

SCHEME AND SYLLABI

FOR

THIRD TO EIGHTH SEMESTERS

OF

BACHELOR OF TECHNOLOGY

IN

PRINTING TECHNOLOGY

FROM 2014 ADMISSION ONWARDS

CALICUT UNIVERSITY (P.O), THENHIPALAM

PT: PRINTING TECHNOLOGY**COMBINED FIRST AND SECOND SEMESTER**

Code	Subject	Hours/Week			Marks		University Examination	
		L	T	P/D	internal	End sem	Hours	Credits
EN14 101	ENGINEERING MATHEMATICS - I	2	1	0	50	100	3	4
EN14 102	ENGINEERING MATHEMATICS - II	2	1	0	50	100	3	4
EN14 103	ENGINEERING PHYSICS	2	1	0	50	100	4	4
EN14 104	ENGINEERING CHEMISTRY	2	1	0	50	100	3	4
EN14 105	ENGINEERING MECHANICS	2	1	0	50	100	3	6
EN14 106	BASICS OF CIVIL & MECHANICAL ENGG.	2		0	50	100	3	4
EN14 107	BASICS OF ELECTRICAL & ELECTRONICS ENGG.	2		0	50	100	3	4
EN14 108	ENGINEERING GRAPHICS	1	0	3	50	100	3	6
EN14 109	HUMANITIES AND COMMUNICATION SKILLS	2	1	0	50	100	3	2
EN14 110 (P)	MECHANICAL WORKSHOP	0	0	2	100	-	-	2
EN14 111 (P)	ELECTRICAL AND CIVIL WORKSHOPS	0	0	2	100	-	-	2
TOTAL		17	6	7				42

THIRD SEMESTER

Code	Subject	Hours/Week			Marks		University Examination	
		L	T	P/D	internal	End sem	Hours	credits
EN14 301	ENGINEERING MATHEMATICS - III	3	1	0	50	100	3	4
EN14 302	COMPUTER PROGRAMMING IN C	2	0	1	50	100	3	4
PT14 303	GRAPHIC REPRODUCTION	3	1	0	50	100	3	4
PT14 304	PRINTING SUBSTRATES	3	1	0	50	100	3	4
PT14 305	PRINTING INK AND COLOR THEORY	3	1	0	50	100	3	4
PT14 306	NON IMPACT PRINTING	3	1	0	50	100	3	4
PT14 307(P)	IMAGE GENERATION LAB	0	0	3	50	100	3	2
PT14 308(P)	QUALITY CONTROL LAB	0	0	3	50	100	3	2
TOTAL		18	6	6				28

FOURTH SEMESTER

Code	Subject	Hours/Week			Marks		University Examination	
		L	T	P/D	internal	End sem	Hours	credits
EN14 401	ENGINEERING MATHEMATICS - IV	3	1	0	50	100	3	4
EN14 402	ENVIRONMENTAL SCIENCE	2	1	0	50	100	3	4
PT14 403	OFFSET MACHINERY- I	3	1	0	50	100	3	4
PT14 404	MECHANICS OF SOLIDS	3	1	0	50	100	3	4
PT14 405	INSTRUMENTATION AND CONTROL SYSTEM	3	1	0	50	100	3	4
PT14 406	ELECTRONIC COMPOSITION	3	1	0	50	100	3	4
PT14 407(P)	<i>MACHINE DRAWING</i>	0	0	3	50	100	3	2
PT14 408(P)	<i>ELECTRONIC COMPOSITION LAB</i>	0	0	3	50	100	3	2
TOTAL		18	6	6				28

FIFTH SEMESTER

Code	Subject	Hours/Week			Marks		University Examination	
		L	T	P/D	internal	End sem	Hours	credits
PT14 501	ENGINEERING ECONOMICS AND PRINCIPLES OF MANAGEMENT_	3	1	0	50	100	3	4
PT14 502	ANALOG AND DIGITAL ELECTRONICS	3	1	0	50	100	3	4
PT14 503	OFFSET MACHINERY - II	3	1	0	50	100	3	4
PT14 504	MARKETING MANAGEMENT	3	1	0	50	100	3	4
PT14 505	THEORY OF MECHANISM	3	1	0	50	100	3	4
PT14 506	ELECTRICAL DRIVES AND CONTROL	3	1	0	50	100	3	4
PT14 507(P)	<i>PRINTING MACHINE LAB</i>	0	0	3	50	100	3	2
PT14 508(P)	<i>ELECTRICAL AND ELECTRONICS ENGG LAB</i>	0	0	3	50	100	3	2
TOTAL		18	6	6				28

SIXTH SEMESTER

Code	Subject	Hours/Week			Marks		University Examination	
		L	T	P/D	internal	End sem	Hours	credits
PT14 601	DESIGN OF MACHINE ELEMENTS	3	1	0	50	100	3	4
PT14 602	MICROPROCESSOR & MICRO CONTROLLERS	3	1	0	50	100	3	4
PT14 603	FLEXOGRAPHY	3	1	0	50	100	3	4
PT14 604	PRINT FINISHING & CONVERTING	3	1	0	50	100	3	4
PT14 605	SCREEN PRINTING AND GRAVURE	3	1	0	50	100	3	4
PT14 606	ADVANCEMENT IN PRINTING TECHNOLOGY	3	1	0	50	100	3	4
PT14 607(P)	<i>SCREEN PRINTING & FLEXO LAB</i>	0	0	3	50	100	3	2
PT14 608(P)	<i>PRINT FINISHING LAB</i>	0	0	3	50	100	3	2
TOTAL		18	6	6				28

SEVENTH SEMESTER

Code	Subject	Hours/Week			Marks		University Examination	
		L	T	P/D	internal	End sem	Hours	credits
PT14 701	TONE AND COLOR ANALYSIS	3	1	0	50	100	3	4
PT14 702	PACKAGING TECHNOLOGY	3	1	0	50	100	3	4
PT14 703	QUALITY CONTROL AND STANDARDIZATION	3	1	0	50	100	3	4
PT14 704	ELECTIVE -I	3	1	0	50	100	3	4
PT14 705	ELECTIVE -II	3	1	0	50	100	3	4
PT14 706(P)	<i>TONE AND COLOR ANALYSIS LAB</i>	0	0	3	50	100	3	2
PT14 707(P)	<i>PACKAGING TECHNOLOGY LAB</i>	0	0	3	50	100	3	2
PT14 708(P)	<i>PROJECT</i>	0	0	4	100	-	-	4
TOTAL		15	5	10				28

ELECTIVE I

1. PT14 704A Total Quality management (TQM)
2. PT14 704B Operation Research
3. PT14 704C Mechanics of printing
4. PT14 704D News paper and Periodical Publishing
5. PT14 704E Management Information System

ELECTIVE II

1. PT14 705A Advertising Management
2. PT14 705B Designing Planning and Media Production
3. PT14 705C Multimedia
4. PT14 705D Production and operation management
5. PT14 705 E Print Plant Layout & Facility Design

EIGHTH SEMESTER

Code	Subject	Hours/Week			Marks		University Examination	
		L	T	P/D	internal	End sem	Hours	credits
PT14 801	PRINT MANAGEMENT COSTING & ESTIMATING	3	1	0	50	100	3	4
PT43 802	PRINTING MACHINERY AND MAINTENANCE	3	1	0	50	100	3	4
PT14 803	SECURITY PRINTING	3	1	0	50	100	3	4
PT14 804	ELECTIVE -III	3	1	0	50	100	3	4
PT14 805	ELECTIVE - IV	3	1	0	50	100	3	4
PT14 806(P)	SEMINAR	0	0	3	100	-	-	2
PT14 807(P)	PROJECT	0	0	7	100	-	-	5
PT14 808(P)	VIVA VOICE	0	0	0	-	100	-	3
TOTAL		15	5	10				30

TOTAL CREDITS : 212**ELECTIVE III**

1. PT14 804A Computer Graphics
2. PT14 804B Book publishing
3. PT14 804C E- Publishing
4. PT14 804D Publishing Science
5. PT14804E Digital Photography

ELECTIVE IV

1. PT14805A Digital Pre press
2. PT14805B Entrepreneurship Management
3. PT14805C Scanners & systems
4. PT14805D Packaging Science
5. PT14805E On demand printing

THIRD SEMESTER

EN14 301 ENGINEERING MATHEMATICS III

(Common for all branches)

Teaching scheme

3 hours lecture and 1 hour tutorial per week

Credits: 4

Objective

- *To provide a quick overview of the concepts and results in complex analysis that may be useful in engineering.*
- *To introduce the concepts of linear algebra and Fourier transform which are wealths of ideas and results with wide area of application.*

Module I: Functions of a Complex Variable (13 hours)

Functions of a Complex Variable – Limit – Continuity – Derivative of a Complex function – Analytic functions – Cauchy-Riemann Equations – Laplace equation – Harmonic Functions – Conformal Mapping – Examples: e^z , $\sin z$, $\cosh z$, $(z+1/z)$ – Mobius Transformation.

Module II: Functions of a Complex Variable (14 hours)

Definition of Line integral in the complex plane – Cauchy’s integral theorem (Proof of existence of indefinite integral to be omitted) – Independence of path – Cauchy’s integral formula – Derivatives of analytic functions (Proof not required) – Taylor series (No proof) – Laurent series (No proof) – Singularities - Zeros – Poles - Residues – Evaluation of residues – Cauchy’s residue theorem – Evaluation of real definite integrals.

Module III: Linear Algebra (13 hours) – (Proofs not required)

Vector spaces – Definition, Examples – Subspaces – Linear Span – Linear Independence – Linear Dependence – Basis – Dimension– Orthogonal and Orthonormal Sets – Orthogonal Basis – Orthonormal Basis – Gram-Schmidt orthogonalisation process – Inner product spaces – Definition – Examples – Inequalities ; Schwartz, Triangle (No proof).

Module IV: Fourier Transforms (14 hours)

Fourier Integral theorem (Proof not required) – Fourier Sine and Cosine integral representations – Fourier transforms – transforms of some elementary functions – Elementary properties of Fourier transforms – Convolution theorem (No proof) – Fourier Sine and Cosine transforms – transforms of some elementary functions – Properties of Fourier Sine and Cosine transforms.

Text Books

Module I:

Erwin Kreysig, *Advanced Engineering Mathematics, 8e*, John Wiley and Sons, Inc.
Sections: 12.3, 12.4, 12.5, 12.6, 12.7, 12.9

Module II:

Erwin Kreysig, *Advanced Engineering Mathematics, 8e*, John Wiley and Sons, Inc.
Sections: 13.1, 13.2, 13.3, 13.4, 14.4, 15.1, 15.2, 15.3, 15.4

Module III:

Bernaed Kolman, David R Hill, *Introductory Linear Algebra, An Applied First Course*, Pearson Education.

Sections: 6.1, 6.2, 6.3, 6.4, 6.8, Appendix.B.1

Module IV:

Wylie C.R and L.C. Barrett, *Advanced Engineering Mathematics*, McGraw Hill.
Sections: 9.1, 9.3, 9.5

Reference books

1. H S Kasana, *Complex Variables, Theory and Applications*, 2e, Prentice Hall of India.
2. John M Howie, *Complex Analysis*, Springer International Edition.
3. Anuradha Gupta, *Complex Analysis*, Ane Books India.
4. Shahnaz bathul, *Text book of Engineering Mathematics, Special functions and Complex Variables*, Prentice Hall of India.
5. Gerald Dennis Mahan, *Applied mathematics*, Springer International Edition.
6. David Towers, *Guide to Linear Algebra*, MacMillan Mathematical Guides.
7. Inder K Rana, *An Introduction to Linear Algebra*, Ane Books India.
8. Surjeet Singh, *Linear Algebra*, Vikas Publishing House.
9. Howard Anton, Chris Rorres, *Elementary Linear Algebra, Applications Version*, John Wiley and Sons.
10. Anthony Croft, Robert Davison, Martin Hargreaves, *Engineering Mathematics*, Pearson Education.

Internal Continuous Assessment (Maximum Marks-50)

60% - Tests (minimum 2)

30% - Assignments (minimum 2) such as home work, problem solving, group discussions, quiz, literature survey, seminar, term-project, software exercises, etc.

10% - Attendance and Regularity in the class

University Examination Pattern

PART A: Analytical/problem solving SHORT questions *8x 5 marks=40 marks*

Candidates have to answer EIGHT questions out of TEN. There shall be minimum of TWO and maximum of THREE questions from each module with total TEN questions.

PART B: Analytical/Problem solving DESCRIPTIVE questions *4 x 15 marks=60 marks*

Two questions from each module with choice to answer one question.

Maximum Total Marks: 100

EN14 302 COMPUTER PROGRAMMING IN C

(Common for all branches)

Teaching scheme

2 hours lectures and 1hour lab per week

Credits: 4

Objectives

- *To impart the basic concepts of computer and information technology*
- *To develop skill in problem solving concepts through learning C programming in practical approach.*

Module I (8 hours)

Introduction to Computers: CPU, Memory, input-output devices, secondary storage devices, Processor Concepts - Evolution and comparative study of processors. Machine language, assembly language, and high level language. Inside a PC, Latest trends and technologies of storage, memory, processor, printing etc. Concept of Program and data, System software - BIOS, Operating System- Definition-Functions- Windows, and Linux. Compilers and assemblers, Computer networks, LAN, WiFi.

Module II (9 hours)

Basic elements of C: Flow chart and algorithm – Development of algorithms for simple problems. Structure of C program – Operators and expressions – Procedure and order of evaluation – **Input and Output functions.** *while, do-while* and *for* statements, *if, if-else, switch, break, continue, goto,* and *labels.* Programming examples.

Module III (10 hours)

Functions and Program structures: Functions – declaring, defining, and accessing functions – parameter passing methods – **Recursion** – Storage classes – *extern, auto, register* and *static.* Library functions. Header files – C pre-processor. Example programs. **Arrays:** Defining and processing arrays – passing arrays to functions – two dimensional and multidimensional arrays – application of arrays. Example programs.

Module IV (9 hours)

Structures – declaration, definition and initialization of structures, unions, **Pointers:** Concepts, declaration, initialization of pointer variables simple examples **Concept of a file** – File operations File pointer.

Text Books

1. P. Norton, *Peter Norton's Introduction to Computers*, Tata McGraw Hill, New Delhi.
2. E. Balaguruswamy, *Programming in ANSI C*, 3rd ed., Tata McGraw Hill, New Delhi, 2004

Reference Books

1. B. Gottfried, *Programming with C*, 2nd ed, Tata McGraw Hill, New Delhi, 2006
2. B. W. Kernighan, and D. M. Ritchie, *The C Programming Language*, Prentice Hall of India, New Delhi, 1988
3. K. N. King. *C Programming: A Modern Approach*, 2nd ed., W. W. Norton & Company, 2008
4. P. Norton, *Peter Norton's Computing Fundamentals*, 6th ed., Tata McGraw Hill, New Delhi, 2004.
5. S. Kochan, *Programming in C*, CBS publishers & distributors
6. M. Meyer, R. Baber, B. Pfaffenberger, *Computers in Your Future*, 3rd ed., Pearson Education India

Internal Continuous Assessment (Maximum Marks-50)

- 50% - Lab Practical Tests
- 20% - Assignments
- 20% - Main Record
- 10% - Regularity in the class

University Examination Pattern

PART A: Analytical/problem solving *SHORT* questions 8x 5 marks=40 marks

Candidates have to answer EIGHT questions out of TEN. There shall be minimum of TWO and maximum of THREE questions from each module with total TEN questions.

PART B: Analytical/Problem solving *DESCRIPTIVE* questions 4 x 15 marks=60 marks

Two questions from each module with choice to answer one question.

Maximum Total Marks: 100

PT14 303 GRAPHIC REPRODUCTION

Teaching scheme

3 hours lecture and 1 hour tutorial per week

Credit 4

Objectives:

- *To impart the basic idea of printing industry and Printing processes .*
- *To obtain knowledge about Printing materials and imaging techniques*

Module I (12 hours)

History and developments of Printing, Printing Industry – Its structure and workflow, organizing printing service, Scope of printing technology, Preparation for career in printing, printing industries in India. Printing methods-Conventional and nonconventional methods - their Principles and applications – Relief printing, Recess printing, Planographic printing, Stencil Printing and Digital printing Processes. Types of originals-line photography-half tone photography –theories of dot formation–tone reproduction curve.

Module II (14 hours)

Types of process camera-Mechanical and optical principles–lens-focal length-image formation-lens aberrations-factors governing design and layout of studio-illumination, reflection and transmission –film processing- lith and rapid access film processing –replenishment- -Reciprocity failure-intermittency effect -contact photography.

Module III (14 hours)

Planning layout and Film assembly-Basic steps involved in planning a layout, Factors to be considered while planning a layout, positive & -ve film assembly, Planning of multicolor work, imposition consideration for sheet fed & web fed press. Printing Materials- Introduction. Light sensitive coating-dichromate colloids, Diazo compounds, photopolymers. 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

Module IV (14 hours)

Planographic plates- The plate base- cross section of an aluminum plate, cross section of 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 non-image areas-densitizing gum, chemistry of gum Arabic, other natural & synthetic gum. Negative working plate-additive pre-sensitized plates, subtractive diazo PS plates, photopolymer pre-sensitized plates, aqueous developable plates, driographic plates, multimetal plates. Producing a multimetal plate. Types- bimetallic, trimetallic. Diffusion and transfer methods, electrostatic. Positive working lithographic plates- pre-sensitized plates, Baking of Positive plates – photo direct plates. Screen less lithography, laser exposed plates, deep etch plates and their purposes. Waterless plate.

Text Books

1. Nelson R Eldred, Chemistry for the Graphic arts, GATF, USA, 1992.
2. Prakash Shetty, Science and Technology of Printing Materials, MJP Publishers, Chennai, 2008.
3. Adams J.M, Faux,D.D and Rieber L.J, Printing Technology, Delmar Publishers, NewYork.
4. Heigh. M. Speir, Introduction in Printing Technology.

Reference books

1. Hand book of Modern halftone photography, perfect graphic arts, USA
2. Jack Eggleston, Sensitometry for photographers, focal Press, London
3. Woddiff Thomas , J R.SPSE handbook of photographic science and engineering, John Wiley & Son
4. Puri B.R, Sharm L.R and Pathania M.S, Principals of PhysicalChemistry, Vishal Publishing Co, Jalandhar, 2002.
5. Anthony Bristow, Advances in Printing Sciences and Technology, Vol. 24-J.
6. A.S. Porter.- Lithographic Press Work

Internal Continuous Assessment (Maximum Marks-50)

60% - Tests (minimum 2)

30% - Assignments (minimum 2) such as home work, problem solving, group discussions, quiz, literature survey, seminar, term-project, software exercises, etc.

10% - Regularity in the class

University Examination Pattern

PART A: Analytical/problem solving SHORT questions *8x 5 marks=40 marks*

Candidates have to answer EIGHT questions out of TEN.
There shall be minimum of TWO and maximum of THREE questions from each module with total TEN questions.

PART B: Analytical/Problem solving DESCRIPTIVE questions *4 x 15 marks=60 marks*

Two questions from each module with choice to answer one question.

Maximum Total Marks: 100

PT14 304 PRINTING SUBSTRATES

Teaching scheme

3 hours lecture and 1 hour tutorial per week

Credit: 4

Objectives: *This paper gives a basic knowledge about the characteristics and importance of various Printing substrates.*

Module I (16 hours)

Paper-Raw materials- Sources and kinds of cellulose - fibers, non-fibers and additives, Stages of paper making- Debarking, chipping, Screening, Pulping, Washing, Refining, Stock preparation. Paper making machines-different sections, finishing operations, coating, board making-furnish, manufacture and finishing. Types of paper and Paper properties-Main classes of paper and Paper board, Board sizes, paper requirements for different printing process, paper handling. Paper properties run-ability and printability-structural formation, 2 sidedness, grain direction- physical: GSM, caliper, bulk, porosity, smoothness, dimensional stability, curves, moisture content and Rh-optical: glosses, brightness, color, opacity-chemical: pH, ash content, tensile, burst, tear internal bonding, fold endurance, stiffness, pick resistance.

Module II (12 hours)_

Recycled paper- Introduction recycling process, fiber preparation- screening, centrifugal cleaning, flotation, washing, deinking plant functions, continuous drum pulper, pre-screening and cleaning, primary flotation, cleaning, fine screening, thickening, dispersing, brightness control, post flotation, light weight cleaning, washing, thickening and storage. Deinking chemistry. Bleachers-Hydrogen peroxide, oxygen and ozone bleaching, reductive bleaching agents, chelating agents, sodium silicate, catalyst enzymes, agglomerating chemicals, surfactants. Biodegradation of surfactants, dispersants and the principles of washing, deinking, disjectors.

Module III (13 hours)_

Paper tester – Introduction. Optical Property Testers – Brightness meters, glossmeters, opacimeters, Printability property testers – Absorbency testers, , Dynamic property testers, expansimeters, coefficient-of-friction testers, Hydrostatic testers, lintering testers, moisture meters, picking testers, relative humidity testers. End use property testers – Abrasion testers, adhesion testers, adhesive testers, basic weight testers, book strength testers, bursting strengths testers, compression testers, crush resistance testers, folding endurance testers, micrometers, puncture testers, roll coating testers, stiffness testers, tearing strength testers, tensile strength testers, wet strength testers, wick resistance testers.

Module IV (13 hours)_

Plastic substrates-Types-PE, PP, PVC, PET, PS, Polyester and Cellophane. Properties, Testing and suitability of plastics to various printing processes. Metallic substrates-Types: Aluminum, Gold, Silver, Tin, Copper, lead, Nickel and other metals. Properties and their testing. Suitability to various printing applications. Multi layered substrates-Metal on Paper and Board, Plastic on Paper, Metal on Plastic etc. Textile, wood, ceramic, glass ,leather and other substrates-Properties and their suitability for various printing applications.

Text Books

1. Bob Thomson, Printing Materials Science and Technology, PIRA
2. W.H. Bureau, "What the printer should know about the paper", GATF

Reference books

1. Handbook of printing and production-Michael Bernard, John Peacock.
2. Introduction in Printing Technology-Heigh. M. Speir.
3. J.P. Casey, Pulp and paper chemistry and chemical technology.
4. R.J. McGill, " Measurement and control in paper making", Adam Hilger Ltd.
5. D.Venkateswaralu, Paper for printing and packaging. SS Graphics

Internal Continuous Assessment (Maximum Marks-50)

60% - Tests (minimum 2)

30% - Assignments (minimum 2) such as home work, problem solving, group discussions, quiz, literature survey, seminar, term-project, software exercises, etc.

10% - Regularity in the class

University Examination Pattern

PART A: *Analytical/problem solving SHORT questions* *8x 5 marks=40 marks*

Candidates have to answer EIGHT questions out of TEN.
There shall be minimum of TWO and maximum of THREE questions from each module with total TEN questions.

PART B: *Analytical/Problem solving DESCRIPTIVE questions* *4 x 15 marks=60 marks*

Two questions from each module with choice to answer one question.

Maximum Total Marks: 100

PT14 305 PRINTING INK AND COLOR THEORY

Teaching scheme

Credit: 4

3 hours lecture and 1 hour tutorial per week

Objectives

- To provide an overview about the relevance of color in Printing technique.
- To study the Classification, Properties and testing of Printing inks.

Module I (13 hours)

Color: Understanding color, Visual system-eyes and visual sense, structure and functioning of human eye, electromagnetic response, Cones and rods, temporal properties, Perceived color. Color & color theory – Additive & subtractive -Terms to describe color, - color separation technique. GATF, color triangles & color circle, color spaces, color matching, color original, method of color measurement, color Gamut.

Module II (14 hours)

Printing inks-raw materials-colorants: pigment classifications, preparations and properties-Inorganic: white and colored, carbon black, metallic, ultramine and fluorescent-Organic: Diarylide yellow, hansa yellow, rodamine, lithol, rubine toner, phalocyanine blue and green and alkali blue, benzidine orange, toluidine red and lake red C-Dyestuffs: classification, preparation and properties and uses, acid, basics, solvents and disperse dyes. Oils: classification, preparation and properties and uses of drying semi – drying and non-drying oils-resins: natural: rosin and its derivatives, Gum Arabic, synthetic resins: epoxy resins, acrylic resins and varnishes. Solvents: aliphatic and aromatic hydro carbon, alcohol, esters, glycols & ketones. Additives- properties and applications Driers, waxes, antioxidants, plasticizers, wetting agents, deforming agents and anti- skinning agents.

Module III (14 hours)

Paste inks: single roll mill, roll mill, triple roll mill, twin horizontal mixer, zarm stirrer- liquid inks: ball mill, bead mill, and attritor. Flow chart for ink manufacturing, weighting, mixing, grinding, testing and packing. Viscosity, tack, color, gloss, rub resistance, length, dry characteristics, and fineness of grind. Special inks and drying mechanism: heat sets, quick sets, gloss, magnetic and water based inks, Radiation curable inks-IR, UV & EB, Raw materials to constitute the inks and the equipments used for drying. Different types of ink drying mechanism. Ink problems-related to major printing processes-causes and remedies.

Module IV (13 hours)

Ink testers – Introduction. Working property testers – colorimeters & spectrophotometers, dispersion testers, drying time testers, drying time tester, film applicators, Ink film thickness gauges, film thickness gauge accessories, fineness-of-grind testers, Mixing scales, tack testers, tack tester accessories, viscometers, rotational viscometers, viscometer accessories, viscosity control instruments, viscosity cups, viscosity tubes, weight-per-gallon cups

Text Books

1. Adams J.M, Faux,D.D and Rieber L.J, Printing Technology, Delmar Publishers, NewYork
2. R.H. Leach, The Printing Ink Manual, fifth edition, Chapman & Hall, London.
3. R.W.G. Hunt, reproduction of colour, Fountain Press
4. Robert F Reed, What the Printer should know about inks, GATF

Reference books

1. Clifwool, A Manual for Flexographic inks, Fishbum Printing ink co. Ltd
2. Fonald E Tood, Printing inks, Pira International, United Kingdom
3. Hand book of Modern halftone photography, perfect graphic arts, USA
4. Woddiff Thomas , J R.SPSE handbook of photographic science and engineering, John Wiley & Son

Internal Continuous Assessment (Maximum Marks-50)

60% - Tests (minimum 2)

30% - Assignments (minimum 2) such as home work, problem solving, group discussions, quiz, literature survey, seminar, term-project, software exercises, etc.

10% - Regularity in the class

University Examination Pattern

PART A: *Analytical/problem solving SHORT questions* *8x 5 marks=40 marks*

Candidates have to answer EIGHT questions out of TEN.
There shall be minimum of TWO and maximum of THREE questions from each module with total TEN questions.

PART B: *Analytical/Problem solving DESCRIPTIVE questions* *4 x 15 marks=60 marks*

Two questions from each module with choice to answer one question.

Maximum Total Marks: 100

PT14 306 NON IMPACT PRINTING

Teaching scheme

3 hours lecture and 1 hour tutorial per week

Credit: 4

Objectives: *To develop awareness about various digital work flows and technologies in printing and also helps to create an idea about inkjet printing techniques.*

Module I (13hours)

Electrophotography, Ionography, Thermography, Electrography, Photography, X-graphy, Hybrid printing systems, CTF,-types, workflow, film materials. CTP- Designs, Plate substrates, workflow, imaging systems CTP for flexographic printing, Computer to cylinder for Gravure printing, Computer to Screen for Screen Printing, CTCP.

Module II (13hours)

Computer to Press/Direct imaging: Direct imaging with removal of master for each job, Re- imagable Master, Concepts of Re- imagable Master with material application/Ablation- re imagable printing plate systems without material application. Chemical material systems for generating re- imagable surface.

Module III (13 hours)

Inkjet printing: Introduction and development of the inkjet process over years. Types of Inkjet Technology, Thermal bubble jet, Piezzo electric and dye sublimation Inside an Inkjet printer-Parts of a typical Inkjet Printer, Print head assembly, Print Head, Ink Cartridges, Ink Cartridge combinations, Separate black and color cartridges, color and black in a single cartridge for each ink color. The cartridges with print head itself. Print head stepper motor, Belt, Stabilizer bar, Paper feed assembly, Paper tray / feeder-rollers – paper feed stepper motor, Power supply control circuitry interface port(s)-The parallel port, USB port. Serial port (SCSI) port.Comparison of inkjet with other types of printers both non-impact and conventional. Application of Inkjet printing in various fields. Scope and development of Inkjet in various industries and ongoing trends.

Module IV (15 hours)

Click OK to Print, Computer to Ink jet Printer- The process and requirements RAM, Buffer series of steps from command to printing, substrate used for inkjet printing- papers types and quality, compatibility of ink and paper, properties of inkjet paper, Other substrates. Long format digital ink jet printing. Areas of application and materials that can be used as substrates. The technology and advantages, Nozzle head, Ink supply, transport mechanism, Software, UV Ink, safety features.

Text Books

1. H Kippan , *Hand book of Print Media*- Heidelberg.
2. J.Michael Adams, David D Faux, Lloyd, J.Reiber, *Printing Technology*, 3E, Delma Publishing
3. Grehard A Northmann, *Non Impact Printing*.

Reference Books

1. Martin Graham, *Non Impact Printing*, Pira International, UK, 1992
2. Harald Johnson, *Understanding Digital Printing*, Thomson Publishers, Boston, 2005
3. Phil Green, *Understanding Digital Color*, GATF and PIRA, USA
4. Romano J F, *Professional Pre press, Printing and Publishing*, PTR Hall, USA, 1999

Internal Continuous Assessment (*Maximum Marks-50*)

60% - Tests (minimum 2)

30% - Assignments (minimum 2) such as home work, problem solving, group discussions, quiz, literature survey, seminar, term-project, software exercises, etc.

10% - Regularity in the class

University Examination Pattern

PART A: *Analytical/problem solving SHORT questions* *8x 5 marks=40 marks*

Candidates have to answer EIGHT questions out of TEN.
There shall be minimum of TWO and maximum of THREE questions from each module with total TEN questions.

PART B: *Analytical/Problem solving DESCRIPTIVE questions* *4 x 15 marks=60 marks*

Two questions from each module with choice to answer one question.

Maximum Total Marks: 100

PT14 307 (P) IMAGE GENERATION LAB

Teaching scheme

3 hours Practical per week

Credit: 2

Objectives: *To be equipped with Planning layout, film assembly and Platemaking.*

List of experiments:

1. Layout of facilities and workflow of Plate making department
2. Layout Preparation, Study of Leading edge, Margin and registration Process
3. Terminology for impositions, Layout for sheet and half sheet work
4. Sheet work impositions- 4 page layout, 8 page layout, 16 page layout, 32 page layout
5. Half Sheet work impositions- 4 page layout, 8 page layout, 16 page layout, 32 page layout
6. Page makeup- folders and Pamphlets
7. Page makeup- Newspaper and Bookwork
8. Preparation of Pre sensitized plates
9. Page imposition using imposition softwares
10. Study of effect of exposure and development factors on quality of the plate

Internal Continuous Assessment (*Maximum Marks-50*)

60% - Laboratory Practical and record

30% - Test

10% - Regularity in the class

End Semester Examination (*Maximum mark 100*)

70%-Procedure, conducting experiment, results, tabulation, and inference

20%- Viva voice

10%-Fair record

PT14 308(P) QUALITY CONTROL LAB

Teaching scheme

3 hours Practical per week

Objective: *To know the characteristics of printing materials and its quality testing.*

Credit: 2

List of Experiments:

1. Measuring the GSM of Paper and Paper borad
2. Curl test
3. Moisture content of paper
4. Measuring the tensile strength of Paper
5. Measuring the Bursting strength of paper
6. Measuring the folding endurance of paper
7. Measuring the Brightness and Gloss of Paper
8. Measuring the Opacity and RGB reflectance of Paper
9. Ink testing
 - a. Flow property
 - c. Length
10. Measuring the drying time of Ink
11. Measuring the Paper pH
12. Measuring the pH of Fountain solution

Internal Continuous Assessment (*Maximum Marks-50*)

60% - Laboratory Practical and record

30% - Test

10% - Regularity in the class

End Semester Examination (Maximum mark 100)

70%-Procedure, conducting experiment, results, tabulation, and inference

20%- Viva voice

10%-Fair record

FOURTH SEMESTER

EN14 401A: ENGINEERING MATHEMATICS IV

(Common for ME, CE, PE, CH, BT, PT, AM, and AN)

Teaching scheme

3 hours lecture and 1 hour tutorial per week

Credits: 4

Objective

- *To provide a comprehensive introduction to those models and methods most likely to be encountered and used by students in their careers in engineering.*
- *To provide an introduction to some important partial differential equations*

Module I: Probability Distributions (13 hours)

Random variables – Mean and Variance of probability distributions – Binomial Distribution – Poisson Distribution – Poisson approximation to Binomial distribution – Hyper Geometric Distribution – Geometric Distribution – Probability densities – Normal Distribution – Uniform Distribution – Gamma Distribution.

Module II: Theory of Inference (14 hours)

Population and Samples – Sampling Distribution – Sampling distribution of Mean (σ known) – Sampling distribution of Mean (σ unknown) – Sampling distribution of Variance – Interval Estimation – Confidence interval for Mean – Null Hypothesis and Tests of Hypotheses – Hypotheses concerning one mean – Hypotheses concerning two means – Estimation of Variances – Hypotheses concerning one variance – Hypotheses concerning two variances – Test of Goodness of fit.

Module III: Series Solutions of Differential Equations (14 hours)

Power series method for solving ordinary differential equations – Frobenius method for solving ordinary differential equations – Bessel's equation – Bessel functions – Generating functions (No proof) – Relation between Bessel functions – Orthogonality property of Bessel functions (Proof not required).

Module IV: Partial Differential Equations (13 hours)

Introduction – Formation of PDE – Complete Solution – Equations solvable by direct integration – Linear PDE of First order, Lagrange's Equation: $Pp + Qq = R$ – Non-Linear PDE of First Order, $F(p,q) = 0$, Clairaut's Form: $z = px + qv + F(p,q)$, $F(z,p,q) = 0$, $F_1(x,q) = F_2(y,q)$ – Classification of Linear PDE's –

Derivation of one dimensional wave equation and one dimensional heat equation – Solution of these equation by the method of separation of variables.

Text Books

Module I:

Richard A Johnson, CB Gupta, *Miller and Freund's Probability and statistics for Engineers*, 7e, Pearson Education- Sections: 4.1, 4.2, 4.3, 4.4, 4.6, 4.8, 5.1, 5.2, 5.5, 5.7

Module II:

Richard A Johnson, CB Gupta, *Miller and Freund's Probability and statistics for Engineers*, 7e, Pearson Education- Sections: 6.1, 6.2, 6.3, 6.4, 7.2, 7.4, 7.5, 7.8, 8.1, 8.2, 8.3, 9.5

Module III:

Erwin Kreysig, *Advanced Engineering Mathematics*, 8e, John Wiley and Sons, Inc.- Sections: 4.1, 4.4, 4.5

Module IV:

N Bali, M Goyal, C Watkins, *Advanced Engineering Mathematics, A Computer Approach*, 7e, Infinity Science Press, Fire Wall Media- Sections: 16.1, 16.2, 16.3, 16.4, 16.5, 16.6, 16.7, 16.8, 16.9

Erwin Kreysig, *Advanced Engineering Mathematics*, 8e, John Wiley and Sons, Inc. Sections: 11.2, 11.3, 9.8 Ex.3, 11.5

Reference books

11. J.S.Chandan, *Statistics for Business and Economics*, Vikas Publishing House.
12. Anthony Croft, Robert Davison, Martin Hargreaves, *Engineering Mathematics*, Pearson Education.
13. H Parthasarathy, *Engineering Mathematics, A Project & Problem based approach*, Ane Books India.
14. B V Ramana, *Higher Engineering Mathematics*, McGrawHill.
15. J K Sharma, *Business Mathematics, Theory and Applications*, Ane Books India.
16. John bird, *Higher Engineering Mathematics*, Elsevier, Newnes.
17. Wylie C.R and L.C. Barret, *Advanced Engineering Mathematics*, McGraw Hill.
18. V R Lakshmy Gorty, *Advanced Engineering Mathematics-Vol. I, II.*, Ane Books India.
19. Sastry S.S., *Advanced Engineering Mathematics-Vol. I and II.*, Prentice Hall of India.
20. Michael D Greenberg, *Advanced Engineering Mathematics*, Pearson Education.
21. Babu Ram, *Engineering Mathematics Vol.I & II*, Pearson Education.
22. S.Palaniammal, *Probability and Random Processes*, Prentice Hall of India.

Internal Continuous Assessment (Maximum Marks-50)

60% - Tests (minimum 2)

30% - Assignments (minimum 2) such as home work, problem solving, group discussions, quiz, literature survey, seminar, term-project, software exercises, etc.

10% - Attendance and Regularity in the class

University Examination Pattern

PART A: Analytical/problem solving SHORT questions 8x 5 marks=40 marks

Candidates have to answer EIGHT questions out of TEN. There shall be minimum of TWO and maximum of THREE questions from each module with total TEN questions.

PART B: Analytical/Problem solving DESCRIPTIVE questions 4 x 15 marks=60 marks

Two questions from each module with choice to answer one question.

Maximum Total Marks: 100

EN14 402 ENVIRONMENTAL SCIENCE

(Common for all branches)

Teaching scheme

2 hours lecture and 1 hour tutorial per week

Credits: 4

Objectives

- *To understand the problems of pollution, loss of forest, solid waste disposal, degradation of environment, loss of biodiversity and other environmental issues*
- *To create awareness among the students to address these issues and conserve the environment in a better way.*

Module I (8 hours)

The Multidisciplinary nature of environmental science. Definition-scope and importance-need for public awareness. Natural resources. Renewable and non-renewable resources: Natural resources and associated problems-forest resources: Use and over exploitation, deforestation, case studies. Timber extraction, mining, dams and their defects on forests and tribal people- water resources: Use and over utilization of surface and ground water, floods, drought , conflicts over water, dams-benefits and problems.- Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies.- Food resources: World food problems, changes caused by agriculture over grazing, effects of

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modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.-Energy resources: Growing energy needs, renewable and non-renewable energy resources, use of alternate energy resources, Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification.

Module II (8 hours)

Ecosystems-Concept of an ecosystem-structure and function of an ecosystem – producers, consumers, decomposers-energy flow in the ecosystem-Ecological succession- Food chains, food webs and Ecological pyramids-Introduction, types, characteristics features, structure and function of the following ecosystem-Forest ecosystem- Grassland ecosystem –Desert ecosystem-Aquatic ecosystem(ponds, streams, lakes, rivers, oceans , estuaries), Biodiversity and its consideration Introduction- Definition: genetic, species and ecosystem diversity-Bio-geographical; classification of India –value of biodiversity: consumptive use, productive use, social ethical , aesthetic and option values Biodiversity at Global, national , and local level-India at mega –diversity nation- Hot spot of biodiversity-Threats to biodiversity: habitat loss, poaching of wild life, man , wild life conflicts – Endangered and endemic species of India-Conservation of biodiversity : In-situ and Ex-situ conservation of biodiversity.

Module III (10 hours)

Environmental pollution Definition-Causes, effects and control measures of Air pollution- Water pollution –soil pollution-Marine pollution-Noise pollution-Thermal pollution-Nuclear hazards-Solid waste management: Causes, effects and control measures of urban and industrial wastes-Role of an individual in prevention of pollution. Pollution case studies-Disaster management: floods , earth quake, cyclone and landslides-Environmental impact assessment

Module IV (10 hours)

Environment and sustainable development-Sustainable use of natural resources-Conversion of renewable energy resources into other forms-case studies-Problems related to energy and Energy auditing-Water conservation, rain water harvesting, water shed management-case studies-Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust-Waste land reclamation Consumerism and waste products-Reduce, reuse and recycling of products-Value education.

Text Books:

1. Daniels & Krishnaswamy, Environmental studies, Wiley India pvt ltd, 2009
2. Raman Sivakumar, Introduction to environmental science and engineering, 2nd edn, .Tata McGraw Hill, 2010
3. Anindita Basak, Environmental Studies, Pearson Education, 2009
4. Suresh K.D, Environmental Engineering and Management, Katson Books, 2007
5. Benny Joseph, Environmental studies, 2nd edn, McGraw Hill, 2009

References:

1. Raghavan Nambiar,K Text book of Environmental Studies,Scitech Publishers(India) Pvt. Ltd
2. S.P Misra, S.N Pandey, Essential Environmental studies, Ane books, Pvt Ltd, 2009
3. P N Palanisamy, P Manikandan,A Geetha, Manjula Rani, Environmental Science, Pearson Education, 2012
3. D.L. Manjunath, Environmental Studies, Pearson Education, 2011

Internal Continuous Assessment (*Maximum Marks-50*)

60% - Tests (minimum 2)

30% - Assignments (minimum 2) such as home work, problem solving, group discussions, quiz, literature survey, seminar, term-project, software exercises, etc.

10% - Attendance and Regularity in the class

Note: Field work can be Visit to a local area to document environmental assets-river/forest/grass land/mountain or Visit to local polluted site-urban/rural/industrial/agricultural etc. or Study of common plants, insects, birds etc. or Study of simple ecosystems-pond, river, hill slopes etc. or mini project work on renewable energy and other natural resources , management of wastes etc.

University Examination Pattern

PART A: *Analytical/problem solving SHORT questions* *8x 5 marks=40 marks*

Candidates have to answer EIGHT questions out of TEN. There shall be minimum of TWO and maximum of THREE questions from each module with total TEN questions.

PART B: *Analytical/Problem solving DESCRIPTIVE questions* *4 x 15 marks=60 marks*

Two questions from each module with choice to answer one question.

Maximum Total Marks: 100

PT14 403 OFFSET MACHINERY-I

Teaching scheme

3 hours lecture and 1 hour tutorial per week

Credit: 4

Objectives: *This paper deals about the working operation of a sheet fed offset machine and helps to understand about a basic idea of lithographic process.*

Module I (14 hours)

Offset process-principle, advantages, and limitations. Various press configurations. Sheet control unit. In feed unit-pile table, pile height, air blast nozzles, forwarding pick up 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. Front lay type of movements. Side lay-push type lays, pull type lays, Side lay settings. Sheet detectors-mechanical types, electromechanical types, pneumatic types. No sheet detectors-early or fast detectors, twisted sheet detectors. Double sheet detectors. Grippers –spring gripper, pin type gripper, spring pad gripper, compression spring, tension spring. Plate insertion system-tumbler gripper, rotary gripper, swing arm gripper. Sheet transfer section-chain transfer, single drum transfer, three drum transfer. Delivery unit-skeleton wheels. Transfer drum.

Module II (13 hours)

Sheet decurler. Sheet guiding device blow downs. Air cushion transfer drum. Slow down mechanisms. Antiset-off spray equipments. Joggers. Extended deep pile delivery. Double delivery. Puff system. Metered powder supply. Electrostatic system. Introduction. Dwell time. Ductor shock. Ink duct. Ink fountain. Ink feed roller. Oscillating roller. Reciprocating rollers. Drive rollers. Intermediate & plate inking rollers. Drum type inking system. Roller setting. Roller covering. Roller maintenance System cleanliness. Ink agitators.

Module III (13 hours)

Dampening system. Introduction. Fountain roller. Dampening feed roller. Dampening solution composition, Iso propanol alcohol-storage of alcohol, substitute of alcohol. PH of dampening solution. Conductivity of dampening system. Damper setting, Roller covers- molleton fabric cover, stockinette cover, paper damper cover, synthetic damper cover. Damper cleaning machine. Pre make ready, make ready, inspection of press sheets, control of press function during press run maintaining the inking system, maintaining the dampening system, operating the feeder, operating the delivery

Module III (14 hours)

Cylindrical design. Plate cylinder-cylinder driving cylinder body, cylinder gap, plate clamping, plate punching, bearer contact cylinder., bearer gap cylinder. Plate mounting. Preparing plate in cylinder – measuring height of a mounted plate. Determining packing requirement. Types of blanket. Blanket squaring Blanket punching. Under blankets. Shore durometer. Mounting the blanket. Recovering from blanket smash. Use of slightly damaged blanket. Care of blanket, blanket cleaning device. Impression cylinder. Transfer cylinder. Delivery cylinder. Colour sequence in two colour and multi colour operations. Printability and runability. Wet –on-wet printing. Wet–on Dry printing. Perfecting presses. Direct imaging presses.. Printing unit problems. Inking unit problems. Paper problems. Blanket troubles.

Text Books

1. Dejdas L.P and Destree T.M, Sheetfed Offset Press Operating, GATF,USA, 1998.
2. A S Porter, Manual for Lithographic Press Operation.
3. Edwin A Dennis, Olusegan Odesina, Lithographic Technology.
4. Offset Technology-C S. Mishra.

Reference Books.

1. Crowhurst L, Small Offset: Press and Ieration, GATF,USA,1982
2. GATF Staff, Solving Sheetfed Offset Press Problems, GATF, USA, 1994
3. Faux Lanz, Litho Printing, Blurprint Publishing Ltd, Lonon,1987.

Internal Continuous Assessment (Maximum Marks-50)

60% - Tests (minimum 2)

30% - Assignments (minimum 2) such as home work, problem solving, group discussions, quiz, literature survey, seminar, term-project, software exercises, etc.

10% - Regularity in the class

University Examination Pattern

PART A: Analytical/problem solving SHORT questions 8x 5 marks=40 marks

Candidates have to answer EIGHT questions out of TEN. There shall be minimum of TWO and maximum of THREE questions from each module with total TEN questions.

PART B: Analytical/Problem solving DESCRIPTIVE questions 4 x 15 marks=60 marks

Two questions from each module with choice to answer one question.

Maximum Total Marks: 100

PT14 404 MECHANICS OF SOLIDS

Teaching scheme

3 hours lecture and 1 hour tutorial per week

Credits: 4

Objective

- To study the internal effects produced and deformations of bodies caused by externally applied forces
- To understand the strength characteristics of different materials and structural members subjected to Shear, Torsion and Bending

Module I (13 hours)

Tension, compression & shear, Types of external loads – self weight –internal stresses-normal and shear stresses-strain-Hooke's law-Poisson's ratio-relationship between elastic constants-stress strain diagrams working stress- elongation of bars of constant and varying sections- statically indeterminate problems in tension and compression –assembly and thermal stresses-strain energy in tension –compression and shear Analysis of stress and strain, Stress on inclined planes for axial and biaxial stress fields-principal stresses-Mohr's circle of stress.

Module II (15hours)

Bending moment and shearing force. Different types of beams –shear force and bending moment diagrams for simply supported and cantilever beams-relationship connecting intensity of loading – shearing force and bending moment-shear force and bending moment diagrams for statically determinate plane frames. Stresses in laterally loaded symmetrical beams. Theory of simple bending-limitations-bending stresses in beams of different cross sections-moment of resistance- beams of uniform strength-beams of two materials-principal stresses in bending-strain energy due to bending- shearing stresses in bending.

Module III (13 hours)

Deflection of beams. Differential equation of the elastic curve-Slope and deflection of beams by method of successive integration –Macaulay's method –moment area method –conjugate beam method.

Module IV(13 hours)

Theory of columns. Axial loading of short strut-long columns-Euler's formula –Rankine formula -Secant formula-eccentric loading-direct bending stress. Torsion-Torsion of circular solid and hollow shafts –power transmission-strain energy in shear and torsion –close coiled and open coiled helical springs. Thin and thick cylinder. Lamé's equation –stresses in thick cylinders due to internal and external pressures –compound cylinders-shrink fit-wire wound pipes and cylinders

Text Books

1. Timoshenko & Young, Elements of Strength of Materials, Affiliated East West Press
2. Popov E.P, Mechanics of Materials, Prentice Hall India
3. James M Gere & Stephen P Timoshenko Mechanics of materials, CBS Publishers

Reference Books.

1. Hearn E.J, Mechanics of Materials, Pergamon Press, Oxford University Press
2. Warnok F.V, Strength of Materials, Schaum's Outline Series, McGraw Hill
3. Wang C.K, Statically Indeterminate Structures, McGraw Hill
4. Nash W A, Strength of materials, Schaum's Outline series, McGraw Hill .
5. D.K Singh, Strength of materials, Anne books.

Internal Continuous Assessment (Maximum Marks-50)

60% - Tests (minimum 2)

30% - Assignments (minimum 2) such as home work, problem solving, group discussions, quiz, literature survey, seminar, term-project, software exercises, etc.

10% - Regularity in the class

University Examination Pattern

PART A: Analytical/problem solving SHORT questions *8x 5 marks=40 marks*

Candidates have to answer EIGHT questions out of TEN. There shall be minimum of TWO and maximum of THREE questions from each module with total TEN questions.

PART B: Analytical/Problem solving DESCRIPTIVE questions *4 x 15 marks=60 marks*

Two questions from each module with choice to answer one question.

Maximum Total Marks: 100

PT14 405 INSTRUMENTATION & CONTROL SYSTEMS

Teaching scheme

3 hours lecture and 1 hour tutorial per week

Credit: 4

Objectives:

- *To impart the basic concept and operating principle of various Measuring instruments, Electrical and Mechanical sensors.*
- *An introduction to control system and its analysis*

Module I (8 hours)

Measurement terminology – calibration, accuracy, precision, sensitivity, errors in measurement. Basic mechanical detector – Transducer elements, Elastic transducers. Electrical resistance. Capacitance, inductances. Differential transformers, CRO recording techniques.

Module II (14 hours)

Flat grid, Foil grid, Rectangular rosette type electrical resistance strain gages, theory of operation, gage materials, gage factor, mounting techniques, moisture proofing, comparison between Ballast circuit & Wheatstone Bridge circuit, temperature compensation, calibration, strain measurement on static & rotary

shafts. Geometric features – basic definition of straightness, flatness, parallelism, roundness, circularity, squareness etc. – principles and equipments for measurement – principles of interferometry Surface roughness – Definitions – General considerations – Tally surf – Profilometer – roughness indicators – symbols in geometric features.

Module III (15 hours)

Proper orientation of gages for measurement of axial & bending strains, block diagram of strain indicator, strain measurement CRO, paper & styles oscillograph, light beam oscillograph Proving ring. Proving ring strain gage load cell. Hydraulic load cell, pneumatic load cell. Pressure measurement – Bourdon gauge, diaphragms, mechanical & electrical resistance type secondary transducers, McLeod gage, bulk modules gauge. Measurement of torque: cradled dynamometer, band brake, water brake, Torque meter. Temperature Measurement-Bimetallic Thermometer, constant volume thermometer. Vapor pressure thermometer, laws of thermocouples, thermocouple materials, optical pyrometer. Vibration: Vibration detectors, practical vibrometer, practical accelerometers.

Module IV (17 hours)

Introduction, servomechanism, historical development – multivariable control systems, engineering examples of control systems. Mathematical models of physical systems. Examples of electrical, mechanical, thermal, liquid level, pneumatic systems. Transfer functions. Derivation of transfer functions for the above systems and D.C. motor with load, block diagrams. Signal time response of first order system, time response of second order systems, steady state errors and error constants. Concepts of stability, relative stability. Routh's stability criteria and Nyquist stability criteria.

Text Books

1. A.K. Sawhney, Dhanpat Rai & Sons.- Mechanical Measurements Instrumentation
2. I.J. Nagarth / M. Gopal.- Control Systems Engineering
3. Gupta I.C, A Textbook of Engineering Metrology

Reference Books.

1. Wealey Publishing Company, Buck & Beck, With Mechanical Measurement. Addison
2. Sirohi, Radhakrishna.- Mechanical Measurement
3. B.C. Nakra, K.K. Chaudhry.- Instrumentation Measurement & Analysis
4. Harrison & Bollinger.- Automatic Control Systems
5. Benjamin C. Kuo. - Automatic Control Systems
6. R K Jain *Industrial Metrology*, Khanna Publishers

Internal Continuous Assessment (Maximum Marks-50)

- 60% - Tests (minimum 2)
- 30% - Assignments (minimum 2) such as home work, problem solving, group discussions, quiz, literature survey, seminar, term-project, software exercises, etc.
- 10% - Regularity in the class

University Examination Pattern

PART A: Analytical/problem solving SHORT questions 8x 5 marks=40 marks

Candidates have to answer EIGHT questions out of TEN. There shall be minimum of TWO and maximum of THREE questions from each module with total TEN questions.

PART B: Analytical/Problem solving DESCRIPTIVE questions 4 x 15 marks=60 marks

Two questions from each module with choice to answer one question.

Maximum Total Marks: 100

PT14 406 ELECTRONIC COMPOSITION

Teaching scheme

3 hours lecture and 1 hour tutorial per week

Credit: 4

Objectives:

- *To impart the basic concept of design principle & Typography*
- *An introduction to DTP softwares*

Module I (12 hours)

Alphabet design, Type face classification, Typographical measurement, Size of Type , set of a type face, Page widths AND depths, Recognition of type faces - ascenders, decenders and x-height, width of various letters, serifs, sans serifs, weight of the type face, angle of shading in round letters, design of letters, Typography in advertising, Printers measurement systems. Casting up, Casting off - word count method, character count method, en-count method.

Module II (12 hours)

Importance of a good design. Elements of design. Principles in designing, Visual ingredients of graphic design, point, line, graphic space, texture, color, scale, balance and contrast. Suitability for a particular job, design, printing technique and paper surface. Legibility and readability, monograms and trademarks, Selection and co-ordination of production processes within the economic terms of the brief consideration of composition methods. Limitations of binding, finishing and ancillary processes as they affect design. Selection and specification of ink, paper and other materials in relation to design specifications and to the production process decided.

Module III (15 hours)

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 for makeup. Page makeup of pamphlets, folders, book-work, journals, magazines, catalogues, newspapers. Composition Software - Automatic Page Make up, Text and graphics Integration, Page display, WYSIWYG. Post Script (PS): Introduction. PostScript Fundamentals-Structure, code, the user space, Encapsulated PS, Images, color processing, the printer driver, errors, limitations, Adobe acrobat. True type.

Module III (15 hours)

Components of Electronic Composition: Applications, Benefits of Electronic Composition, Output quality and speed, color input and output, Page make-up. Software for DTP - Word processing - heavy duty program, medium duty programs, light duty program, Graphic programs, Illustration programs, Business Graphics, Type manipulation software, Optical Character Recognition (OCR) software, PageMaker, Illustrator, InDesign, Quark-Express, Ventura Publisher, Photoshop.

Text Books

1. Speirs H (1998) "Introduction to Prepress" *Pira International*, UK
2. David Bergsland (1997) "Printing in a Digital World " *Delmar Publishing*, Albany
3. Kleper M.L. (1990) "Illustrated hand book of desk top publishing and type setting " *Wind Crest*, Pennsylvania

Reference Books.

1. Sohick (Cd)- Fundamentals of Copy & Layout- A.C. Book (Ac)
2. Craig- Production for the Graphic Designer
3. Muray (Ray)- How to brief designs & buy print
4. David A.Akar & John G. Myers.- Advertisement management
5. Arthur Robinson, Randall Sale & J.K. Morrison- Elements of Cartography.
6. Leon O Chus & Pen Min Lin C.A.- Copy Preparation

Internal Continuous Assessment (*Maximum Marks-50*)

60% - Tests (minimum 2)

30% - Assignments (minimum 2) such as home work, problem solving, group discussions, quiz, literature survey, seminar, term-project, software exercises, etc.

10% - Regularity in the class

University Examination Pattern

PART A: Analytical/problem solving SHORT questions *8x 5 marks=40 marks*

Candidates have to answer EIGHT questions out of TEN. There shall be minimum of TWO and maximum of THREE questions from each module with total TEN questions.

PART B: Analytical/Problem solving DESCRIPTIVE questions *4 x 15 marks=60 marks*

Two questions from each module with choice to answer one question.

Maximum Total Marks: 100

PT14 407(P) MACHINE DRAWING

Credits: 2

Teaching scheme

3 hours practical per week

Objectives: *This section helps the students to practice part drawings, production drawing, assembly drawing and line drawing of printing machines*

1. Familiarization with screwed fastenings
2. Familiarization with Foundation bolts
3. Drawing Exercise of Welded joints
4. Drawing Exercise of Joints
5. Familiarization of Power transmission systems
 1. Couplings
 2. Pulleys
 3. Keys
6. Gears:- Terminology , Types
7. Bearings:- Journal, Roller
8. Lathe Parts: - Tail Stock, Tool Post, and Carriage.
9. Valves – Stop valves, Safety valves
10. Miscellaneous Machine Elements- C-clamp, Bench-vice, Screw jack, Machine vice
11. Surface, Texture, Limit, Fit, Tolerance.
12. Drawings of Operation process charts in Presses.
13. Simple exercises using (Auto CAD)

14. Line Drawing exercise of following Printing machines
 - a. Stitching machine.
 - b. Cutting machine.
 - c. Feed board with grippers.
 - d. Roll Stand & Brake Assembly of web offset machine.

Internal Continuous Assessment (*Maximum Marks-50*)

- 60% - Laboratory Practical and record
- 30% - Test
- 10% - Regularity in the class

End Semester Examination (*Maximum mark 100*)

- 70%-Procedure, conducting experiment, results, tabulation, and inference
- 20%- Viva voice
- 10%-Fair record

PT14 408(P): ELECTRONIC COMPOSITION LAB

Teaching scheme

3 hours Practical per week

Credit: 2

Objectives: *To Develop a concept in designing and designing softwares.*

List of experiments

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, ord art.
3. Page Maker- Designing of visiting cards, page make up 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. Corel draw- working principles, designing and practicing.
6. Adobe InDesign – working principles, designing and practicing.
7. Adobe Illustrator – working principles, designing and practicing.
8. Quark express – working principles, designing and practicing.
9. Comparing various outputs-Dot matrix, Inkjet printer, Laser printer, Digital printer.

Internal Continuous Assessment (*Maximum Marks-50*)

60% - Laboratory Practical and record

30% - Test

10% - Regularity in the class

End Semester Examination (*Maximum mark 100*)

70%-Procedure, conducting experiment, results, tabulation, and inference

20%- Viva voice

10%-Fair record

FIFTH SEMESTER

PT14 501 ENGINEERING ECONOMICS AND PRINCIPLES OF MANAGEMENT

(Common for ME, PE, CS, IC, IT, PT and AM)

Teaching scheme

3 hours lecture and 1 hour tutorial per week

Credits: 4

SECTION 1: ENGINEERING ECONOMICS

Objective:

The prime objective of the Engineering Economics course is to make students familiar with the economic way of thinking. This course provides the students with the foundations of economic theory, tools and techniques for use in the process of efficient economic decision-making in their engineering and managerial profession.

Module1 (14 Hrs)

Introduction to Engineering Economics – Technical efficiency, Economic efficiency – Cost concepts: Elements of costs, Opportunity cost, Sunk cost, Private and Social cost, Marginal cost, Marginal revenue, Profit maximisation, Break-even analysis.

Supply and Demand: Determinants of demand, Law of demand, Determinants of supply, Law of supply, Market equilibrium. Elasticity of demand – Types of elasticity, Factors affecting the price elasticity of demand.

National Income Concepts: GDP and GNP, Per capita income, Methods of measuring national income. Inflation and Deflation: Concepts and regulatory measures – Monetary policy and Fiscal policy.

Module II (13 Hrs)

Value Analysis - Time value of money - Interest formulae and their applications: Single-payment compound amount factor, Single-payment present worth factor, Equal-payment series compound amount factor, Equal-payment series sinking fund factor, Equal-payment series present worth factor, Equal-payment series capital recovery factor, Effective interest rate.

Investment criteria: Pay Back Period, Net Present Value, Internal Rate of Return, Benefit-cost ratio.

Text Books

1. Panneer Selvam, R, “*Engineering Economics*”, Prentice Hall of India Ltd, New Delhi, 2001.
2. Dwivedi, D.N., “*Managerial Economics, 7/E*”, Vikas Publishing House, 2009.

Reference Books

1. Sullivan, W.G, Wicks, M.W., and Koelling. C.P., “*Engineering Economy 15/E*”, Prentice Hall, New York, 2011.
2. Chan S. Park, “*Contemporary Engineering Economics*”, Prentice Hall of India, 2002.
3. Prasanna Chandra, “*Financial Management: Theory & Practice, 8/E*”, Tata-McGraw Hill, 2011.

Internal Continuous Assessment (Maximum Marks-25)

60% - Tests (minimum 2)

30% - Assignments (minimum 2) such as home work, problem solving, group discussions, quiz, literature survey, seminar, term-project, software exercises, etc.

10% - Attendance and Regularity in the class

University Examination Pattern for Section 1

PART A: Analytical/problem solving SHORT questions 4x 5 marks=20 marks

Candidates have to answer FOUR questions out of FIVE. There shall be minimum of TWO and maximum of THREE questions from each module with total FIVE questions.

PART B: Analytical/Problem solving DESCRIPTIVE questions 2 x 15 marks=30 marks

Two questions from each module with choice to answer one question.

Maximum Total Marks: 50

University Examination Pattern – for Section 1

Note: Section 1 and Section 2 are to be answered in separate answer books

Maximum 50 marks each for Section 1 and Section 2

SECTION 2: PRINCIPLES OF MANAGEMENT

Teaching scheme

1 hour lecture and 1 hour tutorial per week

Credits: 2

Objective

- To provide knowledge on principles of management, decision making techniques, accounting principles and basic management streams

Module I (13 hours)

Principles of management – Evolution of management theory and functions of management
Organizational structure – Principle and types. Decision making – Strategic, tactical & operational decisions, decision making under certainty, risk & uncertainty and multistage decisions & decision tree
Human resource management – Basic concepts of job analysis, job evaluation, merit rating, wages, incentives, recruitment, training and industrial relations

Module II (14 hours)

Financial management – Time value of money and comparison of alternative methods. Costing – Elements & components of cost, allocation of overheads, preparation of cost sheet, break even analysis. Basics of accounting – Principles of accounting, basic concepts of journal, ledger, trade, profit & loss account and balance sheet. Marketing management – Basic concepts of marketing environment, marketing mix, advertising and sales promotion. Project management – Phases, organisation, planning, estimating, planning using PERT & CPM

Reference Books

1. F. Mazda, *Engineering management*, Addison Wesley, Longman Ltd., 1998
2. Lucy C Morse and Daniel L Babcock, *Managing engineering and technology*, Pearson, Prentice Hall
3. O. P. Khanna, *Industrial Engineering and Management*, Dhanpat Rai and Sons, Delhi, 2003.
4. P. Kotler, *Marketing Management: Analysis, Planning, Implementation and Control*, Prentice Hall, New Jersey, 2001
5. Venkata Ratnam C.S & Srivastva B.K, *Personnel Management and Human Resources*, Tata McGraw Hill.
6. Prasanna Chandra, *Financial Management: Theory and Practice*, Tata McGraw Hill.
7. Bhattacharya A.K., *Principles and Practice of Cost Accounting*, Wheeler Publishing
8. Weist and Levy, *A Management guide to PERT and CPM*, Prantice Hall of India
9. Koontz H, O'Donnel C & Weihrich H, *Essentials of Management*, McGraw Hill.
10. Ramaswamy V.S & Namakumari S, *Marketing Management : Planning, Implementation*

Internal Continuous Assessment (Maximum Marks-25)

- 60% - Tests (minimum 2)
- 30% - Assignments (minimum 2) such as home work, problem solving, group discussions, quiz, literature survey, seminar, term-project, software exercises, etc.
- 10% - Attendance and Regularity in the class

University Examination Pattern – for Section 2

Note: Section 1 and Section 2 are to be answered in separate answer books

Maximum 50 marks each for Section 1 and Section 2

University Examination Pattern for Section 2

PART A: Analytical/problem solving SHORT questions *4x 5 marks=20 marks*

Candidates have to answer FOUR questions out of FIVE. There shall be minimum of TWO and maximum of THREE questions from each module with total FIVE questions.

PART B: Analytical/Problem solving DESCRIPTIVE questions *2 x 15 marks=30 marks*

Two questions from each module with choice to answer one question.

Maximum Total Marks: 50

PT14 502 ANALOG AND DIGITAL ELECTRONICS

Teaching scheme

3 hours lecture and 1 hour tutorial per week

Credit: 4

Objectives: *This Subject deals about BJT, FET, MOSFET Operational amplifier and its configuration, Introduction to Digital electronics and sequential circuits*

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Module I (13 Hours)

Transistor as an amplifier- Biasing- need of biasing-different types – load line –bias stabilization – stability factor – Transistor CC ,CB, CE configurations- h parameter-Equivalent of Transistor CC ,CB, CE configurations- JFET- construction- characteristics-MOSFETS- types-enhancement &depletion type – transfer & Drain characteristics- JFET biasing- self biasing- fixed biasing- Analysis of CS and CD Configuration.

Module II (14 Hours)

Differential amplifier- Configurations-Op-amp-Block diagram- Basic OP-amp-parameters – CMRR- Inverting and Non inverting amplifier – Amplification of OP-amp-Summer, Scaling-Averaging amplifier – Subtractor, OP-amp integrator. Differentiator-Instrumentation amplifier.

Module III (13 hours)

Number systems and its conversions, Gray codes, Excs 3 codes, Alpha numeric codes, Representation of signed numbers, Two's and One's compliment, Arithmetic and Logic Operations, Boolean exoressions, Logic gates, realization of expressions using Gates Expansion of Boolean Operations to SOP and DOS Forms, K map(Two, Three and Four variable K map), Don't care conditions, Binary addition Subtraction, Adder, Subtractor, , Multiplexer, Demultiplexer, Decodes and Encodes.

Module IV (14 hours)

Sequential circuits- Latch-, Flip flops- SR, JK, D & T-Flip flop- Concept of Triggering-Conversion and Application of Flip flops. Shift Register-types-Ring and Johnson counter, Synchronous and Asynchronous counter.

Text Books

1. Boylesand & Nashelsky L, Electronics Devices & Circuit Theory' ,Prentice Hall of India
2. Millman & Halkias, Integrated Electronics, McGraw Hill
3. Mano M M, Digital Design, PHI
4. Thomas L Floyd & R.P Jain, digital Fundamentals (Eight edition), Pearson

Reference Books.

1. Hay W.H.,Electronic Analysis & Design ,Jaico Pub.
2. Borgrat T.F.,Electronic Devices & Circuits', McGraw Hill
3. Horenstein M. N., Microelectronic Circuits & Devices', Prentice Hall of India
4. Schilling D.L & Belove C, Electronic Circuits, McGraw Hill
5. Baker R.J, Li H.W & Boyce D.E, CMOS-Circuit Design, Layout & Simulation, Prentice of

Internal Continuous Assessment (Maximum Marks-50)

- 60% - Tests (minimum 2)
- 30% - Assignments (minimum 2) such as home work, problem solving, group discussions, quiz, literature survey, seminar, term-project, software exercises, etc.
- 10% - Regularity in the class

PT14 503 OFFSET MACHINERY-II

Teaching scheme

Credit: 4

University Examination Pattern	
<i>PART A: Analytical/problem solving SHORT questions</i>	<i>8x 5 marks=40 marks</i>
Candidates have to answer EIGHT questions out of TEN. There shall be minimum of TWO and maximum of THREE questions from each module with total TEN questions.	
<i>PART B: Analytical/Problem solving DESCRIPTIVE questions</i>	<i>4 x 15 marks=60 marks</i>
Two questions from each module with choice to answer one question.	
<i>Maximum Total Marks: 100</i>	

3 hours lecture and 1 hour tutorial per week

Objectives: *This paper helps to give knowledge about the working and operation of a web offset printing*

Module I (13 hours)

Introduction, Overview. General terminology-web offset, direct lithography, folder, sheeter, gusset wrinkle, rewinder, gear side, operator side, printing couple, printing unit, perfecting, nonperfecting, inline, horizontal presses, vertical presses-I-C presses. Blanket to Blanket presses-Introduction, plate cylinder, Blanket cylinder, cylinder pressure & timing, Arithmetic oh packing. Packaging gauge, bench micrometer. Inking system –Introduction, functions of Inking system, construction of Inking system, roller setting methods, wash-up machines.

Module II (13 hours)

Dampening systems- conventional dampening system, dampening roller coverings, water stop for regulating water flow. Types of dampening systems –levy flap dampening systems, continuous flow dampening systems, brush dampening using flick blades, Clare brush dampening systems, goss brush dampening systems. Alcohol in fountain solution. Continuous flow dampening systems- inker feed systems; Dahlgreen dampening systems-Miehle-matic-roland-matic-Harris duotrol-Epic litho/dampener plate feed systems. Combination continuous –flow systems. Critical metering nip.Reverse slips nip-Smith dampening systems. Spray-bar dampening systems.construction of plate dampening roller. Flap system for metering, air knife system for metering.

Module III (14 hours)

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Single- roll stand, multiple roll stand, dancer roller, Lug air shaft, continuous roll feeding devices-Flying Pasters-splicing sequence on flying paster. Zero speed splicer-splicing sequence on a zero speed paster. Preparing a splice. Splice template, infeed operation.Dryers-introduction, function, setting of quick set ink, setting of heat set ink. Types of dryers, removal of solvent-lader air from web, putting a controlled ripple in the web. Chill rolls-Introduction, function, types of roll system. The evolution of chill roll design, chill roll plumbing, Average web temperature after chilling, side-to-side temperature variation after chilling.Folders-Introduction,folding principles, parts of folder, combination folder, ribbon folder, double-former folder, the mechanics oh folding process of jaw fold, chopper fold mechanisms. Operation of collect cylinder, press folders, doubleformer prefolder, flow folders, insert folders.

Module IV (14 hours)

Inline finishing-Introduction, gluers, paster wheels, demonstrable pattern gluers,segmented gluers, envelope pattern gluers, backbone gluers. Pattern perforating and numbering units-sheeters,variable rotary cutters, auxillary equipments- Remote control console ,plate scanners, scanning densitometer, close- 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, liquid applicator systems, roller applicator systems, antistatic devices, Imprinters, Perfectors, cut off controls, stroboscope, synchroscope, counter.Web control factors, measuring tension, setting tensions a the press, paper behaviour a press. Image control- registration, register marks backup, colour register, relative print width, relative print lengths, and controlling fan out. Web control-side lay, box tilt, cut off, no slip cut off, web to web and ribbon to ribbon. Make ready-make readyinfeed, makeready printing units, makeready dryer and chill rolls make ready folder, running makeready.Press room safety.

Text Books

1. David B.Crouse, Robert J Schneider,Jr, Web offset press operating.
2. C.S.Mishra ,Offset M/C II.
3. A.S .Porter, Manual for Lithography press operator

Reference Books.

1. Crouse D.B and Schneider R J, Web offset Operating, GATF,USA,1989
2. Durrant Bob, Introduction to Web Printing, PIRA International, UK,1994
3. Durrant Bob, Developments in Web Offset, PIRA International, UK,1993
4. GATF Staff, Solving Web Offset problems, GATF,USA, 1990

Internal Continuous Assessment (Maximum Marks-50)

- 60% - Tests (minimum 2)
- 30% - Assignments (minimum 2) such as home work, problem solving, group discussions, quiz, literature survey, seminar, term-project, software exercises, etc.
- 10% - Regularity in the class

University Examination Pattern

PART A: Analytical/problem solving SHORT questions *8x 5 marks=40 marks*

Candidates have to answer EIGHT questions out of TEN.
There shall be minimum of TWO and maximum of
THREE questions from each module with total TEN
questions.

PART B: Analytical/Problem solving DESCRIPTIVE questions *4 x 15 marks=60 marks*

Two questions from each module with choice to answer
one question.

Maximum Total Marks: 100

PT14 504 MARKETING MANAGEMENT

Teaching scheme

3hours lecture and 1 hour tutorial per week

Credit: 4

Objective: *Imparts concepts of marketing and emphasis the role of marketing in organization*

Module I (14 hours)

Needs, wants and demands, products, value, cost and satisfaction, exchange, transactions and relationships, markets, marketing and marketers, company orientation towards the market place production concepts, product concept, selling concept, marketing concept, societal marketing concept. Adoption of marketing management-In business sector, in non profit sector, in international sector. Marketing as a managerial function, role of marketing in modern organizations. Corporate strategic planning- Corporate mission, strategic business unit identification, evaluating the current business portfolio, corporate new business plan. Business strategy Planning- Business mission, external environmental analysis, internal environment analysis, goal formulation, strategy formulation, are grain formulation, implementation, feedback and control. Market opportunity –Size of market, demand analysis, industry analysis, competition analysis, segmentation analysis. Product market selection,

approaches to marketing planning-PIMS, BCG. Structure of marketing plan, process of marketing planning.

Module II (12 hours)

Concept of MIS, components of MIS, internal record system, marketing intelligence system, marketing research system, suppliers of MR, scope of MR. The research process-problem definition, statement of research objectives, research design, exploratory, descriptive, causative. Sources of data- Primary source of data, secondary data, advantages of sec. data, new age of secondary information. Data collection-

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procedure, tools. Data analysis. Report and presentation. Identifying the company's competitors, industry concept of competition, market concept of competition, identifying the competitors strategies, determining the competitors objectives, assessing the competitors strengths & weakness. Estimating the competitions reaction patterns. Designing the competitive intelligence system.

Module III (13hours)

Concept in demand measurement, estimating current demand, estimating future demand-Survey of buyers intentions, composite of sales force opinions, expert opinion, market test method, time series analysis, statistical demand analysis. New product decisions. The era of new product, what is a new product,factors contributing new product development-Changing customers preferences, technological changes, govt. policy. New product development process- idea generation, identifying prospective customers, concept development & testing, feasibility analysis, product development, test marketing, commercialization. Organization of new product, internet and new product development. Designing marketing strategies for market leaders, challenges, followers & Nichers-Market lead strategies-expanding the total market, defending market share, marketing strategies, expanding market share. Market challenger strategies-strategic objectives and opponents. Market follower strategies, market nichers strategies.

Module IV (15 hours)

Direct Marketing-nature, growth, advantages. Major tools of direct marketing, development of integrated direct marketing, maxi marketing model for integrated marketing, major decisions in direct marketing. Public relations-decisions in marketing PR, tools in marketing PR. Principles of personal selling- selling, the variety of selling styles & buying styles, negotiation, principled negotiation approved to bargaining, bargaining tactics, relationship management, when & how to use relationship management.Marketing organizations-evolution of marketing dept. ways of organizing marketing department, strategies for company wide marketing orientation. Marketing implementation-diagnostic skills, Evaluating and controlling marketing performance. Annual-plan control-Sales analysis, Market share analysis, financial analysis, customer satisfaction trading, corrective action. Profitability control, Efficiency control, Strategic control, Marketing controller concept.

Text Books

1. Philip Kotler.- Marketing Management & Analysis Planning Implementation & Control
2. Rajan Saxena.- Marketing ManagementReference Books.

Reference

1. Marketing Management- Planning, Implementation & Control- 3rd edition, V Ramaswamy S Hamakumari.
2. Strategic Marketing Management- 2nd edition- Carol H Andreson, Julian W Vincze

Internal Continuous Assessment (Maximum Marks-50)

- 60% - Tests (minimum 2)
- 30% - Assignments (minimum 2) such as home work, problem solving, group discussions, quiz, literature survey, seminar, term-project, software exercises, etc.
- 10% - Regularity in the class

University Examination Pattern

PART A: *Analytical/problem solving SHORT questions* 8x 5 marks=40 marks

Candidates have to answer EIGHT questions out of TEN. There shall be minimum of TWO and maximum of THREE questions from each module with total TEN questions.

PART B: *Analytical/Problem solving DESCRIPTIVE questions* 4 x 15 marks=60 marks

Two questions from each module with choice to answer one question.

Maximum Total Marks: 100

PT14 505 THEORY OF MECHANISM

Teaching scheme

3 hours lecture and 1 hour tutorial per week

Credit: 4

Objectives: *Provides the necessary foundation and establish the theory, analysis, design and practice of mechanism and kinematics & dynamics of machine*

Module I (14 hours)

Mechanism and machine. Kinematic pair. Chain and inversions. Constrained and unconstrained motion. Four bar mechanism. Single and double slider crank mechanism with inversions, quick return mechanism. Toggle mechanism, oldham's coupling, Hooke's joint. Types of cams. Types of followers. Cam profiles. Graphical methods for simple harmonic motion. Uniform velocity and cycloidal motion. Radical and oscillating follower. Calculation of maximum velocity and acceleration of follower.

Module II (14 hours)

Gear classifications. Law of gearing. Spur gear definitions. Involute tooth profile and involutometry. Determination of length of path of contact. Arc of contact. Contact ratio. Interference in involute gear. Minimum number of teeth on pinion to avoid interference. Parallel and crossed helical gear. Simple compound reverted. Epicyclic gear train. Solution by tabular column method only. Torque transmitted by epicyclic gear train. Bevel epicyclic gear train. Differential gear drive of an automobile.

Module III (13 hours)

Static and dynamic balancing. Balancing of revolving masses in single plane and different planes (Graphical method). Action of belt on pulleys. Open and crossed belt drives. Velocity ratio. Slip belt thickness. Length of belts. Ratio of friction tensions. Maximum power transmitted by belt.

Module IV (13 hours)

Definitions. Types of vibration. Natural vibration. Un-damped and damped (Viscous damping only). Logarithmic decrement. Forced damped vibrations. Vibration isolation and transmissibility.

Text Books

1. Ballany P.L.- Theory of machines
2. S.S. Rattan.- Theory of machines Reference Books.

Reference Books.

1. Hamilton H. Mabie and Oevirk.- Mechanisms and dynamics of machines
2. Jagadishlal.- Theory of machines
3. Dr. J.S. Rao & Dukkipati.- Theory of machines and mechanisms
4. V.P. Singh.- Theory of machines.

Internal Continuous Assessment (Maximum Marks-50)

60% - Tests (minimum 2)

30% - Assignments (minimum 2) such as home work, problem solving, group discussions, quiz, literature survey, seminar, term-project, software exercises, etc.

10% - Regularity in the class

University Examination Pattern

PART A: Analytical/problem solving SHORT questions 8x 5 marks=40 marks

Candidates have to answer EIGHT questions out of TEN. There shall be minimum of TWO and maximum of THREE questions from each module with total TEN questions.

PART B: Analytical/Problem solving DESCRIPTIVE questions 4 x 15 marks=60 marks

Two questions from each module with choice to answer one question.

Maximum Total Marks: 100

PT14 506 ELECTRIC DRIVES & CONTROL

Teaching scheme

3 hours lecture and 1 hour tutorial per week

Credits: 4

Objectives

- Study the basic concepts of power electronics & power electronic converters

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- Study the different types of electric drives

Module I (15 hours)

Structure & static characteristics of Silicon Controlled Rectifier (SCR) - structure of Power Transistor, Power MOSFET & IGBT – comparison – turn-on methods of SCR – UJT triggering circuit – controlled rectifier – 1-phase full-wave controlled bridge rectifier with R load – with RLE load (continuous & ripple free load current) – expression for average output voltage – 1-phase dual converter without circulating current – inverter – 1-phase full bridge inverter with R load – 3-phase full bridge inverter with R load (180°) mode – waveforms of line voltages only

Module II (11 hours)

1-phase AC voltage controllers (full wave) with R load – waveforms of output voltage – expression for RMS output voltage – 1-phase to 1-phase step-down cyclo-converter (bridge type) with R load – dc choppers – step down chopper - step-up chopper - step up and down chopper – expression for average output voltage in terms of duty ratio – two-quadrant chopper – four-quadrant chopper

Module III (15 hours)

Electric drives – parts of electric drives – torque equation - components of load torque – four quadrant operation – dc drives – different types of dc motors – separately excited, shunt, series and compound motors – basic equations – armature control & field control of separately excited dc motor – 1-phase fully controlled converter for dc drives (continuous conduction only) – 1-phase dual converter fed dc drive – four quadrant operation – two-quadrant & four-quadrant chopper controlled dc motor

Module IV (13 hours)

3-phase induction motor – squirrel cage and wound rotor type – equivalent circuit – torque equation – speed-torque characteristics – speed control - stator voltage control – stator frequency control – stator voltage & frequency control - pole changing method – rotor resistance control – static rotor resistance control - slip-power recovery scheme – static Kramer drive – synchronous motor drives – cylindrical-rotor motors – salient-pole motors.

Text Books

1. P.S. Bimbhra, *Power Electronics*, Khanna Publishers, New Delhi

Reference Books

1. P.S. Bimbhra, *Electrical Machinery*, Khanna Publishers, New Delhi
2. Muhammad H. Rashid, *Power Electronics Circuits, Devices and Applications*, Pearson Education
3. Gopal K. Dubey, *Fundamentals of Electrical Drives*, Narosa Publishing House, New Delhi

Internal Continuous Assessment (Maximum Marks-50)

- 60% - Tests (minimum 2)
- 30% - Assignments (minimum 2) such as home work, problem solving, group discussions, quiz, literature survey, seminar, term-project, software exercises, etc.
- 10% - Regularity in the class

University Examination Pattern

PART A: Analytical/problem solving SHORT questions *8x 5 marks=40 marks*

Candidates have to answer EIGHT questions out of TEN.
There shall be minimum of TWO and maximum of
THREE questions from each module with total TEN
questions.

PART B: Analytical/Problem solving DESCRIPTIVE questions *4 x 15 marks=60 marks*

Two questions from each module with choice to answer
one question.

Maximum Total Marks: 100

PT14 507(P): PRINTING MACHINES LAB

Teaching scheme

3 hours Practical per week

Credit: 2

Objectives: *To develop a practical knowledge in Sheet fed and web offset machine.*

List of Experiments:

1. Familiarization of printing equipments and conventional methods of printing.
2. Setting the feeder board, lays, and delivery of sheet fed offset machine.
3. Mounting the plate
4. Setting inking system
5. Setting Dampening system
6. Taking single color print from sheet fed offset machine
7. Taking multi color print from sheet fed offset machine
8. Preparation of imposition for Web-offset Printing
9. Study of pre-make ready & make-ready operations of web offset machine.
10. To obtain single color print from web offset machine.
11. To obtain multi color print from web offset machine.

Internal Continuous Assessment (*Maximum Marks-50*)

- 60% - Laboratory Practical and record
- 30% - Test
- 10% - Regularity in the class

End Semester Examination (*Maximum mark 100*)

- 70%-Procedure, conducting experiment, results, tabulation, and inference
- 20%- Viva voice
- 10%-Fair record

PT14 508 (P) ELECTRICAL & ELECTRONICS ENGG. LAB

Teaching scheme

3 hours practical per week

Credit: 2

Objectives: *To get a basic idea about working of electrical and electronics circuits*

List of Experiments:

1. Diode & Zener diode characteristics –dc and dynamic resistance
2. Op amplifier parameters
3. Inverting and Non inverting amplifier
4. FET Characteristics
5. UJT characteristics & the relaxation oscillator
6. Familiarization with logic gates
7. Implementation of logic gates using Universal gates
8. First and second order LPF/HPF/BPF with R and C for a given cut-off frequency
9. Verification of Kirchhoff's Law in DC circuit.
10. Verification of super position theorem in DC circuit
11. 3 Φ Power measurement using one wattmeter & two wattmeters
12. Load test on D.C shunt & series motor
13. Plot the following characteristics
 - a) Output Vs efficiency
 - b) Output Vs line current
 - c) Output Vs Speed
 - d) Speed Vs torque
 - e) Line current Vs torque
14. Load test on 3 Φ squirrel cage & slip ring induction motors

- a. Conduct the break test on both types of machines
 - b. Obtain & plot the various performance characteristics
 - c. Find the KVAR required improving the power factor to 0.95 at various loads & finding the relation.
15. No load & blocked rotor test on a 3Φ squirrel cage induction motors & slip ring induction motor.
- a) Conduct no load & blocked rotor tests on both type of machines
 - b) Determine the equivalent circuit parameters & draw the equivalent circuit.
 - c) Draw the circuit diagram & there from pre-determine the performance chara

Internal Continuous Assessment (Maximum Marks-50)

- 60% - Laboratory Practical and record
- 30% - Test
- 10% - Regularity in the class

End Semester Examination (Maximum mark 100)

- 70%-Procedure, conducting experiment, results, tabulation, and inference
- 20%- Viva voice
- 10%-Fair record

SIXTH SEMESTER

PT014 601 DESIGN OF MACHINE ELEMENTS

Teaching scheme

3 hours lecture and 1 hour tutorial per week

Credit: 4

Objective: *This paper aims at imparting knowledge about the factors that should be considered while designing a component so as to enable the design for manufacturing.*

Module 1 (12 hours)

Machine design – introduction – basic procedure – basic requirements of machine elements – Design of machine elements – traditional methods – standard in design – selection of preferred sizes – aesthetic and ergonomic consideration – mechanical properties – different types of steels – non ferrous materials – selection of materials. Design against static load – design against fluctuating load, Design of threaded joints, keys and couplings

Module II (15 hours)

Design of belt drives – chain drives – Open, Crossed and Wire rope – rolling contact bearings – spur gears – helical gears, worm gear.

Module III (13 hours)

Hydrodynamic theory- sommerfeld number-dimensionless parameters-optimum journal bearings- design problem in journal bearings – newer bearing materials-types of antifriction bearings-static and dynamic and capacity- cubic mean load, variable load-selection of anti-frictional bearings

Module IV (14 hours)

Design of shafts - forces on shafts due to gears, belts, and chains- estimation of shaft size based on strength and critical speed- selection of material. Design of springs- stresses and deflection in round wire helical springs- accounting for variable stresses- concentric springs- design of helical and leaf springs.

Text Books

1. Shigley, Mechanical Engineering Design
2. Design Data hand book, DAV Printers, Coimbatore

Reference Books.

1. Faies V.M, Design of Machine Elements, Mac Millan, Co, London
2. Dobrovalasky, Machine Elements, MIR Publications

Internal Continuous Assessment (Maximum Marks-50)

60% - Tests (minimum 2)

30% - Assignments (minimum 2) such as home work, problem solving, group discussions, quiz, literature survey, seminar, term-project, software exercises, etc.

10% - Regularity in the class

University Examination Pattern

PART A: Analytical/problem solving SHORT questions 8x 5 marks=40 marks

Candidates have to answer EIGHT questions out of TEN.
There shall be minimum of TWO and maximum of THREE questions from each module with total TEN questions.

PART B: Analytical/Problem solving DESCRIPTIVE questions 4 x 15 marks=60 marks

Two questions from each module with choice to answer one question.

Maximum Total Marks: 100

PT14 602 MICROPROCESSOR AND IMAGE GENERATION

Teaching scheme

2 hours lecture and 1 hour tutorial per week

Credit: 4

Objectives:

- Understanding the architecture and programming of 8086 microprocessor
- Understanding the architecture, programming and interfacing of basic microcontrollers.
- To provide the basics of image generation using MAT Lab

Module I (13 Hours)

.8086 Microprocessor:- Introduction to 8086, Pin details of 8086, Architecture of 8086, Addressing modes, instruction formats, instruction set- Data transfer- Arithmetic, Logic and branching operations, assembly language programming..

Module II (14 hours)

8086 Interrupt –implementation of the 8086 interrupts- Multiple interrupts & priorities Programmable. interrupt controller— 8259A , Director memory access . Basic interfacing concepts – I/O execution, Execution of memory related data transfer instruction.

Module III (14 hours)

Introduction. Comparing micro processors & micro controllers. 8051 Micro controller hardware. Input/Output pins, Ports of circuits, Counters & Timers Serial data interrupts, Data transmission, Data reception.

Module IV (13 hours)

Introduction to MATLAB, Starting MATLAB, Using MATLAB as a calculator, Operations with variables, Mathematical functions, Basic plotting, Matrix generation, Array operations, Introduction to programming in MATLAB, Control flow and operators,

Text Books

1. Sunil Mathur, Microprocessor 8086 : Architecture, Programming and Interfacing, PHI Learning Pvt. Ltd.
2. Kenneth J Ayala, 8086 Microprocessor: Programming and Interfacing the PC, West Pub., 1995
3. Kenneth J. Ayala, The 8051 Microcontroller 3E, 3rd edition, Cengage Learning, 2004

Internal Continuous Assessment (Maximum Marks-50)

- 60% - Tests (minimum 2)
- 30% - Assignments (minimum 2) such as home work, problem solving, group discussions, quiz, literature survey, seminar, term-project, software exercises, etc.
- 10% - Regularity in the class

University Examination Pattern

PART A: Analytical/problem solving SHORT questions *8x 5 marks=40 marks*

Candidates have to answer EIGHT questions out of TEN.
There shall be minimum of TWO and maximum of
THREE questions from each module with total TEN
questions.

PART B: Analytical/Problem solving DESCRIPTIVE questions *4 x 15 marks=60 marks*

Two questions from each module with choice to answer
one question.

Maximum Total Marks: 100

PT14 603 FLEXOGRAPHY

Teaching scheme

3 hours lecture and 1 hour tutorial per week

Credit: 4

Objectives: *To impart an idea about flexo printing methods this is mainly applicable for printing on flexible substrates.*

Module I (12 hours)

Definition, flexographic printing, flexographic products, Flexographic substrates Advantages of flexography, Press development. Mechanical principles of flexography – Fountain roll, Anilox roll, plate cylinder, impression cylinder. Basic elements of flexography – Print plate, cylinder, integral, demountable, sleeves, magnetic. Gears. Mounting & proofing devices, flexographic printing press – unwind and in feed section, printing section, drying section, out feed and rewind section. Sheet fed flexo presses. Inks, variations on flexopresses. Flexo press types – Stack press, Central impression cylinder press, Inline press. Narrow Web presses- its components. Wide web presses. Corrugated presses. Pre printed liner presses.

Module II (14 hours)

Introduction. Plates for process printing – Molded rubber plates – basics of rubber plate making, rubber printing plate components, rubber plate molding. Negatives, engravings and hard durometer photo polymer masters, preparation of metal and image exposure, powder less etching of metal, finishing, qualities of a good metal engraving, basic types of engravings, types of metal originals other originals.. Auxiliary equipment needed to produce printing plate. Making the thermosetting mold or matrix – Composition of matrix, shrinkage and its control, matrix floor, determining thickness control bearers, preheat function, position molding, Pressure and curing requirements, matrix mold make-ready, procedure

for molding a matrix. Rubber plate molding. Types of molded printing plate. Photo polymer plates – Basics of photopolymer plates. Types of Photopolymers – Plate making from liquid photo polymer, plate making from sheet photo polymer.

Module III (14 hours)

Tension in flexographic m/c, Tension gear, tension levels and pattern for zones, Web tension contact systems. Unwind equipments – general, single-position unwind – flying-splice unwind, unwind tension systems, infeed unit, cooling drum a 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. Cooling rolls – Balancing flexo rolls, deflection of rolls. Unwind equipment. Repeat lengths increments – Direct drive quadrant geared press. Flexographic printing problems.

Module IV (14 hours)

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..Molded printing plate manufacture – molding press, thickness control bearers, bench micrometers, rubber plate finishing. Mounting and proofing of flexo plates- Pre mounting procedures, Understanding the mounting instructions. Computerised mounting and Proofing system.Pin register mounting system, Plate mounting without a mounting & proofing equipment. Miscellaneous procedures – removing plates from the cylinder, mounting metal-backed plates, reusing sticky back, plate staggering, use of release agents. Environment and safety concerns.

Text Books

1. Flexography principles and practices, Fourth edition, Foundation of flexographic technical association.

Reference Books.

1. Flexography principles and practices , Fifth edition, Foundation of flexographic technical association
2. Adams J.M, Faux,D.D and Rieber L.J, Printing Technology, Delmar Publishers, NewYork.

Internal Continuous Assessment (Maximum Marks-50)

- 60% - Tests (minimum 2)
- 30% - Assignments (minimum 2) such as home work, problem solving, group discussions, quiz, literature survey, seminar, term-project, software exercises, etc.
- 10% - Regularity in the class

University Examination Pattern

PART A: Analytical/problem solving SHORT questions *8x 5 marks=40 marks*

Candidates have to answer EIGHT questions out of TEN. There shall be minimum of TWO and maximum of THREE questions from each module with total TEN questions.

PART B: Analytical/Problem solving DESCRIPTIVE questions *4 x 15 marks=60 marks*

Two questions from each module with choice to answer one question.

Maximum Total Marks: 100

PT14 604 PRINT FINISHING AND CONVERTING

Teaching scheme

3hours lecture and 1 hour tutorial per week

Credit: 4

Objectives: *To impart the knowledge about post press operation and converting process in printing industry.*

Module I (13 hours)

Introduction to Print finishing-Binding – Classification-styles. Paper grades- Factors affecting buying of paper, Binding Materials: Covering materials of all types, preparation and treatment in covering. Miscellaneous materials such as thread cords, tapes, mull, eyelets etc.. Methods of dealing with fungi and insect pests. End Papers- Purpose- kind-Quality required. Binding tools- Forwarding and finishing tools.

Binding equipments-Laying press, Standardizing press, Sewing frame, Glue pot, Board cutting. Paper size-Classification, Application, advantages-disadvantages.

Module II (13 hours)

Introduction, Principles of adhesives, operating parameters for adhesives – operative, wet tack, compression, solidification. Types of adhesives – Drying adhesives – solvent based adhesives, water based adhesives, pressure sensitive adhesives. Hot melt adhesives – pressure sensitive hot melts, applying hot melts. Curing adhesives – cure by mixing two or more components, cure when heated, exposure to moisture. Radiation curing, Ultra curing, Pressure sensitive adhesive. Styrenic block copolymers – ultraviolet curing SBC's comparison of this stages involved in bond formation. Adhesive classes and Properties – Acrylics, animal glues, casein, starch, dextrin, pregelatinized starch, ethylene acetate copolymer, hot melts, polyamide hot melts, polyester hot melts, resin hot melts, natural rubber – latex adhesives, polyurethanes, polyvinyl acetate, poly vinyl alcohol, polyvinylidene chloride, SBS and SIS block copolymers, styrene-butadiene rubber, vinyl acetate copolymers, vinyl acetate – ethylene copolymers for liquid applications. Theories of adhesion – mechanical adhesion, chemical adhesion, theories of chemical adhesion – chemical reaction theory, absorption theory, electrostatic theory, diffusion theory, contact angle and wettability, surface modification.

Module III (14 hours)

General principles of the single knife guillotines. Semiautomatic and automatic programming systems, principles and applications. Three-knife pile trimmers, features and operations of semi automatic and continuous machines. Mechanism and maintenance of guillotines and three-knife trimmers; causes and prevention inaccurate cutting. Folding-. Folding schemes, classification-Basic principles of Sheetfed and Web-fed folding mechanism- Use of perforators, creasers and slitters; feeding unit and delivery. Suitability of folding method and machine to job requirements and paper stock. Causes and prevention of inaccurate folding.

Module IV (14 hours)

Principles of machine gathering types of machines available. Coupling of other units for in-line production. Insetting and wire stitching by semiautomatic and automatic means. Wire stitching, thread stitching, adhesive binding, sewing. General principles, materials used, styles, varieties and purposes of each method. Spiral wire binding, plastic comb binding, loose-leaf binders; thong and ring binders. Principles and operation of perforating, punching, drilling, round cornering, indexing, creasing, gluing, eyeletting, ruling and numbering. Tipping in-Embossing-foil stamping-Marbling-Graining .Varnishing, gumming and film lamination machines. Machines used for gathering, collating, insetting and attaching plates. Maintenance of these equipment for trouble free running; production capacities.

Text Books

1. A.G. Martin.- Finishing Process in Print Industry
2. U.S. Govt. Printing- Theory and Practice of Book Binding

Reference Books.

1. Aurther W. Johnson.-The Thames and Hudson Manual of Book Binding
2. Michael Barnard. -Introduction to Print Buying Printing, Bob Thompson, Materials Science and Technology

Internal Continuous Assessment (Maximum Marks-50)

60% - Tests (minimum 2)

30% - Assignments (minimum 2) such as home work, problem solving, group discussions, quiz, literature survey, seminar, term-project, software exercises, etc.

10% - Regularity in the class

University Examination Pattern

PART A: Analytical/problem solving SHORT questions *8x 5 marks=40 marks*

Candidates have to answer EIGHT questions out of TEN.
There shall be minimum of TWO and maximum of THREE questions from each module with total TEN questions.

PART B: Analytical/Problem solving DESCRIPTIVE questions *4 x 15 marks=60 marks*

Two questions from each module with choice to answer one question.

Maximum Total Marks: 100

PT14 605 SCREEN PRINTING & GRAVURE

Teaching scheme

3 hours lecture and 1 hour tutorial per week

Credit: 4

Objectives: *This paper helps to develop a basic concept about screen printing process and gravure industry.*

Module I (10 hours)

History of Screening Printing, Stencils – knife cut stencils, photo stencils – Indirect stencil systems, Direct photo stencil systems, capillary systems, Direct/Indirect photo stencil systems. Screening materials. Screens – multifilament, mono filaments, Selecting mesh material, stretching screen fabric 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 shape and application. On contact printing, Off contact printing. Screen ink uniqueness – U.V. inks.

Module II (12 hours)

Manual Printing Process, Semi automatic Screen Printing m/c. Automatic Screen Printing m/c. Screen Printing machines – Flat bed hinged frame, Flat bed vertical lift, Cylinder-bed presses, Container printing m/c, Rotary Screen Printing m/c, Carousel m/c. Special Machine configurations. Basic registration techniques. Method of halftone preparation for screen printing. Drying methods – Evaporation, Oxidation, Penetration, Polymerization. Drying Equipments – Drying racks, wicket dryers, Jet dryers, Infrared dryers, Ultraviolet dryers. Flocking process. Introduction, Paper and Paper board, Wood, Textiles, Plastics, Metals, Ceramics and glass. Specialized Areas – Printed circuit boards of screen printing.

Module III (18 hours)

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, Re use 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.

Module IV (14 hours)

A generic printing unit. Typical press configurations. – Other gravure presses – Intaglio plate printing, offset gravure and flexogravure. Gravure with flexo units. Gravure units as other equipment. Gravure roller coating. 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 from incinerators. Solvent Recovery Methods. 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.

Text Books:

1. Screen Printing Preview, Babette Magee
2. Screen Printing , John Stephens
3. Gravure process and technology, GAA.
4. Printing Technology, Adams, Faux, Rieber.

Reference:

- Samuel B.H. (1997) “Screen Printing - Contemporary Approach” *Delmar publisher*, New York
Babette Magee (1985) “Screen printing Primer”, *GATF*, Pennsylvania.
Herbert L.W. (1985) “Gravure and flexographic Printing Presses” *Converting Technology Co, USA*.
Ray Blair and Thomas M.D. (1991) “Gravure Process and Technology” *GAA, USA*.
Harry and Smith (1994) “Modern Gravure Technology, A Literature Review” *Pira International*, UK.

Internal Continuous Assessment (*Maximum Marks-50*)

60% - Tests (minimum 2)

30% - Assignments (minimum 2) such as home work, problem solving, group discussions, quiz, literature survey, seminar, term-project, software exercises, etc.

10% - Regularity in the class

University Examination Pattern

PART A: Analytical/problem solving SHORT questions *8x 5 marks=40 marks*

Candidates have to answer EIGHT questions out of TEN.
There shall be minimum of TWO and maximum of THREE questions from each module with total TEN questions.

PART B: Analytical/Problem solving DESCRIPTIVE questions *4 x 15 marks=60 marks*

Two questions from each module with choice to answer one question.

Maximum Total Marks: 100

PT14 606 ADVANCEMENT IN PRINTING TECHNOLOGY

Teaching scheme

4

Credits:

Objective: *Helps to impart an idea about the various scope and Developments of printing technology*

Module I (12 hours)

3D Printing: Definition, Additive Printing, Additive Manufacturing File Format (AMF) - Basic file structure, **Geometry specification, Curved triangles, Color specification, Texture maps, Material specification, Mixed, graded, lattice, and random materials, Print constellations, Meta-data, Design Consideration.**

Module II (14 hours)

Digital Fabrication: Introduction to digital fabrication, History, Technology: Rapid prototyping, Machines for fabrication: CNC, Laser cutting, Inkjet printing, stereo lithography Applications: Printed electronics, 3D printing, Bio-fabrication, Challenges

Bio fabrication: Tissue Engineering Basics, Objectives of Bio fabrication, From Cell to Organ Printing, Processing Technologies, Biochips

Module III (14 hours)

Rapid Prototyping: Introduction, Process, Prototyping Techniques- Stereo lithography, Laminated Object Manufacturing, Selective Laser Sintering, Selective Laser Sintering, Solid Ground Curing, 3-D Ink-Jet Printing, Applications – Prototyping Rapid Tooling, Rapid Manufacturing, Future Developments.

Module IV (14 hours)

Printed Electronics: Introduction, [Organic electronics](#), printing approaches for the fabrication of electronics, Materials, Substrates, Application of Gravure and Flexo printing in application of Printed electronics, Printing Electronic Devices, Printed electronics Market, Application: Printed Battery, Printed RFID Tags, etc, Challenges.

Text books:

1. Eugenio Cantatore, Applications of Organic and Printed Electronics: A Technology-Enabled Revolution, Springer, 2012
2. Flexible Electronics: Materials and Applications, *Volume 11 of Electronic materials: science & technology*, William S. Wong, Alberto Salleo, Springer, 2009
3. Additive Manufacturing Technologies: Rapid Prototyping to Direct Digital Manufacturing, Ian Gibson, David W. Rosen, Brent. Stucker, Springer, 2010
4. 3d Printing: High-Impact Emerging Technology - What You Need to Know: Definitions, Adoptions, Impact, Benefits, Maturity, Vendors, Kevin Roebuck, Tebbo, 2011
5. Biofabrication: Micro- and Nano-fabrication, Printing, Patterning and Assemblies, Gabor Forgacs, Wei Sun, William Andrew, 2013

Internal Continuous Assessment (Maximum Marks-50)

- 60% - Tests (minimum 2)
- 30% - Assignments (minimum 2) such as home work, problem solving, group discussions, quiz, literature survey, seminar, term-project, software exercises, etc.
- 10% - Regularity in the class

University Examination Pattern

PART A: Analytical/problem solving SHORT questions *8x 5 marks=40 marks*

Candidates have to answer EIGHT questions out of TEN.
There shall be minimum of TWO and maximum of
THREE questions from each module with total TEN
questions.

PART B: Analytical/Problem solving DESCRIPTIVE questions *4 x 15 marks=60 marks*

Two questions from each module with choice to answer
one question.

Maximum Total Marks: 100

PT14 607(P) SCREEN PRINTING & FLEXO LAB

Teaching scheme

3hours practical per week

Credit: 2

Screen Printing:

1. Study of various types of Screen Materials.
2. Screen fabric Stretching
3. Stencil Preparation
 - a) Direct Method
 - b) Indirect Method
 - c) Capillary Method
4. Screen Printing – Printing of Letterheads and Visiting Cards.
5. Screen Reclamation

Flexo Laboratory:

1. Study of Stereos and Polymer Plates.
2. Study of Machine Operation

Internal Continuous Assessment (Maximum Marks-50)

- 60% - Laboratory Practical and record
- 30% - Test
- 10% - Regularity in the class

End Semester Examination (Maximum mark 100)

- 70%-Procedure, conducting experiment, results, tabulation, and inference
- 20%- Viva voice
- 10%-Fair record

PT14 608(P) PRINT FINISHING LAB

Teaching scheme

3hours practical per week

Credit: 2

Objectives: To develop a basic knowledge in the post press operation of printing

List of experiments

I Study of various controls, operations and mechanisms of the following machines: 1. Folding Machine. 2. Guillotine Machine. 4. Laminating Machine. 5. Sewing and Stitching Machine.

III. **Preparation of:** a) Saddle b) side stitched Booklets. b) Saddle sewing of Booklets d) Quarter Bound Note Book – flush sewing. e) Quarter Bound books sewing on tapes. Binding of Half Bound Book. Binding of full bound. Perfect Binding.

Internal Continuous Assessment (Maximum Marks-50)

60% - Laboratory Practical and record

30% - Test

10% - Regularity in the class

End Semester Examination (Maximum mark 100)

70%-Procedure, conducting experiment, results, tabulation, and inference

20%- Viva voice

10%-Fair record

SEVENTH SEMESTER

PT14 701 TONE AND COLOR ANALYSIS

Teaching scheme

3hours lecture and 1 hour tutorial per week

Credit: 4

Objectives: *This paper deals about the concept of tone and the role of color management in printing.*

Module I (13 hours)

CIE- Spectral reflectance- CIE color standard – standard observer- tristimulus values Munsell- Hue circle - CIELAB, CIELUV, metamerism, Memory color- color management- Introduction- WYSWYG- functions of color management- color management module-Color enginefunctions of CMM-Principle of color management- models of color management, RGB, HSB,ICC-Colorimeter and spectrophotometer-color calibration.

Module II (14 hours)

Introduction, development of electronic publishing, basic elements of scanners, principles of electronic scanning – basic of electronic scanning- RIP- its structure and function- pixels-binary resolution- AM, FM Screening- digital halftones- basic scanner types-pantone-focal tone- trumatch- special/spot color-application of special color- digital images- sampled images-bitmap- raster- vector graphics. Scanning-automated scanning software, copy dot scanning and rescreening. Image capture elements- photomultiplier tubes, charged coupled device. Scanner adjustments, Scanner workflow, scanner resolution, scanner choice, preparing originals for scanning, types of scanners, working and their advantages. Tone adjustments- White, black point adjustments, gradation, color adjustments, automatic scanners adjustments, color separation.

Module III (13 hours)

Types of originals- transparencies- the ideal transparencies- color correction – need for color correction- Masking- Integral color masking – color printing using standard inks- digital color separation- ink color sequence- brief intro to manual retouching- masking for color correction- types of masking- positive masking- negative masking- double overlay masking- integral color masking – dye retouching-chemical correction or reduction – positive dot etching- intensification- unsharp masking- grey balance and tone reproduction.

Module IV (14 hours)

Densitometry- type of densities- specular – diffuse- double diffuse density- color printing- factors in color printing- -printed color density- n-trapping- tone value- additivity and proportionality failure- UCR- GCR- color control strips and punch register system- duo ones- dot area measurement- Murray Davis equation and Yule nelson correction.

Text Books

1. Principles of color reproduction- J.A.C. Yale
2. Color – Robin B. McAllister

Internal Continuous Assessment (Maximum Marks-50)

- 60% - Tests (minimum 2)
- 30% - Assignments (minimum 2) such as home work, problem solving, group discussions, quiz, literature survey, seminar, term-project, software exercises, etc.
- 10% - Regularity in the class

University Examination Pattern

PART A: Analytical/problem solving SHORT questions 8x 5 marks=40 marks

Candidates have to answer EIGHT questions out of TEN. There shall be minimum of TWO and maximum of THREE questions from each module with total TEN questions.

PART B: Analytical/Problem solving DESCRIPTIVE questions 4 x 15 marks=60 marks

Two questions from each module with choice to answer one question.

Maximum Total Marks: 100

PT14 702 PACKAGING TECHNOLOGY

Teaching scheme

3 hours lecture and 1 hour tutorial per week

Credit: 4

Objectives: *This paper deals about the importance of packaging and about the technology used for creating good package according to the product.*

Module I (15 hours)

Introduction, Function of a package, Factors influencing design of a package, Computer, Aided, Package Design, Packaging Cycle, Product Package Relationship, 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 – Climatic test –, Fungus resistance test, Shelf life, Corrosion – Types, cause, Classification of corrosion prevention methods. Desiccants. Cushioning Materials – Functions, properties, Classifications. Expanded polystyrene – process of manufacturing, advantages, applications.

Module II (13 hours)

Wood-classification, effect of moisture on wood, preservation of wood, advantages. Board-types, paper-types Glass- properties, advantages, types, production process of glass, Plastics-BOPP.HDPE, LDPE, LLDPE, PVC, PP, PET, Polyolefins, Cellulosics, Polyimides, Nylon-6 – advantages, functions & applications. Tests on plastics, process of making plastic sheets. Classifications of plastics. Aluminium foils – Manufacturing of foil, properties, applications.

Module III (15 hours)

Carton style. Folding cartons – Production steps, types. Corrugated containers – classifications, components in a corrugated board, flutes, stages in preparation in corrugated boards. Gas packaging – MAP & CAP, Vacuum packaging, shrink packaging, stretch wrapping blister packaging, skin packaging, strip packaging, Aerosol packaging – working principle. Vacuum metalization. Injection blow moulding, Extrusion blow moulding, Extrusion. Injection Molding, Vacuum forming – Drape forming, Snap back forming, Plug Assist forming. Pressure forming. . Thermo form/fill/seal- Horizontal machine, Vertical machine.

Module IV (11 hours)

Futuristic trends in packaging. Advancements in food packaging. Environmental implications of packaging – recycling, Pyrolysis. Legal aspects in packaging. Designing – Cans, metal tubes, Plastic tubes. Closures-screw caps, Snap-on caps. Adhesive tapes – Fabric tapes, Paper tapes, Film tapes, Foil tapes, Foam tapes, Two faced tapes. Labels – Basic elements of correct labeling, Purpose types.

Text Books

1. Packaging Technology – Volume I - IIP
2. Packaging Technology – Volume II - IIP
3. Packaging Technology – Volume III – IIP

Reference Books

1. Frank Paine, Packaging design and performance.
2. John Briston., Advance in Plastic Packaging Technology.

Internal Continuous Assessment (Maximum Marks-50)

60% - Tests (minimum 2)

30% - Assignments (minimum 2) such as home work, problem solving, group discussions, quiz, literature survey, seminar, term-project, software exercises, etc.

10% - Regularity in the class

University Examination Pattern

PART A: Analytical/problem solving SHORT questions *8x 5 marks=40 marks*

Candidates have to answer EIGHT questions out of TEN. There shall be minimum of TWO and maximum of THREE questions from each module with total TEN questions.

PART B: Analytical/Problem solving DESCRIPTIVE questions *4 x 15 marks=60 marks*

Two questions from each module with choice to answer one question.

Maximum Total Marks: 100

PT14 703 QUALITY CONTROL AND STANDARDIZATION

Teaching scheme

2 hours lecture and 1 hour tutorial per week

Credit: 3

Objective: *This paper gives knowledge about the quality control aids and importance of testing in printing.*

Module I (13 hours)

Introduction-Definition of quality, Quality control, its meaning and purpose. Setting up a quality control programme and establishing necessary procedures, economic consideration. Management responsibility. Quality systems and ISO 9000. Materials control-Establishing clear specifications and standardization of materials to be purchased. Inspection and testing of incoming materials as part of quality control, importance of proper handling and maintenance of records of performance of materials, Sampling.

Module II (14 hours)

Print characteristic definition, Print characteristic attributes-substrate, primary colour hue, secondary and tertiary colour hues, tone transfer, grey balance. Print characteristic specification. Measurement of the print characteristic. Print control strips-position of control strip on sheet, Ink colour and film thickness elements, trapping elements, Grey balance elements, Register targets. Tone transfer control elements(plate making)-continuous tone step wedge, micro lines, highlight and shadow dots. Tone transfer control elements(printing)-star target, variable dot size elements, coarse and fine screen halftones, tone patches for density measurement. Slur and doubling elements-star target, concentric circles, line tint areas.

Module III (13hours)

Requirement of quality control devices, Functions, Classifications – Diagnostic quality control devices, Process control devices, Standardization control devices. GATF Test Form-Introduction, Purposes of the Test Form, Targets for Evaluation, Information Block, Line Resolution Target, GATF/Systems of Merritt Digital Plate Control Target, Digital Ladder Targets, Image Fit Target, Mottle Patches, Gray Balance Chart, Three-Color Gray Bars, Digital Proof Comparator, Transfer Grids, Color Correction Target, Ink Coverage Target, Twenty-step Tone Scales and Vignettes, Dot Size Comparator, Single-Tier Control Bar, Six-Color Two-Tiered Control Bar, IT 8.7/3 Basic Data Set, GATF/RHEM Light Indicator

Module IV (14 hours)

Quality control instrumentation- ,Process control instruments, devices and aids used in camera, darkroom, stripping department, plate room and press room. Press sheet control devices for color printing. Minimum instrumentation necessary to produce a product consistent with the appropriate quality level. Control charts, attributes vs. variables, disadvantages of monitoring attributes, the statistics of control charts, defects vs. defectives, subgroup size. Different types of control charts-monitoring variables: the x-bar/R chart, monitoring print attributes, p chart, examples of p chart, c chart, examples of c chart.

Text books

1. Miles Southworth and Donna Southworth. Quality and Productivity in the Graphic Arts Publishing Company(1980)
2. Douglas C. Montgomery, Introduction to Statistical Quality Control, John Wiley(1985)
3. Brian Rothery, ISO 9000, Productivity and Quality Publishing Private Ltd
4. Kelvin Tritton, Colour Control for Lithography, PIRA International.
5. Mortimer, A Colour Reproduction in Printing Industry PIRA International.
6. Phil Green Quality Control for Print Buyers, Blue Print
7. J.P Casey (Ed) Pulp and Paper Chemistry and Chemical Technology, Vol II Wiley interscience
8. Ronald E. Todd, Printing Inks – Formulation Principles, Manufacture and Quality Control Testing Procedures. PIRA International.
9. H.L Apfelberg and M.J. Apfelberg, Implementing Quality Management in Graphic Arts, GATF.

Internal Continuous Assessment (Maximum Marks-50)

60% - Tests (minimum 2)

30% - Assignments (minimum 2) such as home work, problem solving, group discussions, quiz, literature survey, seminar, term-project, software exercises, etc.

10% - Regularity in the class

University Examination Pattern

PART A: Analytical/problem solving SHORT questions 8x 5 marks=40 marks

Candidates have to answer EIGHT questions out of TEN. There shall be minimum of TWO and maximum of THREE questions from each module with total TEN questions.

PART B: Analytical/Problem solving DESCRIPTIVE questions 4 x 15 marks=60 marks

Two questions from each module with choice to answer one question.

Maximum Total Marks: 100

ELECTIVE I

PT14 704A TOTAL QUALITY MANAGEMENT IN G.A.1

Teaching scheme

3hours lecture and 1 hour tutorial per week

Credit: 4

Objective: Deals about total quality management process in graphic arts industry

Module I (15 hours)

Embrace the tenets of tqm, definition of quality and related terms, basic elements of tqm, characteristics, advantages, holistic features, application of quality concept, quality principles, tqmmodels-kaizen, european quality awards, malcom baldridge award, deming prize, indian quality awards, motorola 6 sigma concepts, zero defect quality, quality by design. quality gurus and their contribution-deming, crosby, taguchi, ishikkava, juran. bench marking processes & practice, re-engineering. statistical process control (spc), purpose of spc, spc tools-process maps, ishikawa diagrams, check sheets, pareto analysis, histograms, run charts, contact charts, correlation diagrams, monitoring variables- xbar/r-chart, monitoring print attributer-p-chart, counting defects-c-chart. manufacturing categories-project oriented process, job shop oriented process, assembly oriented process, continuous oriented process.

Module II (15 hours)

conventional wisdom. cost of quality and categories. relationship between the cost element & strategies for cost reduction. implementing a quality cost measurement system. data collection and analysis. reasons for collecting data. data collection principles. measurement of critical print variables. 100% inspection. statistical sampling. acceptance sampling by attributes. acceptance sampling by mil-std-iose. attributes v/s variables. disadvantages of monitoring attributes. the plan-do-check-act cycle. Problem solving tool kit. Case study of customer satisfaction (printing industry).

Module III (12 hours)

Introduction, example to illustrate the PCS, distribution displaying skew ness, distributions that are multi model or random, distributions displaying kurtosis, comparing natural o/p of the process to man-made specification imposed up on it. process capability indices, making predictions based upon the findings, comparison of design of experiments to statistical process control, fundamentals of doe (design of experiments), one variable at a time (ovot) v/s doe, steps in designing the experiment, analysis of experiment, evolutionary operation (evop) and response surfaces.

Module IV (12 hours)

Historical development, benefit of quality improvement teams, developing a quality team effort, soliciting quality-oriented projects, issues to avoid, identify and prioritize quality projects. action team development & training, team member reports and action on team projects introduction. basic assumption concerning employees and work habit changes. perceived threats, facilitating change. fine tenets of continual process improvement, supplier process. internal & external suppliers and mechanism, operation and adjustment, of folding machines; causes and prevention of inaccurate folding; maintenance of machine feeders; production capacity.

Text Books

1. TQM and ISO 14000 – Dr. K.C. Arora.
2. Applying ISO 9000 QMS – International Trade centre
3. Test Images for printing – Pamela J. Groff.
4. Implementing Quality management in graphic arts- Herschel L.Apfelberg.

Internal Continuous Assessment (*Maximum Marks-50*)

- 60% - Tests (minimum 2)
- 30% - Assignments (minimum 2) such as home work, problem solving, group discussions, quiz, literature survey, seminar, term-project, software exercises, etc.
- 10% - Regularity in the class

University Examination Pattern

PART A: Analytical/problem solving SHORT questions *8x 5 marks=40 marks*

Candidates have to answer EIGHT questions out of TEN. There shall be minimum of TWO and maximum of THREE questions from each module with total TEN questions.

PART B: Analytical/Problem solving DESCRIPTIVE questions *4 x 15 marks=60 marks*

Two questions from each module with choice to answer one question.

Maximum Total Marks: 100

PT14 704 B OPERATIONS RESEARCH

Teaching scheme

3 hours lecture and 1 hour tutorial per week

Credit: 4

Objective:

- *This paper gives a systematic and scientific study of the operations of the system.*
- *It provides a good intellectual support in making decisions and Coordination of the policies of the different components.*

Module I (13 hours)

History and development of O.R. - linear programming - formulation of L.P.P - graphical solutions - simplex method - two-phase method - dual and its solutions - sensitivity analysis

Module II (13 hours)

Transportation and assignment problems - formulation and solution - test for optimality - cases of degeneracy Net work techniques - networks: PERT / CPM. Computation of critical path - float - crashing and resource leveling - minimal spanning tree problems - shortest route problem - maximal flow problem

Module III (14 hours)

Queuing theory - types of queues - poisson arrival exponential service - single server queues - multiple server queues - introduction to simulation techniques - Monte Carlo simulation (no problems) - theory of games - decision making under certainty - uncertainty and risk - maxi-mini and mini-max principles - saddle points - solution of simple problems

Module IV (14 hours)

Dynamic programming - concept of stages - principles of optimality - application in deterministic and simple probabilistic situations - integer programming - method of integer programming - formulations - cutting plane algorithms branch & bound algorithms

Text books

1. Sharma S.D., *Operations Research*, Kedarnath Ramnath
2. Taha H.A., *Operations Research*, Prentice Hall of India

Reference

1. Richard Bronson and Govindasami, *Operation Research*, 2nd edition.
2. A Ravindran, Don T Philip, James J Solberg, *Operation Research*, WILEY

Internal Continuous Assessment (Maximum Marks-50)

60% - Tests (minimum 2)

30% - Assignments (minimum 2) such as home work, problem solving, group discussions, quiz, literature survey, seminar, term-project, software exercises, etc.

10% - Regularity in the class

University Examination Pattern

PART A: Analytical/problem solving SHORT questions 8x 5 marks=40 marks

Candidates have to answer EIGHT questions out of TEN. There shall be minimum of TWO and maximum of THREE questions from each module with total TEN questions.

PART B: Analytical/Problem solving DESCRIPTIVE questions 4 x 15 marks=60 marks

Two questions from each module with choice to answer one question.

Maximum Total Marks: 100

PT14 704 C MECHANICS OF PRINTING

Teaching scheme

3hours lecture and 1 hour tutorial per week

Credit: 4

Objectives: *To be acquainted with the mechanical aspects of printing.*

Module I (12 hours)

Typical lithographic press design-Printing cylinders, Inking system-Dampening system-Three important phenomena-wetting-Ink contact angle-wet by ink, wet by fountain, Surface tension-young's equation-emulsification-NIP action-Theory behind the lithographic press, cylinder design-required printing pressures-for gravure, offset lithography

Module II (15 hours)

Rollers and rolling action-roller design properties-Mechanical construction, dead shaft roller design, live shaft roller design-ink receptive roller material-water receptive roller material, compliant rollers-rigid material-surface specification of rigid rollers and compliant rollers, Relation connecting surface speed (V) width of stripe(S).

Module III (15 hours)

Inking system design-inking rollers-Macpherc's design requirements-over shot orientation-under shot, Types of metering elements-continuous blade-segmented blade, discrete elements-discrete elements with cover-ductor mechanism-dynamic behavior of inking system-long term and short term behavior, Relationship between print density and ink feed rate, heat generation in inking system- heat generation due to film slitting (Qfs)-due to vibration action (Qva) due to slippage due to cyclic straining(Qcs)

Module IV (12hours)

Web presses – categorization of web press- heat set –non heat set- web guides- web tension-role of capstan roller-capstan equation for controlling web tension –wrap angle- relation ship between velocity and tension of web.

Text book:

JohnMacphee, GATF Press, Fundamentals of lithography printing, Volume I Mechanics of printing.

Internal Continuous Assessment (Maximum Marks-50)

60% - Tests (minimum 2)

30% - Assignments (minimum 2) such as home work, problem solving, group discussions, quiz, literature survey, seminar, term-project, software exercises, etc.

10% - Regularity in the class

University Examination Pattern

PART A: Analytical/problem solving SHORT questions 8x 5 marks=40 marks

Candidates have to answer EIGHT questions out of TEN. There shall be minimum of TWO and maximum of THREE questions from each module with total TEN questions.

PART B: Analytical/Problem solving DESCRIPTIVE questions 4 x 15 marks=60 marks

Two questions from each module with choice to answer one question.

Maximum Total Marks: 100

PT14 704D NEWS PAPER AND PERIODICAL PUBLISHING

Teaching scheme

3hours lecture and 1 hour tutorial per week

Credit: 4

Objectives: *This paper deals about the complex process of news paper & periodical publishing industry and also describes about the principles of publication.*

Module I (13 hours)

Determinants to work, Organisation; Owner, editorial organisation, management; Flow charts of staff in newspaper organisation; management, Incoming materials, Financial aspects, Production, advertising, distribution and promotion. The role of copy editors, city editors, news editors ,editorial cartoonist, artists, Sunday editor, sports editor, business editor, journalists & reporters; editorial responsibilities.

Module II (14 hours)

Manuscripts from editorial organisation: layout & design; Parts of a news paper 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 importance. Art work; colour, First proof; Lab work to be given to prepare a Newspaper and a periodical for a given manuscript.

Module III (13 hours)

Basic determinants of News; impact, unusual and prominent: Additional determinants of news; conflict, proximity, timeliness, currency. Gathering the news, source of news; Beat system, interviewing, wire services, syndicate, news writing, copy preparation, features & reviews, Editorial and opinion columns, sports and photo production; editing Manuscript editing, creative and substantive editing, technical editing, editing conference proceeding, editing a successful journal; copy desk, proof reading, photo editing.

Module IV (14 hours)

The Campus magazine, the professional magazine, writer-editor relationships, magazine copy editing, writing headlines and titles, picture editing and using colours, layout and design, printing, financial aspects of a new journal, completing journal issues. The press and the law libel, defence against libel, mitigation & damages.

Text Books

1. Robert H. Bohle, *From news to newsprint*, prentice hall, Inc.Englewood clefts, New Jersey
2. William L Rivers, *Magazine editing in the 80's*, wadsworth publishing company, Belmont, California.

Reference

1. Melvin Mencher, *Basic News Writing*, Wm.C.brown Company Publishers, Dubuque, Iowa
2. William L. Rivers, *News editing in the 80's*,Wadsworth publishing company, Belmont, California.
3. MO'Connor, *Editing Scientific Books and journals*, Pitman Medical.

Internal Continuous Assessment (Maximum Marks-50)

60% - Tests (minimum 2)

30% - Assignments (minimum 2) such as home work, problem solving, group discussions, quiz, literature survey, seminar, term-project, software exercises, etc.

10% - Regularity in the class

University Examination Pattern

PART A: Analytical/problem solving SHORT questions *8x 5 marks=40 marks*

Candidates have to answer EIGHT questions out of TEN. There shall be minimum of TWO and maximum of THREE questions from each module with total TEN questions.

PART B: Analytical/Problem solving DESCRIPTIVE questions *4 x 15 marks=60 marks*

Two questions from each module with choice to answer one question.

Maximum Total Marks: 100

PT14 704 E: MANAGEMENT INFORMATION SYSTEM

Teaching scheme

3hours lecture and 1 hour tutorial per week

Credit: 4

Objectives: *This course will introduce the methods and the influence of the information systems in management milieu and use MIS as an effective tool in management and decision making*

.Module I (13 hours)

Evolution of MIS concepts - concept of information - definition of information - information in the mathematical theory of communication - mathematical definition of information - entropy -redundancy - data reduction - classification and compression - organisational summarising and filtering inference - age and quality of information concepts to information system design – system concepts - definition of a system - characteristics of a system - types of systems - deterministic and probabilistic - closed and open systems - law of requisite variety - filtering - system concepts applied to MIS - integrated system vs total system - human being as Information processor and its implication for MIS design - basic model of manual information processing system - comparison with computer systems - limits on human processing

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Module II (13 hours)

Structure of MIS - basic structural concepts - operational elements - synthesis of MIS structure conceptual and physical extent of integration and the extent of man/machine interaction – methodology of system design - feasibility study data gathering techniques documentation - forms design - codification and classification

Module III (14hours)

MIS support for planning and control - planning and control process - strategic planning – tactical planning - operation controls - their requirements and relevant support from MIS - MIS support for marketing function - marketing function - product introduction, pricing - enlarging the market and channel strategies - their requirements and relevant support from MIS design - MIS support for personnel function - Development of mis - approaches to the development of mis, bottom up and top down approach - determining information requirements - decision analysis approach - data analysis approach - evolution of the decision and data analysis alternative - techniques and technology for mis-development - process - driven/forms driven methods - evolution of system analysis and design technique - information system audit - review of documentation procedure - evaluating the utilisation and output quality - audit for system security - future trends in mis - sociological considerations, personnel administration - database consideration - personnel status reportingsystem - personnel action data system - relevant support from MIS - MIS support for finance function - financial status and status change - payment control - credit control and material control – support from MIS - MIS support for production function - production planning and control - quality control - waste and rejection

Module IV (14 hours)

Development of MIS - approaches to the development of MIS, bottom up and top down approach - determining information requirements - decision analysis approach - data analysis approach - evolution of the decision and data analysis alternative - techniques and technology for MIS development - process - driven/forms driven methods - evolution of system analysis and design technique - information system audit - review of documentation procedure - evaluating the utilisation and output quality - audit for system security - future trends in MIS - sociological considerations

Text Books

1. Production/ Operation Management – Anantha.K
2. Production and Operation Management Concepts, models and behaviour (3rd edition) – Everett E.Adam.Jr., Ronald J. Ebert
3. Modern production/ Operations Management (8th edition) – Elwood S .Buffa, Rakesh K. Sarin.
4. Elements of production Planninng and control – Samuel Eilo.

Internal Continuous Assessment (Maximum Marks-50)

- 60% - Tests (minimum 2)
- 30% - Assignments (minimum 2) such as home work, problem solving, group discussions, quiz, literature survey, seminar, term-project, software exercises, etc.
- 10% - Regularity in the class

University Examination Pattern

PART A: Analytical/problem solving SHORT questions 8x 5 marks=40 marks

Candidates have to answer EIGHT questions out of TEN. There shall be minimum of TWO and maximum of THREE questions from each module with total TEN questions.

PART B: Analytical/Problem solving DESCRIPTIVE questions 4 x 15 marks=60 marks

Two questions from each module with choice to answer one question.

Maximum Total Marks: 100

PT13 705 ELECTIVE II

PT14 705A ADVERTISING MANAGEMENT

Teaching scheme

3hours lecture and 1 hour tutorial per week

Credit: 4

Module I (13 hours)

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

Module II (13 hours)

Factors involved in advertising planning decision making, basis for advertising objectives, Dagmar model, marginal analysis, methods of advertising. Media concept, structure of media, media characteristic publication media, TV and radio, direct mail and POP, out of home and other media. Media planning concept, media decision tool, media plan strategy, media buying and scheduling, Advertising on the internet.

Module III (14hours)

Copy concept, copy structure, essential of a copy, creative approaches ,copy testing criteria, types of copy testing, validity and reliability of copy test. Advertising design, layout, visualization, principles of

advertising design, contribution of visual elements, what to picture, how to choose color, test of good layout, production of print advertising, production of TV/radio commercials.

Module IV (14hours)

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

Text books:

1. Charles J. Driksen and other- Advertising principles, problems and cases
2. David A. Aker and John G. Myers- Advertising Management
3. B .S. Rathor-Advertising management

Reference books:

1. Leon G. Schiff man and Lelie Lajar konar.,- Consumer Behaviour
2. Loudon, Della Bitta,- Consumer behaviour concepts and application
3. Cyber Graphic, U.S.,<http://www.cybergraphic.com>

Internal Continuous Assessment (Maximum Marks-50)

60% - Tests (minimum 2)

30% - Assignments (minimum 2) such as home work, problem solving, group discussions, quiz, literature survey, seminar, term-project, software exercises, etc.

10% - Regularity in the class

University Examination Pattern

PART A: Analytical/problem solving SHORT questions 8x 5 marks=40 marks

Candidates have to answer EIGHT questions out of TEN. There shall be minimum of TWO and maximum of THREE questions from each module with total TEN questions.

PART B: Analytical/Problem solving DESCRIPTIVE questions 4 x 15 marks=60 marks

Two questions from each module with choice to answer one question.

Maximum Total Marks: 100

PT14 705B DESIGN & PLANNING FOR MEDIA PRODUCTION

Teaching scheme

3 hours lecture and 1 hour tutorial per week

Credit: 4

Objectives: *To develop the concept of design in print media and gives knowledge about the planning methods in media production.*

Module I (12 hours)

Importance of a good design. Impact of a design on various target audience. Relationship between design of a communication and sale of a product. Graphic designer and his role. Elements of design. Principles in designing. Characteristics of vision. Human interpretation of movement, colour pattern. Psychological influences of consistency. Language as a communication tool-terminologies meaning of metaphor, simile, synecdoche, allegory etc., examples denotation, connotation.

Module II (14 hours)

Visual ingredients of graphic design, point, line, graphic space, texture, color, scale, balance and contrast. Use of computers in designing. Introduction to some designing softwares. Suitability for a particular job, design, printing technique and paper surface. Legibility and readability, monograms and trademarks. The relationship between type, illustration and Photography. Types of images. Photography as a design element preparation, selection and assessment of originals, photographs, sketches, paintings. Factors to be considered in photography.

Module III (15 hours)

Relationship of a design studio with production and sales departments of a press. Control and checking of art work at all stages, employment of free-lance artists, designers and photographers. The advertising agency, its structure and its services. Methods of preparing a design in various stages. Design for books, magazines, newspapers, catalogues, cartons and commercial stationary. Materials and tools used in preparing layouts and art work. Copy preparation. Casting-off and markingup. Identifying requirements of the proposed print job and obtaining a clear brief. Explanation of a good brief. Writing a good brief. Relationship between designer, customer and printer. Analysis of production problems. Understanding estimating procedures. Technical influences of choice of process and materials available.

Module IV (13 hours)

Selection and co-ordination of production processes within the economic terms of the brief consideration of composition methods. Limitations of binding, finishing and ancillary processes as they affect design. Selection and specification of ink, paper and other materials in relation to design specifications and to the production process decided. Designing of a website. Factors to be considered. Importance of a site map. Content creation. Co-ordination of work between various departments. Selection of color. Hosting maintenance of website. Production of advertising commercials, corporate and industrial films. Job flow and co-ordination between various agencies. Meaning of a script, story board and final presentation. Production for radio jingles-factors to be considered. Work flow and final execution.

Text books:

1. Sohick (Cd)- Fundamentals of Copy & Layout- A.C. Book (Ac)
2. Craig- Production for the Graphic Designer
3. Muray (Ray)- How to brief designs & buy print
4. Leon O Chus & Pen Min Lin C.A.- Copy Preparation

Reference books:

1. A.S. Porter - Lithographic Press Work
2. Rooney J. & Steadmazn P.- Principle of CAD
3. David A.Akar & John G. Myers.- Advertisement management
5. Arthur Robinson, Randall Sale & J.K. Morrison- Elements of Cartography.
6. Jal Baker.- Analysis of Electronic Circuit

Internal Continuous Assessment (*Maximum Marks-50*)

60% - Tests (minimum 2)

30% - Assignments (minimum 2) such as home work, problem solving, group discussions, quiz, literature survey, seminar, term-project, software exercises, etc.

10% - Regularity in the class

University Examination Pattern

PART A: Analytical/problem solving SHORT questions *8x 5 marks=40 marks*

Candidates have to answer EIGHT questions out of TEN.
There shall be minimum of TWO and maximum of THREE questions from each module with total TEN questions.

PART B: Analytical/Problem solving DESCRIPTIVE questions *4 x 15 marks=60 marks*

Two questions from each module with choice to answer one question.

Maximum Total Marks: 100

PT14 705 C MULTIMEDIA

Teaching scheme

3hours lecture and 1 hour tutorial per week

Credit: 4

Objective: *To the part of media mix. To impart an idea of technology in creativity.*

Module I (12ours)

Introduction- Basic theory, sound , sound of physics , human hearing mechanism, recording technology- microphone, amplifier, equalizer, sampling MIDI, file formats (image & sound file formats) digital audio, GIF , Bit map, image capturing & editing.

Module II (14 hours)

Software supports-Basic tools painting & drawing tools, image editing tools, OCR softwares, sound editing, animation, video and digital movies. Digital video and editing Basic compression techniques, lossy and lossy compression , digital video formats – quick time , JPEG,MPEG , editing software-Adobe premier, Digitizers video formats.

Module III (14 hours)

Authorizing tools- card based tools, icon based tools , time based tools, object oriented tools. Macromedia authoreware,- Macromedia director with lingo creating a presentation using sound text , images, video, interactive icon , calculating icon , navigation, frame work icon, decision icon.

Module IV (14 hours)

Introduction to web development , History , Introduction to web development tools, Web designing, Web designing tools, Web designing techniques, Introduction to HTML, XHTML, XML etc , The use of Cas Cading Style sheets(CSS) in web development , Scripting, client side scripting, Server side scripting, ECMA (ECMA Scripting), Web development techniques, Web development as an industry, End users (browsers used, web standards, accessibility etc), Introduction to W3C (World Wide Web Consortium), Future of Web development

Text books:

1. Corel Draw 8 Tata McGraw Hill
2. Adobe Photoshop 5 – class room in a book- Techmedia

Reference:

1. Adobe premiere 5- Classroom in a book- Tech media
2. Inside Macromedia Director 6 with Lingo- Tech media
3. Authorware an introduction to multimedia- Simon Hooper

Internal Continuous Assessment (Maximum Marks-50)

- 60% - Tests (minimum 2)
- 30% - Assignments (minimum 2) such as home work, problem solving, group discussions, quiz, literature survey, seminar, term-project, software exercises, etc.
- 10% - Regularity in the class

PT14 705 D PRODUCTION & OPERATION MANAGEMENT

Teaching scheme

3hours lecture and 1 hour tutorial per week

Credit: 4

Objectives:

*To impart the concepts, model and behaviour of production and operation management
It emphasizes the analysis and quantitative techniques and overall role of operations management in organization*

Module I (16 hours)

Definition, Types of production systems: Job production, Batch Production, Continuous production, Functions, Production – consumption cycle. Organization of RRC. Section conventional organisation structure – variations, central and decentralized PPC in case of multiplant establishment. Product development and design – Effect of company policy and competition on design Product analysis Marketing Aspect functional aspect – operational aspect-durability and dependability aspect-atheistic aspect. Economic analysis – profit and competitiveness standardization – simplification – preferred numbers – break-even analysis, profit volume charts for single product and multi-products – production aspects.

Module II (14 hours)

Factors affecting plant location, types of layouts, use of load travel chart calculations in layout planning. Process analysis – use of flow process charts, activity charts, (man-machine charts), Production master program, route sheet (process sheet), job cards Calculations for requirements of equipment manpower. Sales forecasting: use of forecasts, types of forecasts, forecasting techniques – qualitative methods – quantitative methods – time series methods – trend line, calculation of seasonal indices – moving average – weighted moving average – exponentially weighted' moving average (exponential smoothing) – correlation technique. Forecast control – MAD, MSE, tracking signal.

Module III (12 hours)

Inventory control: Classification of inventories – ABC analysis ordering cost, carrying cost, setup cost. Economic order quantity determination: 1) Instantaneous Delivery, 2) Delivery over a period of time 3) Instantaneous delivery with shortage permitted, 4) Delivery over a period of time with shortage permitted. Effect of quantity discount on order size; reorderpoint, leadtime, safetytock, graphical representation, M.R.R. (material Requirements Planning)- M.R.R. Concepts, Inputs and Outputs, M.R.R. Logic problems.

Module IV (12 hours)

Aggregate Planning: Trial and error method, use of transportation algorithm; master production schedule. Job Shop Scheduling: Index method of loading (Ref: Sheets, Weatermann and Wimmert). Scheduling

methodology – Gantt charts; shortest processing time (SPT) rule. Critical Ratio Rule; sequencing of ‘n’ jobs through: machines (Johnson’s rule) ‘n’ jobs through 3 machines, 2 jobs through ‘m’ machines.

Text Books

1. Production/ Operation Management – Anantha.K
2. Production and Operation Management Concepts, models and behaviour (3rd edition) – Everett E.Adam.Jr., Ronald J. Ebert
3. Modern production/ Operations Management (8th edition) – Elwood S .Buffa, Rakesh K. Sarin.
4. Elements of production Planning and control – Samuel Eilo.

University Examination Pattern

PART A: Analytical/problem solving SHORT questions *8x 5 marks=40 marks*

Candidates have to answer EIGHT questions out of TEN.
There shall be minimum of TWO and maximum of THREE questions from each module with total TEN questions.

PART B: Analytical/Problem solving DESCRIPTIVE questions *4 x 15 marks=60 marks*

Two questions from each module with choice to answer one question.

Maximum Total Marks: 100

PT14 705 E PRINTING PLANT LAYOUT & FACILITY DESIGN

Teaching scheme

3hours lecture and 1 hour tutorial per week

Credit: 4

Module I (15hours)

Printing press layout- Determining plant requirement site planning, new facility designing. Layout essentials- Direct product flow, Physical separation expansion. Importance of material movement. Few suggested design for hypothetical cases. Approachability of machines for service etc. Availability of service such as water, drainage, electric supply etc. Fundamentals of Foundation design. Vibration free

mounting requirements. Variations of foundations General guidelines Structural requirements of foundations

Module II (14hours)

Receiving shipping, waste paper, & trash removal, ware housing and storing, maintenance, production office, flammable solvent storage, ink mixing , storage and pumping. Typical settings to be done on a sheet- fed and web press machine. Facility specification- Prepress area, Sheet fed press room, web offset press room, roll paper storage area, bindery, finishing, mailing & pumping

Module III (12 hours)

Materials control-Establishing clear specifications and standardisation of materials to be purchased. Inspection and testing of incoming materials as part of quality control, importance of proper handling and maintenance of records of performance of materials, Sampling.

Module IV (13 hours)

Different types of elevators and lowers handling materials in bulk and for large objects. Worm push plate, push through and belt conveyors: inking belts steel plate and slat conveyors; vibrating through conveyors. Automatic feeding devices for elevators and conveyers. Gravity chutes roller runways ; live rollers humper stacker and gadgets . Fork trucks and pallets, Automatic handling of papers and printing machines, handling of printing rolls in printing machines and their automatic feeding . Conveyor system in finished printing products and automatic counters. Control of paper handling.

Text books:

1. Printing Plant & Facility Design- GATF
2. Material Handling for the printer – GATF

Internal Continuous Assessment (*Maximum Marks-50*)

- 60% - Tests (minimum 2)
- 30% - Assignments (minimum 2) such as home work, problem solving, group discussions, quiz, literature survey, seminar, term-project, software exercises, etc.
- 10% - Regularity in the class

University Examination Pattern

PART A: Analytical/problem solving SHORT questions *8x 5 marks=40 marks*

Candidates have to answer EIGHT questions out of TEN.
There shall be minimum of TWO and maximum of
THREE questions from each module with total TEN
questions.

PART B: Analytical/Problem solving DESCRIPTIVE questions *4 x 15 marks=60 marks*

Two questions from each module with choice to answer
one question.

Maximum Total Marks: 100

PT14 706(P) TONE AND COLOR ANALYSIS LAB

Teaching scheme

3hours lecture and 1 hour tutorial per week

Credit: 2

Objectives: *To impart a basic knowledge about color and its measuring instruments.*

List of Experiments:

1. Familiarizing with half tone & continuous tone copy.
2. Familiarizing with color management softwares.
3. Color measurements by using
 - i. Spectrophotometer.
 - ii. Colorimeter.
 - iii. Densitometer.
4. Calibration of devices-Scanner, Printer, Monitor.
5. Dot area measurement by using dot area meter.

6. Dot area measurement by using Murray Davis Equation.
7. Dot area measurement by using Nauebauger equation.
8. Familiarizing of quality control aids
 - iColor control charts
 - ii. Fogra Charts.
 - iii FOGRA Charts.

Internal Continuous Assessment (*Maximum Marks-50*)

60% - Laboratory Practical and record

30% - Test

10% - Regularity in the class

End Semester Examination (*Maximum mark 100*)

70%-Procedure, conducting experiment, results, tabulation, and inference

20%- Viva voice

10%-Fair record

PT14 708(P) PACKAGING TECHNOLOGY LAB

Teaching scheme

3hours lecture and 1 hour tutorial per week

Credit: 2

Objectives: *To Know about designing and preparation of package designs.*

List of Experiments:

1. Preparation of layout - Parallel tuck-in, Reverse tuck- in, Auto-lock bottom
2. Designing and Preparation of various flexible packages
3. Study and operation of various packaging machines.
4. Study of manufacturing of various types of corrugated boards.
5. Designing and preparation of designs of paper bags.
6. Study of test conducted on packages.

Internal Continuous Assessment (*Maximum Marks-50*)

60% - Laboratory Practical and record

30% - Test

10% - Regularity in the class

End Semester Examination (*Maximum mark 100*)

70%-Procedure, conducting experiment, results, tabulation, and inference

20%- Viva voice

10%-Fair record

PT13 708 (P): PROJECT

Teaching Scheme

4 hours practical per week

Credit: 4

Objectives

- *To judge the capacity of the students in converting the theoretical knowledge into practical systems/investigative analysis.*

Project work is for duration of two semesters and is expected to be completed in the eighth semester. Each student group consisting of not more than five members is expected to design and develop a complete system or make an investigative analysis of a technical problem in the relevant area. ***The project may be implemented using software, hardware, or a combination of both.*** The project work may be undertaken in ***PRESS, PRE PRESS & POST PRESS*** and must have relevance in ***Printing Technology***. Project evaluation committee consisting of the guide and three/four faculty members specialised in ***Printing Technology*** will perform the screening and evaluation of the projects.

Each project group should submit project synopsis within three weeks from start of seventh semester. Project evaluation committee shall study the feasibility of each project work before giving consent. Literature survey and 40% of the work has to be completed in the seventh semester.

Students should execute the project work using the facilities of the institute. However, external projects can be taken up in reputed industries, if that work solves a technical problem of the external firm. Prior sanction should be obtained from the head of department before taking up external project work and there must be an internal guide for such projects.

Each student has to submit an interim report of the project at the end of the 7th semester. Members of the group will present the project details and progress of the project before the committee at the end of the 7th semester.

50% of the marks is to be awarded by the guide and 50% by the evaluation committee.

Internal Continuous Assessment

20% - Technical relevance of the project	:
40% - Literature survey and data collection	:
20% - Progress of the project and presentation	:
10% - Report	:
10% - Regularity in the class	:

EIGHTH SEMESTER

PT14 801 PRINT MANAGEMENT COSTING AND ESTIMATING

Teaching scheme

3hours lecture and 1 hour tutorial per week

Credit: 4

Objectives: To impart the knowledge about the functions of costing and estimating process.

Module I (12 hours)

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

Module II (15 hours)

HRM for printing, employment policy, evaluation of skills requirements for printing occupations, recruitment, job evaluation, staff appraisal, motivation training, human resources factors that limit productivity, staff flexibility. Manning and training requirements, States of industry, Analysis and development of human resources strategy. Management personal skills and development, job satisfaction through involvement. Single & double entry book keeping system. Objectives of bookkeeping. Meaning of journal, ledger, debit, credit, asset, liability & capital. Differences between journal and ledger. Formats of journal & ledger. Types of accounts. Journalising rules, problems. Trial balance meaning & format. Format of balance sheet & income statement, contents to be explained. Ratio Analysis – Liquidity ratios, leverage ratios, turnover ratios, profitability ratios. Problems.

Module III (13 hours)

Cost accountancy & its subjects, relationship of cost & financial accounting, cost accounting & management accounting, costing as a basis for estimating, the purpose of cost accounting, advantages of cost accounting, installation of costing systems, costing system for printing industry & related problem. The concept of cost, Analysis of cost, elements of cost, The costs which are to be ascertaines. Procedure of linking costs with cost, centers & cost units, Methods of cost finding. Overhead – classification. Allocation & apportionment, Over head absorption rates & problem.

Module IV (14 hours)

Purpose and functions of estimating from printer point of view & customers point of view. Difference between costing & estimating. Qualifications of an estimator, working environment, estimators tools, estimating paper – selection of paper, allowance for waste, allowance for trimming, weight of loose sheets, weight of a reel of paper. Estimating ink – 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.

Text books

1. B.S. Raman, Principles of Accounting
2. Prasanna Chandra. - Fundamentals of Financial Management

Internal Continuous Assessment (*Maximum Marks-50*)

60% - Tests (minimum 2)

30% - Assignments (minimum 2) such as home work, problem solving, group discussions, quiz, literature survey, seminar, term-project, software exercises, etc.

10% - Regularity in the class

University Examination Pattern

PART A: Analytical/problem solving SHORT questions *8x 5 marks=40 marks*

Candidates have to answer EIGHT questions out of TEN.
There shall be minimum of TWO and maximum of THREE questions from each module with total TEN questions.

PART B: Analytical/Problem solving DESCRIPTIVE questions *4 x 15 marks=60 marks*

Two questions from each module with choice to answer one question.

Maximum Total Marks: 100

PT14 802 PRINTING MACHINERY AND MAINTENANCE

Teaching scheme

3hours lecture and 1 hour tutorial per week

Credit: 4

Objectives: *Machinery maintenance has a major role in printing industry. This paper provides a basic knowledge about machinery maintenance and its control.*

Module I (13 hours)

Maintenance management- Objective of maintenance management- Maintenance functions- Types of maintenance activities – maintenance planning, scheduling and control, maintenance records – contract maintenance- Training of maintenance staff- Human factor in maintenance. Modern trends- Application of computers in maintenance.

Module II (13 hours)

Prepress Press and Post press maintenance- Pre press production rooms, Plate setters, Plate processors, Image-setters, Computers, Pre press bottlenecks, test run and Diagnostic study, Maintenance of rollers, blankets and dampening systems. Bindery and finishing maintenance. Equipment needed for erection – selection of location and environmental conditions- erection procedure for various machines - loading and transport machines.

Module III (13 hours)

Lubrication and lubricants- Purpose of lubrications- types of lubricants- lubricating instructions for machine operators- replacement of lubricants- lubrication chart- annual lubrications. Replacement schedule- paint marks for lubricating points on the machines- regeneration of used oils. Compressors- reciprocating and rotary. Compressed air systems- Centralized and decentralized. Compressor accessories- valves for pneumatic systems. Reconditioning-Principles of reconditioning-repair methods of various parts.

Module IV (15 hours)

Chain and Sprockets: Types-roller, silent, ewart, block, bead, plain sprockets, Advantages and Disadvantages of chain and sprockets, role of chain in p4rinting machine. Belts-classification, Type of joints, Maintenance of belts, Belt slippage. Pulleys- flat belt, v-belt, v-ribbed, timing belt. Advantages and disadvantages of belt drives. Rack and pinion. Bearings-selection. Journals-types. Antifriction bearings- Ball, Radial roller and Needle bearing. Porous bearing, Oil less bearing, Advantages of bearings, Baring failure.Maintenance of electrical systems- AC motors and DC motors. Electromagnets- magnetic starters and contractors- limit switches- knife switches- micro switches. electric panels- electrical apparatus

Text Books

1. Lithographers manual, Graphical arts Technology Foundation, USA.
2. Herschel L.Apfelberg, Maintaining printing equipment, GATF
3. Barbara, L.Albinini and others, Solving web offset press problems, GATF

Reference Books.

1. H.P. Garg, Industrial maintenance, S.Chand &Company ltd.
2. Lewis and Tow, Readings in maintenance management, Cohners Books.
3. A.S Porter, A manual of Lithographic press operation, Lithographic trading services.
4. Pamela Groff and others, Lithographic Press operators Handbook

Internal Continuous Assessment (Maximum Marks-50)

- 60% - Tests (minimum 2)
- 30% - Assignments (minimum 2) such as home work, problem solving, group discussions, quiz, literature survey, seminar, term-project, software exercises, etc.
- 10% - Regularity in the class

University Examination Pattern

PART A: Analytical/problem solving SHORT questions *8x 5 marks=40 marks*

Candidates have to answer EIGHT questions out of TEN.
There shall be minimum of TWO and maximum of
THREE questions from each module with total TEN
questions.

PART B: Analytical/Problem solving DESCRIPTIVE questions *4 x 15 marks=60 marks*

Two questions from each module with choice to answer
one question.

Maximum Total Marks: 100

PT13 803 SECURITY PRINTING

Teaching scheme

3hours lecture and 1 hour tutorial per week

Credit: 4

Objective: *To gives knowledge about the security process and its importance in printing industry.*

Module I (15 hours)

MICR: Introduction- Need and Requirement-MICRCharacters. Bar Coding: Structure Characteristics- Symbologies – Barcode Readers andScanners-Barcode Printers- Barcode numbering.Securityfeatures: Paper substrate-Watermarks, Chemical reactants, Feel and Sound, Fluorescence-Security fibres, Planchets, Embedded thread,Windowed thread, Perforation. Plastic cards-Laser engraving, Card embedded features. Synthetic Papers-Shadow image-Blind embossing- Self authenticating features. Photochromism, Luminescence, Bleed through security numbering.

Module II (14 hours)

Currency Printing: Basic elements- Materials used- Manufacturing process. Cheque: Specification- Sections- Details- Pre-encoding and Post-encoding-Tolerance data-Testing equipment-Use of MICR-E-13B font- Print specification for Bank cheque- RBI specification - Principles of Cheque design-General requirements.

Module III (15 hours)

Printed Security pattern: Guilloches, Microprinting, See through register, Engraved portraits, Transitory images, Screen decoded images- Scrambled images. Printing inks:, Thermo-chromic ink, Metameric inks, Fugitive inks, Iridescent ink, Magnetic ink, Photochromic ink, Invisible Phosphorescent inks, Biometric ink. Printing techniques.

Module IV (10 hours)

Hologram: Introduction, Types, Manufacturing and recording process. MICR documents: Print specification for MICR documents-Production consideration- Substrate properties, ink, Quality control and testing- Standards for MICR encoded Documents.

Text books

1. Martin Monestics, "The Art of Paper Currency", Quarlet Books Ltd., 1983.
2. Leibinger, "Numbering Machines and Systems", Leibinger Numbering Systems, 2000.
3. William H.Erdei, "Bar Codes – Design, Printing and Quality Control", McGrawHill

Internal Continuous Assessment (Maximum Marks-50)

- 60% - Tests (minimum 2)
- 30% - Assignments (minimum 2) such as home work, problem solving, group discussions, quiz, literature survey, seminar, term-project, software exercises, etc.
- 10% - Regularity in the class

University Examination Pattern

PART A: Analytical/problem solving SHORT questions 8x 5 marks=40 marks

Candidates have to answer EIGHT questions out of TEN. There shall be minimum of TWO and maximum of THREE questions from each module with total TEN questions.

PART B: Analytical/Problem solving DESCRIPTIVE questions 4 x 15 marks=60 marks

Two questions from each module with choice to answer one question.

Maximum Total Marks: 100

PT14 804 ELECTIVE III

PT14 804 A COMPUTER GRAPHICS

Teaching scheme

3hours lecture and 1 hour tutorial per week

Credit: 4

Objectives: *Develop theoretical knowledge about computer graphics and its principles*

Module I (13 hours)

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,A 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,matrices representation-matrices formulation of transformations, concatenation of matrices transformations efficiency.The clipping and windowing-a line clipping algorithm,midpoint sub divisions,clipping other graphic entities,polygon clipping,viewing transformations,the windowing transformations.

Module II (13 hours)

Three dimensional graphics-realism in three dimensional graphics-molecular modeling,CAD, animation,simulation,Techniques for achieving realism-parallel projections,perspective projections,intensity curves,stereo scopic views,Kinetic depth effects,hidden-line elimination,shading with hidden surfaces removed,3D images.Modelling three dimensional scenes-coordinate system,modeling objects,cube representation,representing topology & geometry,structured three dimensional models,constructing models,Modelling & realism

Module III (14 hours)

Illumination models-ambient light, diffuse reflection,atmospheric attenuation,specular reflection,improving the point light source model,multiple light sources.Shading models for polygons-constant shading,interpolated shading,polygon mesh shading,gouraud shading,phong shading,problems with interpolated shading.Surface detail-surface detail polygons texture mapping,bump mapping,other approaches,shadow-scan-line generation of shadow,a two pass object-precision shadow algorithm, shadow volumes,a two-pass-z buffer shadow algorithm,global illumination shadow algorithms. Transparency- non refractive transparency,refractive transparency,inter object reflectins,Physically based illumination models-improving the surface model, the microfacet distribution function, the geometrical attenuation factor,the fresnet term.Extended light sources,spectral sampling,improving the camera model,global illumination algorithms,recursive ray tracing-efficiency considerations for recursive ray tracing-a better illumination model,Area sampling variations,distributed ray tracing,ray tracing from the light source.Radiosity methods-radiosity equations,computing form factors,substructuring,progressive refinement.computing more accurate form factors,specular reflection,combining radiosity and ray tracing.

Module IV(14 hours)

Rendering pipelines-local illumination pipelines,global illumination pipelines,designing flexible renders,progressive refinement.Summery, Animation-conventional animation,computer assistance animation,interpolation,simple animation effects,animation languages-Linear-list notation-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.

Text books

- Computer graphics principles and practice 2nd Ed.-Van Dam,Fole, Fiener Hughes.
2. Principles of interactive computer graphics, 2nd Ed, William N Newman, Robert S Sproull.
3. Computer graphics-Heam &Backer.
4. Procedural elements of computer graphics-David F .Rogers.

Internal Continuous Assessment (Maximum Marks-50)

- 60% - Tests (minimum 2)
- 30% - Assignments (minimum 2) such as home work, problem solving, group discussions, quiz, literature survey, seminar, term-project, software exercises, etc.
- 10% - Regularity in the class

University Examination Pattern

PART A: Analytical/problem solving SHORT questions 8x 5 marks=40 marks

Candidates have to answer EIGHT questions out of TEN.
There shall be minimum of TWO and maximum of THREE questions from each module with total TEN questions.

PART B: Analytical/Problem solving DESCRIPTIVE questions 4 x 15 marks=60 marks

Two questions from each module with choice to answer one question.

Maximum Total Marks: 100

PT14 804B BOOK PUBLISHING

Teaching scheme

3hours lecture and 1 hour tutorial per week

Credit: 4

Objective: *To impart knowledge of publishing process and book publishing organization.*

Module I (13 hours)

Publishing organization. Areas of publishing - general publishing, educational publishing, professional publishing and reference publishing. Publishing house - the role of commissioning editor, the desk editor, the designer, the production manager, the sales/marketing manager, the publishing manager. Editorial process and development. Copy editing, Page makeup, Proofs; the book editor – multipurpose functions, Discussion with author, Editing educational material, decision making role; editorial technique – style sheet, reference aids; the author and his manuscript - unsolicited manuscripts, author-publisher, professional guides and societies, the literary agent, author publisher relationship, writing textbooks for children.

Module II (12hours)

Education and estimating in book publishing. Pre-production planning, Manuscript, layout and design, imposition, composition, Anatomy of a book; Printing techniques; Production Process; technical aspects of production; Quality control - Proofing stage; financial aspects; first copy cost, manufacturing cost, overheads; Economics of publishing - net book, non-net book, variations in price, published price of a book.

Module III (15 hours)

Promotion channels, distribution outlets and sales techniques. Direct Promotion Techniques, mail order advertising, subscription books, Direct mail promotion, Library purchases, export and import of books, publishers and booksellers catalogues, publicity campaign, paperback distribution, the central book clearing house, economics of distribution, the role of bookshop - Booksellers associations, laws and ethics; University, college and Professional Publishing council, Book marketing council, Book development council.

Module IV (14 hours)

Book binding, print finishing and legal aspects. Man made binding, Perfect binding, mechanical binding, loose leaf binding, securing operation, automatic & semiautomatic binding machines, computerise binding, finishing operation; laminating, varnishing, gold foiling, die stamping, rounding, cornering, punching, drilling etc; copy right.

Text books:

1. D. Raghavan, An introduction to Book Publishing, Institute of Book Publishing, New Delhi,1988.
2. John P. Dessauer, Book Publishing, R.R. Bowker Company, New York & London, 1981.
3. Roy Paul Nelson, Publication Design,Wm. C. Brown Company Publishers, Dubugue, Iowa,1983.
4. Charles Clark, Publishing agreement, George Allen & Unwin, London, 1984.
5. Book Production Practice, Second Edition, Publishers Association, British Printing Industries Federation, 1984.
6. Clive Bradley,Publishing A vital National and International Asset,Secretary and Chief Secretary, The Publishers Association, 1982.

PT14 804 C ELECTRONIC PUBLISHING

Teaching scheme

3hours lecture and 1 hour tutorial per week

Credit: 4

Objective: *This provides concepts of paperless printing and its importance in modern world.*

Module I (13 hours)

Electronic publishing. Cultural and social impact. Hybrid formats for books and magazines needing shelf-appeal. Readers adapt to the new media. Create your own books and other publications. Catering for minority interests and niches markets. Multimedia in perspective. Breaking the physical barriers of print. Limitless opportunities. Cooperative writing. Easy, economical publishing. Future trends. Turn your work into multimedia. Selecting authoring software. Multimedia hardware requirements. Adding pictures and sound the easy way. Adding sound is easy and economical. Musical opportunities. Morphing is a practical tool. Virtual reality as a publishing medium. Games as a medium for authors

Module II (14 hours)

Changes in the structure of corporations. New perspective on information. Data and information as objects. Simple solutions may be best for small operators. Coping with the flood. Creating search capabilities. Identify your market. Nontraditional book marketing. Begin with research. Marketing to the world. Editorial publicity. Getting your disks and files safely to the right place. Prepublication offers for positive cash flow. Beware the digitized versions to vanity publishing. Distributing your works. Virtual publications need have no physical existence. Wireless distribution. Publishing by shortware-the fax of the future? Broadcast your book to 20 million people. Distributing and selling on-line. Your own bulletin board. Distributing through on-line and disk catalogs. Financial success from free distribution. Physical distribution on disk and cards. Distribute by renting, and establish long-term relationships. Cutting mailing costs.

Module III (13 hours)

Crossing the media frontiers. Choosing a publishing program. Pause before rushing into digital publication. Paperless magazines can survive where print versions fail Customized newspaper. Keep security in proportion. The impact of electronic publishing on your career. Footloose wordsmiths. Librarians: essential or redundant? librarians become publishers and distributors. Writers and editors. Editors need new skills. Scientists & academics. Educations. Produce an e-book to help your business. E-books as agents for change. Guard and nurture your intellectual property rights. Test cases. Windfalls and pitfalls.

Module IV (14 hours)

Electronic diaries. Therapeutic benefits. Creating family chronicles. Tap into your expertise as well as your experiences. Publishing poetry and drama as multimedia. Opportunities for photographers, artists, and musicians. Science fiction flourishes on-line. Mass-market fiction. Interactive novels establish a new genre. Games as a new medium for fiction writers. Eliminating the out-of-print problem. Writing tips, tricks, and techniques. Keep it simple. Entertain as well as inform. Practical tools for writers. Good news for disabled writers and readers. Reducing the hassles in OCR and scanning. Scanners differ greatly in their capabilities. Capturing screen images. Compression is essential, but can be problematical. Beware of viruses.

Text book

1. Colin Haynes, Paperless Publishing

Internal Continuous Assessment (*Maximum Marks-50*)

60% - Tests (minimum 2)

30% - Assignments (minimum 2) such as home work, problem solving, group discussions, quiz, literature survey, seminar, term-project, software exercises, etc.

10% - Regularity in the class

University Examination Pattern

PART A: Analytical/problem solving SHORT questions *8x 5 marks=40 marks*

Candidates have to answer EIGHT questions out of TEN. There shall be minimum of TWO and maximum of THREE questions from each module with total TEN questions.

PART B: Analytical/Problem solving DESCRIPTIVE questions *4 x 15 marks=60 marks*

Two questions from each module with choice to answer one question.

Maximum Total Marks: 100

PT14 804D PUBLISHING SCIENCE

Teaching scheme

3hours lecture and 1 hour tutorial per week

Credit: 4

Objective: *Deals about the concept of reporting& publishing of a publishing industry.*

Module I (13ours)

Concept and definition of News. News values- factors affecting selection of News. Elements of News, structure of News story- inverted pyramid, truth, objectivity and fairness chronological and narrative style. Kinds of Leads-the body, language of News.

Module II (13 hours)

Duties and responsibilities of reporter-Role of stringer, special correspondent, bureau chief and foreign correspondent. News gathering methods. Sources of News- News agencies, press release, press conference, press briefings and press tours. News beat meetings and speeches.

Module III (13 hours)

Reporting sports, art, culture, crime and disasters. Human interest stories covering elections, civic affairs, government, legislature. Kinds of reporting- Investigative, interpretative advocacy, editorial or comment. Specialised reporting, science. Environment and financial reporting. Interview- Using interviews in news. Technique of interviewing

Module IV (15 hours)

The structure of editorial department. Functions of the editor, the editorial board the news editor, subeditor. The board meeting, crucial decisions. Letters to the editor, its importance. Editorial and advertorials. Editing its significance. Symbols of editing. Manual subbing of agency/mofussil copy. Subbing news, features, sports, political and human interest stories and letters to the editor. Analysis of individual forms of writing selecting authors/writings. Style and techniques of language. Creative writing. Features selecting a topic. Types of features, the magazine scene in India.

Text books:

1. ER Ram Kumar, Jaico Publishing House- Handbook of English Usage of Editors. Writers & Executives
1. KSR Menon.- Stylebook for journalists and writers
2. Doroty Bowles, Diance Bordon- Creative Editing

Reference:

1. . Plotnik Arthur- The Elements of Editing
2. 5. John, Haris.- The Complete Reporter
3. 6. Fred Fredler- Reporting for the Media

University Examination Pattern

PART A: Analytical/problem solving SHORT questions 8x 5 marks=40 marks

Candidates have to answer EIGHT questions out of TEN. There shall be minimum of TWO and maximum of THREE questions from each module with total TEN questions.

PART B: Analytical/Problem solving DESCRIPTIVE questions 4 x 15 marks=60 marks

Two questions from each module with choice to answer one question.

Maximum Total Marks: 100

PT14 804 E DIGITAL PHOTOGRAPHY

Teaching scheme

3hours lecture and 1 hour tutorial per week

Credit: 4

Objectives: *To impart the basic concepts of photography & camera controls.
Provides understanding of photographic processing methods & Digital Imaging.*

Module I (14hours)

Imaging Systems: The production of images. Photographic & Digital Imaging. General characteristics of reproduction systems. Imaging chains. Reproduction of tone and color. Image quality expectations. Fundamentals of light & vision. Photographic light sources: characteristics. Light outputs- units, illumination law, Reflectors & luminaries-constancy of output – efficiency-operation & maintenance. Types of lamps, flash bulb. Types of camera, special purpose cameras, Automatic camera, Digital cameras-principle, features & function.

Module II (13hours)

Camera features: Shutter system, Iris diaphragm, View finders- types & function. Flash synchronization. Focusing systems. Autos focus systems. Exposure metering systems. Battery power. Data Imprinting. Camera movements: Transitional & Rotational. Lens covering power. Control of image sharpness. Limits to lens tilt. Control of image shape.

Module III (14hours)

Sensitive materials & Image Sensors: Latent image formation. Image formation by charge coupled devices. Production of light sensitive materials and sensors. Coating the photographic emulsion. CCD. Size and formats of photographic & electronic sensors and media. Film coating. Spectral sensitivity of photographic materials: Types, Response to short wave radiation & visible radiation. Spectral sensitization. Determination of color sensitivity. Spectral sensitivity of digital camera. Principle of color photography. Reproduction of color.

Module IV (13hours)

Photographic processing: Developers & development, Replenishment. Techniques of development, fixing, washing, drying. Hard copy output media: Photographic papers, types of silver halide emulsion, Color photographic papers- processing & development techniques. Digital output.

Text Book:

1. Ralph E Jacobson, Sidney F ray , Geoffrey AAttridge, Norman R Axford. The manual of photography Photography & digital imaging: 9th ed,

ReferenceBooks:

1. Barbara London, John Upton, KenKobre, Betsy Brill ,Photography 7 th ed ,Prentice Hall.

2. George H Wallace, Chuck Gloman Digital Photography Solutions.

Internal Continuous Assessment (*Maximum Marks-50*)

60% - Tests (minimum 2)

30% - Assignments (minimum 2) such as home work, problem solving, group discussions, quiz, literature survey, seminar, term-project, software exercises, etc.

10% - Regularity in the class

University Examination Pattern

PART A: Analytical/problem solving SHORT questions *8x 5 marks=40 marks*

Candidates have to answer EIGHT questions out of TEN.
There shall be minimum of TWO and maximum of THREE questions from each module with total TEN questions.

PART B: Analytical/Problem solving DESCRIPTIVE questions *4 x 15 marks=60 marks*

Two questions from each module with choice to answer one question.

Maximum Total Marks: 100

PT14 805 ELECTIVE - IV

PT14 805A DIGITAL PRE-PRESS

Teaching scheme

3hours lecture and 1 hour tutorial per week

Credit: 4

Objectives: *This paper provides about the digital pre-press workstations in a printing industry.*

Module I (10 hours)

Structure of Digital Printed Product – Technological capabilities and work flows – Digital description of the Printed Page - Text - Images – Graphics – Layout - The digital page used as a basis from the digital description of the page to its printing. Digital Screening Process – RT Screening, Super cells, irrational screening, output options. Quality requirement – Input and Output resolution Transferable tonal range – Dot shape tonal value influence in printing dot gain print characteristics curve. Color management profile – image dependent effects & corrections.

Module II (14 hours)

Digital Photography: Origin, Image scanning with digital camera, Demands on the resolution special features – tone value quantization, focal length of lenses, aspect ratio, link up to a computer. Digital photography and color management. Digitalizing originals- scanner design & models- scanner technology – Digitalizing & redegitizing scanner operation and image processing sheet assembly and imposition – page make up & sheet assembly, full sheet output, full sheet production in the work flow, imposition through sheet work, imposition sheet & imposition layout, types of imposition programs, demand on imposition programs, imposition work flow

Module III (12 hours)

Rates Image processor (RIP) – structure & function, interpreter interaction, color data, Rip integration/ execution, workflow storage media- classification network- concepts & components, topologies, Data transfer, Ethernet, high speed networks, data formats.

Module IV (18 hours)

Color management – definition, image reproduction process – production of color profiles, structures of colours profiles, connection of colours profiles, rendering intent, colour management and standardization colour management concepts .Digital proof – proofing process Quality Control Press and pre press proofing –digital colour proofing and its limitations –usage of colour charts- 3M match print colour control elements – FORGA standards

Text books:

H. Kippan, Hand book of print media, Heidelberg.
The manual of photography Photography and digital imaging.

Internal Continuous Assessment (Maximum Marks-50)

- 60% - Tests (minimum 2)
- 30% - Assignments (minimum 2) such as home work, problem solving, group discussions, quiz, literature survey, seminar, term-project, software exercises, etc.
- 10% - Regularity in the class

University Examination Pattern

PART A: Analytical/problem solving SHORT questions *8x 5 marks=40 marks*

Candidates have to answer EIGHT questions out of TEN.
There shall be minimum of TWO and maximum of
THREE questions from each module with total TEN
questions.

PART B: Analytical/Problem solving DESCRIPTIVE questions *4 x 15 marks=60 marks*

Two questions from each module with choice to answer
one question.

Maximum Total Marks: 100

PT14 805 B ENTREPRENEURSHIP MANAGEMENT

Teaching scheme

3hours lecture and 1 hour tutorial per week

Credit: 4

Module I (20 hours)

Entrepreneurial perspectives - understanding of entrepreneurship process - entrepreneurial decision, process - entrepreneurship and economic development - characteristics of entrepreneur - entrepreneurial competencies - managerial functions for enterprise

Module II (10 hours)

Process of business opportunity identification and evaluation - industrial policy - environment - market survey and market assessment - project report preparation - study of feasibility and viability of a project - assessment of risk in the industry

Module III (12 hours)

Process and strategies for starting a venture - stages of small business growth – entrepreneurship international environment - entrepreneurship - achievement motivation - time management creativity and innovation structure of the enterprise - planning, implementation and growth

Module IV (12hours)

Technology acquisition for small units - formalities to be completed for setting up a small scale unit - forms of organizations for small scale units - financing of project and working capital - venture capital and other equity assistance available - break even analysis and economic ratios technology transfer

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Text books:

1. Hirich R.D. & Peters Irwin M.P., *Entrepreneurship*, McGraw Hill
2. Rao T.V, Deshpande M.V., Prayag Metha & Manohar S Nadakarni, *Developing Entrepreneurship, A Hand Book*, Learning Systems
3. Donald Kurado & Hodgelts R.M., *Entrepreneurship A Contemporary Approach*, The Dryden Press

Reference books

1. Harold Koontz & Heinz Wehrich, *Essentials of Management*, McGraw Hill International
2. Dr Patel V.G., *Seven Business Crisis*, Tata McGraw Hill
3. Timmons J.A., *New Venture Creation-Entrepreneurship for 21st Century*, McGraw Hill International
4. Patel J.B., Noid S.S., *A Manual on Business Opportunity Identification, Selections*, EDII
5. Rao C.R., *Finance for Small Scale Industries*
6. Pandey G.W., *A Complete Guide to Successful Entrepreneurship*, Vikas Publishing

Internal Continuous Assessment (Maximum Marks-50)

60% - Tests (minimum 2)

30% - Assignments (minimum 2) such as home work, problem solving, group discussions, quiz, literature survey, seminar, term-project, software exercises, etc.

10% - Regularity in the class

University Examination Pattern

PART A: *Analytical/problem solving SHORT questions* 8x 5 marks=40 marks

Candidates have to answer EIGHT questions out of TEN.
There shall be minimum of TWO and maximum of THREE questions from each module with total TEN questions.

PART B: *Analytical/Problem solving DESCRIPTIVE questions* 4 x 15 marks=60 marks

Two questions from each module with choice to answer one question.

Maximum Total Marks: 100

PT14 805C SCANNERS AND SYSTEMS

Teaching scheme

3hours lecture and 1 hour tutorial per week

Credit: 4

Objective: This paper deals about the developments, working and calibration of Scanners.

Module I (13 hours)

Basic principles of a scanner – vario klishograph – The Neugebauer formula – Relative study of crosfield-Danippon Screen, Hell, Royal Zenith, Scitex and Itek colour scanner. Mechanics and functions of a scanner-signal flow in the scanning section-signal processing in the computer. Analog and digital computers- signal processing in the colour computer-Function of scale computer- The basic Mechanics of a exposing section- Operator's features- Poly chromatic Colour Removal (PCR) Pastel colour boost-flexible unsharp Masking-Scanner generated vignettes- Step and repeat-Expose cylinder-film loading, optical system.

Module II (13 hours)

Light source : Xenon lamp and laser exposure unit – scanner data terminal – disk drive unit- Scanner initialisation – cleaning the original - mounting copy of the scanning drums – cylinder change analyse optic procedure – setting focus, aperture and filter, adjusting the lamp house optics: centering the spot, setting vertical resolution – expose optic procedure- setting cylinder size – setting expose turret – setting laser power. Film procedure Loading film – unloading film – safety precautions and environment conditions – general precautions.

Module III (13 hours)

Colour separation by flatbed scanners – Links from the Desktop to the High-end High end vertical type drum Scanners – its working principle – Mechanical and Optical consideration – Text and Graphis combination – Imagesetters – Raster Image Processor (RIP) – High fidelity Colour Printing – Creating digital images – Designing the electronic page – Imaging System Technology and Operation – Elements of digital image processing system – Hardware and software – Cloning or pixel replacement – Data compression and transmission.

Module IV (15 hours)

Calibration – positioning traverse, setting the starting point of the original –enlargement and final size, scan rate, format, auto format, customer values – Luminosity curves, tone, neutral tone boost, colour correction, removal and addition of colour cast, grey balance set up procedure, catchlight, color negative scanning, limit and line mode.Image processing concept – Systems technology – Arrival of images on Disk – Electronic assembly and the layout- cleaning of optics – printer disk care – disk unit cleanliness-temperature and humidity control – scanner unit daily, weekly maintenance fault finding chart – operator error messages, machine fault messages.

Text books:

1. Eric Chambers, Reproduction Photography for lithography, GATF, 1979.
2. Gary, G. Field Colour Scanning and Imaging System, GATF, 1990
3. Dr. R. Molla, Eletronic Colour Separation, R.K. Printing & Publishing Company, West Virginia.

References:

1. Surrey, Graphic Repro, Eaglehead Publishing Ltd., , U.K., 1984.
2. Bill Parsons, Electronic prepress: An Introduction, Delmar Publishers, 1994.
3. J. Michael Adams, David D. Faux, Llyod J. Ribber , Printing Technology,3rd ed., Delmar 1968. Crossfield Operator's manual-6500-8090-03A, 1989

Internal Continuous Assessment (*Maximum Marks-50*)

60% - Tests (minimum 2)

30% - Assignments (minimum 2) such as home work, problem solving, group discussions, quiz, literature survey, seminar, term-project, software exercises, etc.

10% - Regularity in the class

University Examination Pattern

PART A: Analytical/problem solving SHORT questions *8x 5 marks=40 marks*

Candidates have to answer EIGHT questions out of TEN.
There shall be minimum of TWO and maximum of THREE questions from each module with total TEN questions.

PART B: Analytical/Problem solving DESCRIPTIVE questions *4 x 15 marks=60 marks*

Two questions from each module with choice to answer one question.

Maximum Total Marks: 100

PT14 805D PACKAGING SCIENCE

Teaching scheme

3hours lecture and 1 hour tutorial per week

Credit: 4

Objectives: *Helps to get an idea of packaging industry and imparts a comprehensive study about packaging materials, testing & evaluation, barcoding, and environmental concerns.*

Module I (14hours)

Introduction to package-Functions and applications of Package, packaging marks , package design considerations for package design. Folding Carton parts-trends in packaging- testing of material for printing and packaging – Bursting strength, puncture resistance, grammage, drop test, mechanical test tensile strength, modulus of elasticity, Flexural test optical test, chemical test.

Module II (14hours)

Flexible Packaging-Characteristics-pouch styles,pillow pouches, three side seal pouches, Four side seal pouches, stand- up pouches-forming pouches,retort pouches -bulk and heavy duty bags-bag in box. Barcoding-Barcode structures.Types-verifying/analysing, printed barcodes.UPC and flexo printing, upc film masters & printing capability test. SCS Shipping contain barcode printing.

Module III (13hours)

Role of plastic in packaging, thermal properties-mechanical properties-barrier properties-surfaces and addition-optical characteristics-electrical characteristics-adhesion ,adhesives-types-reactive, hot melt, solvent borne, water borne, pressure sensitive, remoistenable, cold seal, UV and e-beam curing-Heat sealing-sealing methods-bar/thermal, impulse, band, hot wire/hot knife sealing, ultrasonic, friction, hot gas & contact, radiant, dielectric , magnetic, induction, solvent sealing

Module IV (13hours)

Food Packaging, Developments in food processing & packaging, Introduction to food packaging technology. Future trends in food packaging- Anti- microbial packaging systems-food safety Antimicrobial packaging –Antimicrobial agents. Antimicrobial mechanisms- Technical factor for anti-microbial system. Oxygen scavenging packaging- package inserts-Intelligent packaging- Applications and technologies- Freshness and microbial indicator, Time temperature indicator, gas concentrator indicator

Text books:

- 1 Innovations in food packaging (edited by Jung. H Han), Elsevier academic Press
2. Susan. E. M Selke, John D Culter, Ruben J Hernandez, Plastic Packaging (2E) , HanserPublishers, Meenich.

Internal Continuous Assessment (*Maximum Marks-50*)

60% - Tests (minimum 2)

30% - Assignments (minimum 2) such as home work, problem solving, group discussions, quiz, literature survey, seminar, term-project, software exercises, etc.

10% - Regularity in the class

University Examination Pattern

PART A: Analytical/problem solving SHORT questions *8x 5 marks=40 marks*

Candidates have to answer EIGHT questions out of TEN. There shall be minimum of TWO and maximum of THREE questions from each module with total TEN questions.

PART B: Analytical/Problem solving DESCRIPTIVE questions *4 x 15 marks=60 marks*

Two questions from each module with choice to answer one question.

Maximum Total Marks: 100

PT14 805E ON DEMAND PRINTING

Teaching scheme

3hours lecture and 1 hour tutorial per week

Credit: 4

Objective: *It is a digital concept and this paper gives details about customized printing methods.*

Module I (15 hours)

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-Market subset, where are pages created. Number of originals and run length. New technologies shift existing methods. Economics of on demand printing- Economic of long run. Advantage for the buyer. Efficiencies of Digital on demand work flow. Short-run pricing paradox.

Module II (16 hours)

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

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applications. Marketing and selling on-demand services- TV programming and ATM cards. Value added. Advantages of an demand. Selling factors. Accepting digital files-File transfer for on-demand.

Module III (11 hours)

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

Module IV (12 hours)

Overview. Print engines. Press director. Multiple runs. Open pre press interface. Colour consistency. User experience. Service. Cost of consumables. Ripstation, Satellite press, Web press software suit.

Text books:

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

Internal Continuous Assessment (*Maximum Marks-50*)

60% - Tests (minimum 2)

30% - Assignments (minimum 2) such as home work, problem solving, group discussions, quiz, literature survey, seminar, term-project, software exercises, etc.

10% - Regularity in the class

University Examination Pattern

PART A: Analytical/problem solving SHORT questions *8x 5 marks=40 marks*

Candidates have to answer EIGHT questions out of TEN.
There shall be minimum of TWO and maximum of THREE questions from each module with total TEN questions.

PART B: Analytical/Problem solving DESCRIPTIVE questions *4 x 15 marks=60 marks*

Two questions from each module with choice to answer one question.

Maximum Total Marks: 100

PT14 806 (P) SEMINAR

Teaching scheme

3hours per week

Credit: 2

Objective: *To assess the ability of the student to study and present a seminar on a topic of current relevance in printing technology or allied fields.*

It enables the students to gain knowledge in any of the technically relevant current topics and acquire the confidence in presenting the topic. The student will undertake a detailed study on the chosen topic under the supervision of a faculty member, by referring papers published in reputed journals and conferences. Each student has to submit a seminar report, based on these papers; the report must not be reproduction of any original paper. A committee consisting of three/four faculty members will evaluate the seminar.

Internal Continuous Assessment

20% - Relevance of the topic and literature survey

50% - Presentation and discussion

20% - Report

10% - Regularity in the class and Participation in the seminar

PT14 807(P) PROJECT

Teaching scheme

7 hours practical per week

Total Credits: 7

Objectives

- *To estimate the ability of the student in transforming the theoretical knowledge studied so far into a working model or a system.*

This project work is the continuation of the project initiated in seventh semester. The performance of the students in the project work shall be assessed on a continuous basis by the project evaluation committee through progress seminars and demonstrations conducted during the semester. Each project group should maintain a log book of activities of the project. It should have entries related to the work done, problems faced, solution evolved etc. There shall be at least an Interim Evaluation and a final evaluation of the project in the 8th semester. Each project group has to submit an interim report in the prescribed format for the interim evaluation. Each project group should complete the project work in the 8th semester. Each student is expected to prepare a report in the prescribed format, based on the project work. Members of the group will present the relevance, design, implementation, and results of the project before the project evaluation committee comprising of the guide, and three/four faculty members specialised in Printing or allied fields. 50% of the marks is to be awarded by the guide and 50% by the evaluation committee.

Internal Continuous Assessment (Maximum Marks - 100)

40% - Design and development/Simulation and analysis

30% - Presentation & demonstration of results

20% - Report

10% - Regularity in the class

PT14 808 (P): VIVA-VOCE

Credits : 3

Objective : *To examine the knowledge acquired by the student during the B.Tech. course, through an oral examination*

The students shall prepare for the oral examination based on the theory and laboratory subjects studied in the B.Tech. Course, seminar, and project. There is only university examination for vivavoce. University will appoint two external examiners and an internal examiner for viva-voce. These examiners shall be senior faculty members having minimum five years teaching experience at engineering degree level. For final viva-voce, candidates should produce certified reports of seminar, and project. If he/she has undergone industrial training/industrial visit/educational tour or presented a paper in any conference, the certified report/technical paper shall also be brought for the viva-voce. Allotment of marks for viva-voce shall be as given below.

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Assessment in Viva-voce (*Maximum marks – 100*)

40% - Subjects

30% - Project and Mini Project

20% - Seminar

10% - Industrial training/industrial visit/educational tour or Paper presented at National-level