course Title	Teaching schedule	Credit
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No.		Teaching schedule			Total	
		L	T	P		
PT 501	REPRODUCTION TECHNOLOGY	3	1		4	3.5
PT 502	GRAVURE TECHNOLOGY	3			3	3
PT 503	<i>OFFSET TECHNOLOGY – I</i>	3	1		4	3.5
PT 504	<i>PRINTING IMAGE GENERATION-I</i>	3	1		4	3.5
PT 505	PRINT MEDIA ETHICS	3			3	3
PT 506	DVERTISING AND MULTIMEDIA	3			3	3
PT 507	REPRODUCTION TECHNOLOGY LAB.			3	3	1.5
PT 508	GRAVURE LAB.			3	3	1.5
PT 509	OFFSET TECHNOLOGY-I LAB.			3	3	1.5
PT 511	INDUSTRIAL TRAINING					1
	TOTAL					25

B. Tech. (Printing Technology) 3rd YEAR (6th Semester)

Course No.	Course Title	Teaching schedule			Total	Credit
		L	T	P		
PT 601	<i>PRINTING MANAGEMENT</i>	3			3	3
PT 602	<i>PRINT FINISHING</i>	3	1		4	3.5
PT 603	PRINTING SUBSTRATES	3			3	3
PT 604	<i>PRINTING INK TECHNOLOGY</i>	3			3	3
PT 605	<i>PRINTING IMAGE GENERATION-II</i>	3	1		4	3.5
PT 606	OFFSET TECHNOLOGY - II	3			3	3
PT 607	PRINT FINISHING LAB.			3	3	1.5
PT 608	PRINTING INK TECHNOLOGY LAB.			3	3	1.5
PT 609	PRINTING IMAGE GENERATION LAB.			3	3	1.5
PT 610	OFFSET TECHNOLOGY - II LAB.			3	3	1.5
	TOTAL					25

Note: Students will undergo for 6 weeks industrial training in vacation after 6th semester and it will be evaluated in 7th semester

GURU JAMBHESHWAR UNIVERSITY, HISAR
SCHEME OF STUDIES & EXAMINATIONS
B. Tech. (Printing Technology) 4th YEAR (7th Semester)

Course No.	Course Title	Teaching schedule				Credit
		L	T	P	Total	
PT 701	ENTREPRENEURSHIP DEVELOPMENT	3			3	3
PT 702	QUALITY CONTROL	3			3	3
PT 703	COLOUR SEPARATION TECHNIQUES	3	1		4	3.5
PT 704	<i>COMPUTER GRAPHICS IN PRINTING</i>	3	1		4	3.5
PT 705	<i>BOOK PUBLISHING</i>	3	1		4	3.5
PT 706	CONTINUOUS STATIONARY & SECURITY PRINTING	3	1		4	3.5
PT 708	QUALITY CONTROL LAB.			3	3	1.5
PT 709	COLOUR SEPARATION LAB.			3	3	1.5
PT 710	SEMINAR		1		1	1
PT 711	INDUSTRIAL TRAINING					1
	TOTAL					25

B. Tech. (Printing Technology) 4th YEAR (8th Semester)

Course No.	Course Title	Teaching schedule				Credit
		L	T	P	Total	
PT 801	PACKAGING TECHNOLOGY	3	1		4	3.5
PT 802	PRINTING MACHINERY MAINTENANCE	3			3	3
PT 803	NEWS PAPER TECHNOLOGY	3	1		4	3.5
PT 804	<i>PRINTER'S COSTING AND ESTIMATING</i>	3	1		4	3.5
PT 805	<i>DIGITAL PRINTING</i>	3	1		4	3.5
PT 806	PRINTING PLANT LAYOUT	3			3	3
PT 807	PACKAGING LAB.			3	3	1.5
PT 808	NEWS PAPER LAB.			3	3	1.5
PT 810	PROJECT			1	1	2
	TOTAL					25

HUM-101-E Essentials of Communication (BTech. Ptg. 1st Sem)

SYLLABUS

The course aims at inculcating a minimum level of language proficiency among students of Engineering and Technology. The purpose is to sensitise them to the nuances of English and its applications for various communication needs.

COURSE CONTENT:

Unit-I

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

Unit-II

Syntax: Sentence structures, Verb patterns and their usage

Unit-III

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.

Unit-IV

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

Unit-V

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

Unit-VI

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.

Unit-VII (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.

TEXT BOOKS:

1. *English for Students of Science* edited by A. Roy and P.L. Sharma, Orient Longman.
2. *Spoken English for India* by R.K. Bansal and J.B. Harrison, Orient Longman.
3. *Intermediate Grammar, Usage and Composition* by M.L. Tickoo and A.E. Subramanian, 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.
2. *A Practical English Grammar* by Thomson and Martinet, OUP, Delhi.
3. *Guide to Patterns and Usage in English* by A.S. Hornby, OUP, Delhi.
4. *A Textbook of English Phonetics for Indian Students* by T. Balasubramanian, MacMillan, Chennai.
5. *Better English Pronunciation* by J.D.O'Connor, Cambridge Univ. Press, London.
6. *English Vocabulary in Use* by McCarthy, Foundation Books (Cambridge University Press), Delhi.
7. *Assessing Listening* by Buck, Foundation Books (Cambridge University Press), 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, Logrithmic 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 :

1. Advanced Engineering Mathematics : F. Kreyszig.
2. Higher Engineering Mathematics : B.S. Grewal.

REFERENCE BOOKS :

1. Engineering Mathematics Part-I : S.S. Sastry.
2. Differential and Integral Calculus : Piskunov.
3. Advanced Engineering Mathematics : R.K. Jain and S.R.K.Iyengar
4. Advanced Engg. Mathematics : Michael D. Greenberg

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.

PHY-101-E Physics-I (B.Tech. Ptg. 1st Sem)

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)
2. Physics Vol-I & II – Resnick & Halliday (Wiley Eastern)
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.

CH-101-E Chemistry (BTech. Ptg. Ist Sem)

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 (H_2O 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 :

Water & its treatment : Part I – Sources of water, impurities in water, hardness of water and its determination, units of hardness, alkalinity of water and its determination, Related numerical problems, scale and sludge formation (composition properties and methods of prevention).

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.).
2. Chemistry in Engineering & Tech., Vol.I & II, Rajaram, Kuriacose (TMH).

REFERENCE BOOKS :

1. Instrumental methods of Chemical Analysis, MERITT & WILLARD (East-West Press).
2. Physical Chemistry, P.W. Atkin (ELBS, Oxford Press).
3. Physical Chemistry, W.J. Moore (Orient-Longman).

EE-101-E Electrical Technology (BTech. Ptg. Ist 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 :

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

UNIT3. 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.

UNIT4. SERIES AND PARALLEL A.C. CIRCUITS :

Series and parallel A.C. circuits, series and parallel resonance, Q factor, cut-off frequencies and bandwidth.

UNIT5. 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.

UNIT6. TRANSFORMERS :

Principle, construction & working of transformer, Efficiency and regulation.

UNIT7. ELECTRICAL MACHINES :

Introduction to D.C. Machines, Induction motor, Synchronous machines.

UNIT8. 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 (BTech. 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 :

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

UNIT3. 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.

UNIT4. SERIES AND PARALLEL A.C. CIRCUITS :

Series and parallel A.C. circuits, series and parallel resonance, Q factor, cut-off frequencies and bandwidth.

UNIT5. 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.

UNIT6. TRANSFORMERS :

Principle, construction & working of transformer, Efficiency and regulation.

UNIT7. ELECTRICAL MACHINES :

Introduction to D.C. Machines, Induction motor, Synchronous machines.

UNIT8. MEASURING INSTRUMENTS :

Voltmeter, Ammeter, Watt meter, Energy meter.

TEXT BOOKS:

1. Basic Electrical Engg (2nd Edition) : Kothari & Nagarith, 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.

ME-105 E Engineering Graphics And Drawing(BTech. Ptg. 1st Sem)

L	T	P	Total Credit	Duration of exam
1	4	3		3 Hours

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

1. Engineering Drawing Plane and Solid Geometry : N.D. Bhatt and V.M.Panchal, Forty-Fourth Edition 2002, Charotar Publishing House.

Reference Books

1. Engineering Graphics and Drafting : P.S. Gill, Millennium Edition, S.K. Kataria and Sons.
2. A Text Book of Engineering Drawing : S.B. Mathur, Second Revised and Enlarged Edition 2000, Vikas Publishing House.
3. Engineering Graphics using AUTOCAD 2000 : T. Jeyapoovan, First Edition 2002, Vikas Publishing House.

CH-103 Chemistry Lab. (BTech. Ptg. 1st Sem)

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.
9. Estimation of calcium in lime stone and dolomite.
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.)
2. Essential of Experimental Engineering Chemistry, Shashi Chawla, Dhanpat Rai Publishing Company.
3. Theory & Practice Applied Chemistry – O.P. Virmani, A.K. Narula (New Age)

EE-103-E Electrical Technology Lab (BTech. Ptg. Ist Sem)

SYLLABUS

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.
- 10.To perform O.C. and S.C. tests of a three phase induction motor.
- 11.To study various type of meters.
- 12.Measurement of power by 3 voltmeter / 3 ammeter method.
- 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.

PHY-103-E : Physics Lab.-I (BTech. Ptg. 1st Sem)

SYLLABUS

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)
2. Practical Physics – S.L.Gupta & V.Kumar (Pragati Prakashan).
3. Advanced Practical Physics Vol.I & II – Chauhan & Singh (Pragati Prakashan).

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

HUM-102-E Communication Skills In English (BTech. 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
2. *Common Errors in English*, Abul Hashem, Ramesh Publishing House, New Delhi.
3. *Objective English*, Tata Mc. Graw Hill Publishing Company Ltd., New Delhi.
4. *Spoken English for India*, R.K. Bansal & J.B. Harrison, Orient Longman, Delhi.
5. *The sounds of English*, Veena Kumar, Makaav Educational Software, New Delhi.
6. *English Phonetics & Phonology*, P. Roach, Cambridge University Press, London.
7. *English for Engineers and Technologists: A Skill Approach*, Vol. 2, Orient Longman, Delhi.
8. *Business Communication*, M.S. Ramesh and C.C. Pattanshetti, R.Chand and Company, Delhi
9. *Group Discussion*, Sudha Publications/Ramesh Publishing House, 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.

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 independence of vectors, 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

Ordinary Differential Equations & its Applications : Exact differential equations. Equations reducible to exact differential equations. Applications of Differential equations of first order & first degree to simple electric circuits, Newton's law of cooling, heat flow and orthogonal trajectories.

Linear differential equations of second and higher order. Complete solution, complementary function and particular integral, method of variation of parameters to find particular Integral, Cauchy's and Legendre's linear equations, simultaneous linear equations with constant co-efficients. Applications of linear differential equations to simple pendulum, oscillatory electric circuits.

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.

Partial Differential Equations and Its Applications : Formation of partial differential equations, Lagrange's linear partial differential equation, First order non-linear partial differential equation, Charpit's method. Method of separation of variables and its applications to wave equation and one dimensional heat equation, two dimensional heat flow, steady state solutions only.

TEXT BOOKS :

1. Advanced Engg. Mathematics F Kreyszig
2. Higher Engg. Mathematics B.S. Grewal

REFERENCE BOOKS :

1. Differential Equations – H.T.H. Piaggio.
2. Elements of Partial Differential Equations – I.N. Sneddon.
3. Advanced Engineering Mathematics – R.K. Jain, S.R.K. Iyengar.
4. Advanced Engg. Mathematics – Michael D. Greenberg.

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 (BTech. 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, Schrodinger wave equations - time dependant and time independent Schrodinger 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)
3. Fundamentals of Solid State Physics – B.S.Saxena, R.C.Gupta and P.N.Saxena (Pragati Prakashan).

REFERENCE BOOKS :

1. Solid State Physics – Pillai (New Age).
2. A text book of Engg. Physics – Avadhanulu and Kshirsagar (S.Chand)
3. Quantum Mechanics – Ghatak & Loknathan.

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.

CSE -101 E Fundamentals of Computers & Programming in C

(BTech. Ptg. 2nd Sem)

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-2: Operating System Basics: The user Interface, Running Programmes, Managing files, Introduction to PC operating Systems: Unix/Linux , DOS, Windows 2000.

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-4: Programming Languages: Machine-, Assembly-, High Level- Language, Assembler, Compiler, Interpreter, debuggers, Programming fundamentals: problem definition, algorithms, flow charts and their symbols, introduction to compiler, interpreter, assembler, linker and loader and their inter relationship.

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 Edi, Brian K Williams & Stacey C. Sawyer, 2003, TMH
- The C Programming Language by Dennis M Ritchie, Brian W. Kernigham, 1988, PHI.
- C Programming – A modern approach by K.N. King, 1996, WW Norton & Co.

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.
- Using Computers and Information by Jack B. Rochester, 1996, Que Education & Training.

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	Introduction: Introduction to Manufacturing Processes and their Classification. Industrial Safety; Introduction, Types of Accidents, Causes and Common Sources of Accidents, Methods of Safety, First Aid.
Unit II	Engineering Materials: General Properties and Applications of Engineering Materials, Mild Steel, Medium Carbon Steel, High Carbon Steel, High Speed Steel and Cast Iron.
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	Cold Working (Sheet Metal Work): Sheet Metal Operations, Measuring, Layout Marking, Shearing, Punching, Blanking, Piercing, Forming, Bending and Joining Advantages and Limitations. Hot Working Processes: Introduction to Hot Working, Principles of Hot Working Processes, Forging, Rolling, Extrusion, Wire Drawing..
Unit V	Introduction to Machine Tools: Specifications and Uses of commonly used Machine Tools in a Workshop such as Lathe, Shaper, Planer, Milling, Drilling, Slotter, Introduction to Metal Cutting. Nomenclature of a Single Points Cutting Tool and Tool Wear. Mechanics of Chips Formations, Type of Chips , Use of Coolants in machining.
Unit VI	Welding: Introduction to Welding, Classification of Welding Processes, Gas Welding: Oxy-Acetylene Welding, Resistance Welding; Spot and Seam Welding, Arc Welding: Metal Arc, TIG & MIG Welding, Welding Defects and Remedies, Soldering & Brazing.
Unit VII	Plant Layout, Objectives of Layout, Types of Plant Layout and their Advantages.

Text Books :

1. Workshop Technology Volt.I & II - Hazra & Chaudhary, Asian Book Comp., New Delhi.
2. Process and Materials of Manufacture -- Lindberg, R.A. Prentice Hall of India, New Delhi.
3. Principles of Manufacturing Materials and Processes - Campbell, J.S.- McGraw- Hill.

Reference Books:

1. Manufacturing Science - Amitabha Ghosh & Ashok Kumar Malik, - East-West Press.
2. Manufacturing Process and Systems - Ostwald, Munoz , John Wiley.
3. Workshop Technology, Vol. 1, 2 & 3 – Chapman, WAJ, Edward Arnold.

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 (BTech. 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:

Definition of machine, Velocity ratio, Mechanical advantage, Efficiency, Laws of machines, Reversibility of machine, Wheel and axle, Differential pulley block, Single, double and triple start worm and worm wheel, Single and double purchase winch crabs, Simple and compound screw jacks. Problems.

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, Poisson'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:

1. Strength of Materials - G.H. Ryder, Pub.- ELBS.
2. Hydraulic and Fluid Mechanics – Modi and Seth, Pub. – Standard Book House, New Delhi
3. Engineering Thermodynamics – C.P. Arora, Pub. - TMH, New Delhi
4. Thermal Engineering – A.S. Sarad, Pub. - Satya Prakashan, New Delhi.
5. Engineering Mechanics – K.L. Kumar, Pub. - TMH, New Delhi.
6. Theory of Machines – S.S. Rattan, Pub. – TMH, New Delhi.

Reference Books:

1. Strength of Materials – Popov, Pub. - PHI, New Delhi.
2. Hydraulic Machines – Jagdish Lal, Pub.- Metropolitan, Allahbad.
3. Thermal Science and Engineering – D.S. Kumar, Pub. – Kateria & Sons, New Delhi.

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.

ME- 109 E Elements of Mechanical Engineering Lab. (BTech. Ptg. 2nd Sem)

SYLLABUS

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 study 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.

PHY-104-E : Physics Lab.-II (BTech. Ptg. 2nd Sem)

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 coefficient 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)
2. Practical Physics – S.L.Gupta & V.Kumar (Pragati Prakashan).
3. Advanced Practical Physics Vol.I & II – Chauhan & Singh (Pragati Prakashan).

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 male 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.
10. Represent a deck of playing cards using arrays.
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

3.Basic operations in printing :Pre press, press and post press operations.

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.LetterPress 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.

8.Screen Printing:

History of Screen Printing, Stencils - Their kinds and methods of preparation.Screenmaterials. Screens - multifilament, mono filaments, Selecting mesh material, stretching screenfabric to frame, screen preparation, screen reclamation - Trouble shooting clogged screens. Care and storage of screens. Image transfer – The squeegee, Squeegee considerations, squeegee preparation, hardness categories of squeegee blades, Variety of blade, its shape and application. Screen ink- its kinds and uses for different substrates and drying methods.

9.Screen Printing Machines:

Their kinds and working principles and methods. Method of halftone preparation for screen printing. Drying Equipments- Drying racks, wicket dryers, Jet dryers, Infrared dryers, Ultraviolet dryers. Flocking process.

10.Screen Printing Substrates:

Introduction, Paper and Paper board, Wood, Textiles, Plastics, Metals, Ceramics and glass. Specialized Areas - Printed circuit boards of screen printing.

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.
3. Printing of line & half tone block in single & multi color.
4. Schematic diagram of different letter press Printing Machines.
5. Study of Running & printing faults on letter press machine.
6. Study of various types of screen materials.
7. Screen stretching techniques.
8. Operating of automatic machine.
9. Stencil preparation - Direct, Indirect, Direct/Indirect, Capillary stencil preparation.
10. Multi color printing of visiting cards, greeting cards, letter heads, certificates, invitations, folders, cover pages, photographs.
11. Printing on various substrates - wood, leather, textile, acrylic, metal, paper & paper products, plastics.
12. Screen printing on Irregular Surfaces - Bottles, Ceramics, Glass.
13. Screen printing on printed circuit boards (PCB)
14. Screen Reclamation

TECHNOLOGY OF TYPOGRAPHY & TYPESETTING (PT302)

1. Definition, concept and scope
2. Printing type, definition, its two-dimensional and three-dimensional concept.

3. Dimensions of printing types.
4. Printers Measurement and Systems: Point System, other units of measurements and application.
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.
14. Imposition, Sheetwork, Half-sheet work, Work and tumble & Work and twist. The regular schemes up to 32 pages (upright and landscape).
15. Planning of composition department, Floor plan and arrangement of equipment.

Recommended Books :

- | | | |
|----|----------------------------------|-----------------------|
| 1 | Theory & practice of composition | By A.C. Goel |
| 2 | Composing & typography Today | By B.D. Mehendirutta. |
| 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.
12. Composing exercises.

PRINTER'S SCIENCE (PT303)

1. Colloids :Characteristics, Proportion, application in Printing Industry.
2. Theory of Electrodeposition, Printing equipments, factors affecting nature of Electrodeposit, chromium Plating, Anodising of metal.
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 hydrophilic, surface water and ink interaction.
7. pH : pH colorimetric method of determining pH; method of determining pH, pH of paper, ink, pH application in Printing.
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.
9. Optical Instruments - Photographic cameras, Depth of Focus, Telephoto Lens, Visual Angle, Angular Magnification, Magnifying Glass, Simple Microscope, Reflection, Transmission, Opacity, Density, Introduction to Densitometer and its types.
10. Effect of light on different plate and film coatings, adhesives & Ink -films, Light fastness 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 specification) BIOS. BIOS compatibility, Expansion slots, parallel serial port power supply SMPS – specialization, Bus- AT bus, PCI, ISA bus.
3. Mass storage technology – data organization – cache operation, FDD, HDD, SCSI driver their storage capacity drives, Compact Disc.

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 : Qukarkx Press
3. Page Maker 6.0 : BPB Publication.

COMPUTER APPLICATION IN PRINTING LAB. (PT309)

1. Introduction to Computer Terminologies.
2. Use of different Hardware devices.
3. Word-Processing Softwares.
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.
9. Image and Text merging.
10. Modifications and Editing of Illustrations and Text.
11. Using various tools of Printing Softwares.
12. Working of Printers.

THEORY OF PRINTING MACHINES (PT305)

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

Rack and Pinion, Ratchet and Pawl arrangements, gear trains, applications. Metrology of cams, gear, screw thread, their measurement methods. Synthesis of mechanisms, Geneva mechanism, intermittent mechanism.

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 Vikev Theory of Machine & Mechanisms

McGraw Hill International Boom company.

(4) Khurmi, Gupta; Theory of Machine S. Chand Publisher New Delhi.

DIGITAL ELECTRONIC CIRCUITS (PT306)

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:

NAND gate latch, NOR gate latch, SR flip-flop, D flip-flop, JK flip-flop and T flip-flop, clocked flipflops, edge-triggered flip-flops, flip-flop conversions.

Sequential Logic Circuits:

Comparison between combinational and sequential logic circuits, shift registers, SISO, SIPO, PISO and PIPO shift registers, ring counter, Johnson 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:

Variable-Resistor network, binary ladder, D/A converter. D/A accuracy and resolution, A/D converters- simultaneous conversion, counter method, continuous conversion, successive approximation method, single slope and dual slope A/D converters.

Digital Camera and Digital Scanner.

Recommended Books :

1. Digital Electronics – **Malvino**.
2. Digital Electronics – **Gothman**.
3. Digital Principles and Applications - **Donald P Leach, Albert Paul Malvino**.
4. Digital Systems-Principles and Applications - **Ronald J.Tocci**.

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
9. Design with D.T.P. : Various software's used for designing.
10. Selection of an appropriate printing process for printing of a job.
11. What is 3D? Visualizing three dimensional effects, from 2D drawings .
12. Perspective : sense of perspective drawing.
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
3. Handbook of Advertising Art Production by schelmmmer.
4. Art & Production by Sarkar.
5. Advertising, Art & Production by J. Nath.
6. A.C. Book (C.D.) so hick, Fundamental of copy and layout , Crair Book.

GRAPHIC DESIGN LAB. (PT407)

1. Stationary and small sales literature.
2. Direct mail.

3. Folders - Single fold & Double fold.
4. Sticker – Two colours.
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.
9. Printing inks: Demonstration system.
10. Knowledge of different computer commands.
11. Color wheel
12. Designing of visiting card. Letterhead, Envelop, Bill form, Receipt, Invitation card, Posters, Title page of a Book, Magazine Cover page.

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:

Methods of preparing a design in various stages. Design for books, magazines, newspapers, catalogues, cartons and commercial stationery. Materials and tools used in preparing layouts and artwork. Copy preparation. Casting-off and marking-up.

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. - **Murray(Ray)**.
- Lithographic Press Work. - **A. S. Porter**.
- Principle of CAD.- **Rooney J. & Steadman P**.
- Advertisement Management. - **David A. Akar & John G. Myers**.
- Elements of Cartography. - **Arthur Robinson, Randall Sale & J. K. Morrison**.
- 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:

Introduction. Plates for printing Rubber plates , its kinds and methodes of preperation, Photopolymer plates its kinds and methodes of preperation, care handling and storage of flexographic plates.

The Printing press:

Flexo press types - Stack press, Central impression cylinder press, Inline press, Tension control in flexographic m/c, Unwind equipments - general, single-position unwind - flying-splice unwind, unwind tension systems, cooling drum and out feed unit. Rewind equipments - surface winders, center winders, rewind tension systems. Web guides. Printing stations - two roll, anilox roll, reverse angle doctor blade system, Deck control, Continuous inking, side and circumferential register control, Dryers. Mechanical components - CI drum, plate cylinders. Anilox roll - construction, cell structure, anilox roll wear, selecting the right anilox roll, chrome plating. Fountain rolls - formulating rubber for rolls, Flexo roller covering, Care of covered rolls.

Mounting and Proofing:

Introduction. Checking the equipment. Operation care of equipment. Understanding the mounting instructions. Mounting and proofing a complete line job - proofing the first set of plates, proofing for printability, methods of prepress makeready, wrapping mounted cylinders. Miscellaneous procedures - removing plates from the cylinder, mounting metal-backed plates, reusing sticky back, plate staggering, use of release agents. Tools for the operator. Basic requirements for process colour printing. Press room practices. Environment and safety concerns.

Flexo graphy 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:

Flexo graphic substrates. Narrow web presses-Narrow web press components, Future narrow web flexography. Wide web presses. Corrugated presses. Pre printed liner presses. Future of Ink distribution system. Tomorrows flexographic plates. News print for water-base flexography. Markets for today and tomorrow.

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.
8. Printing a various substrates i.LDPE, ii.HPDE, iii.Paper, iv.Aluminium foil.
9. Studying modern flexo machines with inline operations.

PRINTING MATERIALS (PT404)

Metals

Type of metals and characteristics of metals used for type alloys for foundry types, hot metal composition and stereos 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

A brief Survey of materials handling and storage, Handling and storage of paper, printing surfaces, films, chemicals and other printing materials Systems and methods of storage. Precautions in handling, storage, use and care of various printing substrates, materials and chemicals. wasteage reduction. Receiving, storage and delivery of raw, semi finished and finished products.

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 Preparation by C. S. Mishra

ELECTRONIC COMPOSITION (PT405)

Elements in copy preparation:

Preparing copy for press, Acquisition of Text- Automatic input, human input, keyboards, offline, online, optical character recognition, working principle, factors affecting performance, automatic voice recognition, desktop scanners, pointing device, mouse, light pen, touch screen. Proofing, different proofs. Proofing stages, proof correction marks, correction of type set matter. Text transferring data - capture device, telecommunications, modems, ISDN. Typesetting commands - code syntax, menu driven systems. General rules of page make up. Composition Software - Automatic Page Make up, Text and graphics Integration, Page display.

Typesetting methods:

Hot type composition, Cold Type, Photolettering, Photo composing -Introduction, Advantages, Basic principle, image setter, film transport system in autologic information APS 3850, film transport system in DS Katana image setters. Price, Laser type, Processing, environmental issues, other factors. Small, Medium and Large format image setters. Page description languages. Post Script Language – Introduction. PostScript Fundamentals-Structure of PS file, Post Script code, The user space, Encapsulated P.S., Images, Postscript colour processing, The printer driver, P.S.errors, Post script limitations, Adobe acrobat..

Desk Top Publishing:

Introduction, Origin, components of DTP, applications of DTP. Benefits of DTP. Developments. Output quality, output speed, output & color input, page make up. IBM-PC and DTP. Software for DTP – word processing-heavy duty programmes, medium duty programmes, light duty programmes. Graphic programs. Illustration programs, Business Graphics, CAD design programs, Type manipulation software, OCR software, Image software. Presentation graphics. Image editing commands-crop, marquee tools, cloning tool, cut & paste, image filters. Page make up software – approach, typography, document & text handling, applications. Standard program features – Adobe PageMaker, Ventura Publisher, Quark Xpress, Letraset Ready set G, Design studio, Frame maker. Desk Top colour – spot colour v/s full colour. Hardware & software for colour. Peripherals & add ons – front–end peripherals, graphics tablets, scanners for text, line art & images, video digisters, fax adaptors, music & sound digisters. DTP as a typesetting front end – distributed desktop, DTP solution, systems from traditional suppliers. Linking PC's, Mac and other computers – disk transfer file translation, transfer by cable or modem.

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 :

Desk Top Publishing 4th edition – **Kirby wilson, Davis, Ron Strutt.**

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**

Composing and

Typography Today - **Mendiratta.B.D.** Hand Book of Typography - **Kailas Takle.**

Guide to DTD-**James Cavuoto**

Printing 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 pamphlets, page make up of advertisements, 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, designing and practicing.
6. Comparing various outputs – Dot matrix, Inkjet printer, Laser printer, Digital printer.

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.
3. Single Phase Motors : Types, single phase induction motor Principles of operation of induction-motor , Repulsion motor, A.C. series motor, Application.
4. Measurement of power in Three phase circuit by three wattmeter method, Two Wattmeters method, Single Wattmeter method.
5. Three Phase Induction Motor : Basic principle of operation, cause of rotating rotor, Slip frequency of rotor current, Relation between torque and rotor power factor, starting Torque for squirrel cage Induction motor, Starting torque for slip ring induction motor, Condition for maximum torque, Effect of rotor resistance on torque, torque-slip characteristics, Different type of starters. Applications of 3 phase induction motor, Circle diagram.
6. Electrolytic Processes : Introduction, Electrolyte, ionisation, Definition of various terms used in electrolysis, Faradays' laws of electrolysis, Extraction of metals, Refining of metals, electrodeposition, power supply for electrolytic processes.

7. Illumination : Introduction, Nature of light, Units, Luminous efficiency glare, Production of light : Light production by excitation, Ionisation, Incandescence.
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.
8. Electric Welding : Principle, Resistance welding, Arc welding, Automatic hydrogen, A.C. & D.C. welding, welding transformer.
9. Electric-heating : Introduction, Resistance heating, Direct resistance.
10. Consideration and selection of electric motor for different industrial drives.

Recommended Books :-

Elements of Electrical Engg. By B.L. Theraja, Vol. I, II

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.
7. Half tone exposure : Special features of half tone exposure. Factors affecting the halftone exposure Basic halftone exposure setting on ordinary and computerized camera with off-line and on-line densitometer.
8. Contrast control : Contrast with glass screen : S.D. variation, multiple stop system (brief study) Contrast control with contact screens Determining B.D.R. and main exposure of the contact screen, Highlight compensation, Use of CC filters with magenta contact screen determining CC filters and exposure calculations.
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

12. Colour reproduction : Defination and concepts Introduction to Corpuscular and Wave nature of light The visible specturm Additive systhesis and subtractive synthesis Additive and subtractive combination for graphic for reproduction and practical interpretation of colour-theories.
13. Mechanism of vision and theories of colour-vision.
14. Colorimetric Properties, Colour and appearance measurement. Introduction to Colorimeter and Spactrometer.
15. Colour separation :
 - a)FAKE colour reproduction
 - b)Filters- Colour seperation filters and other filters ; Overlap in the filters. Wide band and Narrow cut Filters factors and filter ratios.
 - c)Screen angles-Moire, juxtaposing rosettes. Basic rules in angular adjustment. Reproduction of Pre-Printed color originals.
 - 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:

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

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

REPRODUCTION TECHNOLOGY LAB. (PT507)

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

GRAVURE TECHNOLOGY (PT502)

Gravure:

History of gravure, Gravure products and markets - Publication gravure - gravure packaging and converting - product gravure. Gravure Screens. Gravure cylinder preparation - Diffusion etch - Direct Transfer-Electromechanical process - Laser cutting. Electronic engraving systems today. Chemical engraving methods and equipments - cell configurations-advantages and disadvantages. Cylinder correction methods - Re-etching electro mechanical engravings, Colour balance etches, spot plating. Well formation - variables, basic types. Cylinder construction and preparation - Cylinder design, types. Balancing the cylinder. Copper plating and polishing, Reuse of cylinders. Doctor blade - Doctor blade assembly - Blade angles. Blade distance from Nip, Blade edge, Blade mounting. Doctor Blade wear - Fatigue, Corrosion, Abrasive, Adhesive wear, Doctor blade materials, Doctor blade Holder configurations, Blade setting procedures, Preparing blade for use, Doctor blade problems. Gravure Impression Roller - function, Roller covering, Roller pressure, Cylinder diameter, Roller design & configuration. Balance-static & Dynamic. Roller setting. New developments. Storage of impression rollers. Impression roller problems. Impression mechanisms-mechanical, Hydraulic, Pneumatic.

Gravure Press and Its components:

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

Gravure Substrates:

Paper substrates-Roto news papers, Coated papers, Gravure packaging paper substrates - properties. Label stock, Paper board. Non Paper substrates - surface preparation, plastics-properties. Metalized films - Aluminium foil, Foil laminations. Gravure advantages, limitations. Future of Gravure Printing Industry.

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

OFFSET TECHNOLOGY – I (PT503)

Basic principles in planographic printing:

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

Inking system:

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

Dampening system:

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

Printing unit:

Introduction. Cylinder gears - spur gear, helical gear, bevel gear. Cylinder design. Plate cylinder - cylinder driving, cylinder body, cylinder gap, plate clamping, plate punching, bearer contact cylinder, bearer gap cylinder. Plate mounting. Determining packing requirements , - Packing material, problems due to improper packing. Blanket cylinder - Introduction, functions,

manufacture, selecting grade of blanket performance requirement. Types of blanket. Blanket squaring. Blanket punching. Mounting the blanket. Recovering from blanket smash. Use of slightly damaged blanket. Care of blanket, blanket cleaning device. Impression cylinder.

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 multicolour 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 Lithography	Modern
Introduction to Printing Technology - Hugh M Speirs . Operation- GATF .	Sheetfed Press
Offset Technology – C.S.Mishra . Manual	Lithographers
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.
6. Single colour printing.
7. Two colour printing.
8. Four colour printing.
9. Effect of ink and water on the print quality-use of densitometer.
10. Effect of impression pressure on print quality-use of feeder gauge.
11. Effect on colour sequence on print quality-transparaency and opacity of inks.
12. Ink trapping and back trapping- effect of tack, printing speed, ink film thickness.
13. Printing a second colour on a printed sheet problems involved and overcoming them, adjustment of lays, change of packing etc.
14. Identification of printing faults in the given samples-reasons and remedical actions.
15. Mixing of process inks to the shade for a given colour patch-effect of paper and ink film thickness.

PRINTING IMAGE GENERATION - I (PT504)

Assembly of film images:

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

Screen printing, Heat transfer printing, Collotype:

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

Planographic plates:

Introduction. Light sensitive coating -dicromated colloids, diazo compounds, photo polymers, diffusion and transfer methods, electrostatic. Sensitivity of coating to light. Dye-sensitized photo polymerization, dark reaction, post exposure, safe lights, reciprocity law. Action of light sources on coatings, stabilities of coatings. Plate materials - zinc, aluminum, brass, copper, steel, chromium. Action of oil and water on metal - contact angle. Ability to withstand cracking. Susceptibility to dot sharpening. The plate base - cross section of an aluminum plate, cross section of an a plastic plate. Graining of plates - mechanical graining, electrochemical graining. Anodized aluminum, plate washes. Paper plates, paper aluminum laminates, plastic plates. Light sources for plate making - spectral data for various light sources, metal halide, mercury lamps, pulsed - xenon, laser. Treatment of nonimage areas - desensitizing gum,chemistry of gum arabic, other natural & synthetic gums. General processing sequence fo a negative working plate. General processing sequence for a positive working plates. Negative

working plates- additive presensitized plates, subtractive diazo PS plates, photo polymer presensitized plates, aqueous developable plates, driographic plates, multimetal plates. Producing a multimetal plate. Types- bimetallic, trimetallic. 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:-

Heidelberg DI Press- Manual

Chemistry for Graphic

Arts - **Dr. Nelson R. Eldred.**

Printing Technology 3rd

Offset Plate Making - **Robert F. Reed.**

Edition. - **Adams, Fax & Rieber.**

Sheetfed Offset Press

Screen Process Printing - **John Stephens.**

Operating - **Lloyd P. Dejidas.**

Stripping - **Harold L.**

Flexography Premier - **Donna C. Mulvihill.**

Peck.

Selecting The Right

Gravure Process And Technology –GAA.

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:

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

Work life In Indian Philosophy:

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

Attitudes, Beliefs & Life Positions:

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

Overview of the Ethical Value System:

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

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

Relationship between Law and Ethics. Role of the Government of India in enforcing ethical behaviour. The Indian Constitution; Indian Business Laws and their impact on Ethical business behaviour - (a) Business Laws & (b) Labour Laws; Conclusion. Relationship Between Ethics & Corporate Excellence - Corporate Mission Statement, Code of Ethics, Organizational Culture, Ethics & Individual Behaviour - Areas of Influence or Areas of Authority and Areas of Interest. Education without Character, Commerce without Morality, Pleasure without Conscience, Wealth without Work, Science without Humanity.

Social and Economic Responsibilities of Business:

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

Laws, Safeguard the health and well-being of customers; A Look at Social Performance of Business. Economic Responsibilities of Business.

Recommended Books:-

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

ADVERTISING AND MULTIMEDIA (PT 506)

Advertisement

- 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.

Advertisement Budgeting

Methods, determining and appropriation.

Advertisement 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. Read-ership, viewership (target audience), OTS, TRP, circulation.

Advertisement Agency

Structure and function, choosing advertisement agency, advertisement law.

Advertisement and Computers

Introduction, role of computers in advertisement, animation, application of softwares like photoshop, coreldraw, quark-express etc.

Public Relations

Definition, concept and role of public relations in public and corporate sector. Tools of public relations including internet. Image building and public relation campaigns. Marketing-Mix and promotional mix

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

PRINTING MANAGEMENT (PT601)

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

2. Management – Nature scope and importance of Management, Functions of Management –Scientific, Management, CPM & PERT (Introduction).
3. Production and operations Management – Locations and Layout of plant, Maintenance management. Quality assurance, Total quality management (TQM), ISO.
4. Marketing management – Marketing and its functions, distribution channels, salesmanship and advertising.
5. Human resource management: Manpower planning – recruitment, selection, Training performance appraisal Wage and salary administration.
6. Financial Management, Nature, Scope objectives and functions of Financial Management.
7. Work flow and organizational structure in a printing press.
8. Cost Accounting: Cost concept, cost sheet, B.E.P.analysis, cost reduction and cost control.
9. Depreciation - Introduction to different methodes and their comparison.

Recommended Books :-

1. T.A. Saifuddin – Management aspects of printing industry by Nirmal Sadanadn Publishers, Mumbai, 1st edition.
2. G.G. Field- Printing Production Management by Graphic Arts Publishing, 1996.
3. Balaraman – PMCA by Ramaya Features & publications, 1987.
4. Mendiratta B.D. – Estimating & Costing by Print Trade Publications, 1999-2000.
5. Ruggles – Printing Estimating Principles and Practices by Delmer Publication 1985.
 - (1.) Maintenance Engineering Handbook
 - (2.) Lindley R. Higging, Mc Graw Hill International Edition.
 - (3.) Operator's Manually by GATF.
6. R.D. Aggarwal-Organisation and Management-Tata McGraw Hill Publishing Ltd., New Delhi

PRINT FINISHING (PT602)

Introduction:

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

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

Structure Of A Book:

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

Securing Methods:

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

End Papers:

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

Finishing Processes:

Cover Decoration & Other Processes. Print Finishing Operations - Embossing & Debossing, Blind Embossing, Gold Blocking /Foil Stamping. Die Printing. Thermography, Velvet Printing, Marbling, Varnishing, Graining, Laminating, Gumming, Gluing, Punching, Perforating, Drilling. Label Puching, Appliqué. Edge Decoration - Requirement, Colouring The Edges, Marbling Edges, Edge Gilding. Round Corner Cutting. Numbering - Folio Numbering, Double Numbering, Duplicate Numbering. Principle of Rotary Numbering. Skip Numbering, Automatic Numbering. Kindes of Indexes. Ruling - Principle Of Pen & Disk Ruling M.C. Ruling Terms. Banding & Lacing, Poly Bagging, Mailing, Creasing, Bundling, Tacketing. Ultra Violet Curing & Infra Red Curing.

Binding & Finishing Machines:

Study Of Various Modern Machines. Modern Guillotines - Single Knife Guillotines. Three Knife Trimmers. Knife Grinding M/C. Gold Blocking/Foil Stamping M/C. Wire Stitching M/C. Straw Board Cutter. Laminating M/C - Small Laminating M/C. Pouch Laminating M/C. Tunnel Laminating M/C. Tipping M/C. Smashing M/C. Back Gluing M/C. Roller Gliding M/C. Inline Rounding M/C. Lining M/C. Modern Lining M/C. Cloth Cutting M/C. Foil Blocking M/C. Rotary Blocking M/ C. Casing In M/C. Case Making M/C. Box Waste Disposal Process. Box & Carton Manufacturing Process. Adhesive binding machine.

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		
Finishing Process in Printing - A.G.Martin.		

PRINT FINISHING LAB. (PT607)

- I. Preparation of the following types of books.
 1. Quarter bound a/c books by - French sewing method, Tape sewing method, Cord sewing method, Saddle sewing method, Side sewing method, Whip sewing method.
 2. Half bound a/c books by - French sewing method, Tape sewing method, Cord sewing method, Saddle sewing method, Side sewing method, Whip sewing method.
 3. Full bound a/c books by - French sewing method, Tape sewing method, Cord sewing method, Saddle sewing method, Side sewing method, Whip sewing method.
- 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.

PRINTING SUBSTRATES (PT603)

Paper:

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

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,

thickening and storage. Deinking chemistry. Bleaches - Hydrogen peroxide, Oxygen & Ozone bleaching, reductive bleaching agents, chelating agents, sodium silicate, catalase enzyme, agglomerating chemicals, surfactants. Biodegradation of surfactants, dispersants and the principles of washing.

Choosing a suitable paper:

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

Introduction to Non Paper substrates.

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

PRINTING INK TECHNOLOGY (PT604)

Printing Inks

Introduction, solvent based inks, water based ink, ingredients in Ink- pigments-properties, types, carbon black, inorganic pigments, organic pigments, physical characteristics of organic pigments.Vehicles- vehicles for liquid inks, vehicles for paste inks, UV curing vehicles. Additives - driers, extenders, anti oxidants, waxes. Oils- vegetable drying oils, semi drying oils, non drying oils. Drying mechanisms - physical drying mechanisms, absorption drying, evaporation drying, chemical drying systems, oxidation polymerization drying, radiation drying and curing, microwave drying, infrared drying. Viscosity - Newtonian flow, units of viscosity, viscosity & temperature, factors influencing viscosity, simple low viscosity inks, complex high viscosity inks. Ink requirements for printing processes – offset, letterpress, flexography, gravure, screen printing. Optical properties of ink films, rheology and ink transfer requirements, ink distribution and transfer on the press, method for the direct measurement of ink setting on coated paper. Printing Ink manufacturing machines & equipments. Paste inks - single roll mill, twin roll mill, triple roll mill, ball mill, twin horizontal mixer, uni-roll mill, high speed stirrer milling. Liquid inks - ball mill, pearl mill, sand mill, bead mill, shot mill. Trends and developments in ink manufacturing process.

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 fugetive inks, inks reacting with pen evadicators, red-ox reagents, inks reacting with solvents, invisible reactive inks, carbonizing inks. Security inks conformity tests and Q.C.tests- tests for chemical resistance, light fastness, rub resistance test, crumpling resistance test, grinding control, colour control, control of the rheological properties, control of drying time, control of various specific properties. Environmental considerations in security printing.

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.
4. Machine Direction and Cross Direction of paper.
5. Effect of Humidity and Temperature on paper.
6. Ink tackiness Test.
7. Printed samples of different printing processes and their study.
8. Ink Viscosity Test.
9. Introduction to various chemicals used in printing.
10. Conusmables and miscellanous 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.
3. Role of photopolymer in Image formation – Raised and Recessed.
4. Diffusion processes – Reflex and Projection plates.
5. Electro photography – Introduction, process, toner transfer theory, Equipment.
6. Water soluble photosensitive resin plates – introduction, characteristics, structure, processing, image reproductivity.
7. Laser plate making – introduction, system outline, system performance, implications.
8. Computer-to-plate :- Thermal plate, Polyester plate.
9. Surface preparation for screen

Image carriers for flexography:

Introduction. Thickness of flexo graphic plates. Photopolymer flexographic plates
Advantages of photo poly mer plates. Disadvantages of photo polymer plates.
Solid photo polymer plates. Photo initiators and photo sensitizers. Washout
solvents. Liquid photo polymer plates. Base material for photo polymer plates. Rubber
flexo plates, photo engravings, duplicate plates. Rubber plate making process –
Advantages of rubber plates, disadvantage of rubber plates. Photo polymer
plate making process sheet photo polymer plate making, liquid photo polymer
plate making. Letter press plates – Introduction, photo polymer letterpress plates.

Gravure image carrier:

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

Digital Image Carriers:

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

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

Recommended Books :

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

PRINTING IMAGE GENERATION LAB. (PT609)

1. Comparative study of various materials and equipments used in Image Generation Department.
2. Preparation of pre-sensitized plate,
3. Preparation of letter set plates.
4. Layout preparation:
5. Study of gripper margin and registration processes,
6. Positioning of images for plate making,
7. Masking techniques.
8. Page makeup -folders, pamphlets, journals/magazines, newspaper, book work.
9. Layout preparation - Single page layout, 2 page layout, 4 page layout, 8 page layout, 16 page layout, 32 page layout, 64 page layout for work & turn, work & tumble, work & twist.
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**
Roll stands and automatic pasters, Detection of web breaks and control of tension, Web Flutter, casues and correction of misregister Control of fan out, Sidelay, cut-off, web-to-web and ribbon 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**
Why dry-offset; adventages and disadvantages Comparative study of dry offset, letterset and lithographic offset processes, difference between dry offset and letterset machines and inks job suitability.
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 me- chanics 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

Introduction, gluers, paster wheels, remoisterable pattern gluers, segmented gluers, envelope pattern gluers, backbone gluers. Pattern perforating and numbering units-sheeters, variable rotary cutters. Auxilliary Equip ments - Remote control console, Plate scanners, scanning densitometer, closed-loop system, web preconditioners, sheet cleaners, ink agitators, water coded ink oscillators, fountain solution recirculation systems, fountain solution mixers, refrigerating fountain solution, automatic blanket washers, side lay sensors, web break defectors, remoisturizers-liquid applicator system, roller applicators systems, antistatic devices, Imprinters, Perfectors, cutoff controls, straboscope, synchroscope, counters-Denex laser counter, stobb counter.

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.
9. Study of Web-breaks.
10. Operations of Folding machine.

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.

Business Planning Process: Why is a good business plan required? Business Plan-the major benefits, sub plan, Business plan-blue print to success and financing, Small manufactures business plan, Feasibility Study, Preparation of Feasibility Reports, Project Reports.

Forms of Ownership: Different forms of ownership-sole proprietors, 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.

Entrepreneurship Development & Management - **Jose Paul, N. Ajith Kumar.**

Entrepreneurship Development Programmes & Practices - **Jasmer Singh Saini.**

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
2. Quality Control for quality printing, Graphic Arts, Technical Foundations.

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.
13. Measurement of viscosity, tack measurement.
14. Test a printed sheet - proof printing and measurement of colour using spectrophotometer, 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

8. Introduction & Working of image capturing techniques of Drum, Flat Bed Scanners & Image Setters.

Recommended Books :-

1. Dr. R.W.G. Hont :- The reproduction of colour. Fountain Press, 4th edition.
2. Miles Southworth & Donna Southworth :- Colour Reproduction. Graphic Arts Publishing, 3.1 edition.
3. Gary G. Field :- Tone & Colour correction (GATF).

COLOUR SEPARATION LAB. (PT708)

1. Making of Half tone negative using process camera.
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).
6. Working of Image Setter and obtaining output on Image Setter.
7. Colour Correction by using photography masking.
8. Six Colour Wheel.
9. Planning for four Colour Newspapers designs.
10. Software for colour separation Photoshop, CorelDraw, quark express.
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:

Introduction, The origin of computer graphics, working of interactive - graphics display, New display devices, General purpose graphics software, The user-interface, display of solid objects, Line drawing displays - Display devices and controllers, Display devices, The CRT-Electron guns, Deflection system, Phosphors, Beam penetration CRT, Shadow mask CRT. Inherent-memory, devices - Direct view storage tube, Plasma panel, Laser-scan display, The storage-tube display, The refresh line - drawing display. Two dimensional transformations, Transformation principles, concatenation, matrix representations - matrix formulation of transformations, Concatenation of matrix transformations, efficiency. The clipping & windowing - A line clipping algorithm, Midpoint subdivision, clipping other graphic entities, polygon clipping, viewing transformations, The windowing transformation. Three dimensional graphics - Realism in three dimensional graphics - Molecular modeling, CAD, Animation, Simulation. Techniques for achieving realism - parallel projections, Perspective projection, Intensity curves, Stereoscopic views, Kinetic depth effect, hidden - line elimination, shading with hidden surfaces removed, 3D images. Modeling three dimensional scenes - coordinate system, modeling objects, cube representation, representing topology & geometry, structured three dimensional models, constructing models. Modeling and realism.

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:

Introduction. Digital image representation, basic steps of image processing, elements of image processing system - image acquisition, storage, processing, communication, display. Fundamental concepts of digital image processing - introduction, objectives, visual perception - structure of human eye, image formation in the eye, brightness adaptation and discrimination. A simple image model. Sampling and quantization - uniform sampling and quantization, non uniform sampling and quantization. Basic relations between pixels - Neighbours of pixel, connectivity. Labeling and connected components. Relations, equivalence and transitive closure. distance measures. arithmetic/logic operations. image geometry - basics of transformations. perspective transformations. camera model, camera calibration. Photographic film - film structure and exposure, film characteristics, contrast, speed, graininess, resolving power.

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, formating 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.**
Principle of Interactive Computer Graphics 2nd edition - **William N. Newman, Robert S.Sproull.**

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

First copy cost, manufacturing cost, overheads, economic of publishing - net book, non-net book, variations in price of same size books, published price of book Technical aspects of production from receipt of manuscript to completion of book, gestation period, calculating break-even point.

4. Marketing and Distribution in Book Publishing

Home market, export market, closed market, advertising and publicity, types of distribution, conventional and modern channels of distribution. International book trade and barriers. Import and export of books. Relationship of the Editor with the manuscript. Evaluation procedures. External review and its associated problems.

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.

CONTINUOUS STATIONARY & SECURITY PRINTING (PT706)

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-Programmable outers for continuous web-MICR cheque binding system. Machines used for packing and Despatch.

Principles of stochastic screening:

Spot patterns. Gaininess or noise. Combining AM and FM screening. Screen angles. Spot size. Claimed benefits for FM screening. Absence of rosettes and moiré patterns. Improved rendition of detail. Smoother tonal transition. Photographic smoothness. Improved process colour simulation of spot colours. No restriction on reproducible grey levels. Tone value stability with increased inking. Smaller file size and speedier output through imagesetter. Decreased register sensitivity. Limitations associated with FM screening. Film imaging. Film contacting. Plate making. Photomechanical proofing. High levels of dot gain. Fine screen rulings versus FM screening.

Practical experiences with offset litho printing:

Platemaking. Exposure and tone transfer. Using FfM and AM screening together. Vacuum contact and Newton's rings. Negative working plates. Proofing. Negative proofing. Printing. Dot gain in printing. Influence of FM screening spot size. Influence of different screening algorithms. Tone value stability when printing. Sensitivity to register shifts. Colour shifts

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 guidance of seminar guide (faculty member).

INDUSTRIAL TRAINING (PT 711)

Students will undergo for six weeks industrial training in vacation after sixth semester.

PACKAGING TECHNOLOGY (PT801)

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 type, 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 -

Rain test, Sand and dust test, Salt spray test, Fungus resistance test. Shelf life, Cushioning Materials - Functions, properties. Classifications - space fillers, resilient cushioning materials, non resilient cushioning materials.

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, Polyimides, 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:

Carton styles. Folding cartons - Production steps, types. Corrugated containers - classifications, components in a corrugated board, flutes, stages in preparation in corrugated boards. Plastic corrugated boards - features & advantages.

Innovative Packaging Techniques/Processes:

Gas packaging - MAP & CAP, Vacuum packaging, shrink packaging, stretch wrapping, blister packaging, skin packaging, strip packaging, Aerosol packaging container, working principle. Injection Blow Moulding, Extrusion blow moulding, Extrusion. Injection Molding, Compression molding, Thermo forming. Vacuum forming, Pressure forming, Matched mould forming.

Future Trends:

Futuristic trends in packaging. Advancements in food packaging. Environmental implications of packaging - recycling, Legal aspects in packaging. Designing-Cans, metal tubes, Plastic tubes. Closures-Screw caps, Snap-on caps, Plug closures, Lids, Threaded closures, Crowns. Adhesive tapes - Fabric tapes, Paper tapes, Film tapes, Foil tapes, Foam tapes, Two faced tapes. Labels - Basic elements of correct labeling, Purpose, Types. Ancillary Materials : Sealing tapes Strapping and strapping lables and labeling,Adhesives and packaging.

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

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.
10. Drop test,Vibration test,Inclined impact test, Compression test.
11. Rolling test, Drum test.

PRINTING MACHINERY MAINTENANCE (PT802)

1. Drive and Control Systems

Transmission systems such as AC and DC motors, belt, chain, gear, cranks, connecting rods, paul and ratchet machanisms, 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 contruction - 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 - Maintenanceof 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.

6 Identification & rectification of faults. Maintaining different types of Letterpress, Offset, Gravure & Flexo Machine.

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 TECHNOLGY (PT 803)

Introduction to Newspaper organization

Newspaper Hierarchy - editorial organization, souces 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.

Policy of a newspaper. Headlines. History and their significance. Functions of headlines, kickers, blurbs. The grammar of headlines. Unit count in headlines. Treating photographs; crop ping. Captions for photographs.

Basics of Design

The aesthetics of desing. Achieving symmetry/asymmetry, balance/off-balance, use of colour, place ment of various elements in design. The written word and illustration. Principles of adapting content to form. Attracting attention.

Newspaper layout & designing

Difference between design and layout. The various kinds of layout. The importance of visual appeal in page-making. Playing up/down a story. Colour, boxing, verbal and non-verbal languages in design. Graphics/diagrams and illustrations and their importance.

Flow of stories into a newspaper office

The various sources and copy for each page. Reporters, correspondents, agencies, syndicates, columnists, readers. Facsimiles copy & photographs. Editorial content and news. The OP-ED page. The gatekeeping function.

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**
Editing; A Handbook for Journalists - **TJS George**, Indian Institute of Mass communication, Delhi.
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.

PRINTER'S COSTING AND ESTIMATING (PT804)

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 market ing and sales - marketing, sales.

Human Resource Management Concepts:

HRM for printing, employment policy, evaluation of skills requirements for printing occupa- tions, recruitment, job evaluation, staff appraisal, motivation training, human resources fac- tors that limit productivity, staff flexibility. Manning and training requirements, States of indus- try, 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 environ- ment, 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 - 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.
Cost sheet. Daily Docket. Work Instruction Ticket and their importance in costing.

Recommended Books :

Principles of Accounting - **B. S. Raman**
Fundamentals of Financial Management - **Prasanna Chandra**.
Cost Accounting - **B. R. Bhar**
Print Management - **Derek Porter**
Printer's Costing & Estimating - **B. D. Mendiratta**
Management Aspect of Printing Industry - **T. A. Saifuddin**.
Estimating Methods and Cost Analysis for Printers - **K. S. Venkataraman, K. S. Balaraman**.
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, Digitization, Half
toning colour reproduction, colour jumbs, resolution and its qualities.

AC quiring

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 discription languags.

Digital Printing Processes

Silver faldire, Phernal, INKjet, elictrostatic processes.

Rendering Typeline Art and images.

Colour management

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

Market & Applications:

Introduction. Defining «On demand». Defining Digital Printing. Defining variable printing. Typical lengths. Short-run process colour printing. On demand printing & Publishing concepts. Future on-demand. Market research Where are pages created. Number of originals and run length. New technologies shift existing methods. Economics of on demand printing - Economics of long run. Advantage for the buyer. Efficiencies of Digital on demand work flow. Shortrun pricing paradox.

Database Marketing's Role:

Customizing traditional print. Customized on-demand print. The future. Other forces of change -Interactivity advantage. Online interactivity advantage. Interactive TV. Demographics. Advantages of search & Retrieval. Alternative media-CD-ROM's. Manufacturing costs-Paper mailing. Alternative media-online. Commercial online services. Commercial applications - Just in time. Appropriate applications for on demand & DP. Advertising. Author reprints. On demand products. In-appropriate applications. Marketing and Selling On-Demand Services - TV programming and ATM cards. Value added. Advantages of on demand. Selling factors. Accepting digital files - File transfer for on-demand.

Networking:

Networks for printing. Networks for publishing. Networks for Inhouse. Ideal Network. WAN (Wide Area Networks). Flexibility. Changing Markets for Print. Market projections, Projection of changes in the no.of colors. Moving towards shorter runs.

Recommended Books :

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

PRINTING PLANT LAYOUT (PT806)

Site Selection:

Strategic issues of location. The supply-distribution system, Dynamic nature of plant locationlocation strategy-factors influencing choice of location. State regulations on location. Backward areas and Industrial policy. Govt. Policies for decentralization, Industrial estates, comparison of locations-urban v/s rural areas advantages, sub-urban area. Economic survey of site selection. Analytical approach.

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):

Introduction, Advantages of a good factory building, Factors affecting the factory building - nature of manufacturing process-flexibility-expandability-service facilities-employee facilities-lighting-heating-ventilating-air conditioning-appearance- durable construction-security measures-noise control. Types of factory building - single story building, high bay and monitor type buildings, multi storey buildings, building of special types. Comparison between single storey and multistorey building. Types of construction of factory building Wood frame construction, Brick construction, Slow burning mill construction, Steel frame construction, Reinforced concrete construction, Precast concrete construction. Specific parts of factory building-roof,walls,floor.

Plant layout-An analytical approach:

Heuristic and other methods of line balancing. Planer single facility location problems. Minisum examples, insights for minisum problem, minisum location problem with distance. MLP with Euclidean distance.

Recommended Books :

Facility layout and location-**Richard L.Francis, John A. White.**
Computer Aided Production Management - **Mahapatra**
Production and Operations Management - **Mchelmann 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.**
Materials handling for Printer - **A. John Geis, Paul L. Addy.**

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)