

SIES (Nerul) College of Arts, Science and Commerce (Autonomous)

B.Sc. Packaging Technology

Sr. No.	Heading	Particulars
1	Title of the course	B.Sc (Packaging Technology)
2	Eligibility for admission	Amended as follows
3	Semesters	III & IV
4	Level	UG
5	Pattern	3-4 years & 6-8 semesters Choice Based Grading System
6	To be implemented from	From Academic year 2024-25 in a progressive manner

Date: 29th June, 2024

Signature:


Dr. Koel Roychoudhury

AC Chairperson




Dr. Trupti Wani

Head of the Department

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Eligibility :

1. The eligibility for admission to First Year BSc Packaging Technology

“A candidate for being eligible for admission to the degree course of Bachelor of Science Packaging Technology shall have passed XIIth standard examination in science stream conducted by the Maharashtra Board of Higher Secondary Education or its equivalent in any stream from a recognized Board, should have scored not less than 45% marks in aggregate for open category and 40% marks in aggregate in case of reserved category candidates. Students of PCM, PCB and PCMB can be allowed.”

2. The eligibility for lateral admission to Second Year BSc Packaging Technology.

“A candidate who has passed post S.S.C. (Std.X) Three Year Engineering /Technology Diploma in Printing, Packaging, Chemical, Mechanical, Plastics, Production, Electrical, Electronics, Computer, IT or their respective allied Branches with at least 50 % marks (open category) or at least 45 % marks in case of reserved category.

OR

A candidate who has passed post H.S.C. Diploma (two years after XII Std.) of Maharashtra State Board of Technical Education or A.I.C.T.E. approved or any other recognized Government body in the fields mentioned above.

OR

A candidate who has passed post H.S.C. Diploma in Pharmacy (2 years) with at least 45 % marks (open category) or at least 40 % marks in case of reserved category from an AICTE or PCI or Central or State Government approved institution or its equivalent.”

3. To discuss and approve bridge course for students taking lateral admission to Second Year BSc Packaging Technology:

“A bridge course "Primary Packaging Materials" of 4 Credits (3Th+1Pr), shall be conducted for all the candidates entering laterally in second year BSc Packaging Technology, except for candidates who have passed Diploma in Printing or Packaging or allied courses.”



Programme Objectives:

1. To learn about packaging materials, technologies, design, sustainability and quality control.
2. To gain practical skills in packaging design, testing, and production processes, as well as a deep understanding of industry regulations and standards.
3. To understand the packaging industry trends and work towards sustainable solutions.
4. To pursue higher education in packaging in India and abroad.

Programme Outcomes:

1. At the end of the program, students are able to gain thorough knowledge in key areas in the subjects offered.
2. At the end of the program, students will be able to identify, formulate and analyze scientific problems and reach concrete solutions using various principles of mathematics and sciences.
3. At the end of the program, learners will be able to design solutions for complex problems and design a process/ processes that can meet specific needs. (Attainment of this is through projects at the final year level).
4. Learners will be able to communicate effectively on scientific issues with the scientific community and society at large in writing effective reports and designing documentation, make effective presentations and give and receive instructions.
5. At the end of this programme, students will be able to hone the soft-skills required in positively enhancing their academic, professional and personal pursuits towards self and societal advancement.



Preamble

As lifestyles change, materials evolve and the race for branding and marketing continues, the Packaging Industry adapts & benefits. It is a very dynamic, fast-paced marketplace. Anyone working within the packaging industry should expect constant evolution and growth. For capable employees seeking to work in Packaging Industry, the possibilities are endless. This industry is innovative, stable, and creative. This being a specialized field requires special education and training.

The B.Sc. in Packaging Technology specializing in Packaging Materials, Designing, Quality & Testing is designed to impart advanced knowledge and skills that are practical-oriented, career and community oriented. Packaging is usually taught as an interdisciplinary field, bringing together elements from a variety of scientific realms. It has special relevance to industry application with hands-on laboratory training sessions.

The core philosophy of overall syllabus is to -

- a. Form strong foundation of Packaging Science,
- b. Introduce Packaging technologies to the students in a gradual way,
- c. Groom the students for the challenges of Packaging Industry

The curriculum is designed as per the NEP Credit Framework for 4-year UG degree programme.



SIES (Nerul) College of Arts, Science and Commerce (Autonomous)

B.Sc. Packaging Technology Programme
Sem III

(To be implemented from Academic Year- 2024-25)

No. of Courses	Course Code	Semester III	Credits
1	Major		
1	U24PT3MJ01	Ancillary Packaging Materials	03
2	U24PT3MJP01	Ancillary Packaging Materials Laboratory	01
3	U24PT3MJ02	Rigid Packaging Conversion Processes	03
4	U24PT3MJP02	Rigid Packaging Laboratory	01
2	Minor		
1	U24PT3MIP01	Graphic Design Laboratory	02
3	Open Electives (OE)		
1	U24MS3E01	Personality Development II	02
4	VSC/SEC		
1	U24PT3VSC01	Data Analytics using Excel	01
2	U24PT3VSCP01	Data Analytics using Excel Practicals	01
3	U24PT3SEC01	Total Quality Management	02
5	AEC/VEC/IKS		
1	U24PT3AEC01	Understanding Basic Forms of English Literature-1	02
6	OJT, FP, RP, CEP, CC		
1	U24CC3EMP01	Event Planning & Management	04
Total Credits			22



1 credit = 15 lectures
1 lecture/theory = 60 minutes
1 Practical = 2 hours session

COURSE CODE	TITLE	CREDITS 3 (3Th)
U24PT3MJ01	Ancillary Packaging Materials (Sem-III Major)	
Course objectives:	1. Learn and identify various kinds of ancillary materials and its properties. 2. Understand the application of ancillary materials in packaging.	
Course Outcomes:	Learners will be able to: 1. Analyze the types of adhesives and apply the concept of adhesion in the packaging for labels & tapes. 2. Choose the right label for a specific packaging application. 3. Analyze various cushioning materials and describe their properties. 4. Elaborate the functions of various closures and choose a closure for a specific application. 5. Describe the significance of coding and coatings in packaging. 6. Analyze the types of straps and describe their application in different packages.	
Unit I: Adhesion, Labels & Tapes		Lectures 15
<ul style="list-style-type: none"> Principles of Adhesion: Various theories; Surface Properties – wetting, contact angle, surface energy; Surface preparation – cleaning, etching, Corona and plasma treatment, Flame treatment; Types of adhesives – Natural/Synthetic adhesives – Water based/Solvent based/Hot melt – Adhesive applicators; Adhesives and adhesive strength evaluation – Bond, Peel, Shear; Rheological Properties – Viscosity / Tack / Wetting & environmental influences. Labels: Classification - self-adhesive, wet glue, in-mould, inserts, tags, shrink and stretch sleeve, heat sealable, thermal transfer, properties and applications. Label stocks – paper, films, Al foil – specifications and applications – Manufacturing Process & Application Methods. Tapes: Types - Kraft paper tapes, BOPP/PVC self-adhesive tapes; Tape dispensing – Manual, hand held and automatic. 		
Unit II: Cushioning & Closures		Lectures 15
<ul style="list-style-type: none"> Packaging hazards - Drop, Vibration, Shock; Types- flexible, semi-rigid and fillers. Materials – paper, plastic and wood based, foams and rubber, 2 component systems. Properties of Cushioning materials – Creep, moisture and fungus resistance; Fragility Factor and Cushion Factor Caps / Closures: Functions, Types & closure materials – Once only/Tamper-evident, Membranes, Crowns, Re-usable- Roll on – ROPP & RSNP, Lug caps, Plug type, Snap on/slip lid, lever and ring – single/double. Design features of threaded closures –Wadding Materials. Selection Criteria; Special closures – Child resistant, Elder-friendly, easy-dispensing closures, etc. 		
Unit III: Coatings, Coding & Reinforcements:		Lectures 15
<ul style="list-style-type: none"> Lacquers for Metal plate / Cans, Flexible substrates / Laminates- types and functions; Over print varnishes and coatings; Decorative coatings; Functional coatings – heat seal, barrier and protective; Coating Methods. Bar Coding- Significance, structure, parts of the code, Other types – QR Codes; Marking and coding technologies like: Small Character Inkjet, Large Character Inkjet; Thermal Transfer Coders; Laser Coders; Embossing/Debossing and Hot or Cold Stamping Machines. Strapping Materials: Metal-steel, Plastics- HDPE / PP / PET / Nylon; Types of loads; Selection Criteria; Placement; Tensioning; Crimping and Straps. 		



References:

1. K. L. Yam, The Wiley Encyclopedia of Packaging Technology, 3rd ed., Wiley, 2009
2. W. Soroka, Fundamentals of Packaging Technology, 4th ed., IoPP, 2009
3. J. F. Hanlon, Handbook of Package Engineering, 3rd ed., CRC Press, 1998
4. F. A. Paine, The Packaging User's Handbook, Springer, 1990
5. Byett J. et al., "Packaging Technology", 2nd Ed, The Institute of Packaging (SA), 2001.
6. Selke, S. E. M., Culter, J. D. and Hernandez, R. J., "Plastics Packaging: Properties, processing, Applications and Regulation", Carl Hanser Verlag, USA, 2004.

The scheme of examination shall be divided into two parts:

Internal Examination 40% i.e. 40 Marks

Semester-end Examination 60% i.e. 60 Marks

(A) Internal Assessment 40 Marks:

Description	Marks
Internal Test of 20 Marks	20
Q.1 MCQs or True / False - 10 Marks	
Q.2 Attempt two out of 3 question (5 Marks each) – 10 Marks	
Project / Case-studies / Viva Voce / Assignment / Presentation	10
Attendance & Class Behaviour	10
Total	40

(B) Semester end examination 60 Marks:

Duration - 2 Hours	Total Marks - 60
Q.1. (A) OR (B) – 12 Marks each	12
Q.2. (A) OR (B) – 12 Marks each	12
Q.3. (A) OR (B) – 12 Marks each	12
Q.4. (A) OR (B) – 12 Marks each	12
Q.5. (A) OR (B) – 12 Marks each	12
Total	60

Note:
Q.1, 2, 3 & 4 may be divided into sub-questions if required
Q.5 may include theory (short notes) or case study in one of the options.

Passing criteria: Minimum 40% in Internal (16 out of 40) and 40% (24 out of 60) in semester end examination.



COURSE CODE	TITLE	CREDITS 1 (2Pr)
U24PT3MJP01	Ancillary Packaging Materials Laboratory (Sem-III Major)	
Course objectives:	1. Understand the various testing methods employed on ancillary packaging materials.	
Course Outcomes:	Learners will be able to: 1. Perform the various testing methods on ancillary packaging materials and analyse the results	
List of Practicals: (Minimum 8 to be performed)		
<ol style="list-style-type: none"> 1. Determination of adhesive coating weight of a self-adhesive label. 2. Determination of rolling ball tack for a given tape sample. 3. Determination of viscosity of a given sample of adhesive / coating. 4. Determination of 90° Peel Adhesion of self-adhesive label 5. Determination of 180° Peel Adhesion of self-adhesive label 6. Determination of Loop Tack for given label sample. 7. Measure a given cushion's density. 8. Measure the closure dimensions. 9. Measure the opening & closing torque of a closure. 10. Measure the tensile strength & elongation for strap. 11. Perform scotch tape test for given coated sample. 12. Perform strapping operation. 		

Scheme of Examination

Practical Examination:

Paper Pattern:

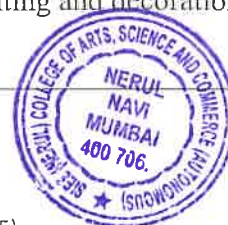
1. Major Experiment: 20 Marks
2. Minor Experiment: 10 Marks
3. Journal: 10 Marks
4. Viva Voce: 10 Marks

Note:

1. Practical Examination to be conducted as per syllabus enlisted.
2. Candidates are required to present certified journal on the day of practical examination.



COURSE CODE	TITLE	CREDITS 3 (3Th)
U24PT3MJ02	Rigid Packaging Conversion Processes (Sem-III Major)	
Course Objectives:	1. Understand the various conversion processes employed in the manufacturing of rigid packages. 2. Understand the principle of working of the machines used in the conversion processes.	
Course Outcomes:	Learners will be able to: 1. Explain the various box conversion processes for making rigid boxes out of paper-based materials. 2. Explain the various conversion processes for making rigid packaging out of plastic materials. 3. Describe the processes for making special containers with the help of combination of various packaging materials. 4. Choose a specific rigid conversion process based on the understanding of the nature of the product and its market.	
Unit I: Paper-based Box Conversion		Lectures 15
<ul style="list-style-type: none"> Folding Carton Manufacturing Process: Board Sizes & Types, Carton Designs, Printing, Cutting and Creasing (Rotary / Flatbed), Creasing & Folding, Embossing, Gluing, Special features: Windowing, Waxing, Packaging operations: Speed, Side-seam gluing, erection of flat cartons, operating efficiency and storage. Liquid Packaging Carton designs: Gable top, Pyramid shape, Brick shape, etc., Applications Rigid Boxes: Styles, Boards, Adhesives and manufacturing, Applications Corrugated Fibreboard Box Manufacturing Process: Standard & Special Types / Designs, Fluting roll profiles, Deckle Size & Cut Length, Creasing & Slotting, Die Punching, Different CFB Configurations, Printing, Applications Solid Fibreboard Boxes: Types & Manufacture, Applications. 		
Unit II: Rigid Plastics Packaging		Lectures 15
<ul style="list-style-type: none"> Injection Moulding: Principle of working, Plastic Materials commonly used, Screw Type & Ram-Type Injection, Cycle time, defects, efficiency and packaging applications. Extrusion (for sheets & cylindrical containers): Principle of working, Plastic Materials commonly used defects, efficiency and packaging applications Blow Moulding: Principle of working for extrusion blow, injection blow and injection stretch blow moulding, Plastic Materials commonly used, defects and packaging applications. Rotational Moulding & Compression Moulding: Principle of working, materials commonly used, defects and packaging applications. 		
Unit III: Other Rigid Conversion Processes		Lectures 15
<ul style="list-style-type: none"> Thermoforming: Types, Plastic materials commonly used, Different forming processes, defects & packaging applications. Composite Cans: Manufacturing methods - Convolute winding, Spiral winding, Linear draw, Single wrap, Materials commonly used – Liner, Paperboard, labels, Printing, Designs – Opening & closing systems, defects & packaging applications. Fibre Drums and Metal Drums: Manufacturing process, Materials used, defects & packaging applications. Moulded pulp packaging - Raw materials, Production, Product drying, Printing and decoration, Defects & Packaging Applications 		



References:

1. Handbook of Paper and Board, Herbert Holik, Wiley-VCH, 2006.
2. Paper and paperboard Packaging Technology, Mark J. Kirwan, Blackwell Publishing, 2005.
3. Handbook of Pulp Vol.1, Herbert Sixta, Wiley-VCH, 2005.
4. Handbook for pulp and paper technologists, G.A. Smook, Angus Wilde Publications, 2001.
5. "The Wiley Encyclopedia of Packaging Technology", 2nd Edition, Wiley, New York, USA, 1995
6. R. E. Mark, C. C. Habeger, Jr., J. Borch and M. B. Lyne, "Handbook of Physical Testing of Paper", 2nd Edition, Marcel Dekker, 2002
7. Twede, D. and Selke, S. E. M., "Cartons, Crates and Corrugated Board – Handbook of Paper and Wood Packaging Technology", DEStech Publications, 2005.
8. Strong A. B., "Plastics: Materials and Processing", 3rdEd, Pearson-Prentice Hall, 2006.
9. Selke, S. E. M., Culter, J. D., Hernandez, R. J., "Plastics Packaging: Properties, processing, Applications and Regulation", Carl Hanser Verlag, USA, 2004.
10. Athalye A. S., "Handbook of Packaging Plastics", 1stEd., Multi Tech Publishing Co., 1999.
11. Tinplate in Packaging, Indian Institute of Packaging
12. Aluminium in Packaging, Indian Institute of Packaging
13. The Complete Technology Book on Aluminium and Aluminium Products, Asia Pacific Business Press, 2007

The scheme of examination shall be divided into two parts:

Internal Examination 40% i.e. 40 Marks

Semester-end Examination 60% i.e. 60 Marks

(A) Internal Assessment 40 Marks:

Description	Marks
Internal Test of 20 Marks	20
Q.1 MCQs or True / False - 10 Marks	
Q.2 Attempt two out of 3 question (5 Marks each) – 10 Marks	
Project / Case-studies / Viva Voce / Assignment / Presentation	10
Attendance & Class Behaviour	10
Total	40

(B) Semester end examination 60 Marks:

Duration - 2 Hours	Total Marks - 60
Q.1. (A) OR (B) – 12 Marks each	12
Q.2. (A) OR (B) – 12 Marks each	12
Q.3. (A) OR (B) – 12 Marks each	12
Q.4. (A) OR (B) – 12 Marks each	12
Q.5. (A) OR (B) – 12 Marks each	12
Total	60
Note: Q.1, 2, 3 & 4 may be divided into sub-questions if required Q.5 may include theory (short notes) or case study in one of the options.	

Passing criteria: Minimum 40% in Internal (16 out of 40) and 40% (24 out of 60) in semester end examination.



COURSE CODE	TITLE	CREDITS 1 (2Pr)
U24PT3MJP 02	Rigid Packaging Laboratory (Sem-III Major)	
Course objectives:	1. Understand the various testing methods employed on rigid packaging.	
Course Outcomes:	Learners will be able to: 1. Perform the various testing methods on rigid packaging and analyse the results	
List of Practicals: (Minimum 8 to be performed)		
<ol style="list-style-type: none"> 1. Perform Box compression test for CFB / Rigid Box / SFB. 2. Perform folding endurance of a given paperboard sample. 3. Measure top load test for a plastic pail. 4. Measure top load test for a given bottle. 5. Measure leakage for a given bottle. 6. Measure overall dimensions of a given plastic bottle (diameter, height, thickness, ovality) 7. Determination of brimful capacity of a given bottle. 8. Perform handle pull test on a plastic pail. 9. Study of Environmental Stress Crack Resistance of given moulded plastic items. 10. Perform compression load testing on PP Sheet boxes. 		

Practical Examination:

Paper Pattern:

1. **Major Experiment:** 20 Marks
2. **Minor Experiment:** 10 Marks
3. **Journal:** 10 Marks
4. **Viva Voce:** 10 Marks

Note:

1. Practical Examination to be conducted as per syllabus enlisted.
2. Candidates are required to present certified journal on the day of practical examination.



COURSE CODE	TITLE	CREDITS 1 (2Pr)
U24PT3MI01	Graphic Design Laboratory (Sem-III Minor)	
Course objectives:	1. Study the basics of how to create a design. 2. Understand the fundamental principles of graphic design & their types. 3. Study the concept of colour and their effects on design. 4. Understand the method to create visual image and layout. 5. Learn and understand the various softwares used for designing.	
Course Outcomes:	Learners will be able to: 1. Create a design based on specific requirement. 2. Analyze the usage of particular colour & text in Package design. 3. Generate various design layouts with proper visual impacts. 4. Create a design for folding carton with appropriate software. 5. Edit an image and use it in a Package design. 6. Generate Logos for a given concept or product.	
List of Practicals: (Minimum 8 to be performed)		
1. To create thumbnails and rough sketches based on theme selected for the design. 2. To prepare an appropriate Layout for the selected design. 3. To edit an image using Adobe Photoshop / Illustrator / CorelDraw 4. To create a logo design. 5. To apply various effects on the image using editing software 6. To prepare a brochure using CorelDraw. 7. To create a design layout for folding carton of given dimensions 8. To create a label design for any given product. 9. To design commercial print products.		

Assignments: Minimum one write-up on each of the following topics:

1. Case study of Layout and Typography used in current Package design / Folding carton design
2. Case study of Flexible package / Label design.

The assignments shall be given on the basis of live problems / packages.

Practical Examination:

1. **Design Practical:** 30 Marks
2. **Assignments:** 10 Marks
3. **Journal:** 10 Marks

Note:

1. Practical Examination to be conducted as per syllabus enlisted.
2. Candidates are required to present certified journal on the day of practical examination.



**Open Electives (OE)/ Generic Electives
(Offered by the Department of Management Studies)**

Personality Development - II

COURSE CODE: U24MS3E01

COURSE CREDIT: 02

1 credit - 15 lectures

1 lecture- 60 minutes

Course Objectives (CO)

1. Define key leadership styles and their applications.
2. Analyze the impact of communication styles on leadership effectiveness.
3. Explain the concept of a growth mind-set and its role in leadership development.
4. Discuss strategies for motivating individuals and teams.

Learning Outcomes

1. Develop a strong foundation of leadership and
2. Learn leadership communication
3. Enhance your ability to motivate and inspire others
4. Build confidence in conflict resolution and decision-making

Unit No.	Topic	No. of Lectures required
Unit-I	The Foundations of Leadership <ul style="list-style-type: none">• Defining leadership styles (e.g., transformational, democratic, servant)• Understanding the role of vision, mission, and values• Developing a growth mind-set and embracing challenges Effective Communication for Leaders <ul style="list-style-type: none">• Delivering clear, concise, and inspiring messages• Practicing active listening and providing constructive feedback	10
Unit-II	Motivation and Delegation <ul style="list-style-type: none">• Understanding what motivates individuals and teams• Setting SMART goals (Specific, Measurable, Achievable, Relevant, Time-bound)• Empowering team members and delegating	20



	effectively	
	<input type="checkbox"/> Conflict Resolution and Decision-Making <ul style="list-style-type: none"> • Developing strategies for navigating difficult conversations • Fostering a collaborative approach to problem-solving • Making sound decisions under pressure <input type="checkbox"/> Leading with Influence <ul style="list-style-type: none"> • Understanding persuasion techniques and building buy-in • Fostering innovation and a culture of creativity • Leading by example and embodying your values 	
	<ul style="list-style-type: none"> • Total Lectures 	30

Course Activities:

- Self-Assessments: Identify your leadership strengths and areas for development.
- Interactive Exercises: Practice communication techniques, role-playing leadership scenarios.
- Case Studies: Analyze real-world leadership challenges and develop solutions.
- Action Planning: Create a personalized roadmap to implement learned skills



SCHEME OF EXAMINATION:

Continuous Evaluation Pattern

Description	Marks
Online Quiz	10
Individual Assignment	10
Group Project	25
Class Participation	5
Total	50

Passing criteria: Minimum 40% ie 20 marks out of 50

References:-

Neelamegam,V.(2010). Business Environment.New Delhi:Vrinda Publications.

1. Fernando.A.C.(2011). Business Environment. Chennai: Dorling Kinderslay (India) Pvt.Ltd. Licenses of pearson education in South Asia.
2. John F. Kennedy: "Special Message to the Congress on Protecting the Consumer Interest.," March 15, 1962. Online by Gerhard Peters and John T. Woolley, The American Presidency Project. <http://www.presidency.ucsb.edu/ws/?pid=9108>.
3. The Consumer Protection Act, 1986 (Amended up-to 2002)
4. United Nations guidelines for consumer protection retrieved from <http://unctad.org/en/Pages/DITC/CompetitionLaw/UN-Guidelines-on-Consumer-Protection.aspx>
5. Chaudhary et al. (2011), Consumer Protection and Consumerism In India, Zenith International Journal of Multidisciplinary Research.Vol.1 Issue 1,pp. 01-12.
6. Consumerism and Its Historical Aspects With Future Perspective retrieved from http://shodhganga.inflibnet.ac.in/bitstream/10603/4464/13/13_chapter%204.pdf
7. <http://www.legalservicesindia.com/article/article/consumerprotectionlawinindia17391.html>
8. <http://www.legalserviceindia.com/article/l220PhenomenonOfConsumerism.htm>

Data Analytics using Excel

COURSE CODE: U24PT3VSC01

COURSE CREDIT: 01

1 credit - 15 lectures

1 lecture is 60 minutes

Course Objectives:

Students will be able to understand the concept of data management with the help of Microsoft Excel and its various functions

Course Outcomes:

To be able to format, organize and calculate data in a spreadsheet by understanding Microsoft Excel and its Functions.

Sr. No	Syllabus	No. of lectures
01	<p>Basic functions of Excel: Introduction to Excel functions: SUM, AVERAGE, COUNT. Logical functions: IF, AND, OR for decision-making in formulas. Sorting and filtering: Organizing and analyzing data to identify patterns. Text Functions: Utilizing functions like CONCATENATE, LEFT, RIGHT, MID for text manipulation. Date and Time Functions: Using functions such as TODAY, NOW, DATE, TIME for handling date and time data effectively.</p> <p>Lookup Functions and Pivot Tables: Vlookup/Hlookup, Index and Match, Creating Smooth User Interface Using Lookup, Nested VLookup. Creating Simple Pivot Tables, Basic and Advanced Value Field Setting, Classic Pivot table, Choosing Field, Filtering Pivot Tables, Modifying PivotTable Data, Grouping based on numbers and Dates, Calculated Field & Calculated Items</p> <p>Charts and Graphs: Creating basic charts: Column, bar, and pie charts to visualize data. Customizing charts: Formatting elements, axes, titles, and legends for clarity. Adding trendlines: Visualizing trends and forecasting future data points.</p>	15

References:

Text Books

1. Advanced Excel Essentials, Jordan Goldmeier, Apress
2. Data Analysis with Excel, Manisha Nigam, BPP publications

Reference Books

1. Advanced Excel Formulas, Murray Alan, Apress
2. Mastering Advanced Excel, Ritu Arora, BPP publications



Data Analytics using Excel Practicals


COURSE CODE: U24PT3VSCP01

COURSE CREDIT: 01

1 credit - 2 lectures

1 lecture is 60 minutes

Sr.No.	List of Practicals
1	<p>A worksheet contains Roll Number , Marks in 2 subjects for 50 students in a class. Calculate Result and Grade using the following: A student is declared as PASS if he gets 40 or more in both the subjects , Otherwise FAIL. All FAILED students will be given Grade IV For PASSED students Grade will be obtained as follows :</p> <p>AVERAGE GRADE >=60 I <60 but >=50 II <50 but >=40 III</p>
2	<p>The following worksheet contains Name & Sales of 10 salesmen .Calculate commission as per the following: Sales Commission First 30,000 5% Next 40,000 10% Excess 15%</p>
3	<p>The following worksheet contains Name & Taxable Income for 50 employees. Calculate Income Tax Surcharge and Total Tax for the following worksheet Income Tax is calculated as follows :</p> <p>Taxable Income Income tax First 1,50,000 Nil Next 1,00,000 10% Next 75,000 20% Excess 30% Surcharge is 3% on Income Tax if Taxable income is above 5,00,000</p>
4	<p>A worksheet contains NAME GENDER CLASS CATEGORY FEES data for 15 students Filter the worksheet to show</p> <ol style="list-style-type: none"> a) Female students from Reserved category b) Male students from TY c) Open category students paying fees > 3000
5	<p>A worksheet contains name and marks in 3 subjects . Calculate Total Marks</p> <ol style="list-style-type: none"> a) Construct 3D Pie Chart for Total marks b) Construct 2D Line Chart for Subject 1 and Subject 3 c) Construct 2D Column Chart for Sub1,Sub2,Sub3 d) Construct Stacked Column Chart for Sub1,Sub2,Sub3

6	<p>For the following worksheet containing amount spent for various items during the year , prepare scenarios using What if Analysis where</p> <p>a) Machinery increases to 80,000 , carriage increases to 9000 & Postage increases to 8000</p> <p>b) Carriage increases to 10,000 Office equipment increases to 7000 and postage increases to 9000</p> <table border="1" data-bbox="327 392 1037 790"> <thead> <tr> <th></th> <th>A</th> <th>B</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Items</td> <td>Costs</td> </tr> <tr> <td>2</td> <td>Machinery</td> <td>60000</td> </tr> <tr> <td>3</td> <td>Carriage</td> <td>8000</td> </tr> <tr> <td>4</td> <td>Transport</td> <td>30000</td> </tr> <tr> <td>5</td> <td>Office equipment</td> <td>6000</td> </tr> <tr> <td>6</td> <td>Postage</td> <td>7000</td> </tr> <tr> <td>7</td> <td>Miscellaneous</td> <td>3000</td> </tr> <tr> <td>8</td> <td>Generator</td> <td>5000</td> </tr> <tr> <td>9</td> <td>Total</td> <td>119000</td> </tr> </tbody> </table>		A	B	1	Items	Costs	2	Machinery	60000	3	Carriage	8000	4	Transport	30000	5	Office equipment	6000	6	Postage	7000	7	Miscellaneous	3000	8	Generator	5000	9	Total	119000
	A	B																													
1	Items	Costs																													
2	Machinery	60000																													
3	Carriage	8000																													
4	Transport	30000																													
5	Office equipment	6000																													
6	Postage	7000																													
7	Miscellaneous	3000																													
8	Generator	5000																													
9	Total	119000																													
7	<p>For the following worksheet obtain the solution for the cost price so that the profit will be 20000</p> <table border="1" data-bbox="347 907 1177 1048"> <thead> <tr> <th></th> <th>A</th> <th>B</th> <th>C</th> <th>D</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>CP</td> <td>ADVT</td> <td>SP</td> <td>PROFIT</td> </tr> <tr> <td>2</td> <td>9000</td> <td>900</td> <td>22000</td> <td></td> </tr> <tr> <td>3</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>		A	B	C	D	1	CP	ADVT	SP	PROFIT	2	9000	900	22000		3														
	A	B	C	D																											
1	CP	ADVT	SP	PROFIT																											
2	9000	900	22000																												
3																															
8	<p>Maximize the profit for the following</p> <p>Current selling price of the bridal costume is Rs. 22000, The cost price is Rs. 10,000 The advertising expenses are Rs.500</p> <p>The constraints are :</p> <p>The cost budget should be between Rs.9000 and Rs.12000 & the advertising expenditure ranges between Rs. 400 and Rs.1000</p>																														
9	<p>The worksheet contains Roll.Nos. & Marks in 5 subject of a student. Calculate his grades as per the following using HLOOKUP :</p> <table data-bbox="327 1400 558 1579"> <thead> <tr> <th>Marks</th> <th>Grades</th> </tr> </thead> <tbody> <tr> <td>0-40</td> <td>4</td> </tr> <tr> <td>40-50</td> <td>3</td> </tr> <tr> <td>50-60</td> <td>2</td> </tr> <tr> <td>60 & above</td> <td>1</td> </tr> </tbody> </table>	Marks	Grades	0-40	4	40-50	3	50-60	2	60 & above	1																				
Marks	Grades																														
0-40	4																														
40-50	3																														
50-60	2																														
60 & above	1																														
10	<p>The worksheet contains Names & Sale for 10 salesmen. Calculate their bonus as per the following using VLOOKUP :</p> <table data-bbox="327 1713 598 1993"> <thead> <tr> <th>Sale</th> <th>Bonus</th> </tr> </thead> <tbody> <tr> <td>0-30000</td> <td>0</td> </tr> <tr> <td>30000-40000</td> <td>3000</td> </tr> <tr> <td>40000-50000</td> <td>4000</td> </tr> <tr> <td>50000-60000</td> <td>5000</td> </tr> <tr> <td>60000-70000</td> <td>6000</td> </tr> <tr> <td>70000-80000</td> <td>7000</td> </tr> <tr> <td>80000 & above</td> <td>8000</td> </tr> </tbody> </table> 	Sale	Bonus	0-30000	0	30000-40000	3000	40000-50000	4000	50000-60000	5000	60000-70000	6000	70000-80000	7000	80000 & above	8000														
Sale	Bonus																														
0-30000	0																														
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50000-60000	5000																														
60000-70000	6000																														
70000-80000	7000																														
80000 & above	8000																														

11	<p>The following worksheet contains Customer No. , Number of units consumed for 10 customers.</p> <p>Calculate their bill amount as per the following using LOOKUP:</p> <p>Number of units Rate</p> <p>< 200 Rs. 3</p> <p>>=200, < 500 Rs. 6</p> <p>>= 500 Rs. 10</p>
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SCHEME OF EXAMINATION

The scheme of examination shall be divided into two parts:

- Practical assessment 40% i.e. 20 marks
- Semester end examination 60% i.e. 30 mark

(A) Practical Assessment 20 marks

Description	Marks
One question of 10 marks practical	10
Journal	5
Viva	5
Total	20

(B) Semester end examination 30 marks PAPER PATTERN

Duration: 1 hours	
Total Marks: 30	
Description	Marks
Q.1 10 marks OR 10 marks	10
Q.2 10 marks OR 10 marks	10
Q.3 10 marks OR 10 marks	10
Total	30
<p>Note:</p> <p>3. Q.1, 2, 3 may be divided into sub questions if required.</p> <p>4. Q.3 May include theory (short notes) /Case Study in one of the options.</p>	

- Passing criteria: Minimum 40% in Internal (8 out of 20) and 40% (12 out of 30) in semester end examination.



COURSE CODE	TITLE	CREDITS 2 (2Th)
U24PT3SEC01	Total Quality Management (Sem-III SEC)	
Course Objectives:	1. To understand the various principles, practices of TQM to achieve quality. 2. To learn the various statistical approaches for Quality control & TQM Tools 3. To learn the importance of ISO and Quality systems	
Course Outcomes:	Learners will be able to: 1. Explain the importance of TQM and its history in manufacturing & services. 2. List and explain various TQM Tools 3. Describe the use of quality tools for root cause analysis and measure performance	
Unit I: Introduction to Quality		Lectures 15
<ul style="list-style-type: none"> • Concept & Definition, Dimensions of product & service quality, Historical perspective of quality control and improvements starting from World War II, Historical perspective of Quality Gurus. • Introduction to Six-Sigma: Overview of Six Sigma, Lean Manufacturing and Total Quality Management (TQM). • Basic concepts of TQM – TQM Framework – Contributions of Quality Gurus – Barriers to TQM – Cost of Quality – Quality statements – Customer focus – Customer orientation. TQM culture, Leadership – quality council, employee involvement, motivation, empowerment, recognition and reward – TQM framework, benefits, awareness and obstacles. Employee involvement – Motivation, Empowerment, Team and Teamwork. 		
Unit II: Quality System & Standards		Lectures 15
<ul style="list-style-type: none"> • Introduction to IS/ISO 9004 Quality Management – Need, Elements, Requirements and Benefits – Guidelines for performance improvements. Quality Audits. PDCA cycle. Supplier partnership – Partnering, selection, Rating. ISO 9001 • Need for SQC in industries. Statistical Process Control: Seven tools of SPC. • Quality circles – Quality Function Deployment (QFD) – Taguchi quality loss function – TPM – Concepts, improvement needs – Performance measures – BPR – Pareto Charts – Ishikawa/Fish Bone diagram 		

References:

1. Er. H.P Garg, "Industrial Maintenance", S. Chand
2. Dale H. Besterfield, "Total Quality Management", PEARSON Prentice Hall
3. Samuelson & Nordhaus, "Economics", Tata McGRAW – Hill Edition
4. Oakland, J.S. (1989): "Total Quality Management", Butterworth–Heinemann Ltd., Oxford
5. Zeiri (1991): "Total Quality Management for Engineers", Wood Head Publishers.
6. 12.Juran J.M and Frank M.Gryna Jr .(1982): "Quality Planning and Analysis", TMH, India.



The scheme of examination shall be divided into two parts:

Internal Examination 40% i.e. 20 Marks

Semester-end Examination 60% i.e. 30 Marks

(A) Internal Assessment 20 Marks:

Description	Marks
Assignments / Presentations	10
Case-studies	5
Attendance & Class Behaviour	5
Total	20

(B) Semester end examination 30 Marks:

Duration - 1 Hour	Total Marks - 30
Q.1. (A) OR (B) – 10 Marks each	10
Q.2. (A) OR (B) – 10 Marks each	10
Q.3. (A) OR (B) – 10 Marks each	10
Total	30
Note: Q.1, 2 may be divided into sub-questions if required Q.3 may include theory (short notes) or case study in one of the options.	

Passing Criteria: Minimum 40% in Internal (8 out of 20) and 40% (12 out of 30) in end semester examination



Understanding Basic Forms of English Literature-1

(To be implemented from AY 2024-25)

Semester-III

[Syllabus for SY B.Com (General), SY B.Com. (B.A.F/B.B.I./B.F.M.),
SY B.Sc. (Computer/I.T./F.V.S./Packaging Technology), SY BMS and SY BAMMC]

COURSE CODE: U24PT3AEC01

COURSE CREDIT: 02

1 credit - 15 lectures

1 lecture is of 60 minutes

* Course Objectives:

1. To develop analytical skills and critical thinking through close reading of literary texts
2. To cultivate appreciation of language as an artistic medium and to help students to understand the importance of forms, elements and style that shape literary works

* Course Outcomes:

1. Learner will be able to recognize the culture and context of the work of literature
2. Learner will be able to imbibe the underlying philosophy and values reflected in literature

Module-1 Study of Poetry (Total 15 Lectures)

1. William Wordsworth: *The Solitary Reaper*
2. Edgar Albert Guest: *Don't Quit*
3. Nissim Ezekiel : *Island*
4. Kamala Das: *An Introduction*
5. Arun Kolatkar : *The Breakfast Time at Kala Ghoda*

Module-2 Study of Novel (Total 15 Lectures)

Lord of The Flies by William Golding



SCHEME OF EXAMINATION

The scheme of examination shall be divided into two parts:

- Internal assessment 40% i.e.20 marks
- Semester end examination 60% i.e.30 marks

• **A) Internal Assessment: Total 20 Marks**

1	* Continuous Evaluation	10 Marks
2	Poetry Recitation /Presentation	05 Marks
3	Attendance	05 Marks

**Application oriented activities will be conducted*

B) Semester end examination 30 marks

Question no.1	A) OR B) Descriptive Question Module no.1	10 Marks
Question no.2	A) OR B) Descriptive Question Module no.2	10 Marks
Question no.3	A) Short Notes 2 out of 3 Module no.1 (5 Marks each) OR B) Short Notes 2 out of 3 Module no.2 (5 Marks each)	10 Marks

Passing Criteria: 40% in Internal as well as in External(i.e.8 Marks in Internal exam of 20 marks and 12 marks in External exam of 30 marks respectively)



EVENT PLANNING & MANAGEMENT

COURSE CODE: U24CC3EMP01

COURSE CREDIT: 04

1 credit - 15 lectures

1 lecture is 60 minutes.

Course Objectives:

1. Students will learn to plan, organize, and execute diverse events, manage logistics, coordinate with vendors, adhere to budgets, and comply with regulations and safety standards.
2. Students will design and implement marketing and communication plans, understand target audiences, utilize digital platforms, create promotional materials, and employ public relations to enhance event visibility of the event.

Course outcomes:

1. Students will effectively organize and manage events, demonstrating skills in logistics, vendor coordination, budget management, and compliance, resulting in successful events that meet goals and ensure client satisfaction.
2. Students will design and implement effective marketing strategies, identifying target audiences, leveraging digital platforms, creating promotional materials, and using public relations to boost event visibility, attendance, and engagement.

Sr. No.	Syllabus	No of Lectures
1	Module - I: Introduction to Event Management	15
	Meaning and Definition of Event Management, Significance of EM in various sectors, Scope and opportunities in the field of EM, Understanding the key components of EM.	
2	Module - II: Event Planning & Team Management	15
	Significance of proper event planning, role of event planning in establishing objectives, creating budgets, and managing resources, Challenges in Event Planning: constraints, budget limitations, logistical issues, etc. SWOT Analysis. Benefits of effective team management, Importance of clear communication and delegation of tasks, Team Building and Leadership.	
3	Module - III: Event Promotion	15



	Meaning and definition of Event Marketing, Role of marketing and advertising in attracting attendees and promoting events, Branding and Publicity, Digital Marketing Techniques, Event Photography and Video Arrangement, Reporting and Analysis.	
4	Module -IV: Event Execution:	15
	Event Operations and logistics, Health, Safety, and Compliance, On-site Event execution, Communication and coordination of event team, Evaluation and Feedback, and Post-Event Activities. A practical example of event planning covers every step from inception to conclusion.	
Total Lectures		60

SCHEME OF EXAMINATION

Total Marks: 50

Continuous evaluation pattern.

Evaluation Criteria	Marks
Actual planning and execution of events at college/ local/ University/ State/ National level and its detailed report and viva	40
Participation in any major events and review writing from the vicinity.	20
Writing a summary of any global events	20
Attendance in seminar / workshop & Training session	20
Total	100



SIES (Nerul) College of Arts, Science and Commerce (Autonomous)

B.Sc. Packaging Technology Programme
Sem IV

(To be implemented from Academic Year- 2024-25)

No. of Courses	Course Code	Semester IV	Credits
1	<i>Major</i>		
1	U24PT4MJ01	Package Printing & Decoration	03
2	U24PT4MJ02	Flexible Packaging Conversion Processes	02
3	U24PT4MJP02	Flexible Packaging Laboratory	01
4	U24PT4MJ03	Statistics for Packaging QA / QC	02
2	<i>Minor</i>		
1	U24PT4MI01	Structural Packaging Design	02
2	U24PT4MIP01	Structural Packaging Design Laboratory	02
3	<i>Open Electives (OE)</i>		
1		Any One – (U24ES4E01-Environmental Toxicology and Risk assessment (EVS) / U24MMC4E01-Photography (BAMMC) / U24BI4E01- financial Literacy/ U24AF4E01 – Investment Management)	02
4	<i>VSC/SEC</i>		
1	U24PT4SEC01	Digital Marketing	02
5	<i>AEC/VEC/IKS</i>		
1	U24PT4AEC01	Understanding Basic Forms of English Literature-2	02
6	<i>OJT, FP, RP, CEP, CC</i>		
1	U24CC4IM01	Introduction to Indian Music	04
Total Credits			22

1 credit = 15 lectures

1 lecture/theory = 60 minutes

1 Practical = 2 hours session



COURSE CODE	TITLE	CREDITS 3 (3Th)
U24PT4MJ01	Package Printing & Decoration (Sem-IV Major)	
Course objectives:	1. Learn and identify various kinds of ancillary materials and its properties. 2. Understand the application of ancillary materials in packaging.	
Course Outcomes:	Learners will be able to: 1. Describe the colour theory and prepress operations before printing. 2. Explain various types of printing processes used in packaging along with their advantages & disadvantages. 3. Elaborate on the types of combination presses and post press operations.	
Unit I: Introduction & Letterpress		Lectures 15
<ul style="list-style-type: none"> • Introduction to Printing, Color Theory, RGB & CMYK, Artwork and Design, Ordering Process, Print Order Checklist, Overruns and Underruns, Inks, Prepress • Printing Processes - Letterpress: Principle, Composition, imposition and printing. Substrates. Advantages & Disadvantages • Flexography: Principle, Preparing the printing plates (photopolymer), plate mounting, Ink application, Substrate feeding, Printing and image transfer, Drying or curing. Substrates. Advantages & Disadvantages 		
Unit II: Lithography, Gravure		Lectures 15
<ul style="list-style-type: none"> • Lithography / Offset: Principle, Substrate Preparation, Plates, Cylinders (Plate & Blanket), Ink fountain & roller, quality. Sheet fed vs Web. Substrates. Advantages & Disadvantages • Gravure/Intaglio: Principle, Image preparation, Cylinder preparation / engraving, Inking & wiping, Printing & drying, Quality. Substrates. Inks (solvent / water based). Advantages & Disadvantages 		
Unit III: Screen & Digital Printing, Combination Presses & Post Press		Lectures 15
<ul style="list-style-type: none"> • Screen Printing: Principle, Making stencils, Coating the screen, exposing the screen, registering & proofing the print, printing. Substrates. Advantages & Disadvantages • Digital Printing: Principle, Digital Images printed directly to substrates, Types – Inkjet & Laser. Substrates. Advantages & Disadvantages • Combination Presses & Post Press: flexo, UV flexo, rotary screen, letterpress, offset, gravure, hot foil stamping, cold foil stamping, embossing, etc. Advantages & Disadvantages. Folding, Cutting, Collating, UV, Lamination, Varnishing, etc. • New-Age Technology – Printed Electronics, Conductive Inks, Security Printing and others. 		

References:

1. Kipphan H., "Handbook of Print Media", Springer Publications
2. Barnard M., "Handbook of Print and Production", John Peacock.
3. J. Anthony Bristow, "Printing Materials Science & Technology" Vol. 24
4. "The Complete technology book on Printing Inks", Asia Pacific Business Press
5. Typesetting – Composition – Geoff, Barlow
6. Handbook of Typography – Kailas Tahle



7. Printing Technology 5th edition, Michael Adams

8. Peacock J., Barnard, M., "The Print and Production manual", PIRA International

The scheme of examination shall be divided into two parts:

Internal Examination 40% i.e. 40 Marks

Semester-end Examination 60% i.e. 60 Marks

(A) Internal Assessment 40 Marks:

Description	Marks
Internal Tests of 20 Marks	20
Q.1 MCQs or True / False - 10 Marks	
Q.2 Attempt two out of 3 question (5 Marks each) – 10 Marks	
Project / Case-studies / Viva Voce / Assignment / Presentation	10
Attendance & Class Behaviour	10
Total	40

(B) Semester end examination 60 Marks:

Duration - 2 Hours	Total Marks - 60
Q.1. (A) OR (B) – 12 Marks each	12
Q.2. (A) OR (B) – 12 Marks each	12
Q.3. (A) OR (B) – 12 Marks each	12
Q.4. (A) OR (B) – 12 Marks each	12
Q.5. (A) OR (B) – 12 Marks each	12
Total	60

Note:
Q.1, 2, 3 & 4 may be divided into sub-questions if required
Q.5 may include theory (short notes) or case study in one of the options.

Passing criteria: Minimum 40% in Internal (16 out of 40) and 40% (24 out of 60) in semester end examination.



COURSE CODE	TITLE	CREDITS 2 (2Th)
U24PT4MJ02	Flexible Packaging Conversion Processes (Sem-IV Major)	
Course objectives:	1. Learn and identify various types of flexible packaging 2. Understand the different processes available today to manufacture multilayer flexible packaging	
Course Outcomes:	Learners will be able to: 1. Explain the various processes employed to manufacture flexible packaging. 2. Identify and write the multilayer structures for a given laminate sample. 3. Explain the importance of barrier properties in flexible packaging. 4. Describe the advantages of plastic vs paperbased flexible packaging.	
Unit I: Flexible Packaging Introduction		Lectures 15
<ul style="list-style-type: none"> • Extrusion Process – Cast Film Extrusion process and Blown Film Extrusion Process to manufacture films and sheets. • Permeability Through Multilayers – Understanding Barrier Properties. • Co-extrusion process for making multilayer packaging films. Various Multilayer Structures that can be coextruded with packaging applications. • Vacuum / Barrier Metallisation Process – Aluminium and Aluminium Oxide (AlOx) • Extrusion Coating and Lamination Process for multilayer packaging. Various Multilayer Laminate Structures with packaging applications • Methodology for writing / representing films and multilayer structures. 		
Unit II: Multilayer Plastic Pouches / Paper Flexible Packaging		Lectures 15
<ul style="list-style-type: none"> • Multilayer Packaging Formats: Three side sealed, Four side sealed, Centre sealed Pouches, Gusseted and standup Pouches, Spouted Pouches formats. • Paperbased Flexible Packaging: Packaging needs met by paper-based flexible packaging, Printing, Provision of a sealing system & barrier properties. Introduction to barrier properties -Barrier to moisture / moisture vapour / gases such as oxygen, carbon dioxide and nitrogen, oil, grease, fat and Barrier to light. Manufacturing process of paper-based flexible packaging, Coatings - Solvent-based / Water-based, 100% solids, including wax and PE, Metallisation, Hot melt coatings, Cold seal coating for pack closure/sealing, Lamination, Dry bonding. 		

References:

1. Selke, S. E. M., Culter, J. D., Hernandez, R. J., "Plastics Packaging: Properties, processing, Applications and Regulation", Carl HanserVerlag, USA, 2004.
2. Paper and paperboard Packaging Technology, Mark J. Kirwan, Blackwell Publishing, 2005.
3. Wagner J. R. Jr., "Multilayer Flexible Packaging", Elsevier, 2010.
4. Morris B., "The science and technology of flexible packaging - Multilayer Films from Resin and Process to End Use", Elsevier, 2017
5. Yam K. L., "The Wiley Encyclopedia of Packaging Technology", 3rdEd., Wiley, 2009.
6. Massey L. K., "Permeability Properties of Plastics & Elastomers", Plastics Design Library, 2003
7. Massey L. K., "Film Properties of Plastics & Elastomers - A Guide to Non-Wovens in Packaging Applications", Plastics Design Library, 2004
8. Piringer O. G., Baner A. L., "Plastic packaging interactions with food and pharmaceuticals", Wiley-VCH, 2008

The scheme of examination shall be divided into two parts:

Internal Examination 40% i.e. 20 Marks

Semester-end Examination 60% i.e. 30 Marks

(A) Internal Assessment 20 Marks:

Description	Marks
Internal Test of 10 Marks	10
Q.1 MCQs or True / False - 5 Marks	
Q.2 Attempt one out of 2 question (5 Marks each) - 5 Marks	
Project / Case-studies / Viva Voce / Assignment / Presentation	5
Attendance & Class Behaviour	5
Total	20

(B) Semester end examination 30 Marks:

Duration - 1 Hour	Total Marks - 30
Q.1. (A) OR (B) – 10 Marks each	10
Q.2. (A) OR (B) – 10 Marks each	10
Q.3. (A) OR (B) – 10 Marks each	10
Total	30

Note:
Q.1, 2 may be divided into sub-questions if required
Q.3 may include theory (short notes) or case study in one of the options.

Passing Criteria: Minimum 40% in Internal (8 out of 20) and

40% (12 out of 30) in end semester examination



COURSE CODE	TITLE	CREDITS 1 (2Pr)
U24PT4MJP02	Flexible Packaging Laboratory (Sem-IV Major)	
Course objectives:	1. Understand the various testing methods employed on flexible packaging.	
Course Outcomes:	Learners will be able to: 1. Perform the various testing methods on flexible packaging and analyse the results.	
List of Practicals: (Minimum 8 to be performed)		
<ol style="list-style-type: none"> 1. Determination of Seal Strength of a given pouch. 2. Determination of heat-sealing range. 3. Determination of Bond strength of a given plastic laminate. 4. Determination of laminate stiffness. 5. Perform leakage test on a pouch. 6. Determination of co-efficient of friction on a given film. 7. Determination of water vapour transmission rate of a given multilayer film 8. Determination of oxygen transmission rate of a given multilayer film 9. Measure treatability of plastic film (dyne test) 10. Perform scuff-proofness test on a given printed sample. 		

Practical Examination:

Paper Pattern:

1. **Major Experiment:** 20 Marks
2. **Minor Experiment:** 10 Marks
3. **Journal:** 10 Marks
4. **Viva Voce:** 10 Marks

Note:

- Practical Examination to be conducted as per syllabus enlisted.
- Candidates are required to present certified journal on the day of practical examination.



COURSE CODE	TITLE	CREDITS 2 (2Th)
U24PT4MJ03	Statistics for Packaging QA / QC (Sem-IV Major)	
Course objectives:	To be familiar with basic tools and techniques of statistics that are useful in packaging testing / QA & QC.	
Course Outcomes:	Learners will be able to: 1. Explain the importance of statistical process control & SQC in packaging. 2. Analyse various packaging or test data with statistical methods 3. Prepare charts / visual representations of the data. 4. Calculate process capability ratios.	
Unit I: Descriptive Statistics, Graphics & Control Charts:		Lectures 15
<ul style="list-style-type: none"> Statistical Methods: Definition, scope & limitations of statistics, Simple Random, Stratified and Systematic sampling techniques, Concepts of statistical population and sample. Data: Primary and Secondary data and its sources, Quantitative and Qualitative, attributes, variables, scales of measurement-nominal, ordinal, interval and ratio. Collection and classification of data, Presentation/Generating graphs & tables: Tabular and Graphical, including histogram and ogives, consistency and independence of data, Bar plots, Pie charts, Box plots, Histogram. Frequency tables, Diagrammatic and Graphical representation of data, Preparation of A Questionnaire Control charts: Control charts for variables: X-bar & R-chart, X-bar & s-chart, Control charts for attributes: np-chart, p-chart, c-chart and u-chart. Comparison between control charts for variables and control charts for attributes. Analysis of patterns on control chart. Measures of central tendency - Mean, Median and Mode, Measures of dispersion: Range, Quartile deviation and Standard deviation. Coefficient of variation and skewness 		
Unit II: Process Capability Analysis and Acceptance Sampling		Lectures 15
<ul style="list-style-type: none"> Process Capability analysis: Process Control, Chance And Assignable Causes Of Variations, Concepts Of Specification And Tolerance Limits, Process Capability - Meaning, Estimation technique for capability of a process Capability Indices: Process capability ratios Cp; Cpk, Cpm, Cmk, Cpc. Process capability analysis using a control chart. Acceptance sampling: Terminologies - Principle of acceptance sampling plans. Attribute sampling plan Single sampling plan and Double sampling plan – OC, ASN, AOQ, AOQL and ATI curves, MILSTD -105E Tables Acceptance sampling variables for process parameter: Sequential plans for process parameter (σ known and unknown) Sampling variables for proportion non-conforming 		

References:

- Douglas C. Montgomery (2009): Introduction to Statistical Quality Control, 6/e, John Wiley and Sons, New York.
- Edward G. Schilling, Dean V. Neubauer, (2009), Acceptance Sampling in Quality Control, Second Edition, Taylor & Francis
- Oakland, J.S. (1989): "Total Quality Management", Butterworth-Heinemann Ltd., Oxford
- Goon A.M., Gupta M.K. and Dasgupta B. (2002): Fundamentals of Statistics, Vol. I & II, Page 11 of 31 8 th Edn. The World Press, Kolkata.
- Miller, Irwin and Miller, Marylees (2006): John E. Freund's Mathematical Statistics with Applications, (7th Edn.), Pearson Education, Asia.
- Mood, A.M. Graybill, F.A. and Boes, D.C. (2007): Introduction to the Theory of Statistics, 3 rd Edn., (Reprint), Tata McGraw-Hill Pub. Co. Ltd, Delhi.
- Barman. M. P., Hazarika. J, Bora. T (2021): Statistical Methods, Mahaveer Pub, Dibrugarh.



8. Jayachandra M (2001) , Staistical Quality control, CRC press
9. Greg Brue (2003), Design of Six sigma, Tata Mc Graw hill, New Delhi
10. Mittage, H.J and Rinne, H (1993): Statistical Methods of Quality Assurance, Chapman Hall, London, UK
11. Zeiri (1991): “Total Quality Management for Engineers”, Wood Head Publishers.
12. Juran J.M and Frank M.Gryna Jr .(1982): “Quality Planning and Analysis”, TMH, India.

The scheme of examination shall be divided into two parts:

Internal Examination 40% i.e. 20 Marks

Semester-end Examination 60% i.e. 30 Marks

(A) Internal Assessment 20 Marks:

Description	Marks
Assignments – Writing user defined functions for finding arithmetic mean, median, factorial, matrix addition and multiplication. Bar and Pie charts. Box plots for single and multiple groups. One sample and two sample t test, etc.	10
Case-studies	5
Attendance & Class Behaviour	5
Total	20

(B) Semester end examination 30 Marks:

Duration - 1 Hour	Total Marks - 30
Q.1. (A) OR (B) – 10 Marks each	10
Q.2. (A) OR (B) – 10 Marks each	10
Q.3. (A) OR (B) – 10 Marks each	10
Total	30
Note: Q.1, 2 may be divided into sub-questions if required Q.3 may include theory (short notes) or case study in one of the options.	

Passing Criteria: Minimum 40% in Internal (8 out of 20) and 40% (12 out of 30) in end semester examination

COURSE CODE	TITLE	CREDITS 2 (2Th)
U24PT4MI01	Structural Packaging Design (Sem-IV Minor)	
Course objectives:	1. Learn and understand the concepts in structural packaging design	
Course Outcomes:	Learners will be able to: 1. Explain the importance of ergonomics, functionality and sustainability in packaging design. 2. Read & analyse drawings of structural packaging designs. 3. Create 2D and 3D drawing of structural packaging designs. 4. Develop prototypes of various packaging structures.	
Unit I: Packaging Design Introduction		Lectures 15
<ul style="list-style-type: none"> • Survey of packaging: Basics of structural package design, Industry trends, Ergonomics • CAD terminologies: 2D / Key line drawings, 3D Models / Views • Kinds of packaging: Folded carton, Rigid packaging, Corrugated carton, flutes, krafts, and overlays, Flexible packaging, Blister packs, Miscellaneous • Design considerations for Materials for packaging • Boards, Papers, Glass, Plastic, Metal, Transparent films, Finishes • Production: - Package design and layout 		
Unit II: Packaging Development & Prototyping		Lectures 15
<ul style="list-style-type: none"> • Basic structure of the package: Package design formats, Problems unique to folding carton design, Problems unique to rigid box design, Problems unique to miscellaneous packaging design • Production: Skills and procedures • Design process for packaging: <ol style="list-style-type: none"> 1. Research 2. Brainstorming initial concepts 3. Refinement of concepts • Use of skills and materials in the production of package design prototypes • Applied package design practices and assignments, Sequential developmental exercises and assignments 		

References:

1. Jackson, Paul. Structural Packaging: Design Your Own Boxes and 3D Forms. London, UK: Laurence King Publishing Ltd., 2012.
2. DuPuis, Steven and Silva, John. Package Design Workbook: The Art and Science of Successful Packaging. Beverly, MA: Rockport Publishers, Inc., 2011.
3. Siems, Paul. Disruptive Package Design. 1st. BookBaby, 2022.

Scheme of Examination

Total Marks: 50 - Continuous evaluation pattern.

Evaluation Criteria	Marks
Case Study / Assignment / Presentation	20
Report on a design prototype after its evaluation	20
Attendance & Class Behaviour	10
Total	50



COURSE CODE	TITLE	CREDITS 2 (4Pr)
U24PT4MIP01	Structural Packaging Design Laboratory (Sem-IV Minor)	
Course objectives:	1. Study the various product design principles and practically apply them. 2. Learn and understand the tools of SolidWorks and EngView software 3. Study the method of designing various shapes and 3D objects as per specifications 4. Understand the designing of various primary and secondary boxes	
Course Outcomes:	Learners will be able to: <ol style="list-style-type: none"> 1. Visualize and prepare detail drawing of a given object 2. Create a design for Plastic/Glass/Metal Container based on specific requirement. 3. Design & draw detail and assembly of different packages 4. Create a correct structural design for packaging considering the basic structural requirements. 5. Understand the concepts of digital sample making. 6. Use layout nesting for the purposes of calculating production cost. 7. Define varnish/special ink print/emboss areas on the graphical design. 8. Create a print-ready file (bleed/conflicts resolution). 	
List of Practicals:		
<p>SolidWorks/AutoCAD:</p> <ol style="list-style-type: none"> 1. Create basic 2D drawings 2. Create basic 3D Models 3. Create 3D Models from 2D Drawings 4. Create an assembly from a given product 2D Drawing 5. Create a package from 2D drawing given 6. Create a 3D Package Model and draw detailed 2D drawing. 7. Create primary package and orient inside a secondary package 8. Design a 3D part for prototyping using 3D Printer. <p>EngView:</p> <ol style="list-style-type: none"> 1. Take an existing packaging box and create the same fixed-size structural design in EngView Package & Display Designer software (understand drafting tools and transformations) 2. Use an existing packaging template from the EngView Parametric Library and modify it. Includes: <ul style="list-style-type: none"> - Changing the length, width and height of the box. - Modifying the bottom. - Adding additional parts – for example, a tongue locking system. 3. Use EngView Package & Display Designer to create a parametric template. 4. Create a 3D model with a detailed folding sequence. Upload it on EngView Shared Space to share with a customer. Export a video file (mp4). 5. Prepare files for cutting a sample (NC file, export vector file), Create layouts by using Array Template, Create layouts by using Arrays Statistics. 6. Open structural designs (EVD files) in Adobe Illustrator and create graphic designs (articles) for boxes' front and rear sides. Extract contours from artworks. Replicate images across panels. Upload 3D models with different articles on EngView Shared Space for customer review. 7. Apply finishing effects in Adobe Illustrator (varnish, special ink print, emboss); Add Print/registration marks and prepare production-ready files (for printing and cutting) of layouts from Adobe Illustrator (bleed, conflicts resolution). 8. Create print documentation: <ul style="list-style-type: none"> - Technical (used material, knives length, parts area, etc. area...) - Assembly instructions 		



Assignments: Minimum four assignments to be given, preferably on actual market products.

For Engview:

1. Create a parametric packaging design for a product
 - 1.1. Parametric structural design
 - 1.2. 3D model with a detailed folding sequence
 - 1.3. Layout
 - 1.4. Artwork (graphic design)
 - 1.5. Print-ready PDF file
2. Create a fixed-size packaging design for a product
 - 2.1. Fixed-size structural design
 - 2.2. 3D model with a detail folding sequence
 - 2.3. Layout
 - 2.4. Artwork (graphic design)
 - 2.5. Print-ready PDF file
3. Use an existing product in the market and create the same
 - 3.1. Parametric or fixed-size structural design
 - 3.2. 3D model with a detailed folding sequence
 - 3.3. Layout
 - 3.4. New artwork (graphic design) or apply finishing effects on an existing artwork to improve the overall packaging effect.
 - 3.5. Print-ready PDF file.

Practical Examination:

1. **Design Practical 1 (CAD):** 30 Marks
2. **Design Practical 2 (EngView):** 30 Marks
3. **Assignments:** 20 Marks
4. **Journal:** 20 Marks

Note:

1. Practical Examination to be conducted as per syllabus enlisted.
2. Candidates are required to present certified journal on the day of practical examination.



COURSE CODE	TITLE	CREDITS 2 (2Th)
U24PT4SEC01	Digital Marketing (Sem-IV SEC)	
Course objectives:	1. To understand the basic Concepts of Digital marketing and the road map for successful Digital marketing strategies.	
Course Outcomes:	Learners will be able to: 1. Explain the concept of digital marketing and its real-world iterations 2. Articulate innovative insights of digital marketing enabling a competitive edge 3. Create and run simple digital media-based campaigns 4. Identify and utilise various tools such as social media for digital marketing.	
Unit I: Introduction, Social Media Marketing & SEO		Lectures 15
<ul style="list-style-type: none"> • Fundamentals of Digital marketing & Its Significance, Traditional marketing Vs Digital Marketing, Key Drivers, Digital Consumer & Communities, Netizen's expectation & influence wrt Digital Marketing. Digital marketing Strategy- Segmenting & Customizing messages, Digital advertising Market in India, Terminology used in Digital Marketing, PPC and online marketing through social media, • Fundamentals of Social Media Marketing& its significance, Building a Successful strategy: Goal Setting, Implementation. Facebook Marketing: Facebook for Business, LinkedIn Marketing, Twitter Marketing, Instagram & Snapchat basics. • Introduction to SEO, How Search engine works, SEO Phases,What is Googlebot (Google Crawler), Types Of SEO technique, Keywords, Keyword Planner tools SEO tactics, Google search Engine, Other Suggested tools 		
Unit II: Advertising Tools, Website Hosting & Web Analytics		Lectures 15
<ul style="list-style-type: none"> • Digital Advertising, Performance of Digital Advertising:- Process & players, Display Advertising Media, Digital metrics, Buying Models- CPC, CPM, CPL, CPA, fixed Cost/Sponsorship, Targeting:- Contextual targeting, remarking, Demographics , Geographic & Language Targeting. Different types of ad tools, Display advertising terminology, different ad formats, Ad placement techniques AdWords & Adsense, YouTube Ads • Website Planning & Development- Website, Types of Websites, Phases of website development, Domain & Web Hosting:- Domain, Building Website using Word press / Google Sites, Different Plug-ins, Themes, social media Plug-ins, page builder plug-ins. • Web Analytics: Small businesses, Medium and Large scale businesses, Analysis vs intuition, Google Analytics - How Google Analytics works?, Content Performance Analysis, Social Media Analytics- Facebook insights, Twitter analytics, Youtube analytics, Social Ad analytics /ROI measurement. Goals and E-Commerce Tracking- Setting up goals Goal reports, Ecommerce tracking. 		

References:

1. Digital Marketing –Kamat and Kamat-Himalaya
2. Marketing Strategies for Engaging the Digital Generation, D. Ryan,
3. Digital Marketing, V. Ahuja, Oxford University Press
4. Digital Marketing, S.Gupta, McGraw-Hill
5. Quick win Digital Marketing, H. Annmarie A. Joannin, Paperback edition



Scheme of Examination

Total Marks: 50 - Continuous evaluation pattern.

Evaluation Criteria	Marks
Case Study / Report / Assignment	20
Run a digital marketing campaign and record the results in a report	20
Attendance & Class Behaviour	10
Total	50



Understanding Basic Forms of English Literature-2

(To be implemented from AY 2024-25)

Semester-IV

[Syllabus for SY B.Com (General), SY B.Com.(B.A.F/B.B.I./B.F.M.),
SY B.Sc.(Computer/I.T./E.V.S./Packaging Technology),SY BMS and SY BAMMC]

COURSE CODE: U24PT4AEC01

COURSE CREDIT: 02

1 credit - 15 lectures

1 lecture is of 60 minutes

* Course Objectives:

1. To develop creative skills and narrative skills through close reading and appreciation of literary texts
2. To cultivate appreciation of language as an artistic medium and to help students to understand the performative aspect of the literary work.

* Course Outcomes:

1. Learner will be able to utilize the literary characteristics of the work of literature for professional development
2. Learner will be able to express effectively after understanding the performative aspect of the literary work

Module-1 Study of Short Stories (Total 15 Lectures)

- 1.O'Henry :*The Last Leaf*
- 2.Doris Lessing: *The Habit of Loving*
3. Ruskin Bond: *The Night Train at Deoli*
- 4.R.K.Narayan: *An Astrologer`s Day*
- 5.SudhaMurty: *In Sahyadri Hills-A Lesson in Humility*

Module-2 Study of Drama (Total 15 Lectures)

A Doll's House by Henrik Ibsen

SCHEME OF EXAMINATION

The scheme of examination shall be divided into two parts:

- Internal assessment 40% i.e.20 marks
- Semester end examination 60% i.e.30 marks

• **A) Internal Assessment: Total 20 Marks**

1	*Continuous Evaluation	10 Marks
2	Role Plays / Group Discussion/Group Presentation	05 Marks
3	Attendance	05 Marks

**Application oriented activities will be conducted*

B) Semesterend examination30marks

Question no.1	A) OR B) Descriptive Question Module no.1	10 Marks
Question no.2	A) OR B) Descriptive Question Module no.2	10 Marks
Question no.3	C) Short Notes 2 out of 3 Module no.1 (5 Marks each) OR D) Short Notes 2 out of 3 Module no.2 (5 Marks each)	10 Marks

Passing Criteria: 40% in Internal as well as in External (i.e.8 Marks in Internal exam of 20 marks and 12 marks in External exam of 30 marks respectively)



INTRODUCTION TO INDIAN MUSIC

COURSE CODE: U24CC4IM01

COURSE CREDIT: 04

1 credit - 15 lectures

1 lecture is 60 minutes.

Course Objectives:

3. Students will learn about the fundamentals of Indian Music, especially the classical forms of Hindustani and Carnatic Music.
4. Students will be able to appreciate Indian music while listening to a simple classical / film song or while attending music concerts

Course outcome

1. Students will be able to identify and explain the types & styles in Indian Music.
2. Students will be able to identify and explain the traditional instruments used in Indian Music.
3. Students will be able to explain the history and importance of Indian Music in today's world.

Sr. No.	Syllabus	No of Lectures
1	Module - I: Principles of Indian Music	15
	Introduction, Origins and Brief History of Indian Music, Basic principles of Shruti, Laya, Swara and Tala, Introduction to Rasa, Role of Bhakti Rasa	
2	Module - II: Fundamentals of Carnatic Music	15
	Origins, Explanation of terminologies, Raga Classification, Melodic Forms of Carnatic Music – Varnam, Alapana, Krithi / Keerthana, Ragam Tanam Pallavi, Thillana and others. Laya & Tala system in Carnatic Music and their types. Melodic & Rhythmic Instruments used in Carnatic Music	
3	Module - III: Fundamentals of Hindustani Music	15
	Origins, Explanation of terminologies, Swara Nomenclature and Saptak, Similarities & Difference in Hindustani & Carnatic Music. Explanation of Dhrupad Music, Introduction to Khayal. Tala system in Hindustani Music and their types. Melodic & Rhythmic Instruments used in Hindustani Music	
4	Module -IV: Indian Music in Today's World	15
	Practicality of Indian Music, Music in Indian Cinema and Theatre, Raga and its link with emotions. Introduction to Music Therapy and Fusion Music.	
Total Lectures		60



SCHEME OF EXAMINATION

Total Marks: 50

Continuous evaluation pattern.

Evaluation Criteria	Marks
Identify 10 songs each, from the Indian Cinema, which are based on Carnatic & Hindustani Ragas	40
Attend a Hindustani concert and submit a report on the same.	20
Attend a Carnatic concert and submit a report on the same.	20
Interaction and involvement in the class and during case studies.	20
Total	100

