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

SCHEME OF STUDIES & EXAMINATIONS

2nd semester

B. Tech. (Printing, Graphic & Packaging)

Subject Code	Subject area	subject Title	Teaching Schedule				Credits	Allotments of Marks				Duration of Exams(Hrs)
								Major Test	Minor Test	Practical	Total	
			L	T	P	Hours /Week						
PGP 201	PC	FUNDAMENTAL OF PACKAGING	4		0	4	4	60	40		100	3
PGP 202	HS	SCIENCE OF COMMUNICATION	4		0	4	4	60	40		100	3
PGP 203	CSE	GRAPHICS	3		0	3	3	60	40		100	3
PGP 204	AS	PHYSICS - II	3		0	3	3	60	40		100	3
PGP 205	AS	MATHEMATICS -I I	3		0	3	3	60	40		100	3
PGP 206	ME	ENGINEERING DRAWING	4		0	4	4	60	40		100	3
		LAB										
PGP 211	PC	PRINTING PROCESS-II LAB			2	2	1		30	45	75	3
PGP 212	HS	SCIENCE OF COMMUNICATION-LAB			2	2	1		30	45	75	3
PGP 213	CSE	GRAPHICS LAB			2	2	1		30	45	75	3
PGP 214	AS	PHYSICS-II LAB			2	2	1		30	45	75	3
		TOTAL					25/25	360	360			

PGP 201

FUNDAMENTALS OF PACKAGING

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.

Total Credit: 4 Max. External: 70 Internal: 30
Time Allowed: 3 Hrs.
Marks: 100

Unit - I

Basics of Packaging:

Introduction, Function of a package, Factors influencing design of a package, Computer Aided Package Design, Packaging Cycle, Product Package Relationship, Product life curve, Elements of Package Design. Classification of Packaging - Flexible package type, Rigid package types. Hazards on package - Mechanical, Climatic, Biological and other hazards.Markings on package - Handling marks, routing marks, information marks. Tests on Package- Mechanical test - Drop test, Vibration test, Compression test, Inclined impact test, Rolling test, Climatic tests - Rain test, Sand and dust test, Salt spray test, Fungus resistance test. Shelf life, Cushioning Materials - Functions, properties. Classifications - space fillers, resilient cushioning materials, non-resilient cushioning materials.

Unit - II

Packaging Media:

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

Unit - III

Carton Production & Innovative Packaging Techniques/Processes:

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

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

Unit -I V

Future Trends:

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

Recommended Books:

Packaging design and performance - **Frank Paine**

Advances in plastic packaging technology - **John Briston**.

Packaging design an introduction - **Laszlo Roth**.

Packaging Technology - Volume I, II, III - IIP

PGP 202

SCIENCE OF COMMUNICATION

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.

Total Credit: 4 Max. External: 70 Internal: 30
Time Allowed: 3 Hrs.
Marks: 100

UNIT –I

Definition, Nature and Scope of Communication.

Function of Communication,

Elements and Process of Communication.

UNIT –II

Essentials in Language and Communication of good communication,

Barriers in Language and Communication.

UNIT –III

Forms of Communication: Verbal and Non verbal, Intra Personal,

Interpersonal, Group Public and Mass Communication

UNIT –IV

Introduction to Print Media: News papers- Magazines

Introduction to Electronic Media: Radio -Television

Introduction to New Media: Interment and Mobile Telephony

Convergence of Information, Communication and Telecom technologies.

PGP203

GRAPHICS

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.

Total Credit: 3 Max. External: 70 Internal: 30
Time Allowed: 3 Hrs.
Marks: 100

UNIT –I

Introduction to "Graphic Design" : What is design, Graphic design, printer's design.

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

UNIT –II

Color theory: dimension of color, color schemes, color symbolism, emotional effects of color. Division of design: natural, conventional, decorative, geometrical and abstract.

UNIT –III

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

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

UNIT –IV

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

Design with D.T.P.: Various softwares used for designing.

Recommended Books :-

1. The Designer's Handbook by Alistair Campbell
2. Design & Technology by Van No strand
3. Handbook of Advertising Art Production by schelmmer.
4. Art & Production by Sarkar.
5. Advertising, Art & Production by J. Nath.
6. A.C. Book (C.D.) so hick, Fundamental of copy and layout ,Crair Book.

PGP204

PHYSICS-II

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.

Total Credit: 3 Max. External: 70 Internal: 30
Time Allowed: 3 Hrs.
Marks: 100

UNIT-I

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

UNIT-II

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

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

UNIT-III

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

UNIT-IV

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

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

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

TEXT BOOKS:

1. Introduction to Solid State Physics (VII Ed.) - Charles Kittel (John Wiley).
2. Quantum Mechanics – Powell and Crasemann (Oxford & IBH)
3. Fundamentals of Solid State Physics – B.S.Saxena, R.C.Gupta and P.N.Saxena (PragatiPrakashan).

REFERENCE BOOKS:

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

PGP205

MATHEMATICS-II

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.

Total Credit: 3 Max. External: 70 Internal: 30
Time Allowed: 3 Hrs.,Marks: 100

UNIT-I

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

UNIT-II

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

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

UNIT-III

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

UNIT-IV

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

REFERENCE BOOKS :

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

PGP206
ENGINEERING DRAWING

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.

Total Credit: 4 Max. External: 70 Internal: 30
Time Allowed: 3 Hrs.,Marks: 100

Unit I

Introduction to Engineering Graphics and Drawing

Importance of engineering graphics and drawing, introduction to drawing instruments, types of lines, dimensioning, lettering, types of projections, theory of orthographic projections, first angle and third angle projections, projection of points.

Unit II

Projection of Lines and Planes

Projection of lines parallel to one or both planes, contained by one or both planes, perpendicular to a plane, inclined to one and parallel to the other, inclined to both the planes, true length of the line and its inclinations to the reference planes, Traces of line.

Introduction, types of planes, Projection of planes by change of position method only, projection of plane perpendicular to a plane, with axis parallel to both planes, with axis parallel to one plane and inclined to the other plane

Unit III

Projection of Solids and Their Development

Types of solids, polyhedra and solids of revolution, projection of solids with axis perpendicular to a plane(Solids in simple position) , axis parallel to both the planes, axis parallel to one and inclined to the other

Development of surface of various simple solids such as cubes, cylinders, prisms, pyramids etc.

Unit IV

Isometric Projection

Introduction, isometric scale, Isometric views of plane figures, prisms, pyramids and cylinders. Orthographic drawings of Bolts and Nuts, Bolted Joints, Screw threads.

Reference Books

1. Engineering Graphics using AUTOCAD 2000, T. Jeyapoovan, First Edition 2002, Vikas publishing House.

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

3. Engineering Graphics and Drafting : P.S. Gill, Millennium Edition, S.K. Kataria and Sons.

4. A Text Book of Engineering Drawing : S.B. Mathur, Second Revised and Enlarged Edition 2000, Vikas Publishing House.

5. A Primer on Computer aided Engineering Drawing-2006, published by VTU, Belgaum

PGP211
FUNDAMENTALS OF PACKAGING (LAB)

Total Credit: 1 Max. External: 45
Internal: 30
Time Allowed: 3 Hrs.,Marks: 75

LIST OF EXPERIMENTS

1. Designing and preparation of various flexible packages.
2. Designing and preparation of various rigid packages.
3. Preparation of Jigged die & unit die for a package design.
4. Study and operation of various packaging machines.
5. Manufacturing of various types of corrugated boards.
6. Cutting, creasing and building up corrugated boxes.
7. Designing & preparation of various designs of paper bags.
8. Testing of raw materials like wood, paper, plastic.
9. Test conducted on Cartons, Corrugated packages, wooden packages.
10. Drop test,Vibrationtest,Inclined impact test, Compression test.

PGP212

SCIENCE OF COMMUNICATION LAB

Total Credit: 1 Max. External: 45
Internal: 30
Time Allowed: 3 Hrs.,Marks: 75

LIST OF EXPERIMENTS

1.Public speeches
2.Power point presentations
3. Group discussions
4. Interviews
5 .Designing poster
6. Designing pamphlets

PGP213

GRAPHICS LAB

Total Credit: 1 Max. External: 45
Internal: 30
Time Allowed: 3 Hrs. ,Marks: 75

LIST OF EXPERIMENTS

1. Stationary and small scales literature.
2. Folders -
3. Sticker
4. Label designing
5. Introduction to computers, various softwares used for designing purpose – Demonstration (Manipulation of same design)
6. Logo designing
7. Color wheel
8. Designing of visiting card. Letterhead, Envelop, Bill form, Receipt, Invitation card, Posters, Title page of a Book, Magazine Cover page.

PGP214

PHYSICS-II LAB

Total Credit: 1 Max. External: 45
Internal: 30
Time Allowed: 3 Hrs.

Marks: 75

LIST OF EXPERIMENTS

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

1. To study He Ne laser
2. Tofind the frequency of ultrasonic waves by piezoeletric methods
3. To find the value of e/m for electrons by Helical method.
4. To find the ionisation potential of Argon/Mercury using a thyratron tube.
5. To study the variation of magnetic field with distance and to find the radius of coil by Stewart and Gee's apparatus..
6. To find the band gap of intrinsic semi-conductor using four probe method.
7. To calculate the hysteresis loss by tracing a B-H curve.

RECOMMENDED BOOKS :

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

2. Practical Physics – S.L. Gupta & V. Kumar (PragatiPrakashan).

3. Advanced Practical Physics Vol. I & II – Chauhan& Singh (PragatiPrakashan).