



B.Tech (Printing, Graphics & Packaging)

Syllabus

Duration: Four year

Eligibility: 10+2 with non-medical or medical stream

w.e.f. Academic Session: 2014-2015

Institute of Mass Communication and Media Technology

Kurukshetra University

B. Tech. (Printing, Graphic & Packaging)
VI Semester

Course No.	Course Title	Internal Assessment	Exam. Marks		Total Marks
			Theory	Practical	
601	PRINTING SUBSTRATE	25	75		100
602	SECURITY AND STATIONARY PRINTING.	25	75		100
603	PACKAGING MACHINERY LOGISTIC AND REGULATIONS	25	75		100
604	PRINT ADVERTISING	25	75		100
605	ELECTRONIC COMPOSITION	25	75		100
606	COSTING & ESTIMATING	25	75		100
	LAB				
611	PRINTING SUBSTRATE-LAB	25		50	75
612	ELECTRONIC COMPOSITION-LAB	25		50	75
613	PACKAGING MACHINERY LOGISTIC AND REGULATIONS-LAB	25		50	75
614	SECURITY AND STATIONARY PRINTING-LAB	25		50	75
660	INDUSTRIAL VISITS/ EXHIBITION	Student has to submit a visit report on a assigned work by his/her concerned teacher & the report will be evaluate by the examiner appointed by Director/Chairperson.			50
	TOTAL				950

Note: The paper of Environment Studies will teach as Special Paper in this semester.

PRINTING SUBSTRATE**Time : 3 hours****Max. Marks: 100**
(25+75)

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

Unit - I**Paper:**

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

Unit - II**Recycled paper:**

Introduction. recycling process, fiber preparation- screening, centrifugal cleaning, flotation, washing, deinking plant function, continuous drum pulper, prescreening and cleaning, primary flotation, cleaning, fine screening, thickening, dispersing, brightness control, washing, thickening and storage. Deinking chemistry. Bleaches - Hydrogen peroxide, Oxygen & Ozone bleaching, reductive bleaching agents, chelating agents, sodium silicate, catalase enzyme, agglomerating chemicals, surfactants. Biodegradation of surfactants, dispersants and the principles of washing.

Unit - III**Choosing a suitable paper:**

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

Unit - IV**Introduction to Non Paper substrates**

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

602
SECURITY AND STATIONARY PRINTING

Time : 3 hours

Max. Marks: 100
(25+75)

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

Unit-I

Introduction:

Trends in the Computer Forms stationery - Demands for the computer forms.

Designing of Computer forms:

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

Paper used for the Production of forms:

Specifications, requirements, storage conditions, etc., Carbon papers - varieties, specifications and manufacturing process.

Unit-II

Manufacture of computer forms:

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

Finishing Machines for computer forms:

Different types of collators - Roll to Roll -Roll to pack and pack to pack, MICR cheque binding system. Machines used for packing and Dispatch.

Unit-III

Principles of stochastic screening:

Spot patterns. AM and FM screening. Screen angles. Spot size. Absence of rosettes and moiré patterns. Smoother tonal transition. Photographic smoothness. Improved process color simulation of spot colors. Tone value stability with increased inking.. Benefits and limitations associated with FM screening. Film imaging. Film contacting. Plate making. Photomechanical proofing. High levels of dot gain. Fine screen rulings versus FM screening.

Unit-IV

Practical experiences with offset litho printing:

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

Recommended Books :

Forms for the 80's. How to design and produce them - Gar Raines.

Stochastic Screening - Kelvin Tritton.

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PACKAGING MACHINERY LOGISTIC AND REGULATIONS**Time : 3 hours****Max. Marks: 100****(25+75)**

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

Unit-I**Packaging Machinery**

Study of special packages and machines for Aerosols, easy opening device, carry home packs, Strip, Shrink, Blister, Skin, Stretch packaging, Cartons, pouch, Controlled Atmosphere(CAP), Modified Atmosphere(MAP) and Aseptic packaging system

Filling of Dry and Liquid Products, Filling of carbonated , Liquids and other Packaging techniques, Labeling and Thermoforming.

Unit-II**Packaging Laws and Regulations**

Standards and standardization, Quality Standards
Standards for packaging material - rigid, non-rigid, and ancillary material.
Standards for export packages-labeling and marketing regulations.
Packaging quality control criteria.
Sampling, variables and attributes, AQL
Implication of ISO-9000.
Eco packaging and regulation.
Recycling and disposal of packaging waste.
Packaging Laws and regulations- legal requirements
Weights and measure/ Packaged Commodities Act and Regulations
Prevention of Food Adulteration (PFA) Act
FPO, FDA Rules and other related regulations
UN certificate code for packaging of Dangerous goods

Unit-III**Advance Package Printing**

Advance Printing Processes used in special products and its packaging, Advance non impact printing technique for printing on regular as well as irregular shape packages. Composition of printing and ink transfer media, use of special papers and inks, Security applications, Holography and hologram stickers.

Unit-IV**Logistics and Physical Distribution**

Physical distribution and material handling methods.
Handling and transportation.
Unit load system.
Palletisation: Skids and pallets – Principles, construction and application.
Conveyer: Loading and unloading and other mechanical handling application.

Recommended Books:

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

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PRINT ADVERTISING

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

Time: 3 hours**Max. Marks: 100**
(25+75)**UNIT-I****Advertising****Definition, Concept, Scope, role and various forms of Advertising**

- A. Print Advertising,
- B. Internet Advertising
- C. Outdoor Advertising

UNIT-II**Publishing Advertising**

News paper, Magazines

Billboards

Leaflets, Hoardings, Pamphlets, Danglor

UNIT-III**Essential for Print Advertising:**

- 1. Headline
- 2. Body copy (illustrations and photographs)
- 3. Text

UNIT-IV**Computer Application**

Software's used in Print Advertising

Printing Techniques in Print Advertising

Printing processes used for newspaper & magazines printing

Printing processes used for billboards printing

Recommended Books:-

Mass Communication Principal & Concept- Seema Hasan

Business Ethics Concepts & Cases - **Sadhri Sorab.**Advertising Theory & Practice - **Chunawalla, Kumar, Sethia, Subramanian, Suchak.**

The Concept of Marketing-By Philip Kotler

Advertising and Promotion-By Belch & Belch

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605
ELECTRONIC COMPOSITION

Time : 3 Hours

**Max.marks:100
(25+75)**

NOTE: The Examiners will set eight questions, taking two from each unit. The students are required to attempt Five questions in all selecting at least one from each unit. All questions will carry equals marks.

UNIT-I

Elements in copy preparation:

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

UNIT-II

Typesetting methods:

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

UNIT-III

Desk Top Publishing:

Introduction, Origin, components of DTP, applications of DTP. History of DTP,Benefits of DTP,IBM-PC and DTP, Software for DTP, Graphic programs, Business Graphics, CAD design program, OCR software, Image software, Image editing commands crop, marquee tools, cloning tool, cut & paste, image filters. Pages make up software – approach, typography, document & text handling, applications. Standard program features – Adobe PageMaker, Ventura Publisher, Quark Xpress,Design studio, Frame maker, scanners for text, DTP as a typesetting front end – distributed desktop, Linking PC's, Mac and other computers – disk transfer file translation, transfer by cable or modem.

UNIT-IV

Digital Fonts:

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

Reference Books:

Desk Top Publishing 4th edition – Kirty wilson, Davis, Ron Strutt.
Typesetting-Composition-Geoff, Barlow
Word Processor to Printed Page - Micheal Card
Digital Typography-Donald E.Knuth Introduction
Introduction to Printing Technology - Hugh Speirs
Composing and Typography Today - Mendiratta.B.D.Hand
Book of Typography - Kailas Takle.
Guide to DTD-James Cavuoto
Printing Technology - Adams
Printing in a Digital World – David Bergsla

COSTING AND ESTIMATING

Time : 3 hours

Max. Marks: 100
(25+75)

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

UNIT-I

Printing Company Organization:

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

UNIT-II

Human Resource Management Concepts:

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

UNIT-III

Estimating:

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

UNIT-IV

Costing:

Job costing, its need and procedures. Elements of cost and their method of recovery. Cost sheet. Daily Docket. Work Instruction Ticket and their importance in costing.

Recommended Books :

Principles of Accounting - B. S. Raman

Fundamentals of Financial Management - Prasanna Chandra.

Cost Accounting - B. R. Bhar

Print Management - Derek Porter

Printer's Costing & Estimating - B. D. Mendiratta

Management Aspect of Printing Industry - T. A. Saifuddin.

Estimating Methods and Cost Analysis for Printers - K. S. Venkataraman, K. S. Balaraman.

Printing Estimating Principle & Practice - Philip Kent Ruggles

Print Production Management - Gray G. Field

Principles of Applied Costing for Printing Industry - K. S. Venkataraman.

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611

PRINTING SUBSTRATE LAB.**Time: 3 Hours****Max. Marks: 75****(25+50)**

LIST OF EXPERIMENTS

1. Various samples of Paper and their study.
2. Different samples of Papers and their study.
3. Light fastness test.
4. Machine Direction and Cross Direction of paper.
5. Effect of Humidity and Temperature on paper.
6. GSM Test.
7. Printed samples of different printing processes and their study.
8. Ink Viscosity Test.
9. Introduction to various chemicals used in printing.
10. Consumables and miscellaneous used in printing.

612

ELECTRONIC COMPOSITION LAB.**Time: 3 Hours****Max. Marks: 75****(25+50)**

LIST OF EXPERIMENTS

1. Familiarizing 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 makeup of pamphlets, page make up of advertisements, folders, journals, book work. Picture and text manipulation, Table work setting, tabular work setting.
4. Photo Shop – Introduction, Picture editing, scanning the picture, converting image formats, resizing the images.
5. CorelDraw – working principles, designing and practicing.
6. Comparing various outputs – Dot matrix, Inkjet printer, Laser printer, Digital printer.

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PACKAGING MACHINERY LOGISTIC AND REGULATIONS

Time: 3 Hours

Max. Marks: 75

(25+50)

LIST OF EXPERIMENTS

1. Operation and study of Aerosol, Strip, Blister, Packaging
2. Operations of the filling dry and liquid products.
3. Study of the recycling and disposal of packaging waste
4. Preparation of the regular as level as irregular shop packages
5. Study of how to print the holography and photograph strikers
6. Study the palletisation
7. Study of the loading and unloading process of the package

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Time: 3 Hours

Max. Marks: 75

(25+50)

SECURITY AND STATIOARY PRINTING LAB

1. Design of fan fold forms computer letter & mailers
2. Design of computer envelops and snap-out-forms
3. Various types of web offset printing
4. Processes use for packaging and dispatch
5. Study of collators
6. Dot loss and dot gain in film imaging
7. Plate making
8. Colour sequence for security printing

660

INDUSTRIAL VISITS/EXHIBITION

Student has to submit a visit report on a assigned work by his/her concerned teacher & the report will be evaluate by the examiner appointed by Director/Chairperson

Max. Marks: 50

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Special Paper

ENVIRONMENTAL STUDIES

Time : 3 hours

**Max.Marks: 100
(25+75)**

Note: The Examiners will set eight questions The students are required to attempt any five questions. All questions will carry equal marks.

Unit I :

The Multidisciplinary nature of environmental studies
Definition, scope and importance.
Need for public awareness.

Unit II :

Natural Resources

Renewable and non-renewable resources :

- Natural resources and associated problems.
- Forest resources : Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people.
 - Water resources : Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems.
 - Mineral resources : Use and exploitation, environmental effects of extracting and mineral resources, case studies.
 - Food resources : World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.
 - Energy resources : Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources. Case studies.
 - Land resources : Land as a resource, land degradation, man induced landslides, soil erosion and desertification.
- Role of an individual in conservation of natural resources.
 - Equitable use of resources for sustainable lifestyles.

Unit III

Ecosystems

- Concept of an ecosystem.
- Structure and function of an ecosystem.
- Producers, consumers and decomposers.
- Energy flow in the ecosystem.
- Ecological succession.
- Food chains, food webs and ecological pyramids.
- Introduction, types, characteristic features, structure and function of the following ecosystem :
 - Forest ecosystem
 - Grassland ecosystem
 - Desert ecosystem
 - Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries).

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Unit : IV

Biodiversity and its conservation

- Introduction – Definition : genetic, species and ecosystem diversity.
- Biogeographical classification of India.
- Value of biodiversity : consumptive use, productive use, social, ethical, aesthetic and option values.
- Biodiversity at global, National and local levels.
- India as a mega-diversity nation.
- Hot-spots of biodiversity.
- Threats to biodiversity : habitat loss, poaching of wildlife, man-wildlife conflicts.
- Endangered and endemic species of India.
- Conservation of biodiversity : in-situ and ex-situ conservation of biodiversity.

Unit 5 : Environmental Pollution

Definition

- Causes, effects and control measures of :
 - a) Air pollution
 - b) Water pollution
 - c) Soil pollution
 - d) Marine pollution
 - e) Noise pollution
 - f) Thermal pollution
 - g) Nuclear hazards
- Solid waste Management : Causes, effects and control measures of urban and industrial wastes.
- Role of an individual in prevention of pollution.
- Pollution case studies.
- Disaster management : floods, earthquake, cyclone and landslides.

Unit 6 : Social Issues and the Environment

- From Unsustainable to Sustainable development
- Urban problems related to energy
- Water conservation, rain water harvesting, watershed management
- Resettlement and rehabilitation of people; its problems and concerns. Case studies.
- Environmental ethics : Issues and possible solutions.
- Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies.
- Wasteland reclamation.
- Consumerism and waste products.
- Environment Protection Act.
- Air (Prevention and Control of Pollution) Act.
- Water (Prevention and Control of Pollution) Act
- Wildlife Protection Act
- Forest Conservation Act
- Issues involved in enforcement of environmental legislation
- Public awareness.

Unit 7 : Human Population and the Environment

- Population growth, variation among nations
- Population explosion – Family Welfare Programme
- Environment and human health.

- Human Rights.
- Value Education.
- HIV/AIDS
- Women and Child Welfare.
- Role of Information Technology in Environment and human health.
- Case Studies.

Unit 8 : Field Work

- Visit to a local area to document environmental assets-river / forest / grassland / hill / mountain.
- Visit to a local polluted site – Urban / Rural / Industrial / Agricultural.
- Study of common plants, insects, birds.
- Study of simple ecosystems – pond, river, hill slopes, etc.