



**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	I & II
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: 29<sup>th</sup> 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 I**

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

No. of Courses	Course Code	Semester I	Credits
<i>1</i>	<i>Major</i>		
1	U24PT1MJ01	Introduction To Packaging	2
2	U24PT1MJ02	Paper Based Packaging	3
3	U24PT1MJP02	Paper Based Packaging - Laboratory	1
<i>2</i>	<i>Minor</i>		
<i>3</i>	<i>Open Electives (OE)</i>		
1	U24MS1E01	Environment and Society	4
<i>4</i>	<i>VSC/SEC</i>		
1	U24PT1VSC01	Basics of Computers	2
2	U24PT1SEC01	Introduction to Good Laboratory Practices	2
<i>5</i>	<i>AEC/VEC/IKS</i>		
1	U24PT1AEC01	Effective Communication Skills – I	02
2	U24PT1VEC01	Understanding Indian Society and Constitutional Values	02
3	U24PT1IKS01	India's Contribution to Mathematics since Ages	02
<i>6</i>	<i>OJT, FP, RP, CEP, CC</i>		
1	U24CC1TW01	Technical Writing Basics	02
<b>Total Credits</b>			<b>22</b>

**1 credit = 15 lectures**

**1 lecture/theory = 60 minutes**

**1 Practical = 2 hours session**





COURSE CODE	TITLE	CREDITS 2 (2Th)
U24PT1MJ01	<b>Introduction to Packaging</b>	
<b>Course Objectives:</b>	1. Study the basic concepts of packaging technology. 2. Study the overall perspective of the packaging industry. 3. Recognize the importance of product-package interaction & its quality aspects in packaging. 4. Understand marketing as an integral tool to packaging.	
<b>Course Outcomes:</b>	Learners will be able to: 1. Classify & evaluate the various types of packaging existing in the market. 2. Analyse the product-packaging compatibility parameters. 3. Explain the importance of packaging in the context of present scenario.	
<b>Unit I: Introduction &amp; Product-Package Compatibility Studies:</b>		<b>Lectures 15</b>
<ul style="list-style-type: none"> <li>• Packaging – History, Need &amp; Evolution; Packaging Functions – Contain, Preserve, Protect, Inform, Identify, Sell; Packaging Hazards – Storage, Transportation, Chemical, Climatic, Biological; Packaging Classifications – Primary / Secondary / Tertiary, Unit / intermediate / Bulk, Flexible &amp; Rigid.</li> <li>• Product Characteristics: Physical (nature, shape, size, texture, Centre of gravity, etc.), Chemical (Acidic, basic, reactivity etc.), Biological (Effect of micro-organisms) and Effect of moisture, oxygen and other gases; Package Characteristics: Material (Plastic, paper, wood, etc.), Physical (tensile, breaking load, burst, molecular/fibre direction, etc.), Chemical (Unreacted chemicals present, pH, etc.), Biological (sensitivity to micro-organisms), Permeability (Barrier properties – Absorption/Diffusion of moisture and gases). Live Problems / Case Studies.</li> </ul>		
<b>Unit II: Packaging – Marketing, Quality, Environment, Cost</b>		<b>Lectures 15</b>
<ul style="list-style-type: none"> <li>• Market Considerations – Importance of Demography &amp; Psychography, Retail Market (POP), Equity &amp; Brand Name; Package Embellishment – Graphic Design Elements – Significance of Shape, Size, Colour, Font, Texture, Lines, Balance &amp; Unity, Symmetry &amp; Harmony; Shelf Appeal Studies - Recall Questioning, Focus Group, Eye-Tracking, S-scope studies.</li> <li>• Quality Control – Need for and importance of packaging; Significance of specifications; Significance of Testing; Introduction to Standards, Conditioning, Sampling; Examples of testing according to standards.</li> <li>• Packaging Costs; Packaging – Environmental considerations &amp; waste management; Introduction to Packaging Laws &amp; Regulations; Packaging Scenario – World &amp; India – Comparison, Scope &amp; Growth in India.</li> </ul>		

#### References:

- Soroka W., “Fundamentals of Packaging Technology”, 3rd Ed, IoPP, 2002.
- Paine F. A., “The Packaging User’s Handbook”, 1st Ed, Blackie Academic & Professional, 1991.
- Byett J. et al., “Packaging Technology”, 2nd Ed, The Institute of Packaging (SA), 2001.
- Selke, S. E. M., Culter, J. D. and Hernandez, R. J., “Plastics Packaging: Properties, processing, Applications and Regulation”, Carl Hanser Verlag, USA, 2004.
- Joseph F. H, Robert J. K, Hallie F, “Handbook of Package Engineering”, Third Edition, Technomic Publishing, 1998.
- Yam K. L., “The Wiley Encyclopedia of Packaging Technology”, Third Edition, Wiley, 2009.



## SCHEME OF EXAMINATION

### For 2 Credits Subject

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 40 marks

Description	Marks
Internal tests of 10 marks each Q.1. Multiple Choice or True & False - 5 Marks Q.2 Attempt 1 questions out of 2 questions - 5 Marks	10
One Project and Viva voce/Presentation/Case studies/Assignments	10
Total	20

#### B) Semester end examination 30 marks

##### PAPER PATTERN

Duration: 2 hours	
Total Marks: 60	
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
Note: 1. Q.1, 2, 3 - 10 marks question may be divided into sub questions if required.	

**Passing criteria: Minimum 20% in Internal (4 out of 20) and 40% (12 out of 30) in semester end examination.**



COURSE CODE	TITLE	CREDITS
U24PT1MJ02	Paper Based Packaging	3
Course objectives:	1. Gain the basic knowledge of pulping and paper making process. 2. Study various types of papers, boards and paper-based packages along with their manufacturing processes 3. Understand the properties of paper & paperboard w.r.t. to packaging applications. 4. Study the various types of CFB, their types & Properties.	
Course Outcomes:	Learners will be able to: 1. Identify various types of paper & paperboards 2. Testing the various properties of paper-based packaging materials 3. Analyse & evaluate the different types of paper-based packaging materials based on their properties & applications	
<b>Unit I: Raw Materials, Pulping &amp; Papermaking</b>		<b>Lectures 15</b>
<ul style="list-style-type: none"> <li>Fibrous raw materials –Soft and Hard Wood, Wood structure and morphology, non-wood fibers and recycled paper, Non fibrous Additives, Sizing Agents, Binders, Fillers and Additives, Wood harvesting, logging, sorting, Debarking, Chipping, Screening &amp; Storage.</li> <li>Pulping: Types- Mechanical, Chemical and Semi-chemical - Pulp properties – Processing of pulp for paper making.</li> <li>Paper Making: Preparation of pulp – Repulping/dispersion, Beating and Refining, Bleaching, Recycled paper – Deinking, Washing and Flotation Fourdrinier Paper Machine- Dry and Wet end operations- Surface treatments- Sizing, Coating and Super calendaring.</li> </ul>		
<b>Unit II: Paper Types &amp; Properties</b>		<b>Lectures 15</b>
<ul style="list-style-type: none"> <li>Types of papers: Printing grades-uncoated papers, coated papers, Newsprint, office paper-Packaging paper grades, properties and applications - Tissue, Parchment, greaseproof, glassine, wet strength paper, stretchable paper, coated paper</li> <li>Paper properties: Optical properties – Colour, brightness, smoothness, gloss, opacity and rub resistance, Strength properties–thickness, grammage, tensile, tear, bursting strength, stiffness, Grain direction, Wire and Felt sides.</li> </ul>		
<b>Unit III: Paper based Boards &amp; Packaging</b>		<b>Lectures 15</b>
<ul style="list-style-type: none"> <li>Paperboard – Folding box board, white lined chipboard, solid bleached board, solid unbleached board, Liquid packaging board, Duplex / grey Board, Solid Fibre Boards, Container boards / Specialty boards. Board making: Sources and Paperboard Manufacturing process, Multiply Board, Cylinder Forming machine, Vat types - Pressure and suction forming. Pressing, drying and finishing, Paper board Coating.</li> <li>Corrugated Board construction - Flutes/Single, Double, Triple Wall, Board grades, Manufacture, Adhesive Bond, Specifications, Box Layout</li> <li>Paper-based packaging: Paper bags &amp; Sacks–Manufacturing &amp; Applications- Types of bags- Multiwall Paper bags - Regenerated Cellulosic films.</li> </ul>		





## 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.



COURSE CODE	TITLE	CREDITS
U24PT1MJP02	Paper Based Packaging Laboratory	1
<b>List of Practicals:</b>		
<ol style="list-style-type: none"> <li>1. To find Grammage for a given sample of paper / paperboard / individual plies &amp; overall CFB</li> <li>2. To find thickness for a given sample of paper / paperboard</li> <li>3. To identify grain direction and top / wire-side of paper.</li> <li>4. To find water absorption / COBB value of paper / paperboard / CFB</li> <li>5. To find Bursting strength and burst factor of paper</li> <li>6. To find Tearing Strength of paper and grain direction</li> <li>7. To find the tensile strength of a given paper sample.</li> <li>8. To find Grammage for a given sample of paperboard,</li> <li>9. To identify the type of flute of a given CFB Sample.</li> <li>10. To find the ECT and RCT of a given CFB Sample.</li> <li>11. To find the puncture resistance of a given CFB Sample.</li> <li>12. To measure Ash Content in a given paper sample</li> <li>13. To measure optical properties: Colour, Brightness, Whiteness Index &amp; Gloss</li> </ol>		



## SCHEME OF EXAMINATION

The scheme of examination shall be divided into two parts:

- Internal assessment 40% i.e. 40 marks
- Semester end examination 60% i.e. 60 marks
- Practical Examination i.e. 50 marks

### (A) Internal Assessment 40 marks

Description	Marks
Internal tests of 20 marks each	20
Q.1 Multiple choice Questions/True or False - 10 Marks	
Q.2. Attempt 2 questions out of 3 questions (5 marks each)- 10 Marks	
One Project and Viva voce/Presentation/Case studies/Assignments	15
Attendance and Class behavior	5
Total	40

### B) Semester end examination 60 marks

#### PAPER PATTERN

Duration : 2 hours	
Total Marks: 60	
Q.1 12 marks OR 12 marks	12
Q.2 12 marks OR 12 marks	12
Q.3 12 marks OR 12 marks	12
Q.4 12 marks OR 12 marks	12
Q.5 12 marks OR 12 marks	12
Three short notes of 4 marks each or Case study	
Total	60
Note: 1. Q.1, 2, 3 and 4 - 12 marks question may be divided into sub questions if required. 2. Q.5 May include theory (short notes) /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.**



## **PRACTICAL EXAMINATION**

### **Paper Pattern**

1. **Major Experiment: 20 Marks**
2. **Minor Experiment: 10 Marks**
3. **Journal: 05 Marks**
4. **Viva Voce: 05 Marks**

### **NOTE:**

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



**COURSE NAME : ENVIRONMENT AND SOCIETY**

**COURSE CODE:** U24MS1E01

**COURSE CREDIT: 04**

**1 credit - 15 lectures**

**1 lecture is 60 minutes**

**Course Objective:**

- To orient the students with various movements for the environment.

**Learning Outcome:**

- The students will be encouraged to participate in activities that promote environmental conservation and are also made aware of the role of society in environmental management.

Sr. No	Syllabus	No. of lectures
01	<b>Module -1- Introduction to Environment and Society</b> <ul style="list-style-type: none"><li>• Concept of environment, Environment and man relationship</li><li>• Scope and Multidisciplinary nature of Environmental Studies</li><li>• Environment education and public awareness</li><li>• Environmental ethics.</li></ul>	15
02	<b>Module-2 - Impact of anthropogenic activities on Environment and Society</b> Impact of the following anthropogenic activities on the environment and society: <ul style="list-style-type: none"><li>• Pollution</li><li>• Industrialization</li><li>• Urbanization</li><li>• Deforestation</li><li>• Mining</li><li>• Developmental projects</li><li>• Reclamation</li><li>• Tourism</li></ul>	15





03	<b>Module-3 - Man and Environment Management</b> <ul style="list-style-type: none"> <li>• Concept and strategies for sustainable development</li> <li>• The Sustainable Development Goals (SDG) 2030 Agenda</li> <li>• Resource utilization and sustainability</li> <li>• Strategies for environmental protection based on consumerism</li> </ul>	15
04	<b>Module-4- Environmental Movements and Society</b> <ul style="list-style-type: none"> <li>• Concept of Social and Environmental Movements</li> <li>• Origin of Environmental movements in India</li> <li>• Case studies of environmental movements (Bishnoi movement, Chipko Movement, Appiko Movement, Narmada Bachao Andolan, Silent Valley movement)</li> <li>• Ideological trends in Environmental Movement</li> </ul>	15

#### References:

1. A Textbook of Environmental Studies, D. K. Asthana, S Chand & Co Ltd
2. A Textbook of Environmental Chemistry and Pollution Control, S. S. Dara, S Chand & Co Ltd
3. Essential Environmental Studies, S P Misra & S N Pandey, Ane Books Pvt. Ltd.
4. Understanding Environment, Chokkan, K.B., Pandya, H. & Raghunathan, H. (eds). 2004 Sagar Publication India Pvt. Ltd., New Delhi.
5. Pandit, M.K. 2013. Chipko: Failure of a Successful Conservation Movement. In: Sodhi, N.S., Gibson, L. & Raven, P.H. Conservation Biology: Voices from the Tropics. pp. 126- 127. Wiley Blackwell, Oxford, UK.



## SCHEME OF EXAMINATION

### For 4 Credits Subject

The scheme of examination shall be divided into two parts:

- Internal assessment 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 each	20
Q.1 Multiple choice Questions/True or False - 10 Marks	
Q.2. Attempt 2 questions out of 3 questions (5 marks each)- 10 Marks	
One Project and Viva voce/Presentation/Case studies/Assignments	15
Attendance and Class behavior	5
Total	40

#### B) Semester end examination 60 marks

##### PAPER PATTERN

Duration : 2 hours	
Total Marks: 60	
Q.1 12 marks OR 12 marks	12
Q.2 12 marks OR 12 marks	12
Q.3 12 marks OR 12 marks	12
Q.4 12 marks OR 12 marks	12
Q.5 12 marks OR 12 marks	12
Three short notes of 4 marks each or Case study	
Total	60
Note: 1. Q.1, 2, 3 and 4 - 12 marks question may be divided into sub questions if required. 2. Q.5 May include theory (short notes) /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 NAME : BASICS OF COMPUTERS**

**COURSE CODE : U24PT1VSC01**

**COURSE CREDIT: 02**

**1 credit - 15 lectures**

**1 lecture is 60 minutes**

**Course Objective:**

- To acquaint the students with Microsoft office and its various tools.

**Learning outcomes:**

- Students will learn the basics of computers and to use various toolbars in Microsoft Word, Microsoft Excel and Microsoft PowerPoint.

Sr. No	Syllabus	No. of lectures
01	<b>Module 1- Basics of Computers</b> <ul style="list-style-type: none"><li>• <b>Microsoft Word</b> – Creating new documents; Page Layout; Styles and Themes; Columns and Ordering; Working with Text; Format Text; Text boxes; Listing of Text; Use of various shapes; Use of Tables; SmartArt Graphics; Saving documents. <b>Microsoft Excel</b> – Starting a workbook; Modifying columns rows and cells; Formatting cells; Creating formulas; Formatting Tables; Aligning Texts; Working with Worksheets; Freezing worksheet panes; Use of Charts; Conditional Formatting.</li><li>• <b>Microsoft PowerPoint</b> – Uses of PowerPoint presentations; Basics of Presentation slides; Text Basics; Themes and Background styles; Pictures and Clip Art; Viewing and Printing slides; Animating Texts and Objects; Use of Slide Transitions; Slide Show options.</li></ul>	15
02	<b>Module 2- Tutorials</b> <ul style="list-style-type: none"><li>• <b>Tutorials based on Basics of Computers</b></li></ul>	15



## References:

1. Maluth, J. (2016). Basic Computer Knowledge. (n.p.): Amazon Digital Services LLC - Kdp.
2. Wempen, F. (2014). Computing Fundamentals: Introduction to Computers. Germany: Wiley.
3. Thareja, R. (2019). Fundamentals of Computers. India: Oxford University Press.
4. Foulkes, L. (2020). Learn Microsoft Office 2019: A Comprehensive Guide to Getting Started with Word, PowerPoint, Excel, Access, and Outlook. United Kingdom: Packt Publishing.
5. Habraken, J. (2022). Microsoft Office Inside Out (Office 2021 and Microsoft 365). United States: Microsoft Press.



## 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
Note: 3. Q.1, 2, 3 may be divided into sub questions if required. 4. Q.3 May include theory (short notes) /Case Study in one of the options.	

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





**COURSE NAME :INTRODUCTION TO GOOD LABORATORY PRACTICES**

**COURSE CODE: U24PT1SEC01**

**COURSE CREDIT: 02**

**1 credit - 15 lectures**

**1 lecture is 60 minutes**

**Course Objective:**

- To acquaint the students with basic rules, etiquettes and handling of chemicals in laboratory.

**Learning outcomes:**

- Students will be able to work in the laboratory with confidence and professional diligence required at the industrial level.

Sr. No	Syllabus	No. of lectures
01	<b>Module 1- Good Laboratory Practices</b> <ul style="list-style-type: none"><li>• Basic rules and etiquettes to be followed in a laboratory.</li><li>• Types of glassware used.</li><li>• Storage and labeling of chemicals.</li><li>• Handling of chemicals.</li><li>• Transfer of chemicals; Use of pipettes.</li><li>• Disposal of chemicals and housekeeping practices.</li><li>• Measures to follow in case of accidents and injuries.</li><li>• Laboratory safety</li><li>• Personal Protective Equipments</li></ul>	15
02	<b>Module 2- Tutorials</b> <ul style="list-style-type: none"><li>• Tutorials based on Good laboratory practices</li></ul>	15

**References:**

1. Seiler, J. P. (2012). Good Laboratory Practice: The Why and the How. Germany: Springer Berlin Heidelberg.
2. Good Laboratory Practice Regulations, Revised and Expanded. (2002). United States: CRC Press.
3. Good Laboratory Practice Regulations. (1989). Switzerland: M. Dekker.
4. Anderson, M. A. (2002). GLP Essentials: A Concise Guide to Good Laboratory Practice. United Kingdom: Interpharm Press.



**Effective Communication Skills-1**  
**Syllabus for FY B.Com (General), FY B.Com. (B.A.F/B.B.I./B.F.M.),**  
**FY B.Sc. (Computer/I.T./E.V.S./Packaging Technology)**  
**Semester-I**

**COURSECODE :U24PT1AEC01**  
**1 credit - 15 lectures**

**COURSECREDIT: 02**  
**1 lecture is of 60 minutes**

**Course Objectives:**

1. To develop an awareness among learners about the complexity of communication process.
2. To develop effective letter writing skills among students with reference to prescribed layouts and formats.
3. To demonstrate the effective use of communication skills applicable for the employability in present situation.

**Course Outcomes:**

1. Learner will be aware about the general nature of Communication process.
2. Learner will be able to write business letters in prescribed layouts and formats.
3. Learner will be able to use different types of oral and written skills to face employability conditions.

Sr.No	Syllabus	No. of lectures
01	<b>Module-1 .Theory of Communication</b> Introduction and Process of Communication, Channels of Communication: Formal /Informal, Vertical, Downward, Upward, Horizontal, Grapevine, Methods of Communication: Verbal/Nonverbal, Barriers in Communication: Physical, Linguistic, Psychological, Sociocultural, Mechanical, Modern Modes of Communication	10
02	<b>Module-2.Business Correspondence -1</b> Theory of Business Letter Writing,7 Cs of Writing, Format of Letter Writing, Full Block Format, Modified Block Format, Parts of Letter : Major Parts/Minor Parts, Personnel Correspondence: Job Application Letter, Resume, Job Acceptance Letter, Resignation Letter, Recommendation Letter, Goodwill Letter . Professional E-mail Writing: Format, Principles of E-mail writing	10
03	<b>Module-3.Language and Writing Skills</b> Paragraph Writing: Developing an idea, Use of appropriate linking devices, Interpretation of Data, Composition on given situation Listening Comprehension, Public Speaking Skills, ICT Enabled Communication, Appropriate use of Non-Verbal Communication, Multilingual Competency.	10



**Reference Books:**

1. A Handbook of Commercial Correspondence by Ashley, A, Oxford University Press, 1992.
2. Basic Business Communication: Skills for Empowering the Internet Generation by Raymond Lesikar and Marie Flatley, 9<sup>th</sup> Edition, Tata McGraw Hill, New Delhi, 2002.
3. Business Communication by D Chaturvedi and Mukesh Chaturvedi, Third Edition, Pearson Publications Ltd, 2013.
4. Business Communication by Meenakshi Raman and Prakash Singh, Oxford University Press, 2007.
5. Business Communication Strategies by Monippally, Matthukutty, M, Tata McGraw Hill New Delhi, 2001.
6. Effective Business Communication by Herta Murphy, Herbert Hildebrandt, Jane Thomas, McGraw Hill Education, 2009.
7. Effective Communication by Balan K.R. and Rayadu C.S., Beacon Publication, New Delhi, 1996.
8. Effective Technical Communication by M. Ashraf, Rizvi, McGraw Hill Publications, 2006.

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**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 20 marks**

Description	Marks
* Continuous Evaluation	10
Project/ Activity Report /Assignments	5
Attendance and Class behavior	5
Total	20

*\*Application oriented activities will be conducted*



**B) Semester end examination 30 marks**

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

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



**Course Name: Understanding Indian Society and Constitutional Values**

**COURSE CODE: U24PT1VEC01**

**COURSE CREDIT: 02**

**1 credit - 15 lectures**

**1 lecture is 60 minutes**

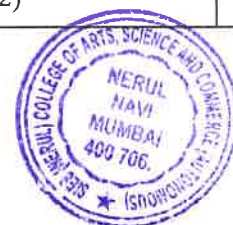
**Course Objectives:**

1. To introduce students to the overview of the Indian Society.
2. To help them understand the constitution of India.
3. To acquaint them with the socio-political problems of India.
4. To introduce students to a basic understanding of the Indian Political System.
- 5.

**Learning Outcome:**

1. Students will understand Indian Social conditions.
2. Students will be acquainted with features of Indian Constitutions.
3. Learners will be aware of the measures to tackle societal problems
4. Learners will understand the intricacies of Indian political system.

UNIT	TOPICS	LECTURES
Unit-I <u>Salient features of Indian Society</u>	<ol style="list-style-type: none"><li>1. Understand the multi-cultural diversity of Indian society through its demographic composition: Population distribution according to religion, caste, geographical location and gender and age. (3)</li><li>2. Co-existence of traditionalism and Modernism in Indian Society (1)</li><li>3. Values emerging from the diversity in Indian Society (1)</li></ol>	5 Lectures
Unit-II <u>Challenges of Diversity to Unity</u>	Disparity Arising out of- <ol style="list-style-type: none"><li>1. Regionalism and Linguism-Meaning, causes and Impact (2)</li><li>2. Casteism and Communalism - Meaning, History, measures to solve these problems. (2)</li></ol>	10 Lectures





	3. Social Inequalities: Meaning, Causes and Effects, (1) 4. Gender Inequalities- Treatment and exclusiveness of Women and Other Genders in the society (2) 5. Economic/ Wealth Inequalities-Class System and Economic Segregation of the Society (2) 6. Measures to improve Equality and Social Justice in the society (1)	
Unit-III <u>Constitutional Values</u>	7. Philosophy of the Constitution as set out in the Preamble (2) 8. Features of the Constitution (2) 9. Fundamental Rights (2) 10. Fundamental Duties (1) 11. Directive Principles of State Policy (1) 12. Federal structure (2)	10 Lectures
Unit-IV <u>Significant Aspects of Political Processes</u>	13. The party system in Indian politics; (2) 14. Local self-government in urban and rural areas; the 73rd and 74th Amendments and their implications for inclusive politics (2) 15. Role and significance of women in politics (1)	5 Lectures

#### References-

1. Social and Economic Problems in India, Naseem Azad, R Gupta Pub ( 2011)
2. Indian Society and Culture, Vinita Padey, Rawat Pub (2016)
3. Urbanisation in India: Challenges, Opportunities & the way forward, I J Ahluwalia, Ravi Kanbur, P K Mohanty, SAGE Pub ( 2014)
4. Regional Inequities in India Bhat L SSSRD- New Delhi
5. The Problems of Linguistic States in India, Krishna Kodesia Sterling Pub
6. Problems of Communalism in india, Ravindra Kumar Mittal Pub
7. Combating Communalism in India: Key to National Integration, KawalKishor Bhardwaj, Mittal Pub
8. Khare, R. S. (1998). Cultural diversity and social discontent: Anthropological studies on contemporary India.
9. Ganesh, K., & Thakkar, U. (Eds.). (2005). Culture and the making of identity in contemporary India. SAGE Publications India.
10. Das, B., & Khawas, V. (2009). Gender issues in development: concerns for the 21st century. (No Title).



11. Mandal, B. P. (2011). Cultural Sociology. Centrum Press.
12. Rapport, N. (2014). Social and cultural anthropology: The key concepts. Routle
13. Oxford Concise Dictionary of Politics, Iain Mclean / Alistair McMillan, Oxford University Press
14. Politics, 2nd Edition, Andrew Heywood, Ane Books.
15. Dictionary of Politics, D. Robertson, Penguin Books India.
16. An Introduction to Political Theory, Gauba, O. P., Macmillan
17. Political ideas and concepts : An introduction, Heywood Andrew, Macmillan, Houndmills
18. Political ideologies : An introduction, Heywood Andrew, Macmillan, Houndmills
19. Oxford Companion to Politics of the World, Krieger Joel Joseph William A Kahler Miles Nzongola – Ntalaja Georges Stallings Barbara B. Weir Margaret, Oxford University Press New York.
20. Political Theory, Das Hari Hara and Chaudhari B. C., National Publishing House.
21. Introduction to the Indian Constitution, Basu D.D., Wadhwa Publications.
22. An Introduction to the Constitution of India, Pylee M V, Vikas Publishing House.
23. Introduction to the Constitution of India, Sharma, Brij Kishore, Prentice-Hall of India.
24. Our Constitution Kashyap Subhash, National Book Trust.
25. Indian Policy for Preliminary Examination, Lakshmikant, Tata McGraw Hill.
26. Indian Government and Politics, Narang A.S., Gitanjali Publishing House, New Delhi.
27. Introduction to Media and Politics, Sarah Oates, Sage publishers.
28. Principles of Modern Political Science, J.C. Johari, Sterling publishers

#### Reference Links for preparing Study Material-

1. <https://lotusarise.com/salient-features-of-indian-society-upsc/>
2. <https://iasscore.in/upsc-syllabus/indian-society/indian-society-mains>
3. <https://lotusarise.com/upsc-notes/indian-society-upsc-notes/>
4. <https://asiasociety.org/education/indian-society-and-ways-living>
5. <https://www.drishtiiias.com/to-the-points/Paper2/inequality-in-india>



## SCHEME OF EXAMINATION

### For 4 Credits Subject

The scheme of examination shall be divided into two parts:

- Internal assessment 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 each	20
Q.1 Multiple choice Questions/True or False - 10 Marks	
Q.2. Attempt 2 questions out of 3 questions (5 marks each)- 10 Marks	
One Project and Viva voce/Presentation/Case studies/Assignments	15
Attendance and Class behavior	5
Total	40

#### B) Semester end examination 60 marks

##### PAPER PATTERN

Duration : 2 hours	
Total Marks: 60	
Q.1 12 marks OR 12 marks	12
Q.2 12 marks OR 12 marks	12
Q.3 12 marks OR 12 marks	12
Q.4 12 marks OR 12 marks	12
Q.5 12 marks OR 12 marks	12
Three short notes of 4 marks each or Case study	
Total	60
Note: 3. Q.1, 2, 3 and 4 - 12 marks question may be divided into sub questions if required. 4. Q.5 May include theory (short notes) /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.**



## **PRACTICAL EXAMINATION**

### **Paper Pattern**

1. **Major Experiment: 20 Marks**
2. **Minor Experiment: 10 Marks**
3. **Journal: 05 Marks**
4. **Viva Voce: 05 Marks**

### **NOTE:**

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



## SCHEME OF EXAMINATION

### For 2 Credits Subject

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 40 marks

Description	Marks
Internal tests of 10 marks each	10
Q.1. Attempt 2 questions out of 3 questions (5 marks each)- 10 Marks	
One Project and Viva voce/Presentation/Case studies/Assignments	10
Total	20

#### Periodical class test Question paper pattern

Sr. No.	Particulars	10 Marks
Q.1.	Match the column/ Fill in the blanks/ MCQ's/ Answer in one- or two-lines concept-based question (1 Mark / 2 Mark each)	05 Marks
Q.2.	Answer in Brief / Practical question (Attempt any 1 out of 3) - 5 marks each	05 Marks

#### B) Semester end examination 30 marks

##### PAPER PATTERN

Duration: 2 hours	
Total Marks: 60	
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
Note: Q.1, 2, 3 - 10 marks question may be divided into sub questions if required.	

**Passing criteria: Minimum 20% in Internal (4 out of 20) and 40% (12 out of 30) in semester end examination.**





## India's Contribution to Mathematics since Ages

COURSE CODE: U24PT1IKS01

COURSE CREDIT: 02

1 credit - 15 lectures

1 lecture is 60 minutes

### Course Objectives:

- To make students aware about the contribution of India to Mathematics.
- To make students aware about the several methods of ancient mathematics that will enhance their speed and accuracy in various competitive and placement exams.

### Course Outcome:

- Learners will be able to know about the contribution of Indian mathematicians and they will be able to apply several tricks and techniques of Vedic mathematics.

Unit	Details	Lectures
I	<p><b>The Non-zero Indian Contribution to Mathematics</b></p> <p>The Indian Number System, The Baudhayana-Pythagoras Theorem, The Mathematics of Language, The Sine Function in Trigonometry, Negative Number, Solution to Quadratic Equations, The Virahanka-Fibonacci Sequence, Binomial Distribution, First Exact Formula for Pie, Geometric Construction with Compass and unmarked Straightedge.</p> <p><b>Indian Mathematician and their Contribution</b></p> <p>Aryabhata, Brahamagupta, Mahavira, Bhaskara, Ramanujan, Madhava.</p>	15
II	<p><b>Sutras</b></p> <p>Ekadhikena Purvena, Urdhva – tiryagbhyam, Nikhilam navatascaramam Dasatah, Paravartya Yojayet, Sunyam Samya Samuccaye, Anurupye Sunyamanyat, Sankalana Vyavakalanbhyam, Ekanyunena Purvena, Yavadunam Tamadun Kartya Varganca Yojayet.</p> <p><b>Vedic Computation</b></p> <p>Beejank, Vinculum Numbers, Simultaneous Linear Equations, Magic Squares, Dates and Calendars</p>	15



### References:

1. Vedic Mathematics Made Easy by *Dhaval Bhatiya*, Jaico Publishing House.
2. Vedic Mathematics by *Bharathi Krishna Tripathi*, Motilal Banarsidass Publisher.
3. Cultures and History of Mathematics, by C. S. Seshadri, Hindustan Book Agency.
4. Contributions to the History of Indian Mathematics by *Gerard G. Emch, R. Sridharan and M. D. Srinivas*.



## SCHEME OF EXAMINATION (for 50 marks ,2 credits (Theory))

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 20 marks

Description	Marks
An internal test	10
Assignment	05
Attendance and Class Participation	05
Total	20

### B) Semester End examination 30 marks

#### PAPER PATTERN

Duration: 1 hour	
Total Marks:30	
Q.1 15 marks OR 15 marks (7 and 8 marks)-Unit 1	15
Q.2 15 marks OR 15 marks (7 and 8 marks)-Unit 2	15
Total	30

**Passing criteria: Minimum 40% in Internal (08 out of 20) and 40% (12 out of 30) in semester-end examination.**



**Co-Curricular Course**  
**Technical Writing Basics**

**COURSE CODE: U24CC1TW01**

**COURSE CREDIT: 02**

**1 credit - 15 lectures**

**1 lecture is 60 minutes**

**Course Objectives:**

- Students will learn how to use critical reading skills to summarize various technical documents, understand and evaluate these texts, and explain how technical writing techniques work to create clear, professional documents.
- Students learn and use a process approach to continue the development of your writing style.

**Course outcome**

- Develop an understanding of the rules of academic writing
- Apply knowledge of sentence grammar to produce effective, correct, and rhetorically appropriate sentence constructions.

Sr. No.	Syllabus	No of Lectures
	<b>Module - I: WRITING SKILLS</b>	
	Introduction to Technical Writing-Basic Principles ,Words-Phrases-Sentences ,Construction of Cohesive Paragraphs, Elements of Style	15
	Principles of Summarizing , Abstract , Summary, Synopsis ,Technical Reports and Salient Features ,Types of Reports , Structure of Reports , Data Collection ,Use of Graphic Aids Drafting and Writing	10
	<b>Module -II: WRITING ARTICLE/ REPORT</b>	
	Basic Guidelines and Documentation	05
	<b>Total Lectures</b>	<b>30</b>



## SCHEME OF EXAMINATION

**Total Marks: 50**

**Continuous Evaluation Pattern.**

<b>Evaluation Criteria</b>	<b>Marks</b>
Selection and Planning Article / Report Writing	20
Article / Report Evaluation	10
Presentation / Viva	15
Attendance and Class Participation	05
<b>Total</b>	<b>50</b>

**Passing criteria: Minimum 40%**



**SIES Nerul College of Arts, Science and Commerce (Autonomous)**  
**B.Sc. Packaging Technology Programme**

**Sem II**

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

No. of Courses	Course Code	Semester II	Credits
<b>1</b>	<b>Major</b>		
1	U24PT2MJ01	Glass , Metal and Textile Packaging Materials	02
2	U24PT2MJ02	Plastic Packaging Materials	03
3	U24PT2MJP02	Plastic Packaging Materials Practicals	01
<b>2</b>	<b>Minor</b>		
	U24PT2MI01	Concept of Matrices	01
	U24PT2MI02	R Programming Practical	01
<b>3</b>	<b>Open Electives(OE)</b>		
1	U24MS2E01	Personality Development – Achieving Personal And Professional Success	02
2	U24AF2E01	Introduction to Entrepreneurship	02
<b>4</b>	<b>VSC/SEC</b>		
1	U24PT2VSC01	Web Designing	01
2	U24PT2VSCP01	Web Designing Practicals	01
3	U24PT2SEC01	Total Quality Management	02
<b>5</b>	<b>AEC/VEC/IKS</b>		
1	U24PT2AEC01	Effective Communication Skills- II	02
2	U24PT2VEC01	Sustainability and Green Business Practices	02
<b>6</b>	<b>OJT, FP, RP, CEP, CC</b>		
	U24CC2LS02	Life Skills II	02
<b>Total Credits</b>			<b>22</b>

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



COURSE CODE	TITLE	CREDITS 2 (2Th)
U24PT2MJ01	<b>Glass Metal and Textile Packaging Materials</b>	
<b>Course Objectives:</b>	1. Understand the use and application of primary packaging materials i.e. glass and metal. 2. Study the types of textile materials and their application 3. Learn the basics package forms and the technology to manufacture them for the above listed materials.	
<b>Course Outcomes:</b>	Learners will be able to: 1. Explain the properties, types and design aspects for various types of package forms made up of glass. 2. Explain the properties, types and for various types of package forms made up of metal. 3. Describe the basics of fabric & textile technology to produce bags of various materials like jute, hemp etc. 4. Discuss various quality control and testing procedures for these package forms.	
<b>Unit I: Glass in Packaging:</b>		<b>Lectures 10</b>
<ul style="list-style-type: none"> <li>• Introduction &amp; History of Glass Materials - Composition - Chemical Structure - Raw Materials used for manufacturing glass containers - Glass properties - Glass Industry - Market Overview</li> <li>• Glass Manufacturing Process - Container Forming Processes - Study of important control parameters during the processes - Post forming Treatments or processes</li> <li>• Types of Glass - Types of glass containers - Advantages &amp; Disadvantages - Applications</li> <li>• Glass bottle design - Specifications &amp; Quality Control - Defects</li> </ul>		
<b>Unit II: Metals in Packaging:</b>		<b>Lectures 15</b>
<ul style="list-style-type: none"> <li>• Introduction &amp; History of Metals - Overview of Extraction Processes - Important Metals in Packaging &amp; their properties - Market &amp; Industry Overview - Aluminium based: Conversion processes for Sheets - Aluminium Foil, properties &amp; their applications; Steel based: Stainless &amp; Galvanized Steel - Coated steels like Tinplate, Tinfree Steel, Polymer coated - Manufacturing Process &amp; Description</li> <li>• Metal Cans: History of Metal Cans – Three-piece &amp; Two-piece Cans - Draw &amp; redraw, Draw &amp; iron, Walled iron Cans - Welded &amp; Seamless Cans - Can Dimensioning - Specifications &amp; Quality Control</li> <li>• Collapsible Tubes - Manufacturing process - Design of Metal Collapsible Tubes - Advantages &amp; Disadvantages of Metal Collapsible tubes, Aerosol Containers - Classification of Aerosols - Design Features - Components - Filling Process - Advantages &amp; Disadvantages of Aerosols - Applications</li> <li>• Metal Drums &amp; Overview of metal corrosion and anticorrosion techniques.</li> </ul>		
<b>Unit III: Textile based Packaging:</b>		<b>Lectures 5</b>
<ul style="list-style-type: none"> <li>• Materials for textile based packaging - Raw materials like Jute, Hemp etc. - Terminologies - Sack Manufacturing Process - Jute Bag classification like Hessians, Tarpaulins &amp; Twilled - Finishing Treatments -Standardization of Sizes - Lining &amp; its Significance - Applications - Comparison with Plastic Bags</li> </ul>		





**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. Le Bourhis, Glass: Mechanics and Technology, 2nd ed., Wiley, 2014
6. Bansal and Doremus, Handbook of Glass Properties, 1st ed., Academic Press, 1986
7. Tinplate in Packaging, Indian Institute of Packaging
8. Aluminium in Packaging, Indian Institute of Packaging
9. The Complete Technology Book on Aluminium and Aluminium Products, Asia Pacific Business Press, 2007



COURSE CODE	TITLE	CREDITS 3 (3Th)
U24PT2MJ02	<b>Plastic Packaging Materials</b>	
<b>Course objectives:</b>	<ol style="list-style-type: none"> <li>1. Understand the fundamentals of polymer science.</li> <li>2. Study and appreciate the macro, micro &amp; molecular level interaction in polymers.</li> <li>3. Learn the factors that affect rheological properties of plastics.</li> <li>4. Study the different types of plastics and their associated properties.</li> </ol>	
<b>Course Outcomes:</b>	Learners will be able to: <ol style="list-style-type: none"> <li>1. Describe the various polymerization mechanisms and techniques.</li> <li>2. Explain different commodity, engineering &amp; speciality polymers based on their types, properties and applications.</li> <li>3. Describe the properties that are important from the point of view of plastic processing.</li> <li>4. Choose a plastic material for a specific application based on their physical and chemical properties.</li> </ol>	
<b>Unit I: Introduction to Polymers</b>		<b>Lectures 15</b>
<ul style="list-style-type: none"> <li>• Introduction to Historical Background of Polymer Science, Various applications of polymers, Raw materials, Market and future of polymers, India in global scenario.</li> <li>• Macromolecular concept, structural features of polymers, Basic concepts and terminology like monomers, oligomers, polymers, copolymers, functionality, degree of polymerization, thermoplastics, thermosets, elastomers/rubbers, plastics, fibers, adhesives.</li> <li>• Classification of Polymers: Classification based on structure, origin, fabrication, properties etc. Linear, branched, crosslinked polymers etc. Crystalline and Amorphous polymers. Polymerization reaction - Polymerization mechanisms (Addition &amp; Condensation), Types of polymerization (Bulk, Solution, Suspension &amp; Emulsion).</li> </ul>		
<b>Unit II: MWD &amp; Structure Property Relationship</b>		<b>Lectures 15</b>
<ul style="list-style-type: none"> <li>• Concept of average molecular weight of polymers, Molecular Weight Distribution, Mw, Mn, Mv and Mz, Polydispersity index. Thermal changes – Glass Transition Temperature (Tg), Softening/Melting Temperature (Tm), Degradation Temperature (Td). Heat Distortion Temperature, understanding Melt Flow Index of plastics.</li> <li>• Glass transition temperature, factors affecting glass transition temperature, melting point and factors affecting it, melt viscosity, Factors affecting Tensile strength, yield strength, modulus, density, impact strength. Heat Distortion Temperature, Vicat Softening Point, and hardness.</li> </ul>		
<b>Unit III: Plastics in Packaging:</b>		<b>Lectures 15</b>
<ul style="list-style-type: none"> <li>• Commodity Plastics in Packaging: Polyethylene (PE): Types, Properties &amp; Applications; Polypropylene (PP): Varieties, Properties &amp; Applications; Polyvinyl Chloride (PVC): Properties, Compounding &amp; Applications; Polystyrene (PS): Types, Properties &amp; Applications.</li> <li>• Properties &amp; Applications of Engineering &amp; Speciality Plastics: Thermoplastics Polyesters (PET &amp; PBT), Polycarbonate (PC), Acrylics (PAN &amp; PMMA), Polyamide (PA 6 &amp; PA 6,6), Polyvinylidene chloride (PVdC), Ethyl Vinyl Acetate (EVA), Ethyl Vinyl Alcohol (EVOH), Ionomer, Polychlorotrifluoroethylene (PCTFE)</li> <li>• Overview of Copolymerization, Alloying and Blending.</li> </ul>		



## References:

1. Strong A. B., "Plastics: Materials and Processing", 3rdEd, Pearson-Prentice Hall, 2006.
2. Gowariker V. R., Viswanathan N. V., Sreedhar J., "Polymer Science", 1stEd, New Age International Publishers, 1986.
3. Selke, S. E. M., Culter, J. D., Hernandez, R. J., "Plastics Packaging: Properties, processing, Applications and Regulation", Carl Hanser Verlag, USA, 2004.
4. Margolis J. M., "Engineering Plastics Handbook", 1stEd., McGraw-Hill, 2006.
5. Athalye A. S., "Handbook of Packaging Plastics", 1stEd., Multi Tech Publishing Co., 1999.
6. Yam K. L., "The Wiley Encyclopedia of Packaging Technology", 3rdEd., Wiley, 2009.



COURSE CODE	TITLE	CREDITS 1 (2Pr)
U24PT2MJP02	Plastic Packaging Materials Laboratory	
Course objectives:	1. Understand the various testing methods employed on plastic materials.	
Course Outcomes:	Learners will be able to: 1. Describe the properties that are important from the point of view of plastic processing.	
<b>List of Practicals:</b>		
<ol style="list-style-type: none"> <li>1. Identification of Plastics by Chemical method</li> <li>2. Identification of Plastics by Instrumentation Method – FTIR / DSC</li> <li>3. Determination of Melt Flow Index of a given plastic sample.</li> <li>4. Determination of thickness of a given plastic sample.</li> <li>5. Determination of tensile strength &amp; elongation of a plastic film.</li> <li>6. Determination of tear resistance of a plastic film.</li> <li>7. Determination of Impact resistance on packaging/plastic specimen – Dart Impact test</li> <li>8. Performing thermal analysis of Plastics by Differential Scanning Calorimeter.</li> <li>9. Determination of specular gloss of plastic films.</li> <li>10. Determination of Coefficient of friction of plastic films.</li> <li>11. Study of Environmental Stress Crack Resistance of plastic items.</li> </ol>		



## SCHEME OF EXAMINATION

The scheme of examination shall be divided into two parts:

- Internal assessment 40% i.e. 40 marks
- Semester end examination 60% i.e. 60 marks
- Practical Examination i.e. 50 marks

### (A) Internal Assessment 40 marks

Description	Marks
Internal tests of 20 marks each	20
Q.1 Multiple choice Questions/True or False - 10 Marks	
Q.2. Attempt 2 questions out of 3 questions (5 marks each)- 10 Marks	
One Project and Viva voce/Presentation/Case studies/Assignments	15
Attendance and Class behavior	5
<b>Total</b>	<b>40</b>

### B) Semester end examination 60 marks

#### PAPER PATTERN

Duration : 2 hours	
Total Marks: 60	
Q.1 12 marks OR 12 marks	12
Q.2 12 marks OR 12 marks	12
Q.3 12 marks OR 12 marks	12
Q.4 12 marks OR 12 marks	12
Q.5 12 marks OR 12 marks Three short notes of 4 marks each or Case study	12
<b>Total</b>	<b>60</b>
<b>Note:</b> 1. Q.1, 2, 3 and 4 - 12 marks question may be divided into sub questions if required. 2. Q.5 May include theory (short notes) /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.**



## **PRACTICAL EXAMINATION**

### **Paper Pattern**

1. **Major Experiment: 20 Marks**
2. **Minor Experiment: 10 Marks**
3. **Journal: 05 Marks**
4. **Viva Voce: 05 Marks**

### **NOTE:**

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



## Minor (1+1)

### Concept of Matrices

COURSE CODE: U24PT2MI01

COURSE CREDIT: 01

1 credit - 15 lectures

1 lecture is 60 minutes

#### Course Objectives:

- To offer basic concepts of vectors, matrices, system of linear equations, Eigen value Eigen vector and linear transformation.
- Understand the basic R-Language and its advantage over other tools
- Explore and understand how to write the R Script.

#### Course Outcome:

Learners will be able to:

- Express clear understanding of the concept of a solution to a system of equations.
- Find eigenvalues and corresponding eigenvectors for a square matrix.
- Have an overview of the arithmetic, relational and logical operators.
- Work with in-built and user-defined functions.

Unit	Details	Lectures
I	<b>Matrices</b> Matrices, Algebra of matrices, Elementary Transformation, Rank of Matrix, Echelon or Normal Matrix, Singularity of matrix, Inverse of matrix, Linear dependence and linear independence of vectors, System of Linear equation, Gaussian Elimination method. <b>Eigenvalues and Eigenvectors</b> Characteristic Polynomials of degree 2 and 3, Eigenvalues and eigenvectors, Properties of eigenvalues and eigenvectors, Cayley–Hamilton Theorem.	15

#### References:

1. Coding the Matrix Linear Algebra through Applications to Computer Science, First Edition, Philip N. Klein, Newtonian Press 2013.
2. 2. Schaum's Outline of Linear Algebra, Sixth Edition by Seymour Lipschutz, Marc Lipson, McGraw Hill 2017.
3. Linear Algebra and Its Applications, David C Lay, Pearson Education India; 3rd Edition, 2002.





## R Programming Practical

COURSE CODE: U24PT2MIP01

COURSE CREDIT: 01

1 credit - 15 lectures

1 lecture is 120 minutes

Sr.No.	List of Practical's
1.	Write an R program to take input from the user (name and age) and display the values. Also print the version of R installation.
2.	Write a R program demonstrating various data type
3.	Write an R program to get the details of the objects in memory.
4.	Write an R program to demonstrate variable assignment
5.	Write an R program to implement basic operations (Basic Arithmetic).
6.	Write a R program to create a sequence of numbers from 20 to 50 and find the mean of numbers from 20 to 60 and sum of numbers from 51 to 91
7.	Write a R program <ol style="list-style-type: none"><li>To find whether a number is positive or not using simple if.</li><li>To find whether a number is positive or negative using if-else.</li></ol>
8.	Write an R program to print text 10 times using while, for loop, repeat.
9.	Write an R program multiplying two vectors of integer data type .
10.	Write a R program to create an empty data frame.



11.	Write an R program to create and combine arrays.
12.	Write an R program to get the unique elements of a given string and unique numbers of vectors.
13.	Write an R program to create three vectors a,b,c with 3 integers. Combine the three vectors to become a 3×3 matrix where each column represents a vector. Print the content of the matrix.
14.	Add and delete a column or row in a matrix. Finding the Determinant of a matrix.
15.	Write an R program to create a simple bar plot.



## 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
Note: 3. Q.1, 2, 3 may be divided into sub questions if required. 4. Q.3 May include theory (short notes) /Case Study in one of the options.	

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



# PERSONALITY DEVELOPMENT – ACHIEVING PERSONAL AND PROFESSIONAL SUCCESS

COURSE CODE: U24MS2E01

COURSE CREDIT: 02

1 credit - 15 lectures

1 lecture is 60 minutes

## Course Objectives:

- The course aims to train students on the importance of self-awareness, personal growth, soft skills, and life skills.
- The course facilitates the participants to understand the skill of influencing, being an effective team member and understanding self-motivation.
- The course aims to foster talent and facilitate employability, empowering the participant to thrive in the fiercely competitive corporate world.

Sr. No	Syllabus	No. of lectures
01	Concept of Self Introduction to Personality Development: Personality traits and theories, MBTI, Self-Image and Self-Concept, Locus of Control, Managing Oneself. Concept, Emotional Intelligence , Importance of Emotional Intelligence and Role of Emotional Intelligence in developing effective personality , Positive Attitude, Self-esteem, Self-confidence	15
02	Understanding Self in Relation with others Concept of Influencing , Art of Influencing , Johari Window , FIRO – B , Interpersonal Relations, Communication in organizations, Personal Branding, Leadership Skills, Presentation Skills, Personal skills- Stress Management, Negotiation skills, Conflict Management, Time Management and Anger Management.	15

## References:

- Organizational Behavior by Fred Luthans
- Organization Behavior by Neharika Vohra Stephen P. Robbins, Timothy A. Judge
- The 7 Habits of Highly Effective People by Stephen Covey
- The Art and Science of Personality Development Dan P. McAdams



## SCHEME OF EXAMINATION

The scheme of examination shall be divided as follows:

- **Comprehensive Internal assessment 100% i.e. 50 marks**

Description	Marks
Case Study/ Case-let/ Situation Analysis – (Group Activity or Individual Activity)/ Group Discussion/ Role Play/ Story Telling/ Presentation/ Practical Assignment/ Written Home Assignment/ Industry Analysis – (Group Activity or Individual Activity)/ Literature Review/ Book Review/ In-depth Viva/ Student Driven Activities/ Newspaper reading/ Report Writing/Precis Writing. (Any one of these)	15
Project	20
Class Test/ Open Book Test/ Quiz	10
Class Participation	5
Total	50

Passing criteria: Minimum 40% (20 out of 50) in Comprehensive Internal assessment.



## Introduction to Entrepreneurship

COURSE CODE: U24AF2E01

COURSE CREDIT: 02

1 credit - 15 lectures

1 lecture is 60 minutes

### Course Objectives:

- Entrepreneurship is one of the major focus areas of the discipline of Management. This course introduces Entrepreneurship to budding managers.
- To develop entrepreneurs & to prepare students to take the responsibility of the full line of management function of a company.

**Course Outcome:** After completion of this course students will be able to:-

- To identify the importance of Entrepreneurship
- To identify the mechanisms available to evaluate and analyze the external environment which affects entrepreneurship .
- The learners will be able to understand venture capital, its sources and problems faced during raising funds.

Sr. No	Syllabus	No. of lectures
1	<b>Foundations of Entrepreneurship Development:</b> Concept and Need of Entrepreneurship Development Definition of Entrepreneur, Entrepreneurship, Importance and significance of growth of entrepreneurial activities Characteristics and qualities of entrepreneur • Theories of Entrepreneurship: Innovation Theory by Schumpeter & Imitating Theory of High Achievement by McClelland X-Efficiency Theory by Leibenstein Theory of Profit by Knight Theory of Social change by Everett Hagen • External Influences on Entrepreneurship Development: Socio-Cultural, Political, Economical, Personal. Role of Entrepreneurial culture in Entrepreneurship Development.	10
2	<b>Entrepreneur Project Development</b> Innovation, Invention, Creativity, Business Idea, Opportunities through change. • Idea generation– Sources-Development of product /idea, • Environmental scanning and SWOT analysis • Creating Entrepreneurial Venture-Entrepreneurship Development Cycle •	10
3	<b>.Venture Development</b> Steps involved in starting of Venture • Institutional support to an Entrepreneur • Venture funding, requirements of Capital (Fixed and working) Sources of finance, problem of Venture set-up and prospects	10



## References:

1. Dynamics of Entrepreneurial Development Management - Vasant Desai, Himalaya Publishing House.
2. Entrepreneurial Development - S.S. Khanna
3. Entrepreneurship & Small Business Management - CL Bansal, Haranand Publication
4. Entrepreneurial Development in India - Sami Uddin, Mittal Publication
5. Entrepreneur Vs Entrepreneurship- Human Diagno





## 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. 30marks

### (A) Internal Assessment 20 marks

Descrion	Marks
Internal tests of 10 marks each Q.1 Multiple choice Questions/True or False - 5 Marks Q.2. Attempt 1 Question out of 2 Questions 5 Marks	10
One Project and Viva voce/Presentation/Case studies/Assignments	10
Total	20

### B) Semester end examination 30 marks

#### PAPER PATTERN

Duration : 1 Hour	
Total Marks: 30	
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
Note: 10 marks question may be divided into sub questions of 5 Marks each if required.	

#### Passing criteria:

**Minimum 40% in Internal (8 out of 20) and 40% (12 out of 30) in semester end examination.**



## Web Designing

COURSE CODE: U24PT2VSC01

COURSE CREDIT: 01

1 credit - 15 lectures

1 lecture - 60 minutes

### Course Objectives:

- The course has been designed to provide the basic knowledge for developing of the web pages using HTML.

### Course Outcomes:

- To design valid, well-formed, scalable, and meaningful pages using emerging technologies.

Sr. No	Syllabus	No. of lectures
01	<b>HTML5:</b> Fundamental Elements of HTML, Formatting Text in HTML, Organizing Text in HTML, Links and URLs in HTML, Tables in HTML, Images on a Web Page, Image Formats, Image Maps, Colors, FORMs in HTML, Interactive Elements, Working with Multimedia - Audio and Video File Formats, HTML elements for inserting Audio / Video on a web page . <b>CSS:</b> Understanding the Syntax of CSS, CSS Selectors, Inserting CSS in an HTML Document, CSS properties to work with background of a Page, CSS properties to work with Fonts and Text Styles, CSS properties for positioning an element	15

### Text Book(s):

- 1) HTML 5 Black Book, Covers CSS 3, JavaScript, XML, XHTML, AJAX, PHP and jQuery, 2ed, Dreamtech Press
- 2) Web Programming and Interactive Technologies, scriptDemics, StarEdu Solutions India.
- 3) PHP: A Beginners Guide, Vikram Vaswani, TMH

### Additional Reference(s):

- 1) HTML, XHTML, and CSS Bible Fifth Edition, Steven M. Schafer, WILEY
- 2) Learn to Master HTML 5, scriptDemics, StarEdu Solutions Pvt Ltd



## Web Designing Practical

COURSE CODE: U24PT2VSCP01

COURSE CREDIT: 01

1 credit - 2 lectures

1 lecture - 60 minutes

Sr.No.	List of Practicals
1	Design a webpage that makes use of a. Document Structure Tags b. Various Text Formatting Tags c. List Tags d. Image and Image Maps
2.	Create an HTML page using tags to accomplish the following: a. A paragraph containing text "All that glitters is not gold". Bold face and italic size this text b. Create equation: $x = 1/3(y1^2 + z1^2)$ c. Put a background image to a page and demonstrate all attributes of background image
3	Design a web page which displays the map of India. Create a clickable region using an image map on the same image so that when we click on Maharashtra it opens another tab with information about Maharashtra. Create two more clickable regions for states of your choice.
4	Design a web page which contains three hyperlinks (audio, video, and gif image). I. When a user clicks on an audio link web page should open in the same tab with some audio content. II. When a user clicks on a video web page should open in the same tab with some video content. III. When a user clicks on a gif image web-page should open in the same tab with some gif content.
5	Design a web page to display following output by using list tags  <b>HTML List Example</b>  <ul style="list-style-type: none"><li>▪ Coffee</li><li>▪ Tea</li><li>▪ Milk</li></ul> <ol style="list-style-type: none"><li>1. Coffee</li><li>2. Tea</li><li>3. Milk</li></ol>
6	Design a webpage to display nested ordered and unordered lists.
7	Design a webpage to display the time table of your class.
8	Create the following table using HTML tags. Properly align cells, give suitable cell padding and cell spacing, and apply background color, bold and emphasis necessary



	<p style="text-align: center;"><b>Activities</b></p> <table border="1"> <tr> <td rowspan="3">Sr School</td> <td>Maths Club</td> </tr> <tr> <td>Robotics Club</td> </tr> <tr> <td>Photography</td> </tr> <tr> <td rowspan="3">Middle School</td> <td>Gymnastic</td> </tr> <tr> <td>Yoga</td> </tr> <tr> <td>Computer Club</td> </tr> <tr> <td rowspan="3">Primary School</td> <td>Dance</td> </tr> <tr> <td>Vocal Music</td> </tr> <tr> <td>Swimming</td> </tr> </table>	Sr School	Maths Club	Robotics Club	Photography	Middle School	Gymnastic	Yoga	Computer Club	Primary School	Dance	Vocal Music	Swimming
Sr School	Maths Club												
	Robotics Club												
	Photography												
Middle School	Gymnastic												
	Yoga												
	Computer Club												
Primary School	Dance												
	Vocal Music												
	Swimming												
9	<p>Design a webpage to display following form</p> <p><b>Send e-mail to someone@example.com:</b></p> <p>Name:</p> <input type="text" value="your name"/> <p>E-mail:</p> <input type="text" value="your email"/> <p>Comment:</p> <input type="text" value="your comment"/> <p><input type="button" value="Send"/> <input type="button" value="Reset"/></p>												
10	Design a webpage to display student registration forms.												
11	Design a webpage that makes use of Cascading Style Sheets with (Background, fonts, Text styles).												
12	<p>Using CSS</p> <ol style="list-style-type: none"> <li>Create a class called income, and make it a background color of #0ff.</li> <li>Create a class called expenses, and make it a background color of #f0f.</li> <li>Create a class called profit, and make it a background color of #f00.</li> <li>Throughout the document, any text that mentions income, expenses, or profit, attach the appropriate class to that piece of text.</li> <li>Further create following line of text in the same document: The current price is 50₹ and new price is 40₹</li> </ol>												



**A) 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
Note: 1. Q.1, 2, 3 may be divided into sub questions if required. 2. Q.3 May include theory (short notes) /Case Study in one of the options.	

Passing criteria: Minimum 40% (12 out of 30) in semester end examination.

**SCHEME OF PRACTICAL EXAMINATION**

**(B) Practical Assessment 20 marks**

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

Passing criteria: Minimum 40% (8 out of 20) in practical examination



COURSE CODE	TITLE	CREDITS 2 (2Th)
U24PT2SEC01	Total Quality Management (Sem-III SEC)	
<b>Course Objectives:</b>	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	
<b>Course Outcomes:</b>	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	
<b>Unit I: Introduction to Quality</b>		<b>Lectures 15</b>
<ul style="list-style-type: none"> <li>• Concept &amp; Definition, Dimensions of product &amp; service quality, Historical perspective of quality control and improvements starting from World War II, Historical perspective of Quality Gurus.</li> <li>• Introduction to Six-Sigma: Overview of Six Sigma, Lean Manufacturing and Total Quality Management (TQM).</li> <li>• 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.</li> </ul>		
<b>Unit II: Quality System &amp; Standards</b>		<b>Lectures 15</b>
<ul style="list-style-type: none"> <li>• 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</li> <li>• Need for SQC in industries. Statistical Process Control: Seven tools of SPC.</li> <li>• Quality circles – Quality Function Deployment (QFD) – Taguchi quality loss function – TPM – Concepts, improvement needs – Performance measures – BPR – Pareto Charts – Ishikawa/Fish Bone diagram</li> </ul>		

#### 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-Hcinemann 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
<b>Total</b>	<b>20</b>

**(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
<b>Total</b>	<b>30</b>
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**





## Effective Communication Skills-2

*(To be implemented from AY 2024-25)*

Syllabus for FY B.Com (General), FY B.Com. (B.A.F/B.B.I./B.F.M.),  
FY B.Sc. (Computer/I.T./E.V.S./Packaging Technology)  
Semester-II

COURSE CODE :U24PT2AEC01

COURSE CREDIT: 02

1 credit - 15 lectures

1 lecture is of 60 minutes

### Course Objectives:

1. To develop effective interpersonal skills among learners for corporate employability.
2. To develop effective business letter writing skills among students applicable in corporate world.
3. To develop professional skills among learners for better personality development.

### Course Outcomes:

1. Learner will be able to apply interpersonal skills for better employability.
2. Learner will be able to utilize effective business letter writing skills required in corporate world.
3. Learner will be able to use specified oral and written skills for the professional development.

Sr.No	Syllabus	No. of lectures
01	<b>Module-1.Group Communication</b> Interview Skills: Preparing for Interview, Types of Interviews, Group Discussion: Nature and Ingredients, Process and Preparation, Corporate Meetings: Theory, Group Dynamics, Process of Conducting Meeting, Notice, Agenda and Minutes of Meeting, Conference: Types, Organization, Advanced Methods of conducting conferences	10
02	<b>Module-2.Business Correspondence -2</b> Trade Letters: Inquiry Letter, Complaint Letter, Adjustment Letter, Sales Letter, RTI and Consumer Grievance Letter ,Report Writing: Types of Report, Format of Report, Investigative Report, Feasibility Report	10
03	<b>Module-3. Language and Writing Skills:</b> Presentation Skills: Principles of Effective Presentation, Use of PPT Summarization: Identification of main points and sub points, Presenting in cohesive manner, Paraphrasing and summarizing,	10

### Reference Books:

9. A Handbook of Commercial Correspondence by Ashley, A, Oxford University Press, 1992.
10. Basic Business Communication: Skills for Empowering the Internet Generation by Raymond Lesikar and Marie Flatley, 9<sup>th</sup> Edition, Tata McGraw Hill, New Delhi, 2002.
11. Business Communication by D Chaturvedi and Mukesh Chaturvedi, Third Edition, Pearson Publications Ltd, 2013.
12. Business Communication by Meenakshi Raman and Prakash Singh ,Oxford University Press, 2007.
13. Business Communication Strategies by Monippally, Matthukutty, M, Tata McGraw Hill New Delhi, 2001.



14. Effective Business Communication by Herta Murphy, Herbert Hildebrandt, Jane Thomas, McGraw Hill Education, 2009.
15. Effective Communication by Balan K.R. and Rayadu C.S., Beacon Publication, New Delhi, 1996.
16. Effective Technical Communication by M. Ashraf, Rizvi, McGraw Hill Publications, 2006.

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### 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 20 marks

Description	Marks
* Continuous Evaluation	10
Project/ Activity Report /Assignments	5
Attendance and Class behavior	5
Total	20

\*Application oriented activities will be conducted

#### B) Semester end examination 30 marks

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

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



## SUSTAINABILITY & GREEN BUSINESS PRACTICES

COURSE CODE: U24PT2VEC01

COURSE CREDIT: 02

1 credit - 15 lectures

1 lecture is 60 minutes

### Objectives

- This program is intended to provide students with the tools needed to help their organization create effective programs, increase efficiency, cut costs, and improve their overall sustainability.
- Students will learn the core principles behind environmental sustainability, explore the “business case” for sustainability, and learn strategies for measuring sustainable practices.

Sr. No	Syllabus	No. of lectures
01	<p><b>Module -1- Natural Resources:</b></p> <p><b>Their Sustainable Management &amp; Conservation, Sustainable Development</b></p> <ul style="list-style-type: none"><li>□ Natural Resources: Meaning, Classification and types of natural resources - Water, Land, Forest, Energy, Minerals, Food; Threats to Natural Resources; Approach for Resource Conservation and Management: Air, Water, Soil and Energy</li><li>□ Sustainable Development: Definition and Meaning, 3 Pillars of sustainable development; Sustainable Development - Yesterday, Today and Tomorrow development; Global challenges of sustainable development : Our common future report, Agenda 21 and Millenium Development Goal, etc.; National sustainable development strategies in India; Important current Issues related to sustainable development (Global warming, climate change, etc.)</li></ul>	15



02	<p><b>Module-2 - Business Strategies and Sustainability and Designing Sustainable Futures</b></p> <ul style="list-style-type: none"> <li>□ Business and sustainability: Concept of responsible business, CERES (coalition for environmentally responsible economics) principles and blended value; Sustainable development in planning and management: Principles and Approaches - Triple bottom line, ESG, etc.; Sustainability reporting(CSR); Life Cycle Analysis; Circular Economy; Indicators of sustainability: Introduction to Nature's Living Planet Index (WWF), Happy Planet Index (New Economics Foundation), Gross Domestic Product, Human Development Index, Dow Jones Sustainability Index, etc.</li> <li>□ Innovation in Business Practices: Waste as a resource, Renewable Energy Resources (sun, wind, bioenergy, etc.) - Case Studies; Green Marketing and Green Consumerism; Green Business Practices: Ecofriendly Packaging, Organic Farming, Ecotourism, Smart Agriculture,etc.</li> </ul>	15
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**References:**

- Green Marketing and Management: A global Perspective by John F. Whaik, Qbase Technologies.
- Green Project Management by Richard Maltzman And David Shiden, CRC Press Books.
- Green and World by Andrew S. Winston, Yale Press B



## SCHEME OF EXAMINATION

The scheme of examination shall be divided as follows:

- Comprehensive Internal assessment 100% i.e. 50 marks

Description	Marks
Case Study/ Case-let/ Situation Analysis – (Group Activity or Individual Activity)/ Group Discussion/ Role Play/ Story Telling/ Presentation/ Practical Assignment/ Written Home Assignment/ Industry Analysis – (Group Activity or Individual Activity)/ Literature Review/ Book Review/ In-depth Viva/ Student Driven Activities/ Newspaper reading/ Report Writing/Precis Writing. (Any one of these)	15
Project	20
Class Test/ Open Book Test/ Quiz	10
Class Participation	5
Total	50

Passing criteria: Minimum 40% (20 out of 50) in Comprehensive Internal Assessment.



## Co-Curricular Course in Life Skills II

COURSE CODE: U24CC2LS02

COURSE CREDIT: 02

1 credit - 15 lectures

1 lecture is 60 minutes.

### Course Objectives:

1. To understand and achieve various states of human well-being.
2. To increase one's knowledge and awareness about yoga and pranayama.
3. To develop sense of gratitude amongst learners
4. To strengthen positive relationships within family.
5. To understand responsibilities as a social being.

### Course outcomes:

After completion of the course, learners would be able to:

1. Demonstrate different states of well-being for holistic development.
2. Practice yoga and Pranayama for living healthy life.
3. Adopt gratitude as a regular practice.
4. Strengthen family relationships and achieve emotional balance.
5. Become a Responsible citizen of society

Module No	Syllabus	No. of hours
<b>1</b> <b>Integral Human Well-being</b>	1. Importance of well-being, inter-relatedness of different kinds of well-being and definition of well-being 2. Well-being and its kinds- Physical well-being, Emotional well-being, Aesthetic well-being, Intellectual well-being, Relational well-being, Moral well-being, Spiritual Well- being 3. Establish and recognize various states of well-being, embedded in different creatures, but consciously understood by humans. 4. Identify the most pronounced emotions in the individual through given activities anecdotes, videos, activity to help identify different states of well-being. 5. Discussion of related values to well-being: Acsthetics, cthics, gratitude, forgiveness, and spiritual health, that is, thinking beyond the senses and the self and for the welfare of others. 6. Importance and practice of well-being through case study and or activity. 7. Ways to attain different states of well-being. 8. Activities.	<b>10</b>
<b>2</b> <b>Yoga and Pranayama</b>	1. Importance of Yoga and Pranayama: a. Yoga and pranayama for the integral well-being and balance in life. b. Yoga and pranayama: Introduction. c. Mind –	<b>5</b>





	Body – Intellect. d. Difference between yoga and pranayama and their interrelatedness. 2. Basic Yogasanas and Pranayama for Learners: a. Every morning. b. Before bedtime. c. Before a presentation. d. Before examination. e. To fight stress 3. Healthy Diet. 4. Healthy Mind. 5. Recommended Routine for Yoga and Pranayama.	
<b>3 Gratitude</b>	1. Gratitude — A great embellishment to a person's mental quality. 2. Duty versus Rights. 3. Wonderment and Simplicity. 4. Gratitude to: a. The family. b. The teachers. c. The society. d. The nation. e. The universe. 5. Activity: Count your blessings; Live in an attitude of gratitude	<b>5</b>
<b>4 Relationship and Family</b>	1. Family: Meaning and constitution. 2. Importance of family relationships 3. Characteristics of a strong family 4. Build strong family relationships	<b>5</b>
<b>5 Role in Society</b>	1. Meaning of Society. 2. Social roles — Meaning and various types. 3. Individual as a Social Being. 4. Responsibilities as Social Being 5. Role conflict versus role strain	<b>5</b>
	Total No of hours	<b>30</b>

References:

1. [https://www.ugc.gov.in/pdfnews/4371304\\_LifeSKill\\_JeevanKaushal\\_2023.pdf](https://www.ugc.gov.in/pdfnews/4371304_LifeSKill_JeevanKaushal_2023.pdf)

**Pedagogy-** Practical session / case study / experiential learning / Demonstration /Biographies /Reflection Journal

**SCHEME OF EXAMINATION**

**Total Marks: 50**

**Continuous Evaluation pattern.**

<b>Evaluation Criteria</b>	<b>Marks</b>
Prepare a report/presentation/movie/video	10
Roleplay /Discussions /Tests /Projects /Assignments	10
Class Participation	10
Reflective journal evaluation	20
<b>Total</b>	<b>50</b>

