M.D. UNIVERSITY, ROHTAK

SCHEME OF STUDIES AND EXAMINATION

B.TECH(PRINTING TECHNOLOGY)

SEMESTER 3RD AND 4TH

Scheme effective from 2019-20

COURSE CODE ANDDEFINITIONS

Course Code	Definition
L	Lecture
T	Tutorial
P	Practical
BSC	Basic ScienceCourses
ESC	EngineeringScienceCourses
HSMC	Humanities and Social Sciences includingManagementcourses
PCC	Professional Core Courses
LC	Laboratory Courses
MC	Mandatory Courses
PT	Practical Training
S	Seminar

B. TECH (PRINTING TECHNOLOGY)

3rd Sem. w.e.f. 2019-20

Subject Code	Course Title	Teaching Schedule			Marks of Class Work	Examination Marks		Total	Credit	Duration of Exam (Hours)
		L	T	P Total		Theory	Practical			
HSMC-201-G	Fundamentals of Management	3	-	-	25	75	-	100	3	3
BSC-PTG -201-G	Basic Sciences for Printing	3	1	-	25	75	-	100	4	3
PCC-PTG-203-G	Content Management	3	-	-	25	75	-	100	3	3
PCC-PTG -205-G	Basic of Printing Processes	3	1	-	25	75	-	100	4	3
PCC-PTG -207-G	Graphic Design in Printing	3	-	-	25	75	-	100	3	3
PCC-PTG -209-G	Computer Technology In Printing	3	-	-	25	75	-	100	3	3
LC-PTG -211-G	Basic Sciences for Printing Lab	-	-	2	25	-	25	50	1	3
LC--PTG 213-G	Basic of Printing Processes Lab	-	-	2	25	-	25	50	1	3
LC-PTG -215-G	Graphic Design in Printing Lab	-	-	2	25	-	25	50	1	3
LC-PTG -217-G	Computer Technology in Printing Lab		-	2	25	-	25	50	1	3
	Total							**800**	**24**	

B. TECH (PRINTING TECHNOLOGY)

4th Sem. w.e.f. 2019-20

Subject Code	Course Title	Teaching Schedule			Marks of Class Work	Examination Marks		Total	Credit	Duration of Exam (Hours)
		L	T	P		Theory	Practical			
*MC-106G	Environmental Studies	3	-	1	25	75	-	-		3
PCC-PTG-202-G	Sciences of Printing Materials	3	-	-	25	75	-	100	3	3
PCC-PTG-204-G	Technology of Flexography	3	-	-	25	75	-	100	3	3
PCC-PTG-206-G	Technology of Screen Printing	3	-	-	25	75	-	100	3	3
PCC-PTG-208-G	Digital Typesetting and E-Publishing	3	-	-	25	75	-	100	3	3
PCC-PTG-210-G	Imaging Techniques in Printing	3	-	-	25	75	-	100	3	3
LC-PTG-212-G	Technology of Flexography Lab	-	-	2	25	-	25	50	1	3
LC-PTG-214-G	Technology of Screen Printing Lab	-	-	2	25	-	25	50	1	3
LC-PTG-216-G	Digital Typesetting and E-Publishing Lab	-	-	2	25	-	25	50	1	3
LC-PTG-218-G	Imaging Techniques in Printing Lab		-	2	25	-	25	50	1	3
LC-PTG - 222-G	Skills & Innovation Lab.	-	-	2	25	-	25	50	1	
S-PTG - 220-G	Seminar-I		02		50	-	-	50	1	3
	Total							**800**	**21**	

*__MC-106G__is a mandatory non –credit course in which the students will be required passing marks in theory.

NOTE: At the end of 4th semester each student has to undergo Practical Training of 4/6 weeks in an Industry/ Institute/ Professional Organization/ Research Laboratory/ training centre etc. and submit typed report along with a certificate from the organization & its evaluation shall be carried out in the 5th Semester.

FUNDAMENTALS OF MANAGEMENT

Course Code: HSMC-201G Course Credits: 0.0 Mode: Lecture (L) and Tutorial (T) Type: Compulsory Contact Hours: 3 hours (L) + 0 hour (T) per week. Examination Duration: 03 hours.	**Course Assessment Methods (Internal: 30; External: 70)** Two minor test each of 20marks, class performance measured through percentage of lecture attended (4 marks), assignments, quiz etc. (6 marks) and end semester examination of 70 marks. \ For the end semester examination, nine questions are to be set by the examiner. Question number one will be compulsory and based on the entire syllabus; it will contain seven short answer type questions. Rest of the eight questions is to be given by setting two questions from each of the four units of the syllabus. A candidate is required to attempt any other four questions selecting one from each of the four units. All questions carry equal marks.

Course Objectives:

- To enhance knowledge skills and attitude to Management.
- To understand management and its relationship with organisation.

UNIT-I

Concept of Management: Definitions, Characteristics, Significance, Practical Implications; Management Vs. Administration; Management- Art, Science and Profession; Development of Management Thoughts; Managerial Functions.

UNIT-II

Concept of Human Resource Management: Human resource planning; Recruitment, Selection, Training and Development, Compensation; Concept of Marketing Management: Objectives and functions of Marketing, Marketing Research, Advertising, Consumer Behavior.

UNIT-III

Concept of Production Management, Production Planning and Control, Material management, Inventory Control, Factory location and Production Layout.

UNIT-IV

Concept of Financial Management, Capital Structure and various Sources of Finance, Working Capital, Short term and long term finances, Capital Budgeting.

Course outcomes:

To develop the basic understanding of the concept of management and functions of management.
The students will come to know about Human Resource management and Marketing management functions of management.
Students will come to know about the production activities of any manufacturing organisations.
To know that how finances are arranged and disbursed for all the activities of business organisations.

Text & Reference Books

1. Principles and Practices of Management: R. S. Gupta, B. D. Sharma, N. S. Bhalla; Kalyani Publishers.
2. Organisation and Management: R. D. Aggarwal; Tata McGraw Hill.
3. Marketing Management: S. A. Sherlikar; Himalaya Publishing House.
4. Financial Management: I.M. Pandey; Vikas Publishing House.
5. Production Management: B. S. Goel; Himalaya Publishing House.

BASIC SCIENCES FOR PRINTING

General Course Information	
Course Code: BSC-201G Course Credit: 3.5	**Course Assessment Methods; Max. Marks: 100 (Internal: 30; External: 70)** Two minor tests each of 20 marks, Class Performance measured through percentage of lectures attended (4 marks) Assignments (4 marks) and class performance (2 marks), and end semester examination of 70 marks.
Contact Hours: 4/week, (L-T-P:3-1-0) Mode: Lectures and Tutorials Examination Duration: 3 Hours	For the end semester examination, nine questions are to be set by the examiner. Question number one will be compulsory and based on the entire syllabus. It will contain seven short answers type questions. Rest of the eight questions is to be given by setting two questions from each of the four units of the syllabus. A candidate is required to attempt any other four questions selecting one from each of the remaining four units. All questions carry equal marks.

Course Objective: To give the students comprehensive knowledge of science related print applications in various printing processes and equipment's used in the industry.

UNIT-I

pH and Conductivity Printing– Definition of pH, Method of determining pH, Importance of pH in Printing & Packaging, pH of paper & Ink, role of pH control in printing & packaging applications. Conductivity, Fountain Solution & Conductivity, Define conductivity? Need of conductivity measuring conductivity, Application of Conductivity in Printing.

Impact of Environmental Condition in Printing and Packaging : Humidity – Definition, Relative Humidity, Measurement, Control by air conditioning, Role of Relative Humidity in Printing & Packaging, Effect of Relative Humidity in packaging operations. Green Printing, VOC gases, its impacts, Use of chemicals in Printing and its environmental impact.

UNIT-II

Chemistry of Photography & Light Sensitive Materials - Introduction to photo-chemistry, Light Sensitive Material, Types of LSM, Constituents of LSM, Properties. Diazo compounds and its role in image creations.

UNIT-III

Understanding Colour : Fundamental of colours, Light, Source of Colour, Primary Colours, Secondary Colours, Additive Colours, Subtractive Colour, Spectral Transmission Curves. Introduction to Colour Measurement.

Surface Chemistry - Surface tension, Contact angles, Capillary Action, Interfacial Tension, Hydrophobic & Hydrophilic, Water and Ink Interaction, Emulsification of Ink.Role of Emulsification in Printing.Viscosity.Importance of Viscosity in Printing.

Effect of light in printing and Packaging - Effect of light on different film and plate coating, Adhesives & Ink-films, Light fastness, Print Characteristics, effect of light on different poly films / Substrates.

UNIT-IV

Polymers and Printing : Monomer, Polymer, Types of Plastics – Thermo-sets & Thermoplastics. Introduction to Natural Polymers, Cellulose Derivatives, Synthetic Polymers, Polythene, Polypropylene, Polyvinyl Plastics.

Optics & Optical Instruments- Reflection, Transmission, Importance of observer angle in viewing print, Optical illusion in viewing colour, Opacity, Density, Visual Angle, Angular Magnification, Magnifying Glass, Microscopes, safe Light Condition, Introduction to Photographic Cameras and Contact printer, Introduction to Densitometer and Spectro-densitometer. Measuring color, International standards for color evaluation, Delta E and its importance.

Colloids in printing &Packaging - Introduction, Kinds, Properties, Absorption and adsorption, Selective Adsorption, Application in printing and packaging.

Fountain Solution -Introduction, Composition and functions. Role of fountain solution in Printing.

Course Outcomes:

This course will enable the students to work with

1. Knowledge of printing related science.
2. Knowledge of pressroom environment, chemical, optical effects in printing.
3. Knowledge of Optics, Color etc.
4. Knowledge to find out the reasons for Printing Problems in the press floor.

Text & Reference Books:

1. Optics by BrijLal and Subrahmaniam
2. Optics by Ajay Ghatak
3. Engineering Chemistry by Jain and Jain
4. Science and Technology of printing material by Parkashshetty.
5. Hand Book of Print Media – by H.Kippan.

CONTENT MANAGEMENT

General Course Information	
Course Code: PCC-203G Course Credit: 3.0	**Course Assessment Methods; Max. Marks: 100 (Internal: 30; External: 70)** Two minor tests each of 20 marks, Class Performance measured through percentage of lectures attended (4 marks) Assignments (4 marks) and class performance (2 marks), and end semester examination of 70 marks.
Contact Hours: 3/week, (L-T-P:3-0-0) Mode: Lectures and Tutorials Examination Duration: 3 Hours	For the end semester examination, nine questions are to be set by the examiner. Question number one will be compulsory and based on the entire syllabus. It will contain seven short answers type questions. Rest of the eight questions is to be given by setting two questions from each of the four units of the syllabus. A candidate is required to attempt any other four questions selecting one from each of the remaining four units. All questions carry equal marks.

Course Objective : To give the students comprehensive knowledge of content management and its various aspects applicable in Printing industry.

UNIT-I

Definition, Purpose, Use of Content management in Printing and Packaging industry.

Scope - A content management system is a set of automated processes that may support the following features

- Import and creation of documents and multimedia material
- Identification of all key users and their roles
- The ability to assign roles and responsibilities to different instances of content categories or types
- Definition of workflow tasks often coupled with messaging so that content managers are alerted to changes in content
- The ability to track and manage multiple versions of a single instance of content
- The ability to publish the content to a repository to support access
- The ability to personalize content based on a set of rules

UNIT-II

Stages of any content management system (Creation, Editing, Publishing/Delivery, Update/version control, Removal),

Roles and responsibilities of Creator, Editor, Publisher, Administrator, Consumer

Version control and its importance

Multichannel delivery,

Governance Structures- Definition, purpose, types of governance structures and their advantages/disadvantages

UNIT-III

Tagging – Definition, Purpose, Problem with conventional content organizing system (Folders, Sub folder, directories) , Classification scheme of tagging (Taxonomy, Ontology).Metadata – Definition, Purpose, Type, Structures, Use, Metadata Publishing,

Data warehouse – Definition, History, Types, Design Methods

UNIT-IV

Content Management System –

Definition, purpose, Salient features, Components- Software & Hardware, Types as per source- Open, Proprietary

Types as per delivery –
Single Source Publishing(SSP) - Separate outputs, Rights-based login, Dynamic filtering
Multi source Publishing(MSP) -

Types as per content – Mobile CMS, Web CMS, Enterprise CMS, Component CMS,
Digital Asset management system, Document Management System, e. Publishing.

Practice Work-Software, Word Press, Joomla, Drupal, Role of Markup languages in Content Management– HTML, XML, and SGML

Course Outcomes:

This course will be helpful for the students to work with

1. Knowledge of printing related features.
2. Thorough knowledge of content management.
3. Knowledge of different software used in printing.

Text & Reference Books:

Content Management: Bridging the Gap between Theory and Practice edited by George Pullman, GuBaotung

http://www.cms.co.uk/cms-glossary.html

https://www.vasont.com/resources/who-needs-cms.html

BASIC OF PRINTING PROCESSES

General Course Information	
Course Code: PCC-205G Course Credit: 3.5	**Course Assessment Methods; Max. Marks: 100 (Internal: 30; External: 70)** Two minor tests each of 20 marks, Class Performance measured through percentage of lectures attended (4 marks) Assignments (4 marks) and class performance (2 marks), and end semester examination of 70 marks.
Contact Hours: 4/week, (L-T-P:3-1-0) Mode: Lectures and Tutorials Examination Duration: 3 Hours	For the end semester examination, nine questions are to be set by the examiner. Question number one will be compulsory and based on the entire syllabus. It will contain seven short answers type questions. Rest of the eight questions is to be given by setting two questions from each of the four units of the syllabus. A candidate is required to attempt any other four questions selecting one from each of the remaining four units. All questions carry equal marks.

Course Objective: To give the students comprehensive knowledge of various types of printing processes available in the industry, their working and suitability for various types of jobs.

UNIT-1

History : Brief history of Printing in the World. A brief survey of the evolution of Printing processes and methods from a craft to the present day sophisticated technology. Brief Introduction of Printing Industry in India, Scope and total Printing capacity. Participation at international level

UNIT-II

Introduction to Printing processes, basic principles, characteristics, identification and applications of letterpress, flexography, lithography and offset, gravure, screen printing etc. General principles of Printing Surface preparation for these processes. Modes of taking impressions. Suitability & limitations of various processes of Printing.

UNIT-III

New trends in Flexography, Scope and possibilities, Difference between the application of Flexo and gravure, Gravure printing-its application and future, Application of Screen printing in modern printing, Use of Flexo, Gravure and Screen printing in security printing application.

UNIT-IV

Different kinds of Printing machine rollers, their types, manufacture, care and maintenance. Common printing faults in various printing processes, set off, scumming, tinting, picking, etc. causes and their remedies.

Course Outcomes:

This course will be helpful for the students to work with

1. Application of various types of printing processes for current market needs.
2. Thorough knowledge of letterpress printing process.
3. Knowledge of various printing defects, causes and their remedies.

Text & Reference Books:

1. Letter Press Printing Part 1, 2, By C.S. Misra
2. Printing Technology by Adams, Faux, Rieber, 5th edition
3. Handbook of Print Media, H. Kippan, Springer
4. Lithographers Manual
5. Printing Technology 5edition – by Adams.

GRAPHIC DESIGN IN PRINTING

General Course Information	
Course Code: PCC-207G Course Credit: 3.0	**Course Assessment Methods; Max. Marks: 100 (Internal: 30; External: 70)** Two minor tests each of 20 marks, Class Performance measured through percentage of lectures attended (4 marks) Assignments (4 marks) and class performance (2 marks), and end semester examination of 70 marks.
Contact Hours: 3/week, (L-T-P:3-0-0) Mode: Lectures and Tutorials Examination Duration: 3 Hours	For the end semester examination, nine questions are to be set by the examiner. Question number one will be compulsory and based on the entire syllabus. It will contain seven short answers type questions. Rest of the eight questions is to be given by setting two questions from each of the four units of the syllabus. A candidate is required to attempt any other four questions selecting one from each of the remaining four units. All questions carry equal marks.

Course Objective: This subjects introduces both functions and forms of graphic design. It will help the students in the field of designing, visual communication and advertising. It will lead to successful designing and provides a guide to generate digital files for prepress.

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. Colour theory: dimension of colour, colour schemes, colour symbolism, emotional effects of colour.

UNIT-II

Division of design: natural, conventional, decorative, geometrical and abstract. Type: Methods of type arrangement, classification of typeface of font designing. Printing planning: rough layout, comprehensive, artwork, type of originals, sizing, mashing and cropping. Design management: Definitions in advertising art, modern art abstract art, applied art, advertising, publicity, public relations, sale promotion, sales manager.

UNIT-III

Computer pre requisites for graphic designing, Bit, Types of bits and computers, Grayscale and colours, Channel, Pixel, Bit depth, Design with computers, Various software used for designing. Selection of an appropriate printing process for printing of a job, Pdf and types of Pdf's.

UNIT-IV

What is 3D? Visualizing three dimensional effects, from 2D drawings. Perspective: sense of perspective drawing. Understanding of scale and sense of proportion.

Course Outcome: This course will enable the students

1. To work with theelements of decide.
2. To study theconcepts and understanding of design fundamentals.
3. To apply the knowledge of commercial design.
4. Knowledge about the advance technologies in design and modeling.

Text & Reference Books:

This course will be helpful for the students to work with

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 N.N.Sarkar.
5. Advertising, Art & Production by J. Nath.

COMPUTER TECHNOLOGY IN PRINTING

General Course Information	
Course Code: PCC-209G Course Credit: 3.0	**Course Assessment Methods; Max. Marks: 100 (Internal: 30; External: 70)** Two minor tests each of 20 marks, Class Performance measured through percentage of lectures attended (4 marks) Assignments (4 marks) and class performance (2 marks), and end semester examination of 70 marks.
Contact Hours: 3/week, (L-T-P:3-0-0) Mode: Lectures and Tutorials Examination Duration: 3 Hours	For the end semester examination, nine questions are to be set by the examiner. Question number one will be compulsory and based on the entire syllabus. It will contain seven short answers type questions. Rest of the eight questions is to be given by setting two questions from each of the four units of the syllabus. A candidate is required to attempt any other four questions selecting one from each of the remaining four units. All questions carry equal marks.

Course Objective: This course encapsulates the computer technology which is helpful for Printing, Packaging& Publishing domains. It has a reach to the pre-press sections of industrial sectors for in-depth assignments for better understanding for the students.

UNIT – I

Personal computers – Schematic diagram, Operating systems. Hardware, Software, Device Interfaces, BIOS. Memory – Primary & Secondary Memory, RAM, DRAM, SRAM, ROM, PROM, EPROM, MAGNETIC TAPE, OPTICAL DISK, MBM, CCD.

UNIT – II

Mass Storage Technology – data organization – cache operation, FD, HD, SCSI, Compact Disc. Display devices – CRT displays (Types, Working, Advantages, and Disadvantages), Display adapter - CGA, VGA, SVGA.

UNIT – III

Input /Output devices - Keyboard, mouse, optical scanners (OCR, BCR), Printers (dot matrix, ink jet, laser), VDT's & its types, Plotters, Digitizers, Electronic Typewriters, Light Pens, Web Camera, Joysticks. Electronic Image, File Formats (BMP, TIFF, GIF).Image compression & its types.

UNIT – IV

Introduction to DTP, Trends in Printing Technology, Usage of Computers in Printing. DTP in Printing Technology, Introduction to DTP software, Word Processing Packages. Story editing & formatting, Working with graphics, importing graphics, working with color, table editing, Cost estimation of DTP.

Course Outcome: This course will enable the students

1. Basics of computer technology in Printing fields.
2. Basics of computer technology in Packaging fields.
3. Basics of computer technology in Publishing fields.

Text & Reference Books:

1. Hardware Bible: Winn IL RochTechmedia.
2. Desk Top Typography: Quark X Press
3. Page Maker 6.0: BPB Publication.
4. Printing in a Digital World – David Bergsland
5. Introduction to Prepress - Hugh Speirs
6. Computer Technology – Sinha&Sinha

BASIC SCIENCES FOR PRINTING LAB

General Course Information	
Course Code: LC-201G Course Credit: 1 Contact Hours: 2/week, (L-T-P:0-0-2) Mode: Practical & Lab Work Examination Duration: 3 Hours	**Course Assessment Methods; Max. Marks: 100 (Internal: 30; External: 70)** **Course Assessment Methods; Max. Marks: 100 (Internal: 30; External: 70)** Internal practical evaluation is to be done by the course co-ordinator. The end semester practical examinations will be conducted jointly by external and internal examiners.

List of Experiments

1. Study of Colloids in Printing.
2. Study of various types of printing inks.
3. Study of Densitometer
4. Study of Printing Paper
5. Application of pH in Printing
6. Working of Process Camera
7. Working of contact printer
8. Preparation of Dampening Solutions
9. Evaluation of pH & conductivity
10. Evaluation of pH Conductivity and Hardness of Water

BASIC OF PRINTING PROCESSES LAB

General Course Information	
Course Code: LC-205G Course Credit: 1 Contact Hours: 2/week, (L-T-P:0-0-2) Mode: Practical & Lab Work Examination Duration: 3 Hours	**Course Assessment Methods; Max. Marks: 100 (Internal: 30; External: 70)** **Course Assessment Methods; Max. Marks: 100 (Internal: 30; External: 70)** Internal practical evaluation is to be done by the course co-ordinator. The end semester practical examinations will be conducted jointly by external and internal examiners.

List of Experiments

1. Identification of different tools &equipments used in letterpress.
2. Study of different Printing Processes.
3. Study of various types of image carriers for different Printing processes.
4. Study of different letter press Printing Machines.
5. Overview of pre-make-ready and make-ready operations.
6. Study of Running & Printing faults on various Printing processes.
7. Study of Single Color Flexographic machine
8. Study of Single Color Gravure machine
9. Study of Photo Polymer Plan
10. Study of Gravure cylinders.

GRAPHIC DESIGN IN PRINTING LAB

General Course Information	
Course Code: LC-207G Course Credit: 1 Contact Hours: 2/week, (L-T-P:0-0-2) Mode: Practical & Lab Work Examination Duration: 3 Hours	**Course Assessment Methods; Max. Marks: 100 (Internal: 30; External: 70)** **Course Assessment Methods; Max. Marks: 100 (Internal: 30; External: 70)** Internal practical evaluation is to be done by the course co-ordinator. The end semester practical examinations will be conducted jointly by external and internal examiners.

List of Experiments

1. Direct mail.
2. Folders - Single fold & Double fold.
3. Sticker – Two colours.
4. Label designing- 2 and 4 colours
5. Introduction to computers, various software's used for designing purpose – Demonstration (Manipulation of same design)
6. Logo designing
7. Knowledge of different computer commands.
8. Color wheel
9. Designing of visiting card. Letterhead, Envelop, Bill form, Receipt
10. Designing of invitation card, Posters, Title page of a Book, Magazine Cover page.

COMPUTER TECHNOLOGY IN PRINTING LAB.

General Course Information	
Course Code: LC-209G Course Credit: 1 Contact Hours: 2/week, (L-T-P:0-0-2) Mode: Practical & Lab Work Examination Duration: 3 Hours	**Course Assessment Methods; Max. Marks: 100 (Internal: 30; External: 70)** **Course Assessment Methods; Max. Marks: 100 (Internal: 30; External: 70)** Internal practical evaluation is to be done by the course co-ordinator. The end semester practical examinations will be conducted jointly by external and internal examiners.

List of Experiments

1. Introduction to Computer Terminologies.
2. Use of different Hardware devices.
3. Word-Processing Software.
4. DTP and its features.
5. Software used in Printing.
6. Page set-up with different sizes and margins.
7. Preparation of Text rich documents; & Image and Text merging.
8. Different kinds of Scanners, their working and uses.
9. Working of Printers.
10. Modifications and Editing of Illustrations and Text.

ENVIRONMENTAL STUDIES

General Course Information	
Course Code: MC-106G Course Credit: 0.0	**Course Assessment Methods; Max. Marks: 100 (Internal: 30; External: 70)** Two minor tests each of 20 marks, Class Performance measured through percentage of lectures attended (4 marks) Assignments (4 marks) and class performance (2 marks), and end semester examination of 70 marks.
Contact Hours: 3/week, (L-T-P:3-0-0) Mode: Lectures and Tutorials Examination Duration: 3 Hours	For the end semester examination, nine questions are to be set by the examiner. Question number one will be compulsory and based on the entire syllabus. It will contain seven short answers type questions. Rest of the eight questions is to be given by setting two questions from each of the four units of the syllabus. A candidate is required to attempt any other four questions selecting one from each of the remaining four units. All questions carry equal marks.

Course Objectives:

To enhance knowledge skills and attitude to environment.

To understand natural environment and its relationship with human activities.

UNIT-I

Multidisciplinary nature of Environmental studies: Definition, scope and importance, need for public awareness; Concept, 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, characteristics features, structure and function of Forest ecosystem, Grassland ecosystem ,Desert ecosystem, Aquatic ecosystem (Ponds, Stream, lakes, rivers, oceans, estuaries); Biodiversity: Introduction, Definition: genetic, species and ecosystem diversity, Bio-geographical classification of India, Value of biodiversity: consumptive use, productive use, social ethical, aesthetic and option values; Biodiversity at global, national and local level, India as a mega-diversity nation, Hot-spot 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-II

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, droughts conflicts over water, dams benefits and problems; Mineral resources: Use and exploitation, environmental effects of extracting and mineral resources; Food resources: World food problem, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity; 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, main induced landslides, soil erosion and desertification, Role of an individual in conservation of natural resources, Equitable use of resources for suitable lifestyle.

UNIT-III

Definition of Environment Pollution; Causes, effects and control measures of: Air Pollution, Water Pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution, Nuclear hazards; Solid waste Management: Causes effects and control measures of urban and industrial wastes; Role of and individual in prevention of pollution, Pollution case studies; Disaster management: floods, earthquake, cyclone and landslides; Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, Case studies; different laws related to environment: 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-IV

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 problem and concern, case studies; Environment ethics: Issues and possible solutions;Wasteland reclamation; Consumerism and waste products; Human Population growth, variation among nation, 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.

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

Course outcomes:

1. Students will be able to enhance and analyze human impacts on the environment.
2. Integrate concepts & methods from multiple discipline and apply to environmental problems.
3. Design and evaluate strategic terminologies and methods for sustainable management of environmental systems.
4. Field studies would provide students first-hand knowledge on various local environment aspects which forms an irreplaceable tool in the entire learning process.

Text & Reference Books:

1. Essentials of Ecology and Environmental Science by Dr. S .V .S. Rana, PHI Learning Pvt. Ltd, Delhi
2. Environmental Chemistry by Anil Kumar De, Wiley Eastern Limited.
3. Environmental Science by T.G. Miller, Wadsworth Publishing Co, 13th edition.
4. Ecology and Environment by P. D. Sharma, Rastogi publications.
5. Erach Bharucha , "Environmental Studies for Undergraduate Courses", University Grants Commission and Bharati Vidyapeeth Institute of Environment Education and Research, Pune, University press pvt. Ltd. (India)
6. Fundamental concepts in Environmental studies by Dr. D.D. Mishra. S. Chand publications

SCIENCES OF PRINTING MATERIALS

General Course Information	
Course Code: PTG-202 -G Course Credit: 3.0	**Course Assessment Methods; Max. Marks: 100 (Internal: 30; External: 70)** Two minor tests each of 20 marks, Class Performance measured through percentage of lectures attended (4 marks) Assignments (4 marks) and class performance (2 marks), and end semester examination of 70 marks.
Contact Hours: 3/week, (L-T-P:3-0-0) Mode: Lectures and Tutorials Examination Duration: 3 Hours	For the end semester examination, nine questions are to be set by the examiner. Question number one will be compulsory and based on the entire syllabus. It will contain seven short answers type questions. Rest of the eight questions is to be given by setting two questions from each of the four units of the syllabus. A candidate is required to attempt any other four questions selecting one from each of the remaining four units. All questions carry equal marks.

Course Objective : This subject should be the foundation of every serious learning about various consumables in Printing. It will help the students in the field of printing and packaging.

UNIT -I

Metals for Plate-making, Printing &Packaging : Types and characteristics of metal used for type alloys, foundry type, & Hot metal composition. Physical and Chemical properties metals used in printing & packaging industry in relation to printing & packaging application, Lithographic properties of Metals.

Photographic Materials : Main kinds of films and photographic papers used in graphic organization, Cross section of films, Main-base, Stripping, Anti halation Coating, Protective Coating, Paper positive materials, Developers, Reducers, and Intensifiers.
Light sensitive materials for printing image carrier for major printing processes.

UNIT -II

Paper Substrates & Non-Paper Substrate for Printing &Packaging:
Paper and Non- Paper Substrate used for printing and packaging industry.
Types of Plastic Substrate – Polyethylene, Polypropylene, Polyvinyl Chloride (PVC), Polyethylene tera-phthalate (PET), Polyester, Polystyrene, Cellophane, Metal, Foils, Laminates.

Printing Inks, Coatings & Varnishes for Printing & Packaging Applications:

Ingredients used in Printing Inks, Coatings and Varnishes. Colorant – Dyes, Pigment, Vehicles, Additives, Binders, Types of printing Inks – Paste Inks, Liquid Inks, Letter Press Inks, Offset/ Lithographic Inks, Gravure Inks, Flexo-graphic Inks. Constituents of coating & varnishes. Application, advantages and limitations of coatings & Varnishes.

UNIT -III

Cushioning Materials Cushioning materials, Solid vs Loose fill, Foam-in-place, Cushion curves and design, Corrugated as a cushioning material, Economics of design - packaging costs vs product damage.

Adhesives for Printing &Packaging : Adhesion, Types of Adhesive – Animal Glues, Fish Glues, Casin Adhesives, Starch Based Adhesives, and Natural resin Adhesives, Cellulose Adhesives, Rubber based adhesives, Synthetic resin adhesives, Inorganic Adhesives, Hot Melt.

UNIT -IV

Miscellaneous Materials : Different types of rubber used in printing, Book binding Materials – Leather, Cloth, Rexene, Threads, Tapes, Stitching Wire, Covering Materials, Varnishes, Laminates Eye-lets, thermoform.

Course Outcomes:

This course will be helpful for the students to study

1. To aware about the consumables in Packaging and Printing.
2. Learning the concepts and understanding of flexography printing and related Technology.
3. Enhance the knowledge of students in Printing & Packaging fields.

Text & Reference Books:

1. Printing Materials: Bob Tompson
2. Materials in Printing Processes
3. Printing Ink Manual
4. Hand Book of Packaging Technology

TECHNOLOGY OF FLEXOGRAPHY

General Course Information	
Course Code: PTG-204 -G Course Credit: 3.0	**Course Assessment Methods; Max. Marks: 100 (Internal: 30; External: 70)** Two minor tests each of 20 marks, Class Performance measured through percentage of lectures attended (4 marks) Assignments (4 marks) and class performance (2 marks), and end semester examination of 70 marks.
Contact Hours: 3/week, (L-T-P:3-0-0) Mode: Lectures and Tutorials Examination Duration: 3 Hours	For the end semester examination, nine questions are to be set by the examiner. Question number one will be compulsory and based on the entire syllabus. It will contain seven short answers type questions. Rest of the eight questions is to be given by setting two questions from each of the four units of the syllabus. A candidate is required to attempt any other four questions selecting one from each of the remaining four units. All questions carry equal marks.

Course Objective: This subject should be the foundation of every serious learning on Flexographic process, Plates and equipments. It will help the students in the field of printing and packaging.

UNIT -I

Introduction to Flexography: Flexographic printing; flexographic market; flexographic products; Advantages, Applications & History of flexography; flexographic substrates and inks.

Basics of Flexography: Comparison with other major printing processes; Mechanical principles of flexography; Basic elements of flexography.

UNIT-II

Flexographic printing plates : Molded Rubber plates and its manufacture; Photopolymer plates- its kinds and methods of preparation; Care, Handling and storage of flexographic plates; Summary of benefits with photopolymer printing plates.

Flexographic Printing Press: Characteristics of the flexo press; components of Flexo press; The Printing System- Inking Configurations, Anilox Roll, Ink feed, Doctor blade, Ink fountain; Types of flexographic presses and their Markets, Examples of flexographic printing presses; Anilox roll - construction, cell structure, Anilox roll wear, selecting the night anilox roll, chrome plating. Fountain rolls - formulating rubber for rolls, Flexo roller covering, Care of covered rolls.

UNIT-III

Accessories and Auxiliary Equipment: Computer control Consoles; In feed and Delivery equipment; Tension control of webs; Register control; Dryers; Web Scanning; Ink control; Robots; Other Auxiliary equipment- sheet cleaner, spray powder Applicator, Static eliminator, electronic Impression control.

Finishing Equipment: Characteristics of finishing equipment; Coaters; Sheeter and Slitters; Die-cutters; Laminating; Foil Stamping and Embossing; De-metalizing.

UNIT-IV

Mounting and Proofing; 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.

Bar Codes: Bar Codes and the package printer; Structure of Bar Codes and their symbols; Specifications for printing Barcodes, Printing the Bar code symbol; Verification of barcodes; generating the barcode symbols

Beyond the Horizon- Tomorrows Flexography: Future narrow web flexography; Future of Ink distribution system. Tomorrows flexographic plates; Markets for today and tomorrow.

Course Outcomes:

This course will be helpful for the students to study

1. To about the Flexo-Printing process, plates and equipments.
2. Learn the concepts and understanding of flexography printing & technology.
3. Enhance the knowledge of students in Printing & Packaging fields.

Text & Reference Books:

1. Flexography principles and practices - Foundation of flexographic technical Association, Ronkonkoma, N.Y. (1991).
2. Package Printing by Nelson R. Eldred.
3. Printing Technology by Adams and Faux.
4. Handbook of Print Media by HelmatKipphan (Ed.).
5. Printing Technology 5E by Adams.

TECHNOLOGY OF SCREEN PRINTING

General Course Information	
Course Code: PTG-206 –G Course Credit: 3.0	**Course Assessment Methods; Max. Marks: 100 (Internal: 30; External: 70)** Two minor tests each of 20 marks, Class Performance measured through percentage of lectures attended (4 marks) Assignments (4 marks) and class performance (2 marks), and end semester examination of 70 marks.
Contact Hours: 3/week, (L-T-P:3-0-0) Mode: Lectures and Tutorials Examination Duration: 3 Hours	For the end semester examination, nine questions are to be set by the examiner. Question number one will be compulsory and based on the entire syllabus. It will contain seven short answers type questions. Rest of the eight questions is to be given by setting two questions from each of the four units of the syllabus. A candidate is required to attempt any other four questions selecting one from each of the remaining four units. All questions carry equal marks.

Course Objective: To give the students complete knowledge of screen printing, its applications, and its current requirements for effective working.

UNIT-I

Historical development of screen printing, Introduction, nature and scope, applications of screen printing, advantages, limitations, Essential Components, Aspects affecting screen printing quality, Screen printing scenario in India

UNIT-II

Screen printing equipment and accessories- printing table, screen frames, screen mesh, squeeze and its considerations, drying racks, emulsion, screen fabric, baseboard, stretching screen fabric to frame, screen printing material, care and maintenance of screens.

UNIT-III

Techniques of preparing stencils, Manual methods- Hand cut, Blocking out method, Photographic Methods- Direct, Indirect, Direct/Indirect, Specialized areas of screen printing- paper and paperboard, textile and jute, glass and ceramics, plastics, wood, metals and metal foils, circuit boards, Gumming, Flocking.

UNIT-IV

Ink and solvents for screen printing, characteristics of screen printing inks, Types and classifications, job and substrate specific ink, screen printing presses and drying systems-drying racks, wicket dryers, jet dryers, infrared dryers, UV dryers, Screen reclamation-Troubleshooting of clogged screens.

Course outcomes:

This course will be helpful for the students to study

1. To conclude various perspectives of Screen Printing.
2. Screen Printing applications in modern Printing and Packaging domains with evidences.
3. Enhance the knowledge of students in Printing & Packaging fields.

Text & Reference Books:

1. Printing Technology by Adams, Faux, Rieber, 5th edition
2. Technology of Screen Printing by B.D. Mendiratta
3. Screen Printing Review by Samuel Hoff
4. Screen Printing by John Stephens
5. Hand Book of in media by HelmatKipphan (Ed.).

DIGITAL TYPESETTING AND E-PUBLISHING

General Course Information	
Course Code: PTG-208 -G Course Credit: 3.0	**Course Assessment Methods; Max. Marks: 100 (Internal: 30; External: 70)** Two minor tests each of 20 marks, Class Performance measured through percentage of lectures attended (4 marks) Assignments (4 marks) and class performance (2 marks), and end semester examination of 70 marks.
Contact Hours: 3/week, (L-T-P:3-0-0) Mode: Lectures and Tutorials Examination Duration: 3 Hours	For the end semester examination, nine questions are to be set by the examiner. Question number one will be compulsory and based on the entire syllabus. It will contain seven short answers type questions. Rest of the eight questions is to be given by setting two questions from each of the four units of the syllabus. A candidate is required to attempt any other four questions selecting one from each of the remaining four units. All questions carry equal marks.

Course Objective: This course highlights the relevance of Digital Typesetting for Printing, Packaging, & Publishing sectors. It also touches the E-Publishing of the pre-press sections of industrial sectors for in-depth assignments. For better understanding of the students.

UNIT – I

Preparing copy for press, Acquisition of Text- Automatic input, human input, keyboards, optical character recognition, working principle, factors affecting performance, automatic voice recognition, desktop scanners, pointing device, mouse, light pen, touch screen. Proofing. Text transferring data - capture device, tele communications, modems, ISDN. General rules of page make up. Composition Software - Automatic Page Make up, Text and graphics Integration.

UNIT – II

Hot type composition, Cold Type, Photo lettering, Photo composing -Introduction, Advantages, Basic principle, Image setter, film transport system, Price, Laser type, Processing, environmental issues, other factors. Small, Medium and Large format Image setters. Page description languages. Post Script Language – Introduction. PostScript Fundamentals, Adobe Acrobat.

UNIT – III

Introduction, Origin, components of DTP, applications of DTP. Benefits of DTP. Developments. Output quality, output speed, page make up. Software for DTP – word processing. Heavy duty programmes, medium duty programmes, light duty programmes. Graphic programs. Type manipulation software, OCR software, Image software. Page make up software – approach, typography, document & text handling, applications. DTP solutions.

UNIT – IV

Digital Fonts, True type fonts, Post Script Type 1, Adobe type manager, Transferring fonts, Font manipulation, Vector & Bitmap text and Graphic creation, Raster Image Processing, Future trends and developments.MS Excel, MS Power Point. Page display. Graphics tablets, scanners for text, line art & images, digitizers.

Course Outcome:

This course will be helpful for the students to study

1. To conclude the basics of Digital Typesetting
2. Knowledge of E-Publishing in Printing, Packaging, & Publishing sections.
3. Knowledge of students in Printing & Packaging fields.

Text & Reference Books:

1. Desk Top Publishing 4th edition – **Kirtywilson, Davis, Ron Strutt**.
2. Typesetting-Composition-**Geoff, Barlow**
3. Word Processor to Printed Page - **Micheal Card**
4. Digital Typography-**Donald E.Knuth**
5. Introduction to Prepress - **Hugh Speirs**
6. Introduction to Printing Technology - **Hugh Speirs**
7. Composing and Typography Today - **Mendiratta.B.D.**
8. Hand Book of Typography - **Kailas Takle**.
9. Guide to DTP -**James Cavuoto**
10. Printing Technology – **Adams, Faux, Rieber (5th Edition)**
11. Printing in a Digital World – **David Bergsland**

IMAGING TECHNIQUES IN PRINTING

General Course Information	
Course Code: PTG-210-G Course Credit: 3.0	**Course Assessment Methods; Max. Marks: 100 (Internal: 30; External: 70)** Two minor tests each of 20 marks, Class Performance measured through percentage of lectures attended (4 marks) Assignments (4 marks) and class performance (2 marks), and end semester examination of 70 marks.
Contact Hours: 3/week, (L-T-P:3-0-0) Mode: Lectures and Tutorials Examination Duration: 3 Hours	For the end semester examination, nine questions are to be set by the examiner. Question number one will be compulsory and based on the entire syllabus. It will contain seven short answers type questions. Rest of the eight questions is to be given by setting two questions from each of the four units of the syllabus. A candidate is required to attempt any other four questions selecting one from each of the remaining four units. All questions carry equal marks.

Course Objective : The aim of this subject is to provide through knowledge of various Imaging Techniques of different printing processes and in Printing & Packaging industry.

UNIT –I

Assembly of Film Images : Equipment's and Tools required, Materials and Supplies: Photographic film (Camera Film, Contact Film, Duplicating films).
Proofing materials : Diazo papers, Polymer papers, Brown Print paper, Diffusion Transfer material, Photographic Paper.
Assembly and masking materials : Goldenrod, Vinyl, Clear Film, Peel able Masking Films, Photographic masking films.
Stripping supplies: Screen Tints, Pressure Sensitive Tapes, Adhesives, Opaque's, Cleaning Solutions, Register Tabs Button & Pins. Register masks, GATF image contact masks.
Kinds of press layout: One-up layout, One side multiple layout, One side combination layout, Sheet wise layout, Work-and-Turn layout, Work-and-Tumble layout.

UNIT –II

Image Carriers for Planography : Light Sensitive Coating: Di-cremated colloids, Diazo Compounds, Photo Polymers, Diffusion and transfer methods, Electrostatic. Sensitivity of coating to light. Dye-sensitized photo polymerization, dark reaction, post exposure, safe lights, reciprocity law. Action of light sources on coatings, stabilities of coatings. **Plate materials**: Zinc, Aluminium, Brass, Copper, Steel, Chromium. Action of oil and water on metal - Contact Angle. **Introduction to Graining of plates** (Mechanical Graining, Electrochemical graining).**Light sources for plate making**: Metal Halide, Mercury Lamps, Pulsed - xenon, Laser. **Types of Plates**: Pre-sensitized plates- Negative Working Plates, Positive working plates; Multi-metal plates - Producing a multifocal plate, Types- Bi-metallic, Tri-metallic. Electrostatic plates; Introduction to Deep Etch plates, Wipe on Plates; Toray Waterless Plates- Structure, Processing and use, Advantages and Dis-advantages. Application of Gum on plate.

UNIT -III

Image Carriers for Flexography : Introduction to Flexographic plates. Photo initiators, Photo Sensitizers and Washout Solvents.

Photopolymer Flexographic Plates: Sheet Photo Polymer Plates, Liquid photo polymer plates. Base material for photo polymer plates, Advantages of photo polymer plates. Disadvantages of photo polymer plates; Rubber Flexographic plates, Photo Engravings, Duplicate Plates. Advantages of Rubber Plates, Disadvantage of Rubber Plates.

Image Carriers for Gravure:

Methods of Cylinder Preparation: Diffusion Etch Method, Direct Transfer Method, Electromechanical process, Laser Cutting Method. **Well formation**: Lateral hard dot wells, Direct Contact Wells, Conventional Gravure Wells. **Cylinder Design:** Parts of Gravure Cylinder, Forms of Gravure Cylinder- Integral Shaft, Mandrel. Copper Plating and Polishing. Reuse of Cylinders. Ballard Shell Cylinders.

UNIT- IV

Image Carriers Screen Printing: **Stencil Making:** Hand Painted Stencil - Introduction, Block-out methods (selective process) - wax resist method. Knife cut stencils. **Stencil Cutting Tools and Cutting Techniques** - Swirl knife, Computerized stencil Cutting. Photomechanical stencil making - Indirect photo stencil film - making an indirect Photo stencil, indirect photo polymer film. Automatic processing and development - direct emulsion photo stencil - making a direct emulsion photo stencil

Digital Image Carriers:

Image generation of a Digital Offset Machine. Laser plate making system, Computer-to-Plate - Thermal plate, Polyester plate. Auto Plate Processor. Troubleshooting for plates.

Course Outcomes:

This course will be helpful for the students to study

1. The knowledge about various Materials and tools used in plate making department.
2. Explore their knowledge about the various techniques used to generate Image Carrier for various printing processes.
3. Thorough knowledge regarding the latest techniques of digital imaging.

Text & Reference Books:

1. Heidelberg DI Press- Manual Chemistry for Graphic Arts - **Dr. Nelson R. Eldred**.
2. Offset Plate Making - **Robert F. Reed**. Printing Technology 3rd Edition. - **Adams, Fax &Rieber**.
3. Screen Process Printing - **John Stephens**. Sheet fed Offset Press Operating - **Lloyd P. Dejidas**.
4. Flexography Premier - **Donna C. Mulvihill**. Stripping - **Harold L. Peck**.
5. Gravure Process and Technology –GAA. Selecting The Right Litho Plate - BPIF.
6. A. L. Gatehouse; Manual for film planning and plate making; roper – GATF Publication, 1983 edition.
7. Lithographers Manual – GATF seventh edition.
8. Paul J.Hartsuch Chemistry for the Graphic Arts, GATF, 1983 edition.
9. Lan Faux, Modern lithography, MacDonald & Evans Publication, 1973. Edition.
10. Lithographic Image Carriers by C.S. Mishra
11. Printing Technology by Adams, Faux, & Rieber

TECHNOLOGY OF FLEXOGRAPHY LAB

General Course Information	
Course Code: LC-204-G Course Credit : 1 Contact Hours: 2/week, (L-T-P:0-0-2) Mode: Practical and Lab Work Examination Duration: 3 Hours	**Course Assessment Methods; Max. Marks: 100 (Internal: 30; External: 70)** **Course Assessment Methods; Max. Marks: 100 (Internal: 30; External: 70)** Internal practical evaluation is to be done by the course co-ordinator. The end semester practical examinations will be conducted jointly by external and internal examiners.

List of Experiments-

1. Introduction and Familiarizing about Flexographic Machine and other related elements.
2. Preparation of Rubber plates
3. Preparation of Photo Polymer Plates
4. Plate Mounting in Flexographic printing machine.
5. Make ready procedures and Single, Two & Four Color Printing in Flexo machine.
6. Study of 6 color and 8 Color flexography machines.
7. Study of Hybrid Printing Systems combining Flexography Printing Technology.
8. Printing on various substrates in flexographic printing.
9. Studying modern flexographic machines with finishing operations.
10. Study of CIC Flexo machines

TECHNOLOGY OF SCREEN PRINTING LAB

General Course Information	
Course Code: LC-206-G Course Credit: 1 Contact Hours: 2/week, (L-T-P:0-0-2) Mode: Practical and Lab Work Examination Duration: 3 Hours	**Course Assessment Methods; Max. Marks: 100 (Internal: 30; External: 70)** **Course Assessment Methods; Max. Marks: 100 (Internal: 30; External: 70)** Internal practical evaluation is to be done by the course co-ordinator. The end semester practical examinations will be conducted jointly by external and internal examiners.

List of Experiments-

1. Study of various types of screen materials.
2. Screen stretching techniques.
3. Stencil preparation - Direct,
4. Stencil preparation - Indirect, Direct/Indirect.
5. Screen Printing of various routine documents.
6. Printing on various substrates
7. Screen Reclamation
8. 2 Colour Screen Printing
9. 4 Colour Screen Printing
10. Study of automatic Screen Printing

DIGITAL TYPESETTING AND E-PUBLISHING LAB

General Course Information	
Course Code: LC-208-G Course Credit: 1 Contact Hours: 3/week, (L-T-P:0-0-2) Mode: Practical and Lab Work Examination Duration: 3 Hours	**Course Assessment Methods; Max. Marks: 100 (Internal: 30; External: 70)** **Course Assessment Methods; Max. Marks: 100 (Internal: 30; External: 70)** Internal practical evaluation is to be done by the course co-ordinator. The end semester practical examinations will be conducted jointly by external and internal examiners.

List of Experiments-

1. Familiarizing with key board.
2. M.S.Word – Justification works, column work, single column, double column,
3. Fonts & type style changing; copy, cut & paste command, word art.
4. Designing of visiting cards,
5. Page makeup of pamphlets,
6. Page make up of advertisements, folders, journals, book work.
7. Picture and text manipulation.
8. Resizing the images.
9. Table work setting.
10. Comparing various outputs – Dot matrix, Inkjet printer, Laser printer.

IMAGING TECHNIQUES IN PRINTING LAB

General Course Information	
Course Code: LC-210-G Course Credit: 1 Contact Hours: 2/week, (L-T-P:0-0-2) Mode: Practical & Lab Work Work Examination Duration: 3 Hours	**Course Assessment Methods; Max. Marks: 100 (Internal: 30; External: 70)** **Course Assessment Methods; Max. Marks: 100 (Internal: 30; External: 70)** Internal practical evaluation is to be done by the course co-ordinator. The end semester practical examinations will be conducted jointly by external and internal examiners.

List of Experiments-

1. Comparative study of various materials and equipment used in Printing Image Generation Department.
2. Assembling positives for four color jobs
3. Layout preparation
4. Study of Wipe-on plates.
5. Study of Albumin plates and Deep-etch plates.
6. Preparation of Pre-sensitized plate
7. Study of gripper margin and registration processes
8. Study of Flexographic plates and Gravure Cylinder
9. Study of Digital Plates
10. Surface Preparation for Screen Printing Process

SEMINAR-I

General Course Information	
Course Code: S-212-G Course Credit: 1	**Course Assessment Methods; Max. Marks: 100 (Internal: 30; External: 70)** Two minor tests each of 20 marks, Class Performance measured through percentage of lectures attended (4 marks) Assignments (4 marks) and class performance (2 marks), and end semester examination of 70 marks.
Contact Hours: 2/week, (L-T-P:0-2-0) Mode: Tutorials Examination Duration: 3 Hours	For the end semester examination, the presentation will be done by the students and Viva-Voce examinations will be conducted by External Examiner.

For the seminar, the student will select a topic in consultation with allotted seminar the preparation o report for final presentation in exam.

SKILLS & INNOVATION LAB

<table>
<tr><th colspan="2">General Course Information</th></tr>
<tr><td rowspan="2">Course Code: LC-214-G

Course Credit: 0

Contact Hours: 3/week, (L-T-P:0-0-3)

Mode: Practical & Lab Work

Examination Duration: 3 Hours</td><td>Course Assessment Methods; Max. Marks: 100 (Internal: 30; External: 70) Two minor tests each of 20 marks, Class Performance measured through percentage of lectures attended (4 marks) Assignments (4 marks) and class performance (2 marks), and end semester examination of 70 marks.</td></tr>
<tr><td>For the end semester examination, the presentation will be done by the students and Viva-Voce examinations will be conducted by External Examiner.</td></tr>
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A group of 5-7 students are required to carry out a project related to current research & development in the field of Printing Technology. Each group of students will try to propose a novel idea/ modified technique/ new interpretation after identifying an existing new processes and/or materials, creating a higher impact than the existing practices etc. using their innovative ideas and concept generation abilities.

The topic of the project will be decided by the students in consultation with the course coordinator. The project report will be submitted by a group at the end of semester. The students may use the equipments/ machines/ instruments available in the labs/ workshops with the due permission of Chairperson on recommendation of the course coordinator.