# UNIVERSITY OF CALICUT

# SCHEME AND SYLLABI

**FOR**

# FIFTH TO EIGHTH SEMESTERS

**OF**

# BACHELOR OF TECHNOLOGY

**IN**

# PRINTING TECHNOLOGY

**FROM 2004 ADMISSION ONWARDS**

## CALICUT UNIVERSITY (P.O), THENHIPALAM

# PT: PRINTING TECHNOLOGY

## FIFTH SEMESTER

| Code | Subject | Hours/Week | | | Sessional Marks | University Examination | |
|---|---|---|---|---|---|---|---|
| | | L | T | P/D | | Hours | Marks |
| PT04 501 | Microprocessor and Micro controllers | 3 | 1 | - | 50 | 3 | 100 |
| PT04 502 | Non Impact printing | 3 | 1 | - | 50 | 3 | 100 |
| PT04 503 | Film Assembly and plate making | 3 | 1 | - | 50 | 3 | 100 |
| PT04 504 | Theory of machines | 3 | 1 | - | 50 | 3 | 100 |
| PT04 505 | Electrical Drives and Controls | 3 | 1 | - | 50 | 3 | 100 |
| PT04 506 | Offset Machinery – II | 3 | 1 | | 50 | 3 | 100 |
| PT04 507(P) | **Printing Machines Lab-II** | - | - | 3 | 50 | 3 | 100 |
| PT04 508(P) | **DTP Lab** | - | - | 3 | 50 | 3 | 100 |
| **TOTAL** | | **18** | **6** | **6** | **400** | | **700** |

## SIXTH SEMESTER

| Code | Subject | Hours/Week | | | Sessional Marks | University Examination | |
|---|---|---|---|---|---|---|---|
| | | L | T | P/D | | Hours | Marks |
| PT04 601 | Design and planning for media production | 3 | 1 | - | 50 | 3 | 100 |
| PT04 602 | Flexography | 3 | 1 | - | 50 | 3 | 100 |
| PT04 603 | Machine Design | 3 | 1 | - | 50 | 3 | 100 |
| PT04 604 | Instrumentation & Control | 3 | 1 | - | 50 | 3 | 100 |
| PT04 605 | Screen Printing &Gravure | 3 | 1 | - | 50 | 3 | 100 |
| PT04 606 | Print Finishing & Converting | 3 | 1 | | 50 | 3 | 100 |
| PT04 607(P) | **Print Finishing Lab** | - | - | 3 | 50 | 3 | 100 |
| PT04 608(P) | **Screen Printing and Flexo Lab** | - | - | 3 | 50 | 3 | 100 |
| **TOTAL** | | **18** | **6** | **6** | **400** | **-** | **800** |

## SEVENTH SEMESTER

| Code | Subject | Hours/Week | | | Sessional Marks | University Examination | |
|---|---|---|---|---|---|---|---|
| | | L | T | P/D | | Hours | Marks |
| PT04 701 | Industrial Management | 3 | 1 | - | 50 | 3 | 100 |
| PT04 702 | Engineering Economics | 3 | 1 | - | 50 | 3 | 100 |
| PT04 703 | Printing machinery Maintenance | 3 | 1 | - | 50 | 3 | 100 |
| PT04 704 | Operation Research | 3 | 1 | - | 50 | 3 | 100 |
| PT04 705 | Elective - I | 3 | 1 | - | 50 | 3 | 100 |
| PT04 706 (P) | **Quality Control lab** | | | 3 | 50 | 3 | 100 |
| PT04 707(P) | **Seminar** | - | - | 3 | 50 | | |
| PT04 708(P) | **Project Work** | - | - | 4 | 50 | | |
| **TOTAL** | | **15** | **5** | **10** | **400** | **-** | **600** |

**Elective-I**

**PT04 705 A: Software engineering**
**PT04 705 B: On demand Printing**
**PT04 705 C: Quality Control in Printing**
**PT04 705 D: Tone and colour analysis**
**PT04 705 E: Production and Operations Management**

## EIGHTH SEMESTER

| Code | Subject | Hours/Week | | | Sessional Marks | University Examination | |
|---|---|---|---|---|---|---|---|
| | | L | T | P/D | | Hrs | Marks |
| PT04 801 | Printing management costing &Estimation | 3 | 1 | - | 50 | 3 | 100 |
| PT04 802 | Marketing Management | 3 | 1 | - | 50 | 3 | 100 |
| PT04 803 | Packaging Technology | 3 | 1 | - | 50 | 3 | 100 |
| PT04 804 | Elective – II | 3 | 1 | - | 50 | 3 | 100 |
| PT04 805 | Elective – III | 3 | 1 | - | 50 | 3 | 100 |
| PT04 806(P) | **Packaging lab** | - | - | 3 | 50 | 3 | 100 |
| PT04 807(P) | **Project Work** | - | - | | | | 100 |
| PT04 808(P) | **Viva Voce** | - | - | 6 | 100 | | |
| **TOTAL**<br>**Aggregate marks for 8 semesters = 8250** | | **18** | **6** | **6** | **400**<br>**2950** | **-** | **700**<br>**5300** |

**Elective – II**

1. **PT04 804 A: Publishing Science**
2. **PT04 804 B: Enterprise Resource Planning**
3. **PT04 804 C: Advertising Techniques**
4. **PT04 804 D: Book Publishing**
5. **PT04 805 E: Total Quality Management in G. A. I**.

**Elective – III**

1. **PT04 805 A: Newspaper and Periodical Publishing.**
2. **PT04 805 B: Continues stationary and Security Printing.**
3. **PT04 805 C: Electronic Paper.**
4. **PT04 805 D: Industrial Psychology**
5. **PT04 805 E: Scanners and Systems**

## FIFTH SEMESTER

## PT04 501 : MICROPROCESSORS & MICROCONTROLLERS

| 3 hours lecture and 1 hour tutorial per week |
|---|

**Module I (16 hours)**

Introduction. Binary digits. Microprocessor as a programmable device. Microprocessor instruction set & computer language. Large computer to single chip micro controller – Large computers, Medium size computers, Microcomputers. Architecture and operations – MP initiated operations & 8085 Bus organisation, Internal data operations and 8085 registers.8085 programming model – Programming registers. Instruction classification – 8085 instruction set. Instruction & data format – Instruction word size, opcode format, data format. Write assemble & execute a program – adding two hexa decimal number, Differentiating between data & instruction code.Data transfer operations – Addressing models, Data transfer form register to output port, Data transfer to control output devices.Timing diagram- instruction cycle-machine cycle-T-states-8085timing diagram for sim[ple instruction execution timings- instruction format- types of instruction-addressing modes- Arithmetic operations – Addition, Arithmetic operations, Addition and increment, Subtraction. Subtraction of two unsigned numbers. Logic operations – Logic AND, Data masking with Logic AND, OR, exclusive – OR and NOT, Setting & resetting specific bits, OR ing data from two input ports. Branch operations – Unconditional jump to set up a continuous loop, Conditional jumps, Testing of the carry flag. Writing assembly language programs – Getting started, Micro processor controlled manufacturing processing. Debugging a programming.

**Module II (11 hours)**

Programming techniques – continuous loop, conditional loop. Additional data transfer & 16 bit arithmetic Instructions – 16 bit data transfer to register pairs, Data transfer from memory to MD, Data transfer from MP to memory, Arithmetic operations related to 16 bits, Review of instructions, Block transfer of data bytes. Arithmetic operations related to memory – Instructions, Addition with carry. Logic operations – Rotate – Instructions, Checking sign with rotate instructions. Logic operations – compare – Instructions, Use of compare instructions to indicate end of data string, Sorting. Stack – Review of important concepts, Resetting and displaying flags. Subroutine – Traffic signal controller, Subroutine documentation and parameter passing. Restart, conditional call & return instructions – Restart instructions, Conditional call & return instructions.

**Module III (12 hours)**

8085 Interrupt – RST instructions, An implementation of the 8085 interrupt, Multiple interrupts & priorities. 8085 vectored interrupts – Trap, RST 7.5, 6.5 & 5.5, Interrupt driven clock. Additional I/O concepts & processes – Programmable interrupt controller – 8259A, Director memory access.Basic interfacing concepts – Peripheral I/O instructions, I/O execution, Device selection and data transfer, Absolute v/s partial decoding, Input interfacing, Interfacing I/O's using decoders. Memory mapped I/O – Execution of memory related data transfer instructions, Safety control system using memory mapped I/O techniques.

**Module IV (13 hours)**

Introduction. Comparing micro processors & micro controllers. The 280 and the 8051, Micro controller survey, Development System for microcontroller.Instruction. 8051 Micro controller hardware – 8051 oscillator and clock, Programm counter & data pointer, A and B CPU registers, Flags & the program status word, Internal memory, Internal RAM. The stack & the stack pointer, Special function registers, Internal ROM. Input/output pins, ports & circuits – Port 0 68, Port 1 69, Port 2 69, Port 3 69. External Memory – Correcting external memory. Timing, Timer modes of operation, Counting. Serial data Input/Output – Serial data interrupts, Data transmission, Data reception, Serial data transmission modes. Interrupts – Timer flag interrupt, Serial port interrupt, External port interrupt, Reset, Interrupt control, Interrupt control priority, Interrupt control destinations, Software-generated interrupts.Instruction. Key boards – Human factors, Key switch factors, Key configurations, Program for key boards, Scanning program for small key boards, Interrupt driven programs for small key boards, Program for a large matrix keyboard. Displays – Seven segment numberic display, Intelligent LCD display. Pulse measurement – Measuring frequency, Pulse width measurement. D/A and A/D conversions – D/A conversions, A/D conversions. Multiple interrupts – Hardware circuits for multiple interrupts.

**Reference**

1. Ramesh S. Gaonker, Microprocessor Architecture, Programming and Applications with the 8085, 4th edition
1. Kenneth J. Ayala, The 8051 Microcontroller – Architecture Programming & Applications

| **Internal assessment:** | | |
|---|---|---|
| Assignments | (minimum 2) | =15 marks |
| 2 Tests | (2 x 15) | =30 marks |
| Regularity | | = 5 marks |
| Total | | =50 marks |

**University examination pattern**

Q I - 8 short type questions of 5 marks, 2 from each module
Q II - 2 questions A & B of 15 marks from module I with choice to answer any one
Q III - 2 questions A & B of 15 marks from module II with choice to answer any one
Q IV - 2 questions A & B of 15 marks from module III with choice to answer any one
Q V - 2 questions A & B of 15 marks from module IV with choice to answer any one

## PT 04 502: NON-IMPACT PRINTING

| 3 hours lecture and 1 hour tutorial per week |
|---|

**Module I (11 hours)**

Basic in Digital Printing - Introduction. Features of Digital printing system. Characteristics of Digital printing process. Non impact printing processes - slow scan, fast scan, Workstations. Secondary storage - Sequential access media, randam access media. Auxillary storage devices - Floppy disk, care & protection of floppy disk, hard disk, magnetic taps, zip disk, Jaz disk, super disk, optical disk - CDROM, Worm, Erasable optical disk, CD-RW media structure, Cross section of CD, CD data formatting. Comparision of memory storage of text and colour printing. Comparision of memory transfer rate for text and color printing. Pixels, resolution and half tone dots. Image refreshment. Colour. Contouring. Substrates and process speed. Impact printing - Dot matrix printer, IBM slectric printer, Daisy wheel printer, Chain, drum printer, Advantages & Disadvantages of each. Comparision betweem impact printing and non impact printing. Comparision between conventional printing and computerized printing system. Future of page o/p device. Optical Storage Media. Introduction, Basic technology, Video Disk and other WORMS, compact disk Digital Audio. Compact Disk Read Only Memory. CD-ROM extended Architecture. Further CD-ROM based developments. Compact Disk Write once, compact disk magneto optical. Principle of the magnetic-optical method. Areas of CD-MO. Prospects of CD technologies.

**Module II (15 hours)**

Digital Colour Printing - Introduction: Future. Just in time production. Individualized output. Inhouse production. Distributed information. Visualization and prototyping. Compilation and off prints. Shortrun printing. Volume printing using digital colour presses - IndigoE-Print, the technologies, modified conventional presses. Electro photography - advantages, technology and design. Digital scanning exposure. Laser scanning system. Electrography - Introduction, advantages, technology and design, writing head assembly, multicolour multipass electrographic architecture, product examples. Ionography - Introduction, advangages, technologies and construction, print head artitecture, product example. Magnetography - Introduction, advantages, technology and construction. Recording elements - longitudinal recording, perpendicular recording, recording head element. Product example. Inkjet printing - introduction, advantages, digital continuous inkjet binary continuous inkjet, drop-on-demand inkjet, thermal inkjet, multinozzle thermal inkjet print head, multinozzle thermal inkjet cartridge, plastic thermal inkjet with rotating print head, multinozzle thermal inkjet cartridge, plastic thermal inkjet with rotating print head, construction and materials - typewriter motion architecture uniform substrate media architecture, Barber motion architecture, product examples. Thermal transfer printing - Introduction, advantages, technology, thermal transfer process, thermal transfer system, thermal transfer architecture. Product examples. Applications & Future Trends. Short run and Inhouse printing, Proofing, Over printing and combinations, bindery lines and mailing, packaging, labels, posters and large formats, electronic press, future of non impact printing, technical developments in non impact printing.

**Module III (13 hours)**

Computer to plate - Introduction: CTP printing systems. The market. Evaluation from phototype setting to plate setting. Variations for, computer-to-technology. Press trends - Press automation, Automatic plate changing, On-press plate making. Plate layout with margins and allowances, comparing print characteristic of digital proofers. Image carrier - Introduction, plate technology, plate exposing system, basic imaging mechanism. Silver halide, Hybrid, photopolymer. Plat handling - handling of large plates, handling of smaller plates, slip sheets, punching. Types of Plate setters - Internal drum, external drum. Sizes of Plate setters Conventional digital plate setters: digital plate setters and analog plates, overview of plate setters, digital versus traditional work flow. plan for adopting a CTP workflow. Return an investment - Elements of ROI. Plate setter profiles - Barco graphics, Dupont, Gerber Systems Corporation, Krause, Linotype-Hell, Optronics, Screen.

**Module IV (13 hours)**

Paperless Publishing - Publishing directly from personal computer, electronic publishing. Cultural and social impact. Hybrid formats for back and magazines needing, shelf-appeal. Readers adapt to the new media, hardware developments, create your own books and other publications. New ways of selling, creating for minority interests and niche markets, multimedia in perspective, breaking the physical barriers of print, limitless opportunities, cooperative writing, easy economical publishing future trends. Electronic publishing in transferring business. Marketing your electronic books - Identify your market, non traditional book

marketing, begin with research. Marketing to the world, editorial publicity getting your disks and files safety to the right place, pre publication offers for positive cash flow, beware digitized versions of vanity publishing. The Impact of electronic publishing on your carrier. The e-book of your life. Packaging and duplicating, writing tips tricks and techniques. Opportunities for photographers, artists and musicians. Electronic Fiction.

**Reference**


1. Computer-to-Plate automating the Printing Industry - Dr. Richard M. Adams
2. Computer Concepts & C-Programming - T.S. B. Sudarshan
3. Understanding Electronic Communication - Pamekgroff, A'isha Ajayi
4. Non Impact Printing - Gerhard A. Nothmann
5. Guide to Desktop Publishing - James Cavuoto & Stephen Bcale
6. Understanding Digital colour - Phil Green.
7. Paper Less Publishing - Colin Hagnes


| **Internal assessment:** | | |
|---|---|---|
| Assignments | (minimum 2) | =15 marks |
| 2 Tests | (2 x 15) | =30 marks |
| Regularity | | = 5 marks |
| Total | | =50 marks |

**University examination pattern**

Q I - 8 short type questions of 5 marks, 2 from each module
Q II - 2 questions A & B of 15 marks from module I with choice to answer any one
Q III - 2 questions A & B of 15 marks from module II with choice to answer any one
Q IV - 2 questions A & B of 15 marks from module III with choice to answer any one
Q V - 2 questions A & B of 15 marks from module IV with choice to answer any one

**PT04 503: FILM ASSEMBLY AND PLATE MAKING**

| 3 hours lecture and 1 hour tutorial per week |
|---|

**Module I (13 hours)**

Objective, tools, materials and equipments used, information required for planning, layout and plate making, preparing layout for production. Types, properties and requirements of base materials for film assembly. Miscellaneous items-transparent tapes, cements, opaques, register mark tabs, sensitivity guide, stripping film, film adhesives, cleaning solution. Direct to plate, hand assembly montage. Different types of pin and punch register system used their design and working principle and method of obtaining multiple ups.

**Module II (13 hours)**

Surface chemistry of oleophilic image areas; hydrophilic non-image areas; Lithographic plate metals treatments; composition characteristics and effects of chemical changes resulting from exposure and processing of light sensitive coatings viz., dichromated colloids, diazo compounds and photopolymers. Use of double exposure, combination exposure and multiple image techniques.

**Module III (11 hours)**

Major items of equipments used for applying light sensitive coatings such as whirling, wipe-on and spraying. Graining process and machinery used. Anodyzing process. Surface plate making process-albumen wipe-on and pre sensitized plates. Deep etch plate making process-Gum bichromate, copperized aluminium deep etch plates, deep etch plates using PVA, bimetal and trimetal plates.

**Module IV (15 hours)**

Different light sources, Vacuum printing down frame, their configuration, step and repeat machines, Automatic plate processing machines, processing chemicals, solvents, gums, developing inks, lacquers, asphaltum etc.Chemical transfer method-reflex and projection methods waterless plates-system configuration and performance characteristics, electrophotostatic plates-structure, system configuration.

**References**

1. A.L. Gatehouse & K.N. Roper, Modern Film Planning & Plate making, Sita Lts., 1983.

1. Ian Faux, Modern Lithography, Sita Ltd., 1982.
3. The Lighographers Manual, GATF.

| **Internal assessment:** | | |
|---|---|---|
| Assignments | (minimum 2) | =15 marks |
| 2 Tests | (2 x 15) | =30 marks |
| Regularity | | = 5 marks |
| Total | | =50 marks |

**University examination pattern**

Q I - 8 short type questions of 5 marks, 2 from each module
Q II - 2 questions A & B of 15 marks from module I with choice to answer any one
Q III - 2 questions A & B of 15 marks from module II with choice to answer any one
Q IV - 2 questions A & B of 15 marks from module III with choice to answer any one
Q V - 2 questions A & B of 15 marks from module IV with choice to answer any one

## PT04 504: THEORY OF MACHINES

| 3 hours lecture and 1 hour tutorial per week |
|---|

**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 couping, 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 involuntometry. 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 epicylic gear train. Bevel epicylic gear train. Differential gear drive of an automobile.

**Module III (12 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 (12 hours)**

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

**Reference**


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

1. V.P. Singh.- Theory of machines.


| **Internal assessment:** | | |
|---|---|---|
| Assignments | (minimum 2) | =15 marks |
| 2 Tests | (2 x 15) | =30 marks |
| Regularity | | = 5 marks |
| Total | | =50 marks |

**University examination pattern**

Q I - 8 short type questions of 5 marks, 2 from each module
Q II - 2 questions A & B of 15 marks from module I with choice to answer any one
Q III - 2 questions A & B of 15 marks from module II with choice to answer any one
Q IV - 2 questions A & B of 15 marks from module III with choice to answer any one
Q V - 2 questions A & B of 15 marks from module IV with choice to answer any one

**PT04 505: ELECTRICAL DRIVES AND CONTROLS**

| 3 hours lecture and 1 hour tutorial per week |
|---|

**Module –I (13 hours)**

Advantages of electric drives - Parts of electric drives- Factors influencing the choice of electric drives – Factors influencing the choice of electric drives- Fundamental torque equations – Multi quadrant operation – Nature and classification of load torque – steady state stability – Load equalization.

**Module – II (13 hours)**

DC motor operation principle – Types of dc motors – Torque equation- speed control – Braking – converter fed dc drives – chopper fed dc drives – Application of DC motors

**Module – III (13 hours)**

Three phase induction motor – starting characteristics – steady state characteristics – Torque equations – Cogging and Crawling – Starting of induction motor – speed control methods – Braking methods – Single phasing – Working principle of single phase induction motor- Applications of Induction motors

**Module – IV (13 hours)**

Synchronous motor, salient pole and Non salient pole – Torque equations- Different types of torque – Starting methods – speed control – Hunting – Electric Traction drives.

**REFERENCE**:


1. Fundamentals of Electric drives - GK Dubey
2. Electric Machines – IJ Nagrath, DP Kothari
3. Electrical Technology – H. Cotton
4. Power Electronics: Converters, applications and design. – Mohan Undeland. Robbins


| **Internal assessment:** | | |
|---|---|---|
| Assignments | (minimum 2) | =15 marks |
| 2 Tests | (2 x 15) | =30 marks |
| Regularity | | = 5 marks |
| Total | | =50 marks |

**University examination pattern**

Q I - 8 short type questions of 5 marks, 2 from each module
Q II - 2 questions A & B of 15 marks from module I with choice to answer any one
Q III - 2 questions A & B of 15 marks from module II with choice to answer any one
Q IV - 2 questions A & B of 15 marks from module III with choice to answer any one
Q V - 2 questions A & B of 15 marks from module IV with choice to answer any one

## PT 04 506: OFFSET MACHINERY-II

| 3 hours lecture and 1 hour tutorial per week |
|---|

**Module I (12 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, washup machines.

**Module II (12 hours)**

Dampening systems-Introduction, pH and conductivity, fountain solution ingredients, parts of dampen system, 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, gross 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.

**Module III (13 hours)**

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 (15 hours)**

Inline finishing-Introduction, gluers, paster wheels, demonstrable pattern gluers, segmented gluers, envelope pattern gluers, backbone gluers.Patternperforating 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, counters – Dentex laser counter, stobb 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.

**Reference:**


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


| **Internal assessment:** | | |
|---|---|---|
| Assignments | (minimum 2) | =15 marks |
| 2 Tests | (2 x 15) | =30 marks |
| Regularity | | = 5 marks |
| Total | | =50 marks |

**University examination pattern**

Q I - 8 short type questions of 5 marks, 2 from each module

Q II - 2 questions A & B of 15 marks from module I with choice to answer any one

| |
|---|
| Q III - 2 questions A & B of 15 marks from module II with choice to answer any one<br>Q IV - 2 questions A & B of 15 marks from module III with choice to answer any one<br>Q V - 2 questions A & B of 15 marks from module IV with choice to answer any one |

**PT04 507(P): PRINTING MACHINES LAB-II**

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|---|
| 3 hours practical per week |

1. To obtain single print from web offset machine
2. To obtain multicolour print from web offset machine.
3. Setting inking system.
4. Setting dampening system.
5. Setting the margins.
6. Cocking the plate.

| | |
|---|---|
| **Internal assessment:** | |
| Lab practical and record | = 25 |
| Test | = 20 |
| Regularity | = 5 |
| Total marks | = 50 |

**PT04 508 (P): DESK TOP PUBLISHING LAB**

| |
|---|
| 3 hours practical per week |

**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, word 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 manupulation, 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. Comparing various outputs-Dot matrix, Inkjet printer, Laser printer, Digital printer.

| | |
|---|---|
| **Internal assessment:** | |
| Lab practical and record | = 25 |
| Test | = 20 |

| | |
|---|---|
| Regularity | = 5 |
| Total marks | = 50 |

## SIXTH SEMESTER

### PT04 601: DESIGN AND PLANNING FOR MEDIA PRODUCTION

3 hours lecture and 1 hour tutorial per week

**Module I (11 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 (13 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 marking-up.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. Conter 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 scratch, sto board and final presentation. Production for radio jingles-factors to be considered. Wo flow and final execution.

**References**


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. A.S. Porter.- Lithographic Press Work
5. Rooney J. & Steadmazn P.- Principle of CAD
6. David A.Akar & John G. Myers.- Advertisement management
7. Arthur Robinson, Randall Sale & J.K. Morrison- Elements of Cartography.
8. Jal Baker.- Analysis of Electronic Circuit
9. Leon O Chus & Pen Min Lin C.A.- Copy Preparation


| **Internal assessment:** | | |
|---|---|---|
| Assignments | (minimum 2) | =15 marks |
| 2 Tests | (2 x 15) | =30 marks |
| Regularity | | = 5 marks |
| Total | | =50 marks |

**University examination pattern**

Q I - 8 short type questions of 5 marks, 2 from each module

| |
|---|
| Q II - 2 questions A & B of 15 marks from module I with choice to answer any one<br>Q III - 2 questions A & B of 15 marks from module II with choice to answer any one<br>Q IV - 2 questions A & B of 15 marks from module III with choice to answer any one<br>Q V - 2 questions A & B of 15 marks from module IV with choice to answer any one |

**PT04 602: FLEXOGRAPHY**

| |
|---|
| 3 hours lecture and 1 hour tutorial per week |

**Module I (13 hours)**

Definition, flexographic printing, flexographic market, flexographic products, growth potential, Advantages of flexography, Press development. Mechanical principles of flexography – Fountain roll, Anilox roll, plate cylinder, impression cylinder. 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. Barcoding-Barcode structures. Types. Verifying / Analyzing printed barcodes. UPC and flexographic printing. UDC film masters and printing capability tests. The shipping container symbol (SCS). SCS shipping contain Barcode printing.

**Module II (13 hours)**

Introduction. Plates for process printing – Molded rubber plates – basics of rubber plate making, rubber printing plate components, rubber plate molding. Photo polymer plates – Basics of photopolymer plates. Types of Photopolymers – Plate making from liquid photo polymer, plate making from sheet photo polymer. 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. Molded printing plate manufacture – molding press, thickness control bearers, bench micrometers, rubber plate finishing. 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 caring requirements, matrix mold make-ready, procedure for molding a matrix. Rubber plate molding. Types of molded printing plate, care and handling of printing plates.

**Module III (13 hours)**

Flexo press types – Stack press, Central impression cylinder press, Inline press, 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. Mechanical components – CI drum, plate cylinders. Anilox roll – construction, cell structure, anilox roll wear, selecting the right anilox roll, chrome plating. Fountain rolls – formulating rubber for rolls, Flexo roller covering, Care of covered rolls, Properties of rubber regarding and polishing. Cooling rolls – Balancing flexo rolls, deflection of rolls. Unwind equipment. Repeat lengths increments – Direct drive quadrant geared press.

**Module IV (13 hours)**

Introduction. Checking the equipment. Operator care of equipment. Understanding the mounting instructions. Mounting and proofing a complete line job – Mounting procedure, proofing the first set of plates, proofing for printability, methods of prepress makeready, additional offline time savers, wrapping mounted cylinders. Miscellaneous procedures – removing plates from the cylinder, mounting metal-backed plates, reusing sticky back, plate staggering, use of release agents. Tools for the operator. Basic requirements for process colour printing. Press room practices. Environment and safety concerns. Flexo graphic substrates. Narrow web presses – Narrow web press components, Future narrow web flexography. Wide web presses. Corrugated presses. Pre printed linear presses. Future of Ink distribution system. Tomorrows flexographic plates. News print for water-base flexography. Markets for today and tomorrow.

**References**

1. Flexography principles and practices – Foundation of flexographic technical association.

| **Internal assessment:** | | |
|---|---|---|
| Assignments | (minimum 2) | =15 marks |
| 2 Tests | (2 x 15) | =30 marks |
| Regularity | | = 5 marks |
| Total | | =50 marks |

**University examination pattern**

Q I - 8 short type questions of 5 marks, 2 from each module
Q II - 2 questions A & B of 15 marks from module I with choice to answer any one
Q III - 2 questions A & B of 15 marks from module II with choice to answer any one
Q IV - 2 questions A & B of 15 marks from module III with choice to answer any one
Q V - 2 questions A & B of 15 marks from module IV with choice to answer any one

**PT04 603 : MACHINE DESIGN**

| 3 hours lecture and 1 hour tutorial per week |
|---|

**Module I (15 hours)**

Stress analysis-Types of stresses- stress strain diagram in tension- mechanical properties of materials- static stress equation in axial, bending and torsional loadings- criteria for failure- factor of safety- combination of normal and shear stresses-principal stresses- theories of failure- variable loads –fatigue strength- SN curves-soderberg and Goodman equations- factors affecting fatigue limit.

**Module II (13 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.

**Module II I(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 antifrictional bearings.

**Module IV(11 hours)**

Selection procedure for V-belt and chains for given power and velocity ratio. Design of gears- gear tooth terminology- base circle and pressure angle-design procedure for spur, helical, bevel and worm gears

**Reference:**


1. Faires, V.M., Design of machine elements, The Macmillan co., London.
2. Dobrovalsky, Machine elements, MIR publications.
3. Shigley, Mechanical Engineering design, McGraw Hill.
4. Design Data handbook, DAV printers, Coimbatore.


| **Internal assessment:** | | |
|---|---|---|
| Assignments | (minimum 2) | =15 marks |
| 2 Tests | (2 x 15) | =30 marks |
| Regularity | | = 5 marks |
| Total | | =50 marks |

**University examination pattern**

Q I - 8 short type questions of 5 marks, 2 from each module
Q II - 2 questions A & B of 15 marks from module I with choice to answer any one
Q III - 2 questions A & B of 15 marks from module II with choice to answer any one
Q IV - 2 questions A & B of 15 marks from module III with choice to answer any one
Q V - 2 questions A & B of 15 marks from module IV with choice to answer any one

## PT04 604 : INSTRUMENTATION & CONTROL

| 3 hours lecture and 1 hour tutorial per week |
|---|

**Module I (10 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. Pressure measurement – Bourdon gauge, diaphragms, mechanical & electrical resistance type secondary transducers, McLeod gage, bulk modules gauge.

**Module II (11 hours)**

Flat grid, Foil grid, Rectangular rosefte 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, 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. Measurement of torque: cradled dynamometer, band brake, water brake, Torque meter. Temperature Measurement: Bimetallic Thermometer, constant volume thermometer. Vapour pressure thermometer, laws of thermocouples, thermocouple materials, optical pyrometer. Vibration: Vibration detectors, practical vibrometer, practical accelerometers.

**Module III (15 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.

**Module IV (16 hours)**

Paper tester – Introduction. Optical Property Testers – Brightness meters, colorimeters, glossmeters, opacimeters, spectro colorimeters, spectro photometers. Printability property testers – Absorbency testers, densitometers, Dynamic property testers, expansimeters, coefficient-of-friction testers, Hydrostatic testers, linting 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. Multiple property testers. Ink testers – Introduction. Working property testers – colorimeters & spectrophoto meters, 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. End-use-property testers – Abrasion testers, exposure resistance testers, rub testers, shear/scratch testers. Process control instruments – Introduction. Photographic process control instruments – Calibration standards, Color control instruments, Densitometers. Densitometers – Densitometric terms & definitions, relationship between density & exposure, Densitometer types – visual densitometer, photoelectric densitometer, transmission, reflection & combination densitometer, practical used densitometer – calculating evenless of illumination-determining filter factor – exposure calculation.

Densitometer accessories – dot area meters, exposure control meters, film inspection system, Light integrators. Stripping process control instruments – layout gauges, screen angle gauges, screen tint specification instrument. Plate making process control instruments – Dot gain meters, light integrators, optical depth gauge. Press process control instruments – blanket gauges, durometers, fountain solution

control instruments, gravure proofing instruments, ink control instruments. MICR-quality control instruments – Packing gauges, scanning densitometers, speed recording instruments, web tension control instruments. General instruments – carton crease gauge, contact coaters, hand coaters, rotary coaters, illuminators, transparency, lighting inspection, magnifiers, stereo microscopes, pH meters, pH meters, buffer sets, printability testers, printability tester accessories, sheet splitters, sound level meters, specimen cutters, surface profile measurement instruments, tack testers, pressure sensitive materials, thermometers, viewing booths, Stroboscope, Synchroscope. Robots in Testing.

**References**


1. Jennifer Hohmans.- Instruments for Graphic Arts
2. Erwin Jaffe.- Halftone Photography
3. Wealey Publishing Company, Buck & Beck, With Mechanical Measurement. Addison
4. A.K. Sawhney, Dhanpat Rai & Sons.- Mechanical Measurements Instrumentation
5. I.J. Nagarth / M. Gopal.- Control Systems Engineering
6. Sirohi, Radhakrishna.- Mechanical Measurement
7. B.C. Nakra, K.K. Chaudhry.- Instrumentation Measurement & Analysis
8. Harrison & Bollinger.- Automatic Control Systems
1. Benjamin C. Kuo. - Automatic Control Systems


| **Internal assessment:** | | |
|---|---|---|
| Assignments | (minimum 2) | =15 marks |
| 2 Tests | (2 x 15) | =30 marks |
| Regularity | | = 5 marks |
| Total | | =50 marks |

**University examination pattern**

Q I - 8 short type questions of 5 marks, 2 from each module
Q II - 2 questions A & B of 15 marks from module I with choice to answer any one
Q III - 2 questions A & B of 15 marks from module II with choice to answer any one
Q IV - 2 questions A & B of 15 marks from module III with choice to answer any one
Q V - 2 questions A & B of 15 marks from module IV with choice to answer any one

## PT04 605: SCREEN PRINTING & GRAVURE

| 3 hours lecture and 1 hour tutorial per week |
|---|

**Module I (12 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 bet 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 (13 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 (15 hours)**

A generic printing unit. Typical press configurations. Gravure publication presses – characteristics. Packaging Gravure Presses – Folding carton presses. Flexible Packaging presses, Label presses. Product gravure. Other gravure presses – Intaglio plate printing, offset gravure and flexogravure. Gravure with flexo units. Gravure units as other equipment. Gravure roller coating. Gravure folders – types. Gravure Ink Dryers – Need for ink dryers, Drying water based inks, Dryers functioning, Dryer limitations, supply air valves, balancing the dryer, filters & dampers, roller condition vital. Heat Sources – steam, electric and gas, combination gas / oil, thermic oil, waste heat 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.

**Reference**

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

| **Internal assessment:** | | |
|---|---|---|
| Assignments | (minimum 2) | =15 marks |
| 2 Tests | (2 x 15) | =30 marks |
| Regularity | | = 5 marks |
| Total | | =50 marks |

**University examination pattern**

Q I - 8 short type questions of 5 marks, 2 from each module
Q II - 2 questions A & B of 15 marks from module I with choice to answer any one
Q III - 2 questions A & B of 15 marks from module II with choice to answer any one
Q IV - 2 questions A & B of 15 marks from module III with choice to answer any one
Q V - 2 questions A & B of 15 marks from module IV with choice to answer any one

**PT04 606** : **PRINT FINISHING AND CONVERTING**

| 3 hours lecture and 1 hour tutorial per week |
|---|

**Module I (11 hours)**

Buying Paper, Paper grades, Factors affecting buying of paper, Paper trade, An outline of the procedure for paper and board buying and an appreciation of the value of paper. Paper and board issue including covers for book and flat work. Binding Materials: Covering materials of all types, preparation and treatment in covering. Miscellaneous materials such as thread cords, tapes, mull, eyelets etc. Purchase, selection, care and use of all types of materials. Methods of dealing with fungi and insect pests.

**Module II (15 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. Styremic block copolymers – ultraviolet curing SBC's comparison of this stages involved in bond formation. Adhesive classes and Properties – Acrylics, animal glues, casein, starch, dextrins, 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, polyvinyliidene chloride, SBS and SIS block copolymers, styrene-bufadiene rubber, vinyle 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 (13 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, operation and maintenance of guillotines and three-knife trimmers; causes and prevention inaccurate cutting. Production capacities. Basic principles of folding by buckle or combination machines. Setting and operating features, use of predators, creasers and slifters; methods of delivery. Suitability of folding method and machine to job requirements and paper stock. Mechanism, operation and adjustment, of folding machines; causes and prevention of inaccurate folding; maintenance of machine feeders; production capacities.

**Module IV (13 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, hose-leaf binders; thong and ring binders. Principles and operation of perforating, punching, drilling, round cornering, indexing, creasing, gluing, eyeletting, ruling and numbering. 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.

**Reference**


1. A.G. Martin.- Finishing Process in Print Industry
2. U.S. Govt. Printing- Theory and Practice of Book Binding
3. Aurther W. Johnsori.-The Thames and Hudson Manual of Book Binding
4. Michael Barnard. -Introduction to Print Buying Printing, Bob Thompson, Materials Science and Technology


| **Internal assessment:** | | |
|---|---|---|
| Assignments | (minimum 2) | =15 marks |
| 2 Tests | (2 x 15) | =30 marks |

| | |
|---|---|
| Regularity | = 5 marks |
| Total | =50 marks |

**University examination pattern**

Q I - 8 short type questions of 5 marks, 2 from each module
Q II - 2 questions A & B of 15 marks from module I with choice to answer any one
Q III - 2 questions A & B of 15 marks from module II with choice to answer any one
Q IV - 2 questions A & B of 15 marks from module III with choice to answer any one
Q V - 2 questions A & B of 15 marks from module IV with choice to answer any one

## PT04 607(P): PRINT FINISHING LAB

| 3 hours practical per week |
|---|

**I. Study of various controls, operations and mechanisms of the following machines**: 1. Folding Machine. 2. Guillotine Machine. 3. Cutter and Greaser. 4. Varnishing Machine. 5. Laminating Machine. 6. Sewing and Stitching Machine.

1. Miscellaneous Machine.

II. **Preparation of the following types of bindings**:

1. Half Bound Account Books. 2. Full Bound Books. 3. Perfect Binding. 4. Loose-Leaf Binding. Knowing the tools, equipments and machines in department, knowing and handling the materials.

III. **Preparation of**: a) Saddle/side stitched Booklets. b) Saddlegiat sewing of Booklets, magazines. c) Receipt Book of 25 receipt in triplicate. d) Quarter Bound Note Book – flush sewing. e) Quarter Bound A/c books sewing on tapes. Binding of Half Bound A/c Book – constructive aspects through durability will be obtained. Binding of full bound, case bound, Publishers. Book emphasis will be given on decoration – Print finishing operation – Gold blocking, embossing, edge decoration, etc.

IV. **Preparation of:** a) Court case file, b) Tag binder, c) Portfolio, d) Loose leaf book, e) Cheque book, Perfect Bind binding, g) Preparing of old books.

| **Internal assessment:** | |
|---|---|
| Lab practical and record | = 25 |
| Test | = 20 |
| Regularity | = 5 |
| Total marks | = 50 |

## PT04 608(P): SCREEN PRINTING AND FLEXO LAB

| 3 hours practical per week |
|---|

**Screen Printing**:

1. Study of various types of Screen Materials.
2. Make ready for Screen Printing – Printing of Letterheads and Visiting Cards.

**Flexo Laboratory**:

1. Mounting of Stereos and Polymer Plates.
2. Setting the machine for a Two colour Printing.
3. Printing on Paper and Plastics.
4. Preparation of Screen Line and Column.

| **Internal assessment:** | |
|---|---|
| Lab practical and record | = 25 |
| Test | = 20 |
| Regularity | = 5 |
| Total marks | = 50 |

## SEVENTH SEMESTER

### PT04 701 : INDUSTRIAL MANAGEMENT

3 hours lecture and 1 hour tutorial per week

**Module I (13 hours)**
Principles of management - management functions - planning - organising - organisation structures - span of control - delegation - directing - leadership and motivation - controlling - decision making - single stage decision making under risk - multistage decision making - decision tree - decision making under uncertainty - equally likely, minimax and maximin criteria

**Module II (14 hours)**
Operation management - production systems and functions - product design and selection - concept of total quality management and ISO 9000 system of standards - concept of supply chain management - project management - projects and management - network analysis - critical path method (CPM) network - finding critical path - slacks - crashing (time-cost trade off) - PERT network

**Module III (12 hours)**
Marketing management - concept of market and marketing - marketing function - marketing mix - market research - advertising and sales promotion - human resources management - manpower requirement analysis - recruitment and training - job analysis - job evaluation - wages and incentives

**Module IV (13 hours)**
Financial management - objectives/functions - concept of time value of money - basics of financial accounting - profit and loss account - balance sheet - costing - elements of costs - cost sheet - allocation of overheads - break-even analysis depreciation - significance and methods of depreciation

**Reference books**


1. Koontz H., O'Donnel C. & Weihrich H., *Essentials of Management*, McGraw Hill
2. Satya Raju R. & Parthasarathy A., *Management: Text and Cases*, Prentice Hall
3. Wiest J.D. & Levy F.K., *A Management Guide to PERT/CPM*, Prentice Hall
4. Ramaswamy V.S. & Namakumari S., *Marketing Management: Planning, Implementation and Control*, Macmillan
5. Srinivasan R., *Case Studies in Marketing: The Indian Context*, Prentice Hall of India Private Limited
6. Majumadar R., *Marketing Research: Text, Applications and Case Studies*, New Age International (P) Limited Publishers
7. Prasanna Chandra, *Financial Management: Theory and Practice*, Tata McGraw Hill Publishing Company Limited


**Internal assessment:**

| | | |
|---|---|---|
| Assignments | (minimum 2) | =15 marks |
| 2 Tests | (2 x 15) | =30 marks |
| Regularity | | = 5 marks |
| Total | | =50 marks |

**University examination pattern**

Q I - 8 short type questions of 5 marks each, 2 from each module
Q II - 2 questions A and B of 15marks each from module I with choice to answer any one
Q III - 2 questions A and B of 15marks each from module II with choice to answer any one
Q IV - 2 questions A and B of 15marks each from module III with choice to answer any one
Q V - 2 questions A and B of 15marks each from module IV with choice to answer any one

**PT04 702 : ENGINEERING ECONOMICS**

3 hours lecture & 1 hour tutorial per week

**Module I (13 hours)**

Definition of economics - nature and scope of economic science - nature and scope of managerial economics - basic terms and concepts - goods - utility - value - wealth - factors of production - land - its peculiarities - labour - its peculiarities and division of labour - capital and capital formation - organisation or enterprise - economies of large and small scale - consumption - wants - its characteristics and classification - law of diminishing marginal utility - relation between economic decision and technical decision - economic efficiency and technical efficiency

**Module II (13 hours)**

Demand - demand schedule - demand curve - law of demand - elasticity of demand - types of elasticity - factors determining elasticity - measurement - its significance - supply - supply schedule - supply curve - law of supply - elasticity of supply - time element in the determination of value - market price and normal price - perfect competition - monopoly - monopolistic competition

**Module III (13 hours)**

Forms of business - proprietorship - partnership - joint stock company - cooperative organisation - state enterprise - mixed economy - money and banking - nature and functions of money - theory of money - inflation and deflation - banking - kinds - commercial banks - central banking functions - control of credit - monetary policy - credit instrument

**Module IV (13 hours)**

International trade - distinction between internal and international trade - theory of international trade - free trade v/s protection - balance of trade and balance of payments - exchange control - trade policy of the Government of India - national income - concepts - measurement - difficulties in the measurement its significant - features of underdeveloped economy with special reference to India - taxation - canons of taxation - direct and indirect tax - impact and incidence of the tax - working capital - factors affecting - sources

**References**


1. Dewett K.K. & Varma J.D., *Elementary Economic Theory*, S Chand
2. Barthwal R.R., *Industrial Economics - An Introductory Text Book*, New Age
3. Jhingan M.L., *Micro Economic Theory*, Konark
4. Samuelson P.A., *Economics - An Introductory Analysis*, McGraw Hill
5. Adhikary M., *Managerial Economics*


**Internal assessment:**

| | | |
|---|---|---|
| Assignments | (minimum 2) | =15 marks |
| 2 Tests | (2 x 15) | =30 marks |
| Regularity | | = 5 marks |
| Total | | =50 marks |

**University examination pattern**

Q1 - 8 short type questions of 5 marks each, 2 from each module
QII - 2 questions A and B of 15 marks each from module I with choice to answer any one
QIII- 2 questions A and B of 15 marks each from module II with choice to answer any one
QIV- 2 questions A and B of 15 marks each from module III with choice to answer any one
QV - 2 questions A and B of 15 marks each from module IV with choice to answer any one

**PT04 703: PRINTING MACHINERY MAINTENANCE**

| 3 hours lecture and 1 hour tutorial per week |
|---|

**Module I (13 hours)**

Maintenance management- Objective of maintenance management- Maintenance functions- Types of maintenance activities – maintenance planing, 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)**

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

**Module III (13 hours)**

Reconditioning-Principles of reconditioning-repair methods of various parts- roller copperising and rerubberising- ebonite covering- dampening and inking systems- paper transport systems- cylinder bearing supports- eccentrics.

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.

**Module IV (13 hours)**

Maintenance of electrical systems- AC motors and DC motors- electro magnetic friction couplings. Electromagnets- magnetic starters and contractors- limit switches- knife switches- micro switches-starting and regulating rheostat- electric panels- electrical apparatus and electric wiring on the machines

**Reference:**


1. H.P. Garg, Industrial maintenance, S.Chand &Company ltd.
2. Jerry Wireman, Computerised maintenance management systems, Industrial press Inc.,
3. Lewis and Tow, Readings in maintenance management, Cohners Books.
4. A.S Porter, A manual of Lithographic press operation, Lithographic trading services.
5. Lithographers manual, Graphical arts Technology Foundation, USA.
6. Herschel L.Apfelberg, Maintaining printing equipment, GATF
7. Barbara, L.Albinini and others, Solving web offset press problems, GATF
8. Pamela Groff and others, Lithographic Press operators Handbook.


**Internal assessment:**

| | | |
|---|---|---|
| Assignments | (minimum 2) | =15 marks |
| 2 Tests | (2 x 15) | =30 marks |
| Regularity | | = 5 marks |
| Total | | =50 marks |

**University examination pattern**

Q I - 8 short type questions of 5 marks, 2 from each module
Q II - 2 questions A & B of 15 marks from module I with choice to answer any one
Q III - 2 questions A & B of 15 marks from module II with choice to answer any one
Q IV - 2 questions A & B of 15 marks from module III with choice to answer any one
Q V - 2 questions A & B of 15 marks from module IV with choice to answer any one

## PT04 704 : OPERATIONS RESEARCH

3 hours lecture and 1 hour tutorial per week

**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 (13 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 (13 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

**Reference books**


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


**Internal assessment:**

| | | |
|---|---|---|
| Assignments | (minimum 2) | =15 marks |
| 2 Tests | (2 x 15) | =30 marks |
| Regularity | | = 5 marks |
| Total | | =50 marks |

**University examination pattern**

Q I - 8 short type questions of 5 marks each, 2 from each module
Q II - 2 questions A & B of 15marks each from module I with choice to answer any one
Q III -2 questions A & B of 15marks each from module II with choice to answer any one
Q IV -2 questions A & B of 15marks each from module III with choice to answer any one
Q V -2 questions A & B of 15marks each from module IV with choice to answer any one

**PT 04 706(P): QUALITY CONTROL LAB**

| 3 hours practical per week |
|---|

**List of Experiments:**

1. Introduction to pH meter
2. Introduction to conductivity meter
3. Paper Testing methods
    a. GSM test
    b. Curl test
4. Fountain solution
    a. pH
    b. Conductivity
5. Paper pH
6. pH of coating material
7. Moisture content of paper
8. Moisture penetration of paper
9. Ink testing
    a. Drying time
    b. Flow property
    c. Length
10. Acid value of resin

| **Internal assessment:** | |
|---|---|
| Lab practical and record | = 25 |
| Test | = 20 |
| Regularity | = 5 |
| Total marks | = 50 |

**PT 04 707(P) : SEMINAR**

| 3 hours per week |
|---|

Individual students should be asked to choose a topic in a field of their interest but in Printing Technology, preferably from outside the B.Tech syllabus and give a seminar on that topic for about thirty minutes - a committee consisting of atleast three faculty members (preferably specialized in different fields of engineering) shall assess the presentation of the seminars and award the marks to the students based on the merits of the topic of presentation - each student shall submit two copies of a write up of his seminar talk - one copy shall be returned to the student after duly certifying it by the chairman of the assessing committee and the other will be kept in the departmental library

| **Sessional work assessment** | |
|---|---|
| Presentation | : 30 |
| Report | : 20 |
| Total marks | : 50 |

**PT 04 708(P) : PROJECT WORK**

| 4 hours per week |
|---|

The project work can be a design project - experimental project - investigation or computer oriented on any of the topics of Press or Prepress or Postpress - it can be allotted as a group project consisting of a maximum number of five students student.

The assessment of all the projects should be done at the end of the seventh semester by a committee consisting of three or four faculty members specialized in the various fields of electrical engineering - the students shall present their project work before the committee for about 20 to 30 minutes duration - the complete project report is not expected at the end of the seventh semester - however a three to four page abstract based on the work done should be submitted by the students to the assessing committee - the group average marks for the various projects will be fixed by the committee - the project guides will award the marks for the individual students in a project group maintaining the group average

| **Sessional work assessment** | | |
|---|---|---|
| Presentation | : | 30 |
| Report | : | 20 |
| Total marks | : | 50 |

**PT04 705 A : SOFTWARE ENGINEERING**

3 hours lecture and 1 hour tutorial per week

**Module I (13 hours)**

*Introduction* - FAQs about software engineering - professional and ethical responsibility - system modeling - system engineering process - *the software process* - life cycle models - iteration - specification - design and implementation - validation - evolution - automated process support - *software requirements* - functional and non-functional requirements - user requirements - system requirements - SRS - *requirements engineering processes* - feasibility studies - elicitation and analysis - validation - management - *system models* - context models - behavior models - data models - object models - CASE workbenches

**Module II (13 hours)**

*Software prototyping* - prototyping in the software process - rapid prototyping techniques - *formal specification* - formal specification in the software process - interface specification - behavior specification - *architectural design* - system structuring - control models - modular decomposition - domain-specific architectures - distributed systems architecture - *object-oriented design* - objects and classes - an object oriented design process case study - design evolution - *real-time software design* - system design - real time executives - *design with reuse* - component-based development - application families - design patterns - *user interface design* - design principles - user interaction - information presentation - user support - interface evaluation

**Module III (13 hours)**

*Dependability* - critical systems - availability and reliability - safety - security - critical systems specifications - critical system development - *verification and validation* - planning - software inspection - automated static analysis - clean room software development - *software testing* - defect testing - integration testing - object-oriented testing - testing workbenches - critical system validation - *software evolution* - legacy systems - software change - software maintenance - architectural evolution - software re-engineering - data re-engineering

**Module IV (13 hours)**

*Software project management* - project planning - scheduling - risk management - *managing people* - group working - choosing and keeping people - the people capability maturity model - *software cost estimation* - productivity estimation techniques - algorithmic cost modeling, project duration and staffing *quality management* - quality assurance and standards - quality planning - quality control - software measurement and metrics - *process improvement* - process and product quality - process analysis and modeling - process measurement - process CMM - *configuration management* - planning - change management - version and release management - system building - CASE tools for configuration management.

**Text book**

2. Ian Sommerville, *Software Engineering*, Pearson Education Asia

**Reference books**

2. Pressman R. S., *Software Engineering*, McGraw Hill
3. Mall R., *Fundamentals of Software Engineering*, Prentice Hall of India
4. Behferooz A. & Hudson F.J., *Software Engineering Fundamentals*, Oxford University Press
5. Jalote P., *An Integrated Approach to Software Engineering*, Narosa

| **Internal assessment:** | | |
|---|---|---|
| Assignments | (minimum 2) | =15 marks |
| 2 Tests | (2 x 15) | =30 marks |
| Regularity | | = 5 marks |

| | |
|---|---|
| Total | =50 marks |

**University examination pattern**

Q I - 8 short type questions of 5 marks each, 2 from each module
Q II - 2 questions A & B of 15marks each from module I with choice to answer any one
Q III -2 questions A & B of 15marks each from module II with choice to answer any one
Q IV -2 questions A & B of 15marks each from module III with choice to answer any one
Q V -2 questions A & B of 15marks each from module IV with choice to answer any one

## PT04 705 B: ON DEMAND PRINTING

3 hours lecture and 1-hour tutorial per week

**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 an 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 & Retrival. Alternative media CD-ROM's. Manufacturing costs-Paper mailing. Alternative media-online. Commercial online services. Commercial applications-Just in time. Appropriate applications for on demand & DP. Advertising. Author reprints. On demand products. In appropriate applications. Marketing and selling on-demand services- TV programming and ATM cards. Value added. Advantages of 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 (10 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.

**Reference**

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

| **Internal assessment:** | | |
|---|---|---|
| Assignments | (minimum 2) | =15 marks |
| 2 Tests | (2 x 15) | =30 marks |
| Regularity | | = 5 marks |
| Total | | =50 marks |

**University examination pattern**

Q I - 8 short type questions of 5 marks, 2 from each module
Q II - 2 questions A & B of 15 marks from module I with choice to answer any one
Q III - 2 questions A & B of 15 marks from module II with choice to answer any one
Q IV - 2 questions A & B of 15 marks from module III with choice to answer any one
Q V - 2 questions A & B of 15 marks from module IV with choice to answer any one

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## PT 04 705 C: QUALITY CONTROL IN PRINTING

| 3 hours lecture and 1 hour tutorial per week |
|---|

**Module I (15 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.statistical quality control-Fundamental statistical methods, tools such as control charts and sampling methods, control chart techniques and interpretation, selection and collection of data, interpretation of data and statistical inference.

**Module II (11 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 III (13 hours)**

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

**Module IV (13 hours)**

Quality control instrumentation-Paper and board testing instruments, Ink testing instruments, process control instruments, devices and aids used in camera, darkroom, stripping department, plate room and press room. Press sheet control devices for colour printing. Minimum instrumentation necessary to produce a product consistent with the appropriate quality level.

**References**:


1) Miles Southworth and Donna Southworth. Quality and Productivity in the Graphic Arts. 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. Apfleberg, Implementing Quality Management in Graphic Arts, GATF.


| **Internal assessment:** | | |
|---|---|---|
| Assignments | (minimum 2) | =15 marks |
| 2 Tests | (2 x 15) | =30 marks |
| Regularity | | = 5 marks |
| Total | | =50 marks |

**University examination pattern**

Q I - 8 short type questions of 5 marks, 2 from each module
Q II - 2 questions A & B of 15 marks from module I with choice to answer any one
Q III - 2 questions A & B of 15 marks from module II with choice to answer any one
Q IV - 2 questions A & B of 15 marks from module III with choice to answer any one
Q V - 2 questions A & B of 15 marks from module IV with choice to answer any one

## PT04 705 D: TONE AND COLOR ANALYSIS

3hours lecture and 1 hour tutorial per week

**Module I (13 hours)**

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

**Module II (13 hours)**

Introduction, development of electronic publishing, basic elements of scanners, principles of electronic scanning – basic of electronic scanning- 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- principle of color separation- screen angles and juxtaposition of dots- Direct- indirect methods – color separation- 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 (13 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- Prepress color proofing- DDCP- inkjet-thermal wax – chromalin proofing- factors in proofing-substrate- color of ink- solid ink density- trapping tone reproduction- proofing methods- soft proof- digital proof-photomechanical proof- press proof- other proofing methods.

**Reference books:**


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


**Internal assessment:**

| | | |
|---|---|---|
| Assignments | (minimum 2) | =15 marks |
| 2 Tests | (2 x 15) | =30 marks |

| | |
|---|---|
| Regularity | = 5 marks |
| Total | =50 marks |

**University examination pattern**

Q I - 8 short type questions of 5 marks, 2 from each module
Q II - 2 questions A and B of 15marks from module I with choice to answer any one
Q III - 2 questions A and B of 15marks from module II with choice to answer any one
Q IV - 2 questions A and B of 15marks from module III with choice to answer any one
Q V - 2 questions A and B of 15marks from module IV with choice to answer any one

## PT04 705 E: PRODUCTION AND OPERATION MANAGEMENT

3 hours lecture and 1 hour tutorial per week

**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 competiveness standardization – simplification – preferred numbers – break-even analysis, profit volume charts for single product and multiproducts – 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 equipmenymanpower. 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 IV (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, leadtme, safetytock, graphical representation, M.R.R. (material Requirements Planning)- M.R.R. Concepts, Inputs and Outputs, M.R.R. Logic problems.

**Module IV (10 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.

**Reference 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 assessment:** | | |
|---|---|---|
| Assignments | (minimum 2) | =15 marks |
| 2 Tests | (2 x 15) | =30 marks |
| Regularity | | = 5 marks |
| Total | | =50 marks |

**University examination pattern**

Q I - 8 short type questions of 5 marks, 2 from each module
Q II - 2 questions A & B of 15 marks from module I with choice to answer any one
Q III - 2 questions A & B of 15 marks from module II with choice to answer any one
Q IV - 2 questions A & B of 15 marks from module III with choice to answer any one
Q V - 2 questions A & B of 15 marks from module IV with choice to answer any one

## EIGHTH SEMESTER

### PT04 801: PRINT MANAGEMENT, COSTING AND ESTIMATION

| 3 hours lecture and 1 hour tutorial per week |
|---|

**Module I (13 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 (11 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.

**Reference.**


1. B.S. Raman, Principles of Accounting
2. Prasanna Chandra.- Fundamentals of Financial Management
3. B.R. Bhar- Cost Accounting
4. Derek Porter, Print Management
5. B.D. Mendiratta- Printer's Costing & Estimating
6. T.A. Saifuddin., Management Aspect of Printing Industry
7. K.S. Venkataraman, K.S. Balaraman.- Estimating Methods and Cost Analysis for Printers
8. Phillip Kent Ruggles, Printing Estimating Principles & Practice
9. Gray G. Field., Print Production Management
10. K.S. Venkataraman, Principles of Applied Costing for Printing Industry


| **Internal assessment:** | | |
|---|---|---|
| Assignments | (minimum 2) | =15 marks |
| 2 Tests | (2 x 15) | =30 marks |
| Regularity | | = 5 marks |
| Total | | =50 marks |

**University examination pattern**

Q I - 8 short type questions of 5 marks, 2 from each module
Q II - 2 questions A & B of 15 marks from module I with choice to answer any one
Q III - 2 questions A & B of 15 marks from module II with choice to answer any one
Q IV - 2 questions A & B of 15 marks from module III with choice to answer any one

Q V - 2 questions A & B of 15 marks from module IV with choice to answer any one

## PT04 802 : MARKETING MANAGEMENT

3 hours lecture and 1 hour tutorial per week

**Module I (14 hours)**

Needs, wants and demands, products, value, cast 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, feed back 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-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 (11 hours)**

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.

**Reference**

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

| **Internal assessment:** | | |
|---|---|---|
| Assignments | (minimum 2) | =15 marks |
| 2 Tests | (2 x 15) | =30 marks |
| Regularity | | = 5 marks |
| Total | | =50 marks |

**University examination pattern**

Q I - 8 short type questions of 5 marks, 2 from each module
Q II - 2 questions A & B of 15 marks from module I with choice to answer any one
Q III - 2 questions A & B of 15 marks from module II with choice to answer any one
Q IV - 2 questions A & B of 15 marks from module III with choice to answer any one
Q V - 2 questions A & B of 15 marks from module IV with choice to answer any one

## PT04 803: PACKAGING TECHNOLOGY

| 3 hours lecture and 1 hour tutorial per week |
|---|

**Module I (15 hours)**

Introduction, Function of a package, Factors influencing design of a package, Computer, Aided, Package Design, Packaging Cycle, Product Package Relationship, Product of curve, Elements of Package Design, Classification of Packaging – Flexible package type, Rigid package types. Hazards on package – Mechanical, Climatic, Biological and other hazards. Markings on package – Handling marks, routing marks, information marks. Tests on Package – Mechanical test – Drop test, Vibration test, Compression test, Inclined impact test, Rolling test, Drum test, Climatic test – Rain test, Sand and dust test., Salt spray test, Fungus resistance test, Shelf life, Rancidity, Corrosion - Shelf life, Rancidity, Corrosion – Types, cause, Classification of corrosion prevention methods. Desiccants. Cushioning Materials – Functions, properties, Classifications – space fillers, resilient cushioning materials, properties. Classifications – space fillers, resilent cushioning materials, non resilent cushioning materials. Expanded polystryrene – 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, basic approaches to designing a bottle, production process of glass, tests on glass-annealing test, thermal shock test, pressure test, impact test, density test. Plastics-BOPP.HDPE, LDPE, LLDPE, PVC, PP, PET, Polyolefins, Celluosics, Polymides, Nylon-6 – advantages, functions & applications. Tests on plastics, process of making plastic sheets. Classifications of plastics. Metals – functions, uses, cross section of in plat, tin plate, black plate. Aluminium foils – Manufacturing of foil, properties, applications, method of laminating foil to film or paper.

**Module III (15 hours)**

Dies – unit die jigged die. Carton style. Folding cartons – Production steps, types. Corrugated containers – classifications, components in a corrugated board, flutes, stages in preparation in corrugated boards. Plastic corrugated boards – features & advantages.Gas packaging – MAP & CAP, Vaccum packaging, shrink packaging, stretch wrapping blister packaging, skin packaging, strip packaging, Aerosal packaging – Aerosol valve assembly cross section of Aerosol container, working principle. Vaccum metalization. Injection Blow Moulding, Extrussion blow moulding, Extrusion. Injection Molding, Compression molding, transper molding, thermo forming. Vaccum forming – Drape forming, Snap back forming, Plug Assist forming. Pressure forming. Matched mould forming. Thermo form/fill/seal- Horizontal machine, Vertical machine.

**Module IV (9 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.

**Reference.**


1. Frank Paine.- Packaging design and performance.
2. John Briston.-Advance in Plastic Packaging Technology.
3. Packaging design an introduction - Laszlo Roth.
4. Packaging Technology – Volume I - IIP
5. Packaging Technology – Volume II - IIP
6. Packaging Technology – Volume III – IIP


| **Internal assessment:** | | |
|---|---|---|
| Assignments | (minimum 2) | =15 marks |
| 2 Tests | (2 x 15) | =30 marks |
| Regularity | | = 5 marks |
| Total | | =50 marks |

**University examination pattern**

Q I - 8 short type questions of 5 marks, 2 from each module
Q II - 2 questions A & B of 15 marks from module I with choice to answer any one
Q III - 2 questions A & B of 15 marks from module II with choice to answer any one
Q IV - 2 questions A & B of 15 marks from module III with choice to answer any one
Q V - 2 questions A & B of 15 marks from module IV with choice to answer any one

**PT 04 806(P) : PACKAGING LAB**

| 3 hours practicals per week |
|---|

**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. Designing and Preparation of various rigid packages
4. study and operation of various packaging machines.
5. Study of manufacturing of various types of corrugated boards.
6. Cutting, creasing, and building up corrugated boards.
7. Designing and preparation of various designs of paper bags.
8. Test conducted on Cartons, Corrugated packages, wooden packages.
9. Drop test, Vibration test, inclined impact test, compression test, rolling test, Drum test.

| **Internal assessment:** | |
|---|---|
| Lab practical and record | = 25 |
| Test | = 20 |
| Regularity | = 5 |
| Total marks | = 50 |

## PT04 807(P) : PROJECT WORK

| 7 hours per week |
|---|

The project work started in the seventh semester will continue - the students should complete the project work in this semester and present it before the assessing committee

The assessment committee as constituted in the seventh semester, will assess the various projects, fix the group average marks - the guides will award the marks for the individual students in a project maintaining the group average - each group will submit the copies of the completed project report signed by the guide to the department - the head of the department will certify the copies and return them to the students - one copy will be kept in the departmental library

| **Sessional work assessment** | |
|---|---|
| Presentation | : 60 |
| Report | : 40 |
| Total marks | : 100 |

## PT 04 808(P) : VIVA VOCE

There is only University examination for this - examiners will be appointed by the university for conducting the viva voce - the viva voce exam will be based on the subjects studied for the B.Tech course, project and seminar reports of the student - the relative weightage would be as follows

| **Evaluation scheme for viva-voce examination** | |
|---|---|
| Subjects | : 50 |
| Mini project | : 10 |
| Project | : 30 |
| Seminar | : 10 |
| Total marks | : 100 |

**PT04 804 A : PUBLISHING SCIENCE**

| 3 hours lecture and 1 hour tutorial per week |
|---|

**Module I (11 hours)**

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, sub-editor. 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.

**Reference**


1. ER Ram Kumar, Jaico Publishing House- Handbook of English Usage of Editors. Writers & Executives
2. KSR Menon.- Stylebook for journalists and writers
3. Doroty Bowles, Diance Bordon- Creative Editing
4. Plotnik Arthur- The Elements of Editing
5. John, Haris.- The Complete Reporter
6. Fred Fredler- Reporting for the Media
1. Adams- Printing Technology .


| **Internal assessment:** | | |
|---|---|---|
| Assignments | (minimum 2) | =15 marks |
| 2 Tests | (2 x 15) | =30 marks |
| Regularity | | = 5 marks |
| Total | | =50 marks |

**University examination pattern**

Q I - 8 short type questions of 5 marks, 2 from each module
Q II - 2 questions A & B of 15 marks from module I with choice to answer any one
Q III - 2 questions A & B of 15 marks from module II with choice to answer any one
Q IV - 2 questions A & B of 15 marks from module III with choice to answer any one
Q V - 2 questions A & B of 15 marks from module IV with choice to answer any one

**PT04 804 B : ENTERPRISE RESOURCES PLANNING**

| 3 hours lecture and 1 hour tutorial per week |
|---|

**Module I (15 hours)**

Introduction. Evolution of ERP. Reasons for the growth of the ERP market. The advantage of ERP. Why do many ERP implementations fail? Why are ERP packages being used now? Enterprise – an Overview. Introduction. Integrated Management Information. Business modeling. Integrated data model.Introduction. Business process reengineering. Management information systems. Decision support system. Executive information system. Data warehousing. Data mining. On-line processing. Supply chain management.

**Module II (15 hours)**

Introduction. ERP CAD/CAM. Materials requirement planning. Bill of material. Closed loop MRP. Manufacturing resource planning. Distribution requirements planning. JIT and Kanban. Product data management. Data requirement. Benefits of PDM. Make to order and Make to stock. Assemble to Order. Engineer to order. Configure to order. ERP Modules. Introduction. Finance. Plant Maintenance. Quality Management. Material Management. Benefits of ERP. Reduction of lead time. On-time shipment. Reduction in Cycle Time. Improved resource utilization. Better customer satisfaction. Improved supplied performance. Increased flexibility. Reduced quality costs. Improved information accuracy and decision making capability.

**Module III (11 hours)**

Introduction. SAP AG. Baan company. ERP Implementation Lifecyle. Introduction. Pre-evaluation screening. Package evaluation. Project planning Phase. Gap analysis. Reengineering. Configuration. Implementation. Vendors, Consultants and Users. Introduction. In house implementation – Pros and Cons. Vendors. Consultants. End-users.

**Module IV (11 hours)**

Introduction. New markets-New channels. Faster implementation methodologies. Business Models and BAPIs. Convergence on Windows NT. Application platforms. New business segments. More features. Web enabling. Market snapshot. Case Studies- An Overview. Mercedes-Benz. Kee Hin Industries. Bull Electronics Angers Plant Manufacturers. Twentieth Century companies. Inc. Ameritch. Essr Steel. Jindal Iron and steel company Ltd. Godrej Soaps and Associated companies. Indian renewable Energy development agency.

**Reference**


1. Alexis Leon- Enterprise Resource Planning
2. Daniel E. O'Leary- Enterprise Resource Planning System
3. Vinod Kumar Garg.- Enterprise Resource Planning Concepts & Practice


| **Internal assessment:** | | |
|---|---|---|
| Assignments | (minimum 2) | =15 marks |
| 2 Tests | (2 x 15) | =30 marks |
| Regularity | | = 5 marks |
| Total | | =50 marks |

**University examination pattern**

Q I - 8 short type questions of 5 marks, 2 from each module
Q II - 2 questions A & B of 15 marks from module I with choice to answer any one
Q III - 2 questions A & B of 15 marks from module II with choice to answer any one
Q IV - 2 questions A & B of 15 marks from module III with choice to answer any one
Q V - 2 questions A & B of 15 marks from module IV with choice to answer any one

## PT04 804C: ADVERTISING TECHNIQUES

3hours lecture and 1 hour tutorial per week

**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 retension, 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 stratergy, media buying and scheduling, Advertising on the internet.

**Module III (13 hours)**

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 (13 hours)**

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.

**Reference books:**


1. Leon G. Schiff man and Lelie Lajar konar.,- Consumer Behaviour
2. Loudon, Della Bitta,- Consumer behaviour concepts and application
3. Charles J. Driksen and other- Advertising principles, problems and cases
4. David A. Aker and John G. Myers- Advertising Management
5. B .s. Rathor-Advertising management
6. Cyber Graphic, U.S.,http://www.cybergraphic.com
7. AVUS Internet, Germany, http://www.avus de.


**Internal assessment:**

| | | |
|---|---|---|
| Assignments | (minimum 2) | =15 marks |
| 2 Tests | (2 x 15) | =30 marks |
| Regularity | | = 5 marks |
| Total | | =50 marks |

**University examination pattern**

Q I - 8 short type questions of 5 marks, 2 from each module
Q II - 2 questions A and B of 15marks from module I with choice to answer any one
Q III - 2 questions A and B of 15marks from module II with choice to answer any one
Q IV - 2 questions A and B of 15marks from module III with choice to answer any one
Q V - 2 questions A and B of 15marks from module IV with choice to answer any one

**PT 04 804 D: BOOK PUBLISHING**

| 3 hours lecture and 1 hour tutorial per week |
|---|

**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 (11 hours)**

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 (13 hours)**

Book binding, print finishing and legal aspects. Man made binding, Perfect binding, mechanical binding, loose leaf binding, securing operation, automatic & semiautomatic binding machines; computerised binding, finishing operation; laminating, varnishing, gold foiling, die stamping, rounding, cornering, punching, drilling etc; copy right, types of agreement between author and publishers, agreement for sale of Translation rights, illustration and artwork agreement, packaging rights agreement; the outright sale of the copy right profit sharing agreement; the royalty system, commission agreements.

**References**


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, Lowa, 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.


| **Internal assessment:** | | |
|---|---|---|
| Assignments | (minimum 2) | =15 marks |
| 2 Tests | (2 x 15) | =30 marks |
| Regularity | | = 5 marks |
| Total | | =50 marks |

**University examination pattern**

Q I - 8 short type questions of 5 marks, 2 from each module
Q II - 2 questions A & B of 15 marks from module I with choice to answer any one
Q III - 2 questions A & B of 15 marks from module II with choice to answer any one
Q IV - 2 questions A & B of 15 marks from module III with choice to answer any one
Q V - 2 questions A & B of 15 marks from module IV with choice to answer any one

**PT04 805 D : TOTAL QUALITY MANAGEMENT IN G.A.1**

3 hours lecture and 1 hour tutorial per week

**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 (11 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 (ovat) v/s doe, steps in designing the experiment, analysis of experiment, evolutionary operation (evop) and response surfaces.

**Module IV (11 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 projectsintroduction. 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 capacities.

**Reference 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 assessment:** | | |
|---|---|---|
| Assignments | (minimum 2) | =15 marks |
| 2 Tests | (2 x 15) | =30 marks |
| Regularity | | = 5 marks |
| Total | | =50 marks |

**University examination pattern**

Q I - 8 short type questions of 5 marks, 2 from each module
Q II - 2 questions A & B of 15 marks from module I with choice to answer any one
Q III - 2 questions A & B of 15 marks from module II with choice to answer any one
Q IV - 2 questions A & B of 15 marks from module III with choice to answer any one
Q V - 2 questions A & B of 15 marks from module IV with choice to answer any one

**PT04 805A: NEWSPAPER &PERIODICAL PUBLISHING**

| 3 hours lecture and 1 hour tutorial per week |
|---|

**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 (13 hours)**

Manuscripts from editorial organisation: layout &design, methods of composition; press works; 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 (13 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.

**References :**


1. Melvin Mencher, basic News Writing, Wm.C.brown Company Publishers, Dubuque, lowa
2.William L. Rivers, news editing in the 80's,Wadsworth publishing company, Belmont, California.
3. Robert H. Bohle, from news to newsprint, prentice hall, Inc.Englewood clefts, New Jersey.
4. William L Rivers, magazine editing in the 80's, wadsworth publishing company, Belmont, California.
5.MO'Connor, Editing Scientific Books and journals, pitman Medical.


| **Internal assessment:** | | |
|---|---|---|
| Assignments | (minimum 2) | =15 marks |
| 2 Tests | (2 x 15) | =30 marks |
| Regularity | | = 5 marks |
| Total | | =50 marks |

**University examination pattern**

Q I - 8 short type questions of 5 marks, 2 from each module
Q II - 2 questions A & B of 15 marks from module I with choice to answer any one
Q III - 2 questions A & B of 15 marks from module II with choice to answer any one
Q IV - 2 questions A & B of 15 marks from module III with choice to answer any one
Q V - 2 questions A & B of 15 marks from module IV with choice to answer any one

## PT04 805 B: CONTINUOUS STATIONARY & SECURITY PRINTING

| 3 hours lecture and 1 hour tutorial per week |
|---|

**Module I (15 hours)**

Trends in the Computer Forms stationary – Demands for the computer forms.Basic designs of various types of forms for input and output – Fan fold forms, Computer letters and Mailers. Computer envelopes, Snap-out-forms, Tags and labels, Computer envelope, MICR cheques etc., Typography – designing of forms with computer based machines etc.Specifications, requirements, storage conditions etc., Carbon papers – varieties, specifications and manufacturing process.

**Module II (11 hours)**

Different types of Web-Offset Printing Presses. Construction and configuration – on-line operations such as numbering, perforating, sprocket hold punching and Zig-Zag folding etc.Different types of collators – Roll to Roll pack to pack – Programmable outers for continuous web-MICR cheque binding system. Machines used for packing and Despatch.

**Module III (14 hours)**

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

**Module IV (12 hours)**

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

**Reference**


1. Gar Raihes., Forms for the 80's How to design produce them.
2. Kelvin Tritton, Stochastic screening


| **Internal assessment:** | | |
|---|---|---|
| Assignments | (minimum 2) | =15 marks |
| 2 Tests | (2 x 15) | =30 marks |
| Regularity | | = 5 marks |
| Total | | =50 marks |

**University examination pattern**

Q I - 8 short type questions of 5 marks, 2 from each module
Q II - 2 questions A & B of 15 marks from module I with choice to answer any one
Q III - 2 questions A & B of 15 marks from module II with choice to answer any one
Q IV - 2 questions A & B of 15 marks from module III with choice to answer any one
Q V - 2 questions A & B of 15 marks from module IV with choice to answer any one

## PT04 805 C: ELECTRONIC PAPER

| 3 hours lecture and 1 hour tutorial per week |
|---|

**Module I (13 hours)**

Electronic paper. 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. Comping 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 (12 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 (13 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 wriers and readers.Reducing the hassless in OCR and scanning. Scanners differ greatly in their capabilities. Capturing screen images. Compression is essential, but can be problematical. Beware of viruses.

**Reference**

1. Colin Haynes, Paperless Publishing

| **Internal assessment:** | | |
|---|---|---|
| Assignments | (minimum 2) | =15 marks |
| 2 Tests | (2 x 15) | =30 marks |
| Regularity | | = 5 marks |
| Total | | =50 marks |

**University examination pattern**

Q I - 8 short type questions of 5 marks, 2 from each module
Q II - 2 questions A & B of 15 marks from module I with choice to answer any one
Q III - 2 questions A & B of 15 marks from module II with choice to answer any one
Q IV - 2 questions A & B of 15 marks from module III with choice to answer any one
Q V - 2 questions A & B of 15 marks from module IV with choice to answer any one

**PT 04 805 D : INDUSTRIAL PSYCHOLOGY**
(common for all programmes)

3 hours lecture and 1 hour tutorial per week

**Module I (13 hours)**

Introduction - psychology as a science - areas of applications - study of individual - individual differences - study of behavior - stimulus - response behavior - heredity and environment - human mind - cognition - character - thinking - attention - memory- emotion - traits - attitude - personality

**Module II (13 hours)**
Organizational behavior - definition - development - fundamental concept - nature of people - nature of organization - an organizational behavior system - models - autocratic model - hybrid model - understanding a social - system social culture - managing communication - downward, upward and other forms of communication

**Module III (13 hours)**
Motivation - motivation driver - human needs - behavior modification - goal setting - expectancy model - comparison models - interpreting motivational models - leadership - path goal model - style - contingency approach

**Module IV (13 hours)**
Special topics in industrial psychology - managing group in organization - group and inter group dynamics -managing change and organizational development - nature planned change - resistance - characteristic of OD - OD process

**Reference books**


3. Davis K. & Newstrom J.W., "*Human Behavior At Work*", McGraw Hill International
4. Schermerhorn J.R. Jr., Hunt J.G. & Osborn R.N., "*Managing Organizational Behavior*", John Willy
5. Luthans, "*Organizational Behavior*", McGraw Hill, International
6. Morgan C.T., King R.A., John Rweisz & John Schoples, "*Introduction to Psychology*", McGraw Hill
7. Blum M.L. & Naylor J.C., Horper & Row, "*Industrial Psychology*", CBS Publisher


**Internal assessment:**

| | | |
|---|---|---|
| Assignments | (minimum 2) | =15 marks |
| 2 Tests | (2 x 15) | =30 marks |
| Regularity | | = 5 marks |
| Total | | =50 marks |

**University examination pattern**

Q I - 8 short type questions of 5 marks each, 2 from each module
Q II - 2 questions of 15marks each from module I with choice to answer any one
Q III - 2 questions of 15marks each from module II with choice to answer any one
Q IV - 2 questions of 15marks each from module III with choice to answer any one
Q V - 2 questions of 15marks each from module IV with choice to answer any one

**PT04 805 E : SCANNERS AND SYSTEMS**

| 3 hours lecture and 1 hour tutorial per week |
|---|

**Module I (13 hours)**

Basic principles of a scanner – vario klishograph – The Neugebauer formula – Relative study of crosfield-Dinippon 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 – saftey precautions and environment conditions – general precautions.

**Module III (12 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 (14 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.

**References**:


1. Eric Chambers, Reproduction Photography for lithography, GATF, 1979.
2. J. Michael Adams, David D. Faux, Llyod J. Ribber , Printing Technology,3rd ed., Delmar 1968.
3. Gary, G. Field Colour Scanning and Imaging System, GATF, 1990.
4. Crossfield Operator's manual-6500-8090-03A, 1989.
5. Surrey, Graphic Repro, Eaglehead Publishing Ltd., , U.K., 1984.
6. Dr. R. Molla, Eletronic Colour Separation, R.K. Printing & Publishing Company, West Virginia.
8. Bill Parsons, Electronic prepress: An Introduction, Delmar Publishers, 1994.


| **Internal assessment:** | | |
|---|---|---|
| Assignments | (minimum 2) | =15 marks |
| 2 Tests | (2 x 15) | =30 marks |
| Regularity | | = 5 marks |
| Total | | =50 marks |

**University examination pattern**

Q I - 8 short type questions of 5 marks, 2 from each module
Q II - 2 questions A and B of 15marks from module I with choice to answer any one
Q III - 2 questions A and B of 15marks from module II with choice to answer any one
Q IV - 2 questions A and B of 15marks from module III with choice to answer any one

| Q V - 2 questions A and B of 15marks from module IV with choice to answer any one |
|---|