

**Kurukshetra University, Kurukshetra**  
(Established by the State Legislature Act XII of 1956)  
(‘A+’ Grade, NAAC Accredited)



Scheme of Examination and Syllabus of  
Master of Science (M.Sc.) Printing, Graphics & Packaging  
Technology  
CBCS CURRICULUM (2022-23) in phase manner

**INSTITUTE OF MASS COMMUNICATION AND MEDIA  
TECHNOLOGY**

**KURUKSHETRA UNIVERSITY, KURUKSHETRA**

**SCHEME OF EXAMINATION FOR MASTER OF SCIENCE (PRINTING, GRAPHICS & PACKAGING TECHNOLOGY)**

**CHOICE BASED CREDIT SYSTEM (CBCS)**

**W. E. F. ACADEMIC SESSION 2022-23 IN PHASED MANNER**

**Semester-I**

Course Code	Course Title	Credits	Marks				Duration of Exam
			T	P	IA	Total	
<b>MPGPT-101</b>	Advance Printing Technology	4	75	-	25	100	3 Hours
<b>MPGPT-102</b>	Package Graphics Technology	4	50	25	25	100	3 Hours
<b>MPGPT-103</b>	Printing & Packaging Material Technology	4	50	25	25	100	3 Hours
<b>MPGPT-104</b>	Research & Development	4	75	-	25	100	3Hours
<b>MPGPT-105</b>	Soft skills and Personality Development	4	50	25	25	100	3hours
<b>Total</b>		20	-			500	

**Semester-II**

Course Code	Course Title	Credits	Marks				Duration of Exam
			T	P	IA	Total	
<b>MPGPT-201</b>	Industrial Packaging	4	50	25	25	100	3Hours
<b>MPGPT-202</b>	Packaging Laws And Regulation	4	75	-	25	100	3 Hours
<b>MPGPT-203</b>	Advanced Security Printing	4	50	25	25	100	3 Hours
<b>MPGPT-204</b>	Environmental Considerations for Packaging	4	75	-	25	100	3Hours
<b>MPGPT-205</b>	Organizational Management	4	75	-	25	100	3 Hours
<b>OE/MOOC*</b>	Open Elective Based on MOOCs (The selected course should not be directly related with Printing ,Graphics and Packaging Technology) Or As Per University Guidelines	2	-	50	-	-	-
<b>Total</b>		20	-			500	

\* The students will have to study open elective paper to be offered within the faculty only in 2<sup>nd</sup> semester. However, student will have also a choice of opting one MOOC course offered on the SWAYAM portal of Ministry of Human Resources Development in 2<sup>nd</sup> semester in lieu of open elective paper.

**Note:-** Summer Training / Internship will be held immediately after 2nd Semester Examination and will be having a minimum duration of one month. Students have to submit the Summer Training / Internship Report latest by 30<sup>th</sup> August. Evaluation of the Report and Viva-Voce shall be held during 3rd Semester. The Viva-Voce will be conducted by a panel of three faculty members appointed by Director.

**MPGPT - 101**  
**ADVANCE PRINTING TECHNOLOGY**

**Time: 3 Hrs.**

**Credits: 4**

**Total Marks: 100**

**Theory: 75**

**Internal Assessment: 25**

**Course Objectives:** This course is designed for theoretical understanding of principles, applications and material used in printing technology. It provides the technical ability to understand various production operations in printing technology.

<b>Course Learning Outcomes:</b> The students learned about the advancement in printing techniques and the student will be able to:
<b>MPGPT101.1:</b> To acquire information about various activities in the Prepress, Press and Post press
<b>MPGPT101.2:</b> To study about the various printing technologies
<b>MPGPT101.3:</b> Enhance knowledge about printing operations in press section.
<b>MPGPT101.4:</b> Know about the troubleshooting in printing presses..

**Note:-** The question paper will be divided into five Units containing nine questions. Students are required to attempt five questions in all. There will be two questions in each unit from I to IV and students are required to attempt one question from each unit. Unit V will have only one Compulsory question containing short notes covering the entire syllabus. All questions carry equal marks.

**UNIT-I**

**Printing Industry** – Recent Trends and Scenarios for the Future, scope of printing, Impact of Globalization on printing Industry, Environmental considerations in the printing industry, Organizational structure in a printing press, Production of commercial jobs, packaging jobs and newspaper.

**UNIT-II**

**Pre-Press Techniques-** Basic colour theory, additive and subtractive colours, colour controls, Colour control devices, Image setter Technology-Type, Working, Principal, Advantages, Limitation & applications, CTP Machines-Type, Working, Principal, Advantages, Limitation & applications. Scanner-Types, Techniques, Advantages, Limitation & applications.

**UNIT-III**

**Printing Techniques** -Computer aided offset presses, Automatic plate mounting and automatic blanket cleaning systems for offset presses, Driography process and Hybrid systems such as Gravure – Flexo, Offset, and Gravure etc., Procurement material for printing, Store-keeping, stock room conditions.

**UNIT-IV**

**Production room condition and planning** - production planning, Study of job and its work flow, Trouble shooting in printing presses, printing defects associated with paper and paperboard, printing defects associated with ink, Proofing Techniques and devices, Operational care and maintenance.

References Books:

1. Lithographers Manual Lithographic Technology - **Erwin A Dennis, Olusegun Odesina**
2. Printing Technology By **Adams, Faux, Rieber**
3. Art & Production by **N.N. Sarkar**
4. Packaging Technology - **Volume I, II, III - II**
5. Production Planning and inventory control-**Seetharama L.Narasimhan,Dennis W.Mcleavey,Peter J.Villington**
6. Production Planning ,Control and management-**K.C.Jain, L.N. Aggarwal**

**MPGPT -102**  
**PACKAGE GRAPHICS TECHNOLOGY**

**Time: 3 Hrs.**  
**Credits: 4**

**Total Marks: 100**  
**Theory: 50**  
**Practical:25**

**Internal Assessment: 25**

**Course Objectives:** This course is designed for theoretical understanding of package graphic technology. It provides the technical ability to understand tools and techniques used in package graphic designing.

<b>Course Learning Outcomes:</b> The students learned about the package design technique and the student will be able to:
---

<b>MPGPT102.1:</b> To describe the importance of package graphic technology.
--

<b>MPGPT102.2:</b> To explain role of graphic design in package graphics
--

<b>MPGPT102.3:</b> To know about the package development process.
---

<b>MPGPT102.4:</b> To about the package structural design and packaging structural design software's .
--

**Note:- The question paper will be divided into five Units containing nine questions. Students are required to attempt five questions in all. There will be two questions in each unit from I to IV and students are required to attempt one question from each unit. Unit V will have only one Compulsory question containing short notes covering the entire syllabus. All questions carry equal marks.**

**UNIT I**

Introduction to Package Designing basics, Role, scope product package cycle, Design considerations – structural development, packaging coordination, graphics, packaging line engineering, cost of development; Package design Economic considerations- package cost vs. product cost, Environmental Considerations, Life cycle Assessment, Legal issues, Recent trends in package graphics

**UNIT II**

Fundamental of Typography, Color Technology, Illustrations, Graphic Design Basics, Package Design Marketing concept, Package Aesthetics, Decoration Aspects, Layout and Feature Selection, Introduction to graphic design software's, The Retail Environment of various packaging.

**UNIT III**

Packaging Graphics Function, Project Scope, Consumer Research, Behavioural Measures, Features of a package, Optimizing flexible and rigid Package Design, Package Design stages, Specifications, Package Designer's Checklist an Evaluation,

## **UNIT IV**

Structural Design – folding cartons, cans, glass containers, plastic containers, bags and pouches; Container Dimensioning; Die-making, Drawing, Moulds, Prototypes, Samples. Hand Hole Design, Package Optimization, Predicting & Assessment of the package performance; Introduction to Package structural design software.

Function, Types, Selection considerations, Closure dimensioning, Metal closures, Closure seals, Plastic closures, Injection moulds and Closure design, Tamper evident closures, Child resistant closures. Special closures and functions, Case study and Mini Project for package design.

### **LIST OF EXPERIMENTS**

1. Introduction to Graphic Design Software Tools
2. Creation of shapes & objects using drawing tools
3. Graphic design using layers
4. Typographic design using text tool
5. Symbols, Logo and Label creation
6. Color specification - Color modes, Process color, Pantone colours
7. File preparation- File formats, Preflighting, PDF Export
8. Image acquisition and editing
9. Digital Proofing
10. Ripping- Process colour, spot colours, coatings separations

## **REFERENCES**

1. Aaron L. Brody and Kenneth S. Marsh, "The Wiley Encyclopedia of Packaging Technology", 1997
2. Walter Soroka, "Fundamentals of packaging technology", 3rd Edition, Institute of packaging professionals, Naperville, Illinois, USA, 2002
3. Giles Calver, "What is Packaging Design?: Essential design handbook", Rotovision, 2004
4. Marianne R. Klimchuk and Sandra A. Krasovec, "Packaging Design: Successful Product Branding from Concept to Shelf", Wiley, 2006,
5. Steven DuPuis, John Silva, "Package Design Workbook: The Art and Science of Successful Packaging", Rockport Publishers, 2008

# MPGPT -103

## PRINTING & PACKAGING MATERIAL TECHNOLOGY

**Time: 3 Hrs.**  
**Credits: 4**

**Total Marks: 100**  
**Theory: 50**  
**Practical: 25**  
**Internal Assessment: 25**

**Course Objectives:** This course is designed for theoretical understanding of material used in printing and packaging. It provides the technical ability to understand properties and testing of material used in printing and packaging.

<b>Course Learning Outcomes:</b> The students learned about the manufacturing of paper and paperboard the student will be able to:
<b>MPGPT103.1:</b> To learn the types of glass, wood and metal packages in detail.
<b>MPGPT103.2:</b> To enhance the knowledge of wood packaging system.
<b>MPGPT103.3:</b> To impart knowledge on metal packaging materials techniques.
<b>MPGPT103.4:</b> Provide an overview about the metal processing for packaging.

**Note:-** The question paper will be divided into five Units containing nine questions. Students are required to attempt five questions in all. There will be two questions in each unit from I to IV and students are required to attempt one question from each unit. Unit V will have only one Compulsory question containing short notes covering the entire syllabus. All questions carry equal marks.

### UNIT I

**Paper and Paperboard-** Manufacturing process of paper & paperboard .Sources, pulping, bleaching, stock preparation, Non-fibrous additives, consistency and other rawmaterials; , Paper and board Coating, Properties and application of paper used in packaging-uncoated, coated, Tissue, Parchment, greaseproof, glassine, wetstrength, stretchable papers, MD: CD. Boards used in packaging-Solid bleached/unbleached, folding boxboard, white lined chip board, Specialty boards, FBB, White back, Grey back. Corrugated board and component. Tests of paper and paper boards cob sizing, bursting strength, GSM, Drop test, compression, vibration, Inclined , rain test.

### UNIT II

**GLASS PACKAGING** - Manufacturing Glass & Additives, Definition, Raw materials, Additives, Other types of glass, Borosilicate, Lead, Leaching, Glassmaking, Furnace, , Regenerator, Refiner, Container Manufacture, press and blow, Centrifugal casting, Ribbon Machine, Annealing, Coating, Nomenclature, Strength/Performance, Brittle failure, Internal pressure, impact, top Load, Hydrodynamic failure, Thermal shock, Stress concentration, Defects, Specifications, Labeling, Recycling methods. Cushioning Material, types of cushioning and importance of cushioning.

**PLASTIC** – Definition, Manufacturing process of plastics, application & importance. BOPP, PET, PP, Polyester, HDPE; LDPE, LLDPE, Polyethylene properties and application. Aluminium foil, , films, metalized films. Factors to be considered for selecting plastic substrate for package.



Identification of the materials for printing & packaging by burning & solubility. Importance of recycling of plastic substrates, Environment Issues. Biodegradable substrates and its characteristics.

### **UNIT III**

**METALS IN PACKAGING** - Properties, manufacturing and application of metals in packaging; Aluminum based, Steel based –stainless steel, galvanized steel – coated steel like tinfoil, tin free plate. Metal cans – Three-Piece can, Two – Piece can (DI and DRD), Internal food can lacquers, Composite cans, Can stresses, Metal foil packaging, Metal Strapping/Banding.

**PACKAGING METALS PROCESSING** Manufacturing process – steel, Stainless, Tinfoil containers, Aluminum – Collapsible tubes, Metal drums and pails, Metal Tubes, drums pails, Aerosols, Uses, Two and Three Phase systems, Valves and dip tubes, Principles of operation; Propellants – fluorocarbons, hydrocarbons, compressed gases; Special aerosols – Piston type, Co-dispensing pumps.

**WOOD PACKAGE** - Wood Classification, Nominal Dimensioning, Board Footage, Moisture Content, Shrinkage/Expansion, Moisture Stresses, Mechanical Properties, Pallets – Wood, Pallet types – one way, two way pallet, design/performance, Wood design principles - Nails, types and holding capacity, Crates/Boxes/Bin Pallets, Wirebound Boxes, Plywood, Particleboard, Fiberboard, Regulations,

### **UNIT IV**

**LEGAL ASPECTS AND FUTURE TRENDS** - Standards of Weights & Measures Act, Standard packages, Maximum permissible error, Packaged Commodities act, ECO-Regulations, Label declaration, Hygiene management system, Food safety Act, Prevention of food adulteration act. Declaration of maximum retail price, Environmental laws for print industry. Latest trends in Packaging Material Technology. Market Capacity and Future Scenario of Printing & Packaging Material.

## **LIST OF EXPERIMENTS**

- 1 To find Grammage and thickness of paper, paperboard and plastic films.
- 2 To determine Crush strength of various packaging materials
- 3 To find Cobb value of paper and board.
- 4 To find Bursting strength and burst factor of paper and CFB.
- 5 To find Tearing Strength of paper.
- 6 To find Stiffness of board.
- 7 To determine Heat sealability of various plastic packaging materials
- 8 To find Box Compression strength of a CFB
- 09 Determination of gloss & haze of various packaging materials
- 10 To find Scuff resistance of various packaging materials.

#### REFERENCES:

1. Handbook on Modern Packaging Industries by National institute of industrial research & Asian Pacific Business press.1978.
2. Joseph F. Hanlon, Robert J. Kelsey, and Hallie Forcinio, "Handbook of Package Engineering", Third Edition, CRC press, 1998.
3. L. Brody, K. S. Marsh, "The Wiley Encyclopedia of Packaging Technology", 2nd
4. Walter Soroka, "Fundamentals of packaging technology", 3rd Edition, Institute of Packaging professionals, Naperville, Illinois, USA, 2002

**MPGPT -104**  
**RESEARCH & DEVELOPMENT**

**Time: 3 Hrs.**  
**Credits: 4**

**Total Marks: 100**  
**Theory: 75**  
**Internal Assessment: 25**

**Course Objectives:** This course is designed for theoretical understanding of Research and development especially in printing and packaging technology. It provides ability to understand the various types of research and the development of various products for any organization.

<b>Course Learning Outcomes:</b> The students learned about the Research and development activities and the student will be able to:
<b>MPGPT104.1:</b> Enhance knowledge about Innovative idea generations and their implementations.
<b>MPGPT104.2:</b> Learn about Research and development process and the challenges for implementations.
<b>MPGPT104.3:</b> Knowledge increase about the wastage reduction and environmental impact of printing.
<b>MPGPT104.4:</b> Know about the advanced technology used in packaging sectors because of R& D.

**Note:-** The question paper will be divided into five Units containing nine questions. Students are required to attempt five questions in all. There will be two questions in each unit from I to IV and students are required to attempt one question from each unit. Unit V will have only one Compulsory question containing short notes covering the entire syllabus. All questions carry equal marks.

**Unit-I**

**Introduction:** Introduction of Research & Development, types of R & D-Basic Research, Applied research, development. R&D in business, Innovation, New product development, Design ,Product design, R& D Decision- Proprietariness, Timing ,Risk ,Cost. In House R &D, External and Joint R&D, R&D Project selection, Evaluation, Management and Termination of R&D projects. Importance of R&D.

**Unit-II**

**R&D Process:** Foster ideas, Focus ideas, Develop, Prototype and trials. Regulatory, Product development activities, Launch. An effective R& D Process, Advantages of R& D- Tax breaks, cost ,financing, recruitment, Patents. R&D challenges- High cost, Uncertain result, Market condition.

**Unit-III**

**R&D in the Printing Industry – Innovation in Printing,** Reducing the environmental impact of printing, Waste reduction of printing processes, Minimizing solvent use, Process and machine optimisation in offset and flexography printing, Quality evaluation and standardisation in digital printing, Packaging and label printing, Print finishing, Measurement and testing methods for controlling machine settings and the printing process, Functional coatings, Ink curing and migration

## **Unit IV**

**R&D in Packaging Industry**-Packaging machinery research and development, especially paperboard forming, Converting of fibre-based packaging materials, Tool design and manufacturing, Sealing solutions for fiber-based packages, Package quality control development, Packaging material technology, Coating and dispersion barriers, Digital printing, Fiber engineering and technology, Nanothin functional coatings.

### **REFERENCES:**

1. Research and development by Prof. M Devendra edition 1<sup>st</sup> , 2022
2. <https://www.investopedia.com/terms/r/randd.asp>
3. Managing reaearch, development and innovation byRavi K. Jain 3<sup>rd</sup> edition

**MPGPT -105**  
**SOFT SKILLS AND PERSONALITY DEVELOPMENT (THEORY)**

**Time: 3 Hrs.**  
**Credits: 4**

**Total Marks: 100**  
**Theory: 75**  
**Internal Assessment: 25**

**Course Objectives:** This course is designed to help the students to groom their personality by learning effective communication and presentation skills. The course will help them to be good professionals as well as established as intelligent citizens of the society.

<b>Course Learning Outcomes: After completing the course the student will be able to:</b>
<b>MPGPT -105. 1: Learn soft presentation skills, etiquette and manners</b>
<b>MPGPT -105.2: Re-Engineer the personality, attitude and understand the influence of habits and body language</b>
<b>MPGPT -105.3: Use yoga and meditation to control stress, anger and time management</b>
<b>MPGPT -105.4: Hone the skills of resume writing, interview and group discussion for today's job Market.</b>

**Note:-** The question paper will be divided into five Units containing nine questions. Students are required to attempt five questions in all. There will be two questions in each unit from I to IV and students are required to attempt one question from each unit. Unit V will have only one Compulsory question containing short notes covering the entire syllabus. All questions carry equal marks.

**Unit - I**

Soft Skills and Hard Skills, Decision making and leadership Skills, Public Speaking and Presentation Skills: Types, content, audience analysis, Personality: Basic of Personality, Human growth and Behaviour, Habits and Attitude

**Unit - II**

Leadership Skills, Team Building and, social etiquettes and mannerism; Body Language: Posture and Gestures, Eye-Contact, Facial Expression Timing, Space. Techniques in Personality development: Self-confidence, Mnemonics, Goal setting, Time Management and Time Planning tools and techniques.

**Unit – III**

Self, Self-confidence, Self-Disclosure, Self-Awareness, Self esteem. SWOT Analysis, Types of Personalities and their characteristics, Techniques in Personality Development: Stress Management, Meditation and Concentration Techniques, Importance of Yoga and meditation for personal wellbeing.

**Unit IV**

Resume / CV Writing: Difference between resume/CV and bio-data, Types, Layout and draft of resume in digital age; Cover letter; Interview: Types of interviews, preparing for interviews, facing interviews, reviewing during and after the interview. Group Discussions: Importance, planning, elements, group discussion skills.

**References:**

- Wood, Julia T: Communication Mosaics: An Introduction to the field of Communication, 2001. Wadsworth
- Larson, Charles U; Persuasion - Reception and Responsibility. Wadsworth, 2001
- Personality Development by Rajiv K Mishra, Rupa& Co.
- An Appointment with Personality: Unlock the Personality by Dr TapeshKiran; Evincepublishing;2023

# MPGPT - 201

## INDUSTRIAL PACKAGING

**Time: 3 Hrs.**  
**Credits: 4**

**Total Marks: 100**  
**Theory: 50**  
**Practical: 25**

**Internal Assessment: 25**

**Course Objectives:** This course is designed for theoretical understanding of packaging techniques, applications, machines and material used in packaging industry. It provides the technical ability to understand various production and converting operations in packaging.

<b>Course Learning Outcomes:</b> The students learned about the advancement in packaging techniques and the student will be able to:
--

<b>MPGPT201.1:</b> To acquire information about various activities used in preparation of package through Prepress, Press and Post-press sections.
--

<b>MPGPT201.2:</b> To study about the various advance packaging technologies.
---

<b>MPGPT201.3:</b> Enhance knowledge about packaging operations in press section.
---

<b>MPGPT201.4:</b> Know about the troubleshooting in packaging organization.
--

**Note:-** The question paper will be divided into five Units containing nine questions. Students are required to attempt five questions in all. There will be two questions in each unit from I to IV and students are required to attempt one question from each unit. Unit V will have only one Compulsory question containing short notes covering the entire syllabus. All questions carry equal marks.

### UNIT I

#### INTRODUCTION

Packaging Industry, scope of packaging industry, Automotive packaging industry and various departments of packaging organization – Planning, Marketing, Pre-press, Press, Post-press, Quality, electrical, mechanical, warehousing, management practices- supply chain management, components of supply chain management systems and features of effective supply chain management.

### UNIT II

#### PACKAGE CONVERTING OPERATIONS

Lamination- Laminating process, Laminating machinery and laminating types, Different Types Of Lamination Films, Importance of lamination, Coating process, Types Of Varnish Coating-aqueous (water-based) and ultraviolet coatings, Importance of coating, Embossing/De-embossing process, Die-cutting process, Liner process, Hot and Cold Foil stamping process, Folding and Gluing.

### UNIT III

#### PACKAGE HANDLING AND STORAGE

Paperboard folding cartons, Flexible cartons, filling machine, packaging defect, shrink machine, stretch wrapping machine, Labelling and numbering - Label tracking and recognition system. Warehousing handling-pallets pick and place of product package equipment, fragile materials, receipt and dispatch, stock condition assessment, control package, preservation, delivery system.

### UNIT IV

#### CORROSION PROTECTION & PACKAGE WASTE MANAGEMENT SYSTEM

Corrosion in packaging causes of corrosion, corrosion prevention, Corrosion inhibitors, Packaging hazards –Mechanical hazards, climatic hazards and biological hazards. Package

recycling and reuse- Recycling process, Reuse, Bio compatible packaging materials- dry grass, banana bark, natural fibres composites.

### **LIST OF EXPERIMENTS**

1. Lamination
2. Study of types Of Varnish
3. Embossing/De-embossing process, Die-cutting process
4. Hot and Cold Foil stamping process,
5. Folding and Gluing
6. Paperboard folding cartons
7. stretch wrapping machine,
8. Labelling and Numbering

### References Books:

1. Joseph F. Hanlon, Robert J. Kelsey, and Hallie Forcinio, "Handbook of Package Engineering", Third Edition, CRC press, 1998
2. Walter F. Friedman, and Jerome J. Kipnas, "Industrial Packaging", Willey.
3. Hans-Hermann Braess, Ulrich Seiffert "Handbook Of Automotive Engineering", Society of Automotive Engineers, 2005
4. Walter Soroka, "Fundamentals of packaging technology", 3rd Edition, Institute of Packaging professionals, Naperville, Illinois, USA, 2002.



**MPGPT -202**  
**PACKAGING LAWS AND REGULATION**

**Time: 3 Hrs.**  
**Credits: 4**

**Total Marks: 100**  
**Theory: 75**  
**Internal Assessment: 25**

**Course Objectives:** This course is designed for theoretical understanding of Indian regulatory system for packaging industries. It provides the ability to understand packaged commodities, international laws and packaging requirements.

<b>Course Learning Outcomes:</b> The students learned about packaging Indian act, laws and regulations and Bureau of Indian Standards.
--

<b>MPGPT202.1:</b> Enhance knowledge about Indian regulatory system for packaging.
--

<b>MPGPT202.2:</b> Learn about packaged commodities, trade and commerce.
--

<b>MPGPT202.3:</b> Knowledge increase about the packaging storage requirements
--

<b>MPGPT202.4:</b> Know about the declaration and labeling, PFA, FPO etc..
--

**Note:- The question paper will be divided into five Units containing nine questions. Students are required to attempt five questions in all. There will be two questions in each unit from I to IV and students are required to attempt one question from each unit. Unit V will have only one Compulsory question containing short notes covering the entire syllabus. All questions carry equal marks.**

**UNIT I**

**INDIAN REGULATORY SYSTEM**

Introduction, The Standards of weights and Measures Act (SWMA), Standard Units, Laws, Regulations and Ministries involved, Essential Commodities Act, Agricultural Produce (Grading and Marketing) Act, Prevention of Food Adulteration Act, Codex Standard Act, Export ( Quality Control and Inspection) Act, Bureau of Indian Standards

**UNIT II**

**DECLARATIONS ON PACKAGED COMMODITIES** - Declarations for Interstate Trade and Commerce, Standard Packages, Maximum Permissible Error, Label Declarations, Standard Quantity specifications for various products, Symbols and Units used

**UNIT III**

**INTERNATIONAL LAWS AND VIOLATION OF LAW** - Uniform Weights and Measures Law, Uniform Packaging and Labelling Regulation (UPLR), Uniform Unit Pricing Regulation (UPR), Details of Violations, offences, Penalties under various sections, EU-REACH Regulations in packaging.

**UNIT IV**

**PACKAGING STORAGE REQUIREMENTS** -various storage requirements of Products, Specifications of Raw Materials used, is Specifications with respect to packaging and Packaging Materials

**PACKAGING REQUIREMENTS AND PFA** 12 Packaging requirements under PFA, Declaration and Labelling, Specification of Display panels, Statutory Requirements on Packages, PFA Enforcement methods, Fruit Products Order (FPO) Meat Food Products Order (MFPO) Agricultural Grading and Marking Rules (AGMARK), Edible Oil Packaging (Regulatory) Order.

**REFERENCES**

1. G C P Range Rao," Modern Food Packaging, Packaging Laws and Regulations", CFTRI Mysore , IIP Publications, 2005
2. The Standards of Weights and Measures act, (1976) & Standards of Weights and Measures (Packaged Commodities) Rules (1977), Rule Book, Govt. Of India.
3. BIS Rule Book, Govt. Of India.

**MPGPT -203**  
**ADVANCED SECURITY PRINTING**

**Time: 3 Hrs.**  
**Credits: 4**

**Total Marks: 100**  
**Theory: 50**  
**Practical: 25**  
**Internal Assessment: 25**

**Course Objectives:** This course is designed for theoretical understanding of different types of security printing features and methods being used in printing of Currency and other secured documents along with their practical applications in modern time.

<b>Course Learning Outcomes:</b> The students learned about the security features and methods used in security printing.
<b>MPGPT203.1:</b> To learn the types of security printing and currency printing.
<b>MPGPT203.2:</b> To enhance the knowledge of negotiable instruments printing
<b>MPGPT203.3:</b> To impart knowledge of security printing processes.
<b>MPGPT203.4:</b> Provide an overview about Security Inks and Substrates.

**Note:-** The question paper will be divided into five Units containing nine questions. Students are required to attempt five questions in all. There will be two questions in each unit from I to IV and students are required to attempt one question from each unit. Unit V will have only one Compulsory question containing short notes covering the entire syllabus. All questions carry equal marks.

UNIT I

**Security Printing :** - Introduction to Security Printing, Introduction to Currency, Certificates, Postal Stamps, Judicial and Non-judicial Stamps, Identity cards, Adhar Card. 2. **Currency Printing :-** Introduction to Currency Printing, Incorporation of Security features in currency, Design concepts for currency, Secret Patterns, Watermarks, Fine line Printing, Micro Printing, Identification standards, Secret Patterns, etc.

UNIT II

**Negotiable Instruments Printing:** - Cheque Printing, Draft Printing, Cheque numbering, coded information, MICR system-magnetic ink character recognition, CBS requirements, Instruments for identification of security features. 4. **Credit & Charge cards Printing:-** Credit card, Debit Card, Plastic Card for payment, Magnetically enclosed stripping, embossed information and holograms, caliper and dimensions, Protection, Signature panels, Identity Cards.

UNIT III

**Security Printing Processes:** - Introduction of security features by Sheet- fed Gravure, Sheet-fed offset, Web-fed gravure, Web-fed offset, Dry offset, Letterpress, Digital printing. **Modern Security Techniques:** - RFID, Bar-coding, Holography, Foils, Highresolution borders, Micro printing.

UNIT IV

**Security Inks and Substrates:-** Metallic inks, Florescent Inks, OVI, Non-convention substrates : -Non tear able paper, plastic. Watermark, Security threads. 8. **Educational Certificates:** - Security features for Degree, DMC and other secured documents of Universities and educational institutes.

## **LIST OF EXPERIMENTS**

1. Colour sequence for security printing
2. Dot loss and dot gain in film imaging
3. Study of Barcode
4. Study of RFID
5. Hologram
6. Security features of currency printing.
7. Security printing substrates and inks

### **References:**

1. Printing Guide to Systems and their uses by W.R. Durrant.
2. MICR by Kant Dabholkar Note:

## MPGPT -204

### ENVIRONMENTAL CONSIDERATIONS FOR PACKAGING

**Time: 3 Hrs.**

**Total Marks: 100**

**Credits: 4**

**Theory: 75**

**Internal Assessment: 25**

**Course Objectives:** This course is designed for theoretical understanding of environmental issues related to packaging. It provides ability to understand the various types of storage, disposing of waste material, environment policies.

<b>Course Learning Outcomes:</b> The students learned about the Research and development activities and the student will be able to:
--

<b>MPGPT204.1:</b> Enhance knowledge about various types of environmental pollutions.
---

<b>MPGPT204.2:</b> Learn about storage and disposal of waste packaging materials.
---

<b>MPGPT204.3:</b> Knowledge increase about the wastage reduction and environmental impact of printing and packaging.
---

<b>MPGPT204.4:</b> Know about the the government environmental policies packaging industries.
---

**Note:- The question paper will be divided into five Units containing nine questions. Students are required to attempt five questions in all. There will be two questions in each unit from I to IV and students are required to attempt one question from each unit. Unit V will have only one Compulsory question containing short notes covering the entire syllabus. All questions carry equal marks.**

#### UNIT I

**INTRODUCTION :** Components of environment; Environmental pollutions, its measurements and management; Air pollution and its control; Water pollution and its control; Solid wastes; Microorganisms as components of the environment; microorganisms as indicators of environmental pollution; bioorganic pollution; microbial toxicants and pollutants their biodegradation; biodegradation of plastics, biofouling; bioremediation. Packaging – Concerns on Environmental Pollution

#### UNIT II

**STORAGE & DISPOSAL OF WASTE :** Types of waste generated; Non- degradable & biodegradable wastes, Solid waste storage and disposal methods- land-filling, burial, incineration, recycling; Biological treatment of food, medical, consumer goods, pharmaceutical, industrial wastes, storage and disposal of liquid and gaseous waste; legal aspects related to storage and disposal; environmental laws; pests & their control. 25

#### UNIT III

**ENVIRONMENTAL AND WASTE MANAGEMENT ISSUES** Plastics Manufacturing and Life cycle assessment, Plastic waste management, Life Cycle Analysis, Optimization of packaging materials, Sources-Reduce, Reuse and Recycling (3R's), 7R's of Packaging, Biodegradable materials, Case Studies.

#### UNIT IV

**RECYCLING:** Waste - Collection, Sorting, Cleaning; Recycling Rate; Recycling techniques/methods – Paper/Paperboard, Plastics, Metals, Glass. Environmental policies of India, Packaging Code of Practice, International Approach - Green Dot; EU Packaging Directive. T

#### REFERENCES:

1. Ann-Christine Albertsson, "Degradable Polymer, Recycling Plastic Waste Management", Taylor & Francis Group, 1995.
2. Herbert F.Lund, "McGraw-Hill Recycling Handbook", 2nd Edition, 2001.
3. John Scheirs, "Polymer Recycling", Wiley Series in Polymer Science, 1997.
4. Joseph P. Greene, "Sustainable Plastics: Environmental Assessments", Wiley, 2014.

**MPGPT -205**  
**ORGANIZATIONAL MANAGEMENT**

**Time: 3 Hrs.**  
**Credits: 4**

**Total Marks: 100**  
**Theory: 75**  
**Internal Assessment: 25**

**Course Objectives:** This course is designed for theoretical understanding of management concepts related to organization. It provides ability to understand the various theories, principle and process of management.

<b>Course Learning Outcomes:</b> The students learned about the management process in an organisation and student will be able to:
--

<b>MPGPT205.1:</b> Enhance knowledge about various types of management.
---

<b>MPGPT205.2:</b> Learn about planning and organizing of work and staff.
---

<b>MPGPT205.3:</b> Knowledge increase about motivation and leadership.
--

<b>MPGPT205.4:</b> Know about the importance of communication and controlling
---

**Note:- The question paper will be divided into five Units containing nine questions. Students are required to attempt five questions in all. There will be two questions in each unit from I to IV and students are required to attempt one question from each unit. Unit V will have only one Compulsory question containing short notes covering the entire syllabus. All questions carry equal marks.**

**UNIT-I**

**Introduction:** Management: Concept and Nature –Types of Managers- Responsibilities and skills of Professional Manager, Functions of Management, Principles of Management, Administration vs. Management– Management Process – Levels of Management – Approaches to the study of Management. Organizational Behaviour, Change and Development: Concept, Meaning, Definition, Objectives, Importance and Limitations of OB.

**UNIT-II**

**Planning and Organizing:** Planning: Concept, Meaning and Definition, Process, Benefits and Limitations-Decision making: Concept, process & techniques- Departmentation: Concept- Basis of Power and Authority: Concept-Delegation and Decentralization: Concept and Definition, Importance and Limitations, Process – Line and Staff Organization – Conflicts between Line and Staff.

**UNIT-III**

**Motivation and Leadership:** Motivation: Concept and Definition, Types, Importance – Theories of Motivation – Motivators: Financial and Non-financial- Leadership: Concept and Definition, Importance, Styles of Leadership, Theories of Leadership- Leader vs. Manager.

**UNIT-IV**

**Communication and Control:** **Communication:** Concept and Definition, Importance, Process, Barriers to Effective Communication and Measures to Overcome Communication barriers- **Controlling:** Concept, Definition, Basic control process, Requirement of Effective control, Control Techniques.

**References:**

1. L.M.Prasad, Principles and Practice of Management, 7Ed, S.Chand Publishers, 2007.
2. Wehrich&Koonty, Essentials of Management, TMH, 1990.
3. Robbins.P, Essential of Organizational Behaviour, 10 Ed, PHI, 2010.
4. Fred Luthans, Organizational Behaviour, 11Ed, TMH, 2006.
5. K.Aswathappa, Organizational Behaviour, 5Ed, Himalaya Publishers, 2001.