PROGRAM EDUCATIONAL OBJECTIVES:

Bachelor of Fashion Technology curriculum is designed to prepare the undergraduates to

1. Have **attitude and knowledge** for the successful **professional and technical career**
2. Have strong foundation in basic **sciences, engineering, management, mathematics and computational platforms**
3. Have **knowledge** on the **theory and practices** in the field of textile based garment manufacturing technology, fashion industry and allied areas
4. Engross in **life-long learning** to keep themselves abreast of new developments, and practice and inspire high **ethical values and technical standards**

PROGRAM OUTCOMES:

The Fashion Technology Graduates will have the ability to

1. Apply knowledge of **mathematics, sciences, engineering, textile and fashion technology** to get **solution** for the **technological problems** in fashion and garment industry
2. Identify, formulate, review literature and **critically analyze the technological problems** in the textile and fashion industry to reach **substantiated conclusion**
3. Design and develop the **solutions** to the **technological and managerial problems** in fashion and garment industry with appropriate consideration for the
public health and safety, and the cultural, societal, and environmental considerations

4. Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions to the technological problems in fashion and textile based garment industry

5. Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools for managing garment manufacturing companies with an understanding of the limitations

6. Apply reasoning gained through the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the profession

7. Understand the impact of the developed solutions in societal and environmental contexts, and demonstrate the knowledge for sustainable development

8. Understand ethical and professional responsibilities

9. Function effectively as an individual, and as a member or leader in diverse teams in the profession

10. Communicate effectively on complex engineering activities with the engineering community and with society at large. Able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. Demonstrate knowledge and understanding of the engineering and management principles and apply these to one’s own work, as a member and leader in a team, to manage projects and in multidisciplinary environments

12. Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM SPECIFIC OUTCOMES:

The Fashion Technology Graduates will have the ability to

1. Understand and apply fundamental and the technical knowledge for managing textile based garment and fashion industries.

2. Be a successful entrepreneur and execute fashion business in the levels of garment design, development and manufacture.

3. Design and develop novel products and manufacturing processes in fashion and Garment fields.
## PEO’s – PO’s & PSO’s MAPPING

<table>
<thead>
<tr>
<th>P E O</th>
<th>PO 1</th>
<th>PO 2</th>
<th>PO 3</th>
<th>PO 4</th>
<th>PO 5</th>
<th>PO 6</th>
<th>PO 7</th>
<th>PO 8</th>
<th>PO 9</th>
<th>PO1 0</th>
<th>PO1 1</th>
<th>PO1 2</th>
<th>PSO 1</th>
<th>PSO 2</th>
<th>PSO 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>II</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>III</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>IV</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Year</td>
<td>Semest er</td>
<td>Course Name</td>
<td>PO</td>
<td>PSO</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>------</td>
<td>-----------</td>
<td>------------------------------------------------------------------------------</td>
<td>----</td>
<td>-----</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>HUMANITIES AND SOCIAL SCIENCES INCLUDING MANAGEMENT COURSES</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>I</td>
<td>English for Engineering and Technology - I</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>II</td>
<td>English for Engineering and Technology - II</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VII</td>
<td>VII</td>
<td>Ethics and Human values</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VII</td>
<td>VII</td>
<td>Management Elective</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Basic Science Courses [BSC]</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>I</td>
<td>Mathematics – I</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>I</td>
<td>Engineering Physics</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>I</td>
<td>Chemistry</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>I</td>
<td>Physics and Chemistry Laboratory</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>II</td>
<td>Mathematics – II</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>II</td>
<td>Physics for Fashion Technologists</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>II</td>
<td>Chemistry for Textile Technologists</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>III</td>
<td>Probability and Statistical Methods</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IV</td>
<td>IV</td>
<td>Environmental Science and Sustainability</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>ENGINEERING SCIENCE COURSE [ESC]</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>I</td>
<td>Programming</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Engineering Graphics</td>
<td>Programming Laboratory</td>
<td>Basics of Electrical and Electronics Engineering</td>
<td>Engineering Practices Laboratory</td>
<td>Electrical &amp; Electronics Engineering Laboratory</td>
<td>PROFESSIONAL CORE COURSES [PCC]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>----------------------</td>
<td>------------------------</td>
<td>-----------------------------------------------</td>
<td>---------------------------------</td>
<td>-----------------------------------------------</td>
<td>----------------------------------</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>Engineering Graphics</td>
<td>Programming Laboratory</td>
<td>Basics of Electrical and Electronics Engineering</td>
<td>Engineering Practices Laboratory</td>
<td>Electrical &amp; Electronics Engineering Laboratory</td>
<td>PROFESSIONAL CORE COURSES [PCC]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>Fiber science</td>
<td>Characteristics of Textile Fibres</td>
<td>3 3 3 3 2 - - - - - - 2 3 1 2</td>
<td>Technology of Spinning processes</td>
<td>3 3 3 3 2 2 2 3 2 2 3 1 1 3</td>
<td>Fiber science</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>Fiber science</td>
<td>Characteristics of Textile Fibres</td>
<td>3 3 3 3 2 - - - - - - 2 3 1 2</td>
<td>Technology of Spinning processes</td>
<td>3 3 3 3 2 2 2 3 2 2 3 1 1 3</td>
<td>Fiber science</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>Fabric Manufacturing</td>
<td>Fabric Manufacturing</td>
<td>3 2 2 1 2 - - - - 1 2 2 3 - 2</td>
<td>Fabric Manufacturing</td>
<td>3 2 2 1 2 - - - - 1 2 2 3 - 2</td>
<td>Fabric Manufacturing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>Fabric Structures</td>
<td>Fabric Structures</td>
<td>3 2 2 1 2 - - - - 1 2 2 3 - 2</td>
<td>Fabric Structures</td>
<td>3 2 2 1 2 - - - - 1 2 2 3 - 2</td>
<td>Fabric Structures</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>Concepts and Evolution of Fashion and Design</td>
<td>Concepts and Evolution of Fashion and Design</td>
<td>1 1 3 3 2 - - - - - - 2 3 1 2</td>
<td>Concepts and Evolution of Fashion and Design</td>
<td>1 1 3 3 2 - - - - - - 2 3 1 2</td>
<td>Concepts and Evolution of Fashion and Design</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>Fabric Structure Laboratory</td>
<td>Fabric Structure Laboratory</td>
<td>3 3 3 2 - - - - 2 - - 3 1 3</td>
<td>Fabric Structure Laboratory</td>
<td>3 3 3 2 - - - - 2 - - 3 1 3</td>
<td>Fabric Structure Laboratory</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>Fashion Illustration Laboratory</td>
<td>Fashion Illustration Laboratory</td>
<td>1 1 1 2 3 - 2 - - 3 1 2 3 3 3</td>
<td>Fashion Illustration Laboratory</td>
<td>1 1 1 2 3 - 2 - - 3 1 2 3 3 3</td>
<td>Fashion Illustration Laboratory</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IV</td>
<td>Apparel Production Machinery</td>
<td>Apparel Production Machinery</td>
<td>1 3 3 2 2 1 - - - - - - 3 3 3 3</td>
<td>Apparel Production Machinery</td>
<td>1 3 3 2 2 1 - - - - - - 3 3 3 3</td>
<td>Apparel Production Machinery</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IV</td>
<td>Fabric and Garment Quality Evaluation</td>
<td>Fabric and Garment Quality Evaluation</td>
<td>3 3 1 2 1 2 1 3 1 1 2 2 1 1 2</td>
<td>Fabric and Garment Quality Evaluation</td>
<td>3 3 1 2 1 2 1 3 1 1 2 2 1 1 2</td>
<td>Fabric and Garment Quality Evaluation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IV</td>
<td>Fundamentals of Garment Manufacturing</td>
<td>Fundamentals of Garment Manufacturing</td>
<td>3 3 2 2 3 - - - - 1 - - 3 2 2</td>
<td>Fundamentals of Garment Manufacturing</td>
<td>3 3 2 2 3 - - - - 1 - - 3 2 2</td>
<td>Fundamentals of Garment Manufacturing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IV</td>
<td>Pattern Engineering</td>
<td>Pattern Engineering</td>
<td>2 2 2 2 3 - - - 1 - - - 2 - 2</td>
<td>Pattern Engineering</td>
<td>2 2 2 2 3 - - - 1 - - - 2 - 2</td>
<td>Pattern Engineering</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IV</td>
<td>Textile Chemical Processing</td>
<td>Textile Chemical Processing</td>
<td>3 3 2 2 - - - - 3 - - 2 2 1 2</td>
<td>Textile Chemical Processing</td>
<td>3 3 2 2 - - - - 3 - - 2 2 1 2</td>
<td>Textile Chemical Processing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IV</td>
<td>Computer Aided Fashion Designing Laboratory</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>---</td>
<td>-------------------------------------------</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>IV</td>
<td>Basics of Pattern Engineering and Garment Construction Laboratory</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>-</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>IV</td>
<td>Textile Chemical Processing Lab</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>V</td>
<td>Garment Construction</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>V</td>
<td>Apparel Production Planning and Process Control</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>V</td>
<td>Garment Construction Laboratory – I</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>-</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>V</td>
<td>Computer Aided Garment Designing Laboratory</td>
<td>3</td>
<td>2</td>
<td>-</td>
<td>2</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>VI</td>
<td>Apparel Marketing and Merchandising</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>VI</td>
<td>Industrial Engineering in Garment Manufacturing</td>
<td>2.2</td>
<td>2.4</td>
<td>2.8</td>
<td>-</td>
<td>-</td>
<td>1.6</td>
<td>1.6</td>
<td>1.8</td>
<td>1.6</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>VI</td>
<td>Garment Construction Laboratory – II</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>-</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>VI</td>
<td>Design Collection / Portfolio</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>VII</td>
<td>Fundamentals of economics and apparel costing</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>2</td>
<td>-</td>
<td>1.6</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>VII</td>
<td>Apparel Product Engineering Laboratory</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>-</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>

**PROFESSIONAL ELECTIVES [PEC]**

| V | Fashion forecasting | 1 | 2 | 3 | 3 | 3 | 3 | - | 3 | 1 | 2 | - | 1 | 2 | 3 | 3 |
| V | Visual merchandising | 2 | 1 | 2 | 2 | - | - | - | - | 2 | - | - | 2 | - | - | - |
| V | Textile Heritage | 1 | - | 1 | - | - | 2 | - | - | - | 2 | - | 2 | 1 | 1 | 1 | |
| V | Apparel Retail Management | 2 | 2 | 3 | 2 | - | - | - | - | 2 | - | 2 | 3 | 2 | | |
| V | Apparel Brand management | 1 | 2 | 3 | 1 | 2 | - | - | - | - | - | - | - | - | - | 2 |
| V | Digital Marketing and E-Business | 2 | 2 | 2 | 1 | 3 | 1 | - | - | - | - | - | - | - | - | 2 |
| V | Apparel Product Development | 1 | 1 | 1.8 | 1 | 0.4 | 0.6 | 0.4 | 0.8 | 0.6 | 0.8 | 0.4 | 1 | 1 | 0.4 | 0.4 |
| V | Clothing Fit and comfort | 1 | 1.2 | 1.2 | 1 | 0.4 | 0.4 | 0.8 | 1.2 | 0. | 0.2 | 1 | 1.2 | 1.2 | 0. | 0.2 |
| VI | Apparrel trims, accessories and Embellishments | 1 | 1.2 | 1.6 | 0.8 | 0.6 | 1.2 | 0.8 | 1 | 0.8 | 1.2 | 0.8 |
| VI | Garment finishing and care | 1 | 1 | 1 | 0.8 | 0.8 | 1 | 1 | 1.4 | 0.2 | 0.2 | 0.2 | 1 | 1 | 0.2 | 0.2 |
| VI | Home Furnishing | 1 | 1 | 1.4 | 0.6 | 0.4 | 1 | 1 | 0.2 | 0.8 | 0.8 | 1.8 | 1 | 1 | 0.8 |
| VI | Knit Product Development | 1 | 1 | 1 | 1 | 0.8 | 0.8 | 1 | 0.8 | 0.8 | 1 | 1 | 0.6 | 6 | 1.8 |
| VI | Automations in Apparel manufacture | 1 | 1.8 | 2.4 | 2.8 | 3 | 1 | - | 1.4 | - | 2 | - | 1.2 | 3 | 3 |
| VI | Lean manufacturing | 1 | 1.8 | 2.4 | 3 | 3 | - | - | 2.8 | 2 | 2 | 1 | - | 3 | 2 | 3 |
| VI | Supply chain management for Apparel Industry | - | - | - | - | - | 1.8 | 2.8 | 3 | 2.4 | 2 | 2.6 | 1 | 1 | 1 | 3 | 3 |
| VI | Social compliances and quality assurance in apparel industry | - | - | - | - | - | 3 | 2.6 | 3 | 1 | 2 | 2 | 3 | 1 | 3 | 2.8 |
| VI | Advanced Technologies for Apparel Industry | 1 | 1.8 | 2.8 | 2.8 | 3 | 1 | 0.6 | 1 | 1.4 | 0 | 2 | 0 | 1.2 | 3 | 3 |
| VI | Computer Applications In Apparel Manufacturing | 1 | 1.8 | 2.8 | 2.8 | 3 | 1 | - | 1.4 | - | 2 | - | 1.2 | 3 | 3 |
| VI | Operation research in Apparel Industry | 3 | 2 | 2 | 3 | 3 | - | - | - | - | 1 | 2 | 1 | 3 | 3 | 2 |
| VI | Enterprise Resource Planning in Apparel Industry | 3 | 2 | 2 | 3 | 3 | - | - | - | - | 1 | 2 | 1 | 3 | 3 | 2 |
| VI | International Textile and apparel Business management | 2 | 1 | 1 | 2 | 1 | - | - | - | - | 1 | - | 1 | 2 | 1 | - |
| VI | Entrepreneurship in apparel manufacture | 2 | 1.6 | 2 | 2.2 | 1.2 | 1.3 | 1.5 | 2.2 | 2.3 | - | - | - | 2 | 3 | 2 |
| VI | Sustainable apparel Business Management | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | - | - | - | 2 | 3 | 2 |
| VI | Human Resource Management | 2 | 2 | 2 | - | - | - | 2 | 3 | 2 | 2 | - | 2 | 3 | - |
| VI | Technology of non-wovens | 1 | 1.2 | 1.4 | 0.2 | 1.2 | 0.6 | 1 | 0.2 | 0.8 | 0.4 | 0.8 | 1.2 | 0.6 | 0.8 | 0.8 |
| VI       | Protective Garments | 1.4 | 1.4 | 1.2 | 0.8 | 0.6 | 0.4 | 0.8 | 0.6 | 0.6 | 0.6 | 1.4 | 0.8 | 1 | 0.8 |
| VI       | Intimate apparels  | 1.4 | 1.8 | 2   | 1   | 0.8 | 0.8 | 1.2 | 1.2 | 0.6 | 0.6 | 0.8 | 1.4 | 0.8 | 1.4 | 1.2 |
| VI       | Smart Textiles and Garments | 1.6 | 1.2 | 1.2 | 0.8 | 1   | 0.8 | 1.2 | 1   | 0.8 | 0.6 | 0.8 | 1.2 | 0.8 | 0.6 | 0.8 |
| VI       | Sports Textiles and Garments | 1.6 | 1.4 | 1.6 | 1.8 | 1.2 | 1.2 | 1.2 | 1   | 1.4 | 0.8 | 1.4 | 1.4 | 1.2 | 1.2 | 1.4 |
| VI       | Medical Textiles and Garments | 1   | 1   | 1.4 | 1.4 | 0.8 | 1.4 | 1   | 1   | 1   | 0.8 | 1   | 1   | 1   | 1.2 | 1   |
|          | **EMPLOYABILITY ENHANCEMENT COURSES (EEC)** | 1    | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  | 11  | 12  | 1   | 2   | 3   |
| V        | Life Skills and Soft Skills | 3    | 3   | 2   | 2.6 | 2.8 | 2   | 2   | 2.1 | 2.1 | 3   | 2.4 | 2.6 | 2.6 | 2.8 | 2.4 |
| V        | Industrial training/internship** | 3    | 3   | 2   | 2.6 | 2.8 | 2   | 2   | 2.1 | 2.1 | 3   | 2.4 | 2.6 | 2.6 | 2.8 | 2.4 |
| VII      | Industrial training/ internship* | 3    | 3   | 2   | 2.6 | 2.8 | 2   | 2   | 2.1 | 2.1 | 3   | 2.4 | 2.6 | 2.6 | 2.8 | 2.4 |
| VIII     | Industrial Training*/Project Work | 3    | 3   | 3   | 3   | 1   | 1   | 1   | 2   | 2   | 2   | 2   | 1   | 3   | 2   | 3   |
### ANNA UNIVERSITY, CHENNAI
NON-AUTONOMOUS COLLEGES AFFILIATED COLLEGES
REGULATIONS 2021
B. TECH. FASHION TECHNOLOGY
CHOICE BASED CREDIT SYSTEM
CURRICULUM FOR SEMESTERS I TO VIII AND SYLLABI FOR SEMESTERS I AND IV
SEMESTER I

<table>
<thead>
<tr>
<th>S. No.</th>
<th>COURSE CODE</th>
<th>COURSE TITLE</th>
<th>CATEGORY</th>
<th>PERIODS PER WEEK</th>
<th>TOTAL CONTACT PERIODS</th>
<th>CREDITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>IP3151</td>
<td>Induction Programme</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0</td>
</tr>
<tr>
<td>2.</td>
<td>HS3151</td>
<td>Professional English - I</td>
<td>HSMC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>3.</td>
<td>MA3151</td>
<td>Matrices and Calculus</td>
<td>BSC</td>
<td>3 1 0</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>4.</td>
<td>PH3151</td>
<td>Engineering Physics</td>
<td>BSC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>5.</td>
<td>CY3151</td>
<td>Engineering Chemistry</td>
<td>BSC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>6.</td>
<td>GE3151</td>
<td>Problem Solving and Python Programming</td>
<td>ESC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>7.</td>
<td>GE3152</td>
<td>தமிழ் மரபு /Heritage of Tamils</td>
<td>HSMC</td>
<td>1 0 0</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

### PRACTICALS

<table>
<thead>
<tr>
<th>S. No.</th>
<th>COURSE CODE</th>
<th>COURSE TITLE</th>
<th>CATEGORY</th>
<th>PERIODS PER WEEK</th>
<th>TOTAL CONTACT PERIODS</th>
<th>CREDITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.</td>
<td>GE3171</td>
<td>Problem Solving and Python Programming Laboratory</td>
<td>ESC</td>
<td>0 0 4</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>9.</td>
<td>BS3171</td>
<td>Physics and Chemistry Laboratory</td>
<td>BSC</td>
<td>0 0 4</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>10.</td>
<td>GE3172</td>
<td>English Laboratory</td>
<td>EEC</td>
<td>0 0 2</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

| TOTAL | 16 | 10 | 27 | 22 |

$ Skill Based Course
### SEMESTER II

<table>
<thead>
<tr>
<th>SI. NO.</th>
<th>COURSE CODE</th>
<th>COURSETITLE</th>
<th>CATEGORY</th>
<th>PERIODS PER WEEK</th>
<th>TOTAL CONTACT PERIODS</th>
<th>CREDITS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>L</td>
<td>T</td>
<td>P</td>
</tr>
<tr>
<td><strong>THEORY</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>HS3251</td>
<td>Professional English - II</td>
<td>HSMC</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2.</td>
<td>MA3251</td>
<td>Statistics and Numerical Methods</td>
<td>BSC</td>
<td>3</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>3.</td>
<td>FT3201</td>
<td>Fibre Science</td>
<td>PCC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4.</td>
<td>BE3252</td>
<td>Basic Electrical, Electronics and Instrumentation Engineering</td>
<td>ESC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5.</td>
<td>GE3251</td>
<td>Engineering Graphics</td>
<td>ESC</td>
<td>2</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>6.</td>
<td>CY3252</td>
<td>Chemistry for Textile Technologists</td>
<td>BSC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>7.</td>
<td>GE3252</td>
<td>தமிழரும் ததொழில்நுட்பமும் / Tamils and Technology</td>
<td>HSMC</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>PRACTICALS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>GE3271</td>
<td>Engineering Practices Laboratory</td>
<td>ESC</td>
<td>0</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>10.</td>
<td>BE3272</td>
<td>Basic Electrical, Electronics and Instrumentation Engineering Laboratory</td>
<td>ESC</td>
<td>0</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>11.</td>
<td>GE3272</td>
<td>Communication Laboratory / Foreign Language $</td>
<td>EEC</td>
<td>0</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>17</td>
<td>1</td>
<td>16</td>
</tr>
</tbody>
</table>

# NCC Credit Course level 1 is offered for NCC students only. The grades earned by the students will be recorded in the Mark Sheet, however the same shall not be considered for the computation of CGPA.

$ Skill Based Course
### SEMESTER III

<table>
<thead>
<tr>
<th>S. NO.</th>
<th>COURSE CODE</th>
<th>COURSE TITLE</th>
<th>CATEGORY</th>
<th>PERIODS PER WEEK</th>
<th>TOTAL CONTACT PERIODS</th>
<th>CREDITS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>L</td>
<td>T</td>
<td>P</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>THEORY</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>MA3357</td>
<td>Probability and Statistical Methods</td>
<td>BSC</td>
<td>3</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>2.</td>
<td>FT3301</td>
<td>Characteristics of Textile Fibres</td>
<td>PCC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>3.</td>
<td>FT3302</td>
<td>Technology of Spinning processes</td>
<td>PCC</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4.</td>
<td>FT3303</td>
<td>Fabric Manufacturing</td>
<td>PCC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5.</td>
<td>FT3304</td>
<td>Fabric Structures</td>
<td>PCC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>6.</td>
<td>FT3305</td>
<td>Concepts and Evolution of Fashion and Design</td>
<td>PCC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>PRACTICALS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>FT3311</td>
<td>Fabric Structure Laboratory</td>
<td>PCC</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>8.</td>
<td>FT3312</td>
<td>Fashion Illustration Laboratory</td>
<td>PCC</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>9.</td>
<td>GE3361</td>
<td>Professional Development$</td>
<td>EEC</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>TOTAL</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$ Skill Based Course

### SEMESTER IV

<table>
<thead>
<tr>
<th>S. NO.</th>
<th>COURSE CODE</th>
<th>COURSE TITLE</th>
<th>CATEGORY</th>
<th>PERIODS PER WEEK</th>
<th>TOTAL CONTACT PERIODS</th>
<th>CREDITS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>L</td>
<td>T</td>
<td>P</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>THEORY</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>FT3401</td>
<td>Apparel Production Machinery</td>
<td>PCC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2.</td>
<td>FT3402</td>
<td>Fabric and Garment Quality Evaluation</td>
<td>PCC</td>
<td>3</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>3.</td>
<td>FT3403</td>
<td>Fundamentals of Garment Manufacturing</td>
<td>PCC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4.</td>
<td>FT3404</td>
<td>Pattern Engineering</td>
<td>PCC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5.</td>
<td>FT3405</td>
<td>Textile Chemical Processing</td>
<td>PCC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>6.</td>
<td>GE3451</td>
<td>Environmental Sciences and Sustainability</td>
<td>BSC</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>7.</td>
<td></td>
<td>NCC Credit Course Level 2*</td>
<td></td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>PRACTICALS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>FT3411</td>
<td>Computer Aided Fashion Designing Laboratory</td>
<td>PCC</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>9.</td>
<td>FT3412</td>
<td>Basics of Pattern Engineering and Garment Construction Laboratory</td>
<td>PCC</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>10.</td>
<td>FT3413</td>
<td>Textile Chemical Processing Laboratory</td>
<td>PCC</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>11.</td>
<td>FT3513</td>
<td>Industrial training/internship I*</td>
<td>EEC</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>TOTAL</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

# NCC Credit Course level 2 is offered for NCC students only. The grades earned by the students will be recorded in the Mark Sheet, however the same shall not be considered for the computation of CGPA.
*Four weeks industrial training/internship carries two credits. Industrial training/internship during IV Semester Summer Vacation will be evaluated in V semester*

**SEMESTER V**

<table>
<thead>
<tr>
<th>S. NO.</th>
<th>COURSE CODE</th>
<th>COURSE TITLE</th>
<th>CATEGORY</th>
<th>PERIODS PER WEEK</th>
<th>TOTAL CONTACT Periods</th>
<th>CREDITS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>L</td>
<td>T</td>
<td>P</td>
</tr>
<tr>
<td>THEORY</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>FT3501</td>
<td>Garment Construction</td>
<td>PCC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2.</td>
<td>FT3591</td>
<td>Apparel Production Planning and Process Control</td>
<td>PCC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td>Professional Elective I</td>
<td>PEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td>Professional Elective II</td>
<td>PEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5.</td>
<td></td>
<td>Professional Elective III</td>
<td>PEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>6.</td>
<td></td>
<td>Mandatory Course-1</td>
<td>MC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PRACTICALS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>FT3511</td>
<td>Garment Construction Laboratory – I</td>
<td>PCC</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>8.</td>
<td>FT3512</td>
<td>Computer Aided Garment Designing Laboratory</td>
<td>PCC</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>9.</td>
<td>FT3513</td>
<td>Industrial training / internship I**</td>
<td>EEC</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td></td>
<td>15</td>
<td>0</td>
<td>6</td>
</tr>
</tbody>
</table>

*Mandatory Course-I is a Non-credit Course (Student shall select one course from the list given under MC-I)*

**SEMESTER VI**

<table>
<thead>
<tr>
<th>S. NO.</th>
<th>COURSE CODE</th>
<th>COURSE TITLE</th>
<th>CATEGORY</th>
<th>PERIODS PER WEEK</th>
<th>TOTAL CONTACT Periods</th>
<th>CREDITS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>L</td>
<td>T</td>
<td>P</td>
</tr>
<tr>
<td>THEORY</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>FT3691</td>
<td>Apparel Marketing and Merchandising</td>
<td>PCC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2.</td>
<td>FT3692</td>
<td>Industrial Engineering in Garment Manufacturing</td>
<td>PCC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td>Open Elective – I*</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td>Professional Elective IV</td>
<td>PEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5.</td>
<td></td>
<td>Professional Elective V</td>
<td>PEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>6.</td>
<td></td>
<td>Professional Elective VI</td>
<td>PEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>7.</td>
<td></td>
<td>Mandatory Course-II</td>
<td>MC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>8.</td>
<td></td>
<td>NCC Credit Course Level 3**</td>
<td>MC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PRACTICALS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>FT3611</td>
<td>Garment Construction Laboratory – II</td>
<td>PCC</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>10.</td>
<td>FT3612</td>
<td>Design Collection / Portfolio</td>
<td>PCC</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>11.</td>
<td>FT3712</td>
<td>Industrial training/ Internship II**</td>
<td>EEC</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td></td>
<td>21</td>
<td>0</td>
<td>6</td>
</tr>
</tbody>
</table>
**Open Elective – I shall be chosen from the emerging technologies.**

**Two weeks industrial training/internship carries one credit. Industrial training/Internship during VI Semester Summer Vacation will be evaluated in VII semester.**

* Mandatory Course-II is a Non-credit Course (Student shall select one course from the list given under MC-II)

# NCC Credit Course level 3 is offered for NCC students only. The grades earned by the students will be recorded in the Mark Sheet, however the same shall not be considered for the computation of CGPA.

---

### SEMESTER VII/VIII

<table>
<thead>
<tr>
<th>S. NO.</th>
<th>COURSE CODE</th>
<th>COURSE TITLE</th>
<th>CATEGORY</th>
<th>PERIODS PER WEEK</th>
<th>TOTAL CONTACT PERIODS</th>
<th>CREDITS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>L</td>
<td>T</td>
<td>P</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>THEORY</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>FT3701</td>
<td>Fundamentals of economics and apparel costing</td>
<td>PCC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2.</td>
<td>GE3751</td>
<td>Human values and Ethics</td>
<td>HSMC</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td>Elective- Management #</td>
<td>HSMC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td>Open Elective – II**</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5.</td>
<td></td>
<td>Open Elective – III***</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>6.</td>
<td></td>
<td>Open Elective – IV***</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>PRACTICALS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>FT3711</td>
<td>Apparel Product Engineering Laboratory</td>
<td>PCC</td>
<td>0</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>8.</td>
<td>FT3712</td>
<td>Industrial training/Internship II##</td>
<td>EEC</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>TOTAL</strong></td>
<td></td>
<td>17</td>
<td>0</td>
<td>4</td>
</tr>
</tbody>
</table>

*If students undergo internship in Semester VII, then the courses offered during semester VII will be offered during semester VIII.

**Open Elective – II shall be chosen from the emerging technologies.**

**Open Elective III and IV (Shall be chosen from the list of open electives offered by other Programmes**

* Elective- Management shall be chosen from the Elective Management courses

## Two weeks industrial training/internship carries one credit. Industrial training/Internship during VI Semester Summer Vacation will be evaluated in VII semester

---

### SEMESTER VIII/VII

<table>
<thead>
<tr>
<th>S. NO.</th>
<th>COURSE CODE</th>
<th>COURSE TITLE</th>
<th>CATEGORY</th>
<th>PERIODS PER WEEK</th>
<th>TOTAL CONTACT PERIODS</th>
<th>CREDITS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>L</td>
<td>T</td>
<td>P</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>PRACTICALS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>FT3811</td>
<td>Internship*/ Project Work</td>
<td>EEC</td>
<td>0</td>
<td>0</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>TOTAL</strong></td>
<td></td>
<td>0</td>
<td>0</td>
<td>20</td>
</tr>
</tbody>
</table>

*If students undergo internship in Semester VII, then the courses offered during semester VII will be offered during semester VIII.

## 15 weeks of continuous Internship in an organization carries 10 credits.

TOTAL CREDTS : 164
### ELECTIVE – MANAGEMENT COURSES

<table>
<thead>
<tr>
<th>SL. NO.</th>
<th>COURSE CODE</th>
<th>COURSE TITLE</th>
<th>CATEGORY</th>
<th>PERIODS PER WEEK</th>
<th>TOTAL CONTACT PERIODS</th>
<th>CREDITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>GE3751</td>
<td>Principles of Management</td>
<td>HSMC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>2.</td>
<td>GE3752</td>
<td>Total Quality Management</td>
<td>HSMC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>3.</td>
<td>GE3753</td>
<td>Engineering Economics and Financial Accounting</td>
<td>HSMC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>4.</td>
<td>GE3754</td>
<td>Human Resource Management</td>
<td>HSMC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>5.</td>
<td>GE3755</td>
<td>Knowledge Management</td>
<td>HSMC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>6.</td>
<td>GE3792</td>
<td>Industrial Management</td>
<td>HSMC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>

### MANDATORY COURSES I

<table>
<thead>
<tr>
<th>SL. NO.</th>
<th>COURSE CODE</th>
<th>COURSE TITLE</th>
<th>CATEGORY</th>
<th>PERIODS PER WEEK</th>
<th>TOTAL CONTACT PERIODS</th>
<th>CREDITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>MX3081</td>
<td>Introduction to Women and Gender Studies</td>
<td>MC</td>
<td>3 0 0</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>2.</td>
<td>MX3082</td>
<td>Elements of Literature</td>
<td>MC</td>
<td>3 0 0</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>3.</td>
<td>MX3083</td>
<td>Film Appreciation</td>
<td>MC</td>
<td>3 0 0</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>4.</td>
<td>MX3084</td>
<td>Disaster Management</td>
<td>MC</td>
<td>3 0 0</td>
<td>3</td>
<td>0</td>
</tr>
</tbody>
</table>

### MANDATORY COURSES II

<table>
<thead>
<tr>
<th>SL. NO.</th>
<th>COURSE CODE</th>
<th>COURSE TITLE</th>
<th>CATEGORY</th>
<th>PERIODS PER WEEK</th>
<th>TOTAL CONTACT PERIODS</th>
<th>CREDITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>MX3085</td>
<td>Well Being with traditional practices (Yoga, Ayurveda and Siddha)</td>
<td>MC</td>
<td>3 0 0</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>2.</td>
<td>MX3086</td>
<td>History of Science and Technology in India</td>
<td>MC</td>
<td>3 0 0</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>3.</td>
<td>MX3087</td>
<td>Political and Economic Thought for a Humane Society</td>
<td>MC</td>
<td>3 0 0</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>4.</td>
<td>MX3088</td>
<td>State, Nation Building and Politics in India</td>
<td>MC</td>
<td>3 0 0</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>5.</td>
<td>MX3089</td>
<td>Industrial Safety</td>
<td>MC</td>
<td>3 0 0</td>
<td>3</td>
<td>0</td>
</tr>
</tbody>
</table>
**PROFESSIONAL ELECTIVE COURSES : VERTICALS**

<table>
<thead>
<tr>
<th>Vertical I</th>
<th>Vertical II</th>
<th>Vertical III</th>
<th>Vertical IV</th>
<th>Vertical V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apparel Marketing</td>
<td>Apparel Product Development</td>
<td>Automations in Apparel manufacture</td>
<td>Operation research in Apparel Industry</td>
<td>Technology of non-wovens</td>
</tr>
<tr>
<td>Fashion forecasting</td>
<td>Clothing Fit and comfort</td>
<td>Lean manufacturing</td>
<td>Enterprise Resource Planning in Apparel industry</td>
<td>Protective Garments</td>
</tr>
<tr>
<td>Visual merchandising</td>
<td>Apparel trims, accessories and Embellishments</td>
<td>Supply chain management for Apparel Industry</td>
<td>International Textile and apparel Business management</td>
<td>Intimate apparels</td>
</tr>
<tr>
<td>Textile Heritage</td>
<td>Garment finishing and care</td>
<td>Social compliances and quality assurance in apparel industry</td>
<td>Entrepreneurship in apparel manufacture</td>
<td>Smart Textiles and Garments</td>
</tr>
<tr>
<td>Apparel Retail Management</td>
<td>Home Furnishing</td>
<td>Advanced Technologies for Apparel Industry</td>
<td>Sustainable apparel Business Management</td>
<td>Sports Textiles and Garments</td>
</tr>
<tr>
<td>Apparel Brand management</td>
<td>Knit Product Development</td>
<td>Computer Applications In Apparel Manufacturing</td>
<td>Human Resource Management</td>
<td>Medical Textiles and Garments</td>
</tr>
<tr>
<td>Digital Marketing and E-Business</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Registration of Professional Elective Courses from Verticals:**
Professional Elective Courses will be registered in Semesters V and VI. These courses are listed in groups called verticals that represent a particular area of specialisation. Students are permitted to choose all Professional Electives from a particular vertical or from different verticals. Further, only one Professional Elective course shall be chosen in a semester horizontally (row-wise). However, two courses are permitted from the same row, provided one course is enrolled in Semester V and another in semester VI.

The registration of courses for B.E./B.Tech (Honours) or Minor degree shall be done from Semester V to VIII. The procedure for registration of courses explained above shall be followed for the courses of B.E/B.Tech (Honours) or Minor degree also. For more details on B.E./B.Tech (Honours) or Minor degree refer to Regulations 2021 Clause 4.10.
### Vertical I: Apparel Marketing

<table>
<thead>
<tr>
<th>SL. NO.</th>
<th>COURSE CODE</th>
<th>COURSE TITLE</th>
<th>CATEGORY</th>
<th>PERIODS PER WEEK</th>
<th>TOTAL CONTACT PERIODS</th>
<th>CREDITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>FT3001</td>
<td>Fashion forecasting</td>
<td>PEC</td>
<td>3 L, 0 T, 0 P</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>FT3002</td>
<td>Visual merchandising</td>
<td>PEC</td>
<td>3 L, 0 T, 0 P</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>FT3003</td>
<td>Textile Heritage</td>
<td>PEC</td>
<td>3 L, 0 T, 0 P</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>FT3004</td>
<td>Apparel Retail Management</td>
<td>PEC</td>
<td>3 L, 0 T, 0 P</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>FT3005</td>
<td>Apparel Brand management</td>
<td>PEC</td>
<td>3 L, 0 T, 0 P</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>6</td>
<td>FT3006</td>
<td>Digital Marketing and E-Business</td>
<td>PEC</td>
<td>3 L, 0 T, 0 P</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>

### Vertical II: Apparel Product Development

<table>
<thead>
<tr>
<th>SL. NO.</th>
<th>COURSE CODE</th>
<th>COURSE TITLE</th>
<th>CATEGORY</th>
<th>PERIODS PER WEEK</th>
<th>TOTAL CONTACT PERIODS</th>
<th>CREDITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>FT3007</td>
<td>Apparel Product Development</td>
<td>PEC</td>
<td>3 L, 0 T, 0 P</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>FT3008</td>
<td>Clothing Fit and comfort</td>
<td>PEC</td>
<td>3 L, 0 T, 0 P</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>FT3009</td>
<td>Apparel trims, accessories and Embellishments</td>
<td>PEC</td>
<td>3 L, 0 T, 0 P</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>FT3010</td>
<td>Garment finishing and care</td>
<td>PEC</td>
<td>3 L, 0 T, 0 P</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>FT3011</td>
<td>Home Furnishing</td>
<td>PEC</td>
<td>3 L, 0 T, 0 P</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>6</td>
<td>FT3012</td>
<td>Knit Product Development</td>
<td>PEC</td>
<td>3 L, 0 T, 0 P</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>

### Vertical III: Garment Manufacturing

<table>
<thead>
<tr>
<th>SL. NO.</th>
<th>COURSE CODE</th>
<th>COURSE TITLE</th>
<th>CATEGORY</th>
<th>PERIODS PER WEEK</th>
<th>TOTAL CONTACT PERIODS</th>
<th>CREDITS</th>
</tr>
</thead>
</table>
1. **FT3013** Automations in Apparel manufacture  
   - PEC  
   - 3 0 0 3 3

2. **FT3014** Lean manufacturing  
   - PEC  
   - 3 0 0 3 3

3. **FT3015** Supply chain management for Apparel Industry  
   - PEC  
   - 3 0 0 3 3

4. **FT3016** Social compliances and quality assurance in apparel industry  
   - PEC  
   - 3 0 0 3 3

5. **FT3017** Advanced Technologies for Apparel Industry  
   - PEC  
   - 3 0 0 3 3

6. **FT3018** Computer Applications In Apparel Manufacturing  
   - PEC  
   - 3 0 0 3 3

---

**VERTICAL 4: MANAGEMENT**

<table>
<thead>
<tr>
<th>SL. NO.</th>
<th>COURSE CODE</th>
<th>COURSE TITLE</th>
<th>CATEGORY</th>
<th>PERIODS PER WEEK</th>
<th>TOTAL CONTACT PERIODS</th>
<th>CREDITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>FT3019</td>
<td>Operation research in Apparel Industry</td>
<td>PEC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>2.</td>
<td>FT3020</td>
<td>Enterprise Resource Planning in Apparel industry</td>
<td>PEC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>3.</td>
<td>FT3021</td>
<td>International Textile and apparel Business management</td>
<td>PEC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>4.</td>
<td>FT3022</td>
<td>Entrepreneurship in apparel manufacture</td>
<td>PEC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>5.</td>
<td>FT3023</td>
<td>Sustainable apparel Business Management</td>
<td>PEC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>6.</td>
<td>FT3024</td>
<td>Human Resource Management</td>
<td>PEC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>

---

**VERTICAL 5: SPECIALTY APPAREL**

17
<table>
<thead>
<tr>
<th>SL. NO.</th>
<th>COURSE CODE</th>
<th>COURSE TITLE</th>
<th>CATEGORY</th>
<th>PERIODS PER WEEK</th>
<th>TOTAL CONTACT PERIODS</th>
<th>CREDITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>TT3691</td>
<td>Technology of non-wovens</td>
<td>PEC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>2.</td>
<td>FT3025</td>
<td>Protective Garments</td>
<td>PEC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>3.</td>
<td>FT3026</td>
<td>Intimate apparels</td>
<td>PEC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>4.</td>
<td>FT3027</td>
<td>Smart Textiles and Garments</td>
<td>PEC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>5.</td>
<td>FT3028</td>
<td>Sports Textiles and Garments</td>
<td>PEC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>6.</td>
<td>FT3029</td>
<td>Medical Textiles and Garments</td>
<td>PEC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>

**OPEN ELECTIVES**

(Students shall choose the open elective courses, such that the course contents are not similar to any other course contents/title under other course categories.)

**OPEN ELECTIVE I AND II (EMERGING TECHNOLOGIES)**

To be offered other than Faculty of Information and Communication Engineering

<table>
<thead>
<tr>
<th>SL. NO.</th>
<th>COURSE CODE</th>
<th>COURSE TITLE</th>
<th>CATEGORY</th>
<th>PERIODS PER WEEK</th>
<th>TOTAL CONTACT PERIODS</th>
<th>CREDITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>OCS351</td>
<td>Artificial Intelligence and Machine Learning Fundamentals</td>
<td>OEC</td>
<td>2 0 2</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>2.</td>
<td>OCS352</td>
<td>IoT Concepts and Applications</td>
<td>OEC</td>
<td>2 0 2</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>3.</td>
<td>OCS353</td>
<td>Data Fundamentals</td>
<td>Science</td>
<td>2 0 2</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>4.</td>
<td>OCS354</td>
<td>Augmented and Virtual Reality</td>
<td>OEC</td>
<td>2 0 2</td>
<td>4</td>
<td>3</td>
</tr>
</tbody>
</table>

**OPEN ELECTIVES – III**

<table>
<thead>
<tr>
<th>SL. NO.</th>
<th>COURSE CODE</th>
<th>COURSE TITLE</th>
<th>CATEGORY</th>
<th>PERIODS PER WEEK</th>
<th>TOTAL CONTACT PERIODS</th>
<th>CREDITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>OHS351</td>
<td>English for Competitive Examinations</td>
<td>OEC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>2.</td>
<td>OCE353</td>
<td>Lean Concepts, Tools</td>
<td>OEC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Course Code</td>
<td>Course Title</td>
<td>Department</td>
<td>Credits</td>
<td>CAPS</td>
<td>GPA</td>
</tr>
<tr>
<td>---</td>
<td>-------------</td>
<td>--------------------------------------------------</td>
<td>------------</td>
<td>---------</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>3</td>
<td>OMG352</td>
<td>NGOs and Sustainable Development</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>OMG353</td>
<td>Democracy and Good Governance</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>OME353</td>
<td>Renewable Energy Technologies</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>6</td>
<td>OME354</td>
<td>Applied Design Thinking</td>
<td>OEC</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>7</td>
<td>OMF351</td>
<td>Reverse Engineering</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>8</td>
<td>OMF353</td>
<td>Sustainable Manufacturing</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>9</td>
<td>OAU351</td>
<td>Electric and Hybrid Vehicle</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>10</td>
<td>OAS352</td>
<td>Space Engineering</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>11</td>
<td>OIM351</td>
<td>Industrial Management</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>12</td>
<td>OIE354</td>
<td>Quality Engineering</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>13</td>
<td>OSF351</td>
<td>Fire Safety Engineering</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>14</td>
<td>OML351</td>
<td>Introduction to non-destructive testing</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>15</td>
<td>OMR351</td>
<td>Mechatronics</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>16</td>
<td>ORA351</td>
<td>Foundation of Robotics</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>17</td>
<td>OAE352</td>
<td>Fundamentals of Aeronautical engineering</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>18</td>
<td>OGI351</td>
<td>Remote Sensing Concepts</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>19</td>
<td>OAI351</td>
<td>Urban Agriculture</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>20</td>
<td>OEN351</td>
<td>Drinking Water Supply and Treatment</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>21</td>
<td>OEE352</td>
<td>Electric Vehicle technology</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>22</td>
<td>OEl353</td>
<td>Introduction to PLC Programming</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>23</td>
<td>OBT352</td>
<td>Biomedical Instrumentation</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>24</td>
<td>OFD352</td>
<td>Traditional Indian Foods</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>25</td>
<td>OFD353</td>
<td>Introduction to food processing</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>26</td>
<td>OPY352</td>
<td>IPR for Pharma Industry</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>27</td>
<td>OCH351</td>
<td>Nano Technology</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>28</td>
<td>OCH352</td>
<td>Functional Materials</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>SL. NO.</td>
<td>COURSE CODE</td>
<td>COURSE TITLE</td>
<td>CATEGORY</td>
<td>PERIODS PER WEEK</td>
<td>TOTAL CONTACT PERIODS</td>
<td>CREDITS</td>
</tr>
<tr>
<td>---------</td>
<td>-------------</td>
<td>--------------------------------------------------</td>
<td>----------</td>
<td>------------------</td>
<td>------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>1.</td>
<td>OHS352</td>
<td>Project Report Writing</td>
<td>OEC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>2.</td>
<td>OCE354</td>
<td>Basics of Integrated Water Resources Management</td>
<td>OEC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>3.</td>
<td>OMA355</td>
<td>Advanced Numerical Methods</td>
<td>OEC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>4.</td>
<td>OMA356</td>
<td>Random Processes</td>
<td>OEC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>5.</td>
<td>OMA357</td>
<td>Queuing and Reliability Modelling</td>
<td>OEC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>6.</td>
<td>OMG354</td>
<td>Production and Operations Management for Entrepreneurs</td>
<td>OEC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>7.</td>
<td>OMG355</td>
<td>Multivariate Data Analysis</td>
<td>OEC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>8.</td>
<td>OME352</td>
<td>Additive Manufacturing</td>
<td>OEC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>9.</td>
<td>OME353</td>
<td>New Product Development</td>
<td>OEC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>10.</td>
<td>OME355</td>
<td>Industrial Design &amp; Rapid Prototyping Techniques</td>
<td>OEC</td>
<td>2 0 2</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Course Code</td>
<td>Course Title</td>
<td>Type</td>
<td>Credits</td>
<td>OEC</td>
<td>ECTS</td>
</tr>
<tr>
<td>---</td>
<td>-------------</td>
<td>--------------------------------------------------</td>
<td>------</td>
<td>---------</td>
<td>-----</td>
<td>------</td>
</tr>
<tr>
<td>11.</td>
<td>OMF352</td>
<td>Micro and Precision Engineering</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>12.</td>
<td>OMF354</td>
<td>Cost Management of Engineering Projects</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>13.</td>
<td>OAU352</td>
<td>Batteries and Management system</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>14.</td>
<td>OAU353</td>
<td>Sensors and Actuators</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>15.</td>
<td>OAS353</td>
<td>Space Vehicles</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>16.</td>
<td>OIM352</td>
<td>Management Science</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>17.</td>
<td>OIM353</td>
<td>Production Planning and Control</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>18.</td>
<td>OIE353</td>
<td>Operations Management</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>19.</td>
<td>OSF352</td>
<td>Industrial Hygiene</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>20.</td>
<td>OSF353</td>
<td>Chemical Process Safety</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>21.</td>
<td>OML352</td>
<td>Electrical, Electronic and Magnetic materials</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>22.</td>
<td>OML353</td>
<td>Nanomaterials and applications</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>23.</td>
<td>OMR352</td>
<td>Hydraulics and Pneumatics</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>24.</td>
<td>OMR353</td>
<td>Sensors</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>25.</td>
<td>ORA352</td>
<td>Foundation of Automation</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>26.</td>
<td>ORA353</td>
<td>Concepts in Mobile Robotics</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>27.</td>
<td>OMV351</td>
<td>Marine Propulsion</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>28.</td>
<td>OMV352</td>
<td>Marine Merchant Vehicles</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>29.</td>
<td>OMV353</td>
<td>Elements of Marine Engineering</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>30.</td>
<td>OAE353</td>
<td>Drone Technologies</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>31.</td>
<td>OGI352</td>
<td>Geographical Information System</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>32.</td>
<td>OAI352</td>
<td>Agriculture Entrepreneurship Development</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>33.</td>
<td>OEN352</td>
<td>Biodiversity Conservation</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>34.</td>
<td>OEE353</td>
<td>Introduction to control systems</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>35.</td>
<td>OEI354</td>
<td>Introduction to Industrial Automation Systems</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>36.</td>
<td>OBT353</td>
<td>Environment and...</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Course Code</td>
<td>Course Title</td>
<td>Department</td>
<td>Credits</td>
<td>Hours</td>
<td>Weeks</td>
</tr>
<tr>
<td>---</td>
<td>-------------</td>
<td>--------------------------------------------------</td>
<td>------------</td>
<td>---------</td>
<td>-------</td>
<td>-------</td>
</tr>
<tr>
<td>37.</td>
<td>OFD354</td>
<td>Fundamentals of Food Engineering</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>38.</td>
<td>OFD355</td>
<td>Food safety and Quality Regulations</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>39.</td>
<td>OPY353</td>
<td>Nutraceuticals</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>40.</td>
<td>OCH353</td>
<td>Energy Technology</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>41.</td>
<td>OCH354</td>
<td>Surface Science</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>42.</td>
<td>OPE353</td>
<td>Industrial safety</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>43.</td>
<td>OPE354</td>
<td>Unit Operations in Petro Chemical Industries</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>44.</td>
<td>OPT352</td>
<td>Plastic Materials for Engineers</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>45.</td>
<td>OPT353</td>
<td>Properties and Testing of Plastics</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>46.</td>
<td>OEC353</td>
<td>VLSI Design</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>47.</td>
<td>OEC354</td>
<td>Industrial IoT and Industry 4.0</td>
<td>OEC</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>48.</td>
<td>OBM353</td>
<td>Wearable devices</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>49.</td>
<td>OBM354</td>
<td>Medical Informatics</td>
<td>OEC</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
### SUMMARY

<table>
<thead>
<tr>
<th>S.No</th>
<th>Subject Area</th>
<th>Credits per Semester</th>
<th>Total Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>I</td>
<td>II</td>
</tr>
<tr>
<td>1</td>
<td>HSMC</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>BSC</td>
<td>12</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>ESC</td>
<td>5</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>PCC</td>
<td>3</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>PEC</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>OEC</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>EEC</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Non-Credit</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>/(Mandatory)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>22</td>
<td>26</td>
</tr>
</tbody>
</table>

Total Credits: 164
**Enrollment for B.E. / B. Tech. (Honours) / Minor degree (Optional)**

A student can also optionally register for additional courses (18 credits) and become eligible for the award of B.E./B.Tech. (Honours) Minor degree.

For B.E. / B. Tech. (Honours), a student shall register for the additional courses (18 credits) from semester V onwards. These courses shall be from the same vertical or a combination of different verticals of the same programme of study only.

For minor degree, a student shall register for the additional courses (18 credits) from semester V onwards. All these courses have to be in a particular vertical from any one of the other programmes. Moreover, for minor degree the student can register for courses from any one of the following verticals also.

Complete details are available in clause 4.10 of Regulations 2021.

**VERTICALS FOR MINOR DEGREE** *(IN ADDITIONS TO ALL THE VERTICALS OF OTHER PROGRAMMES)*

<table>
<thead>
<tr>
<th>Vertical I</th>
<th>Vertical II</th>
<th>Vertical III</th>
<th>Vertical IV</th>
<th>Vertical V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fintech and Block Chain</td>
<td>Fintech and Blockchain</td>
<td>Entrepreneurship</td>
<td>Public Administration</td>
<td>Business Data Analytics</td>
</tr>
<tr>
<td>Financial Management</td>
<td>Foundations of Entrepreneurship</td>
<td>Principles of Public Administration</td>
<td>Statistics For Management</td>
<td>Sustainable infrastructure Development</td>
</tr>
<tr>
<td>Fundamentals of Investment</td>
<td>Team Building &amp; Leadership Management for Business</td>
<td>Constitution of India</td>
<td>Datamining For Business Intelligence</td>
<td>Sustainable Agriculture and Environmental Management</td>
</tr>
<tr>
<td>Banking, Financial Services and Insurance</td>
<td>Creativity &amp; Innovation in Entrepreneurship</td>
<td>Public Personnel Administration</td>
<td>Human Resource Analytics</td>
<td>Sustainable Bio Materials</td>
</tr>
<tr>
<td>Introduction to Blockchain and its Applications</td>
<td>Principles of Marketing Management For Business</td>
<td>Administrative Theories</td>
<td>Marketing And Social Media Web Analytics</td>
<td>Materials for Energy Sustainability</td>
</tr>
<tr>
<td>Fintech Personal Finance and Payments</td>
<td>Human Resource Management for Entrepreneurs</td>
<td>Indian Administrative System</td>
<td>Operation And Supply Chain Analytics</td>
<td>Green Technology</td>
</tr>
<tr>
<td>Introduction to Fintech</td>
<td>Finacing New Business Ventures</td>
<td>Public Policy Administration</td>
<td>Financial Analytics</td>
<td>Environmental Quality Monitoring and Analysis</td>
</tr>
<tr>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Integrated Energy Planning for Sustainable Development</td>
</tr>
<tr>
<td>-</td>
<td>-</td>
<td>-</td>
<td>24</td>
<td>Energy Efficiency for Sustainable Development</td>
</tr>
</tbody>
</table>
(Choice of courses for Minor degree is to be made from any one vertical of other programmes or from anyone of the following verticals)

**VERTICAL 1: FINTECH AND BLOCK CHAIN**

<table>
<thead>
<tr>
<th>SL. NO.</th>
<th>COURSE CODE</th>
<th>COURSE TITLE</th>
<th>CATEGORY</th>
<th>PERIODS PER WEEK</th>
<th>TOTAL CONTACT PERIODS</th>
<th>CREDITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CMG331</td>
<td>Financial Management</td>
<td>PEC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>CMG332</td>
<td>Fundamentals of Investment</td>
<td>PEC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>CMG333</td>
<td>Banking, Financial Services and Insurance</td>
<td>PEC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>CMG334</td>
<td>Introduction to Blockchain and its Applications</td>
<td>PEC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>CMG335</td>
<td>Fintech Personal Finance and Payments</td>
<td>PEC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>6</td>
<td>CMG336</td>
<td>Introduction to Fintech</td>
<td>PEC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>

**VERTICAL 2: ENTREPRENEURSHIP**

<table>
<thead>
<tr>
<th>SL. NO.</th>
<th>COURSE CODE</th>
<th>COURSE TITLE</th>
<th>CATEGORY</th>
<th>PERIODS PER WEEK</th>
<th>TOTAL CONTACT PERIODS</th>
<th>CREDITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CMG337</td>
<td>Foundations of Entrepreneurship</td>
<td>PEC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>CMG338</td>
<td>Team Building &amp; Leadership Management for Business</td>
<td>PEC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>CMG339</td>
<td>Creativity &amp; Innovation in Entrepreneurship</td>
<td>PEC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>CMG340</td>
<td>Principles of Marketing Management For Business</td>
<td>PEC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>CMG341</td>
<td>Human Resource Management for Entrepreneurs</td>
<td>PEC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>6</td>
<td>CMG342</td>
<td>Financing New Business Ventures</td>
<td>PEC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>
### VERTICAL 3: PUBLIC ADMINISTRATION

<table>
<thead>
<tr>
<th>SL. NO.</th>
<th>COURSE CODE</th>
<th>COURSE TITLE</th>
<th>CATEGORY</th>
<th>PERIODS PER WEEK</th>
<th>TOTAL CONTACT PERIODS</th>
<th>CREDITS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CMG343</td>
<td>Principles of Public Administration</td>
<td>PEC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>CMG344</td>
<td>Constitution of India</td>
<td>PEC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>CMG345</td>
<td>Public Personnel Administration</td>
<td>PEC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>CMG346</td>
<td>Administrative Theories</td>
<td>PEC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>CMG347</td>
<td>Indian Administrative System</td>
<td>PEC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>CMG348</td>
<td>Public Policy Administration</td>
<td>PEC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>

### VERTICAL 4: BUSINESS DATA ANALYTICS

<table>
<thead>
<tr>
<th>SL. NO.</th>
<th>COURSE CODE</th>
<th>COURSE TITLE</th>
<th>CATEGORY</th>
<th>PERIODS PER WEEK</th>
<th>TOTAL CONTACT PERIODS</th>
<th>CREDITS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CMG349</td>
<td>Statistics For Management</td>
<td>PEC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>CMG350</td>
<td>Datamining For Business Intelligence</td>
<td>PEC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>CMG351</td>
<td>Human Resource Analytics</td>
<td>PEC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>CMG352</td>
<td>Marketing And Social Media Web Analytics</td>
<td>PEC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>CMG353</td>
<td>Operation And Supply Chain Analytics</td>
<td>PEC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>CMG354</td>
<td>Financial Analytics</td>
<td>PEC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>
### Vertical 5: Environment and Sustainability

<table>
<thead>
<tr>
<th>SL. NO.</th>
<th>COURSE CODE</th>
<th>COURSE TITLE</th>
<th>CATEGORY</th>
<th>PERIODS PER WEEK</th>
<th>TOTAL CONTACT PERIODS</th>
<th>CREDITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>CES331</td>
<td>Sustainable infrastructure Development</td>
<td>PEC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>2.</td>
<td>CES332</td>
<td>Sustainable Agriculture and Environmental Management</td>
<td>PEC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>3.</td>
<td>CES333</td>
<td>Sustainable Bio Materials</td>
<td>PEC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>4.</td>
<td>CES334</td>
<td>Materials for Energy Sustainability</td>
<td>PEC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>5.</td>
<td>CES335</td>
<td>Green Technology</td>
<td>PEC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>6.</td>
<td>CES336</td>
<td>Environmental Quality Monitoring and Analysis</td>
<td>PEC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>7.</td>
<td>CES337</td>
<td>Integrated Energy Planning for Sustainable Development</td>
<td>PEC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>8.</td>
<td>CES338</td>
<td>Energy Efficiency for Sustainable Development</td>
<td>PEC</td>
<td>3 0 0</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>
IP3151  INDUCTION PROGRAMME
This is a mandatory 2 week programme to be conducted as soon as the students enter the institution. Normal classes start only after the induction program is over.

The induction programme has been introduced by AICTE with the following objective:

“Engineering colleges were established to train graduates well in the branch/department of admission, have a holistic outlook, and have a desire to work for national needs and beyond. The graduating student must have knowledge and skills in the area of his/her study. However, he/she must also have broad understanding of society and relationships. Character needs to be nurtured as an essential quality by which he/she would understand and fulfill his/her responsibility as an engineer, a citizen and a human being. Besides the above, several meta-skills and underlying values are needed.”

“One will have to work closely with the newly joined students in making them feel comfortable, allow them to explore their academic interests and activities, reduce competition and make them work for excellence, promote bonding within them, build relations between teachers and students, give a broader view of life, and build character. “

Hence, the purpose of this programme is to make the students feel comfortable in their new environment, open them up, set a healthy daily routine, create bonding in the batch as well as between faculty and students, develop awareness, sensitivity and understanding of the self, people around them, society at large, and nature.

The following are the activities under the induction program in which the student would be fully engaged throughout the day for the entire duration of the program.

(i)  Physical Activity
This would involve a daily routine of physical activity with games and sports, yoga, gardening, etc.

(ii) Creative Arts
Every student would choose one skill related to the arts whether visual arts or performing arts. Examples are painting, sculpture, pottery, music, dance etc. The student would pursue it everyday for the duration of the program. These would allow for creative expression. It would develop a sense of aesthetics and also enhance creativity which would, hopefully, grow into engineering design later.

(iii) Universal Human Values
This is the anchoring activity of the Induction Programme. It gets the student to explore oneself and allows one to experience the joy of learning, stand up to peer pressure, take decisions with courage, be aware of relationships with colleagues and supporting stay in the hostel and department, be sensitive to others, etc. A module in Universal Human Values provides the base. Methodology of teaching this content is extremely important. It must not be through do's and dont's, but get students to explore and think by engaging them in a dialogue. It is best taught through group discussions and real life activities rather than lecturing.

Discussions would be conducted in small groups of about 20 students with a faculty mentor each. It would be effective that the faculty mentor assigned is also the faculty advisor for the student for the full duration of the UG programme.
(iv) Literary Activity
Literary activity would encompass reading, writing and possibly, debating, enacting a play etc.

(v) Proficiency Modules
This would address some lacunas that students might have, for example, English, computer familiarity etc.

(vi) Lectures by Eminent People
Motivational lectures by eminent people from all walks of life should be arranged to give the students exposure to people who are socially active or in public life.

(vii) Visits to Local Area
A couple of visits to the landmarks of the city, or a hospital or orphanage could be organized. This would familiarize them with the area as well as expose them to the under privileged.

(viii) Familiarization to Dept./Branch & Innovations
They should be told about what getting into a branch or department means what role it plays in society, through its technology. They should also be shown the laboratories, workshops & other facilities.

(ix) Department Specific Activities
About a week can be spent in introducing activities (games, quizzes, social interactions, small experiments, design thinking etc.) that are relevant to the particular branch of Engineering / Technology/ Architecture that can serve as a motivation and kindle interest in building things (become a maker) in that particular field. This can be conducted in the form of a workshop. For example, CSE and IT students may be introduced to activities that kindle computational thinking, and get them to build simple games. ECE students may be introduced to building simple circuits as an extension of their knowledge in Science, and so on. Students may be asked to build stuff using their knowledge of science.

**Induction Programme is totally an activity based programme and therefore there shall be no tests / assessments during this programme.**

References:
Guide to Induction program from AICTE

<table>
<thead>
<tr>
<th>HS3151</th>
<th>PROFESSIONAL ENGLISH I</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

**OBJECTIVES :**
- To improve the communicative competence of learners
- To learn to use basic grammatic structures in suitable contexts
- To acquire lexical competence and use them appropriately in a sentence and understand their meaning in a text
- To help learners use language effectively in professional contexts
To develop learners’ ability to read and write complex texts, summaries, articles, blogs, definitions, essays and user manuals.

UNIT I  INTRODUCTION TO EFFECTIVE COMMUNICATION  
What is effective communication? (Explain using activities) Why is communication critical for excellence during study, research and work? What are the seven C’s of effective communication? What are key language skills? What is effective listening? What does it involve? What is effective speaking? What does it mean to be an excellent reader? What should you be able to do? What is effective writing? How does one develop language and communication skills? What does the course focus on? How are communication and language skills going to be enhanced during this course? What do you as a learner need to do to enhance your English language and communication skills to get the best out of this course?

UNIT I  INTRODUCTION TO FUNDAMENTALS OF COMMUNICATION  
Reading - Reading brochures (technical context), telephone messages / social media messages relevant to technical contexts and emails. Writing - Writing emails / letters introducing oneself. Grammar - Present Tense (simple and progressive); Question types: Wh/ Yes or No/ and Tags. Vocabulary - Synonyms; One word substitution; Abbreviations & Acronyms (as used in technical contexts).

UNIT II  NARRATION AND SUMMATION  
Reading – Reading biographies, travelogues, newspaper reports, Excerpts from literature, and travel & technical blogs. Writing - Guided writing—Paragraph writing Short Report on an event (field trip etc.) Grammar –Past tense (simple); Subject-Verb Agreement; and Prepositions. Vocabulary - Word forms (prefixes& suffixes); Synonyms and Antonyms. Phrasal verbs.

UNIT III DESCRIPTION OF A PROCESS / PRODUCT  
Reading – Reading advertisements, gadget reviews; user manuals. Writing - Writing definitions; instructions; and Product/Process description. Grammar - Imperatives; Adjectives; Degrees of comparison; Present & Past Perfect Tenses. Vocabulary - Compound Nouns, Homonyms; and Homophones, discourse markers (connectives & sequence words).

UNIT IV CLASSIFICATION AND RECOMMENDATIONS  
Reading – Newspaper articles; Journal reports –and Non Verbal Communcation ( tables, pie charts etc,. ). Writing – Note-making / Note-taking (*Study skills to be taught, not tested); Writing recommendations; Transferring information from non verbal ( chart , graph etc, to verbal mode) Grammar – Articles; Pronouns - Possessive & Relative pronouns. Vocabulary - Collocations; Fixed / Semi fixed expressions.

UNIT V EXPRESSION  
Reading – Reading editorials; and Opinion Blogs; Writing – Essay Writing (Descriptive or narrative). Grammar – Future Tenses, Punctuation; Negation (Statements & Questions); and Simple, Compound & Complex Sentences. Vocabulary - Cause & Effect Expressions – Content vs Function words.

TOTAL : 45 PERIODS

LEARNING OUTCOMES:
At the end of the course, learners will be able
- To use appropriate words in a professional context
- To gain understanding of basic grammatic structures and use them in right context.
• To read and infer the denotative and connotative meanings of technical texts
• To write definitions, descriptions, narrations and essays on various topics

TEXT BOOKS:
1. English for Engineers & Technologists  Orient Blackswan Private Ltd. Department of English, Anna University, (2020 edition)
2. English for Science & Technology Cambridge University Press, 2021. Authored by Dr. Veena Selvam, Dr. Sujatha Priyadarshini, Dr. Deepa Mary Francis, Dr. KN. Shoba, and Dr. Lourdes Joevani, Department of English, Anna University.

REFERENCE BOOKS:

ASSESSMENT PATTERN
Two internal assessments and an end semester examination to test students’ reading and writing skills along with their grammatical and lexical competence.

MA3151 MATRICES AND CALCULUS
COURSE OBJECTIVES:
• To develop the use of matrix algebra techniques that is needed by engineers for practical applications.
• To familiarize the students with differential calculus.
• To familiarize the student with functions of several variables. This is needed in many branches of engineering.
• To make the students understand various techniques of integration.
• To acquaint the student with mathematical tools needed in evaluating multiple integrals and their applications.

UNIT I MATRICES 9+3
Eigenvalues and Eigenvectors of a real matrix – Characteristic equation – Properties of Eigenvalues and Eigenvectors – Cayley - Hamilton theorem – Diagonalization of matrices by orthogonal transformation – Reduction of a quadratic form to canonical form by orthogonal

UNIT II DIFFERENTIAL CALCULUS
Representation of functions - Limit of a function - Continuity - Derivatives - Differentiation rules
(sum, product, quotient, chain rules) - Implicit differentiation - Logarithmic differentiation -
Applications: Maxima and Minima of functions of one variable.

UNIT III FUNCTIONS OF SEVERAL VARIABLES
Partial differentiation – Homogeneous functions and Euler’s theorem – Total derivative –
Change of variables – Jacobians – Partial differentiation of implicit functions – Taylor’s series
for functions of two variables – Applications: Maxima and minima of functions of two variables
and Lagrange’s method of undetermined multipliers.

UNIT IV INTEGRAL CALCULUS
Definite and Indefinite integrals - Substitution rule - Techniques of Integration: Integration by
parts, Trigonometric integrals, Trigonometric substitutions, Integration of rational functions by
partial fraction, Integration of irrational functions - Improper integrals - Applications: Hydrostatic
force and pressure, moments and centres of mass.

UNIT V MULTIPLE INTEGRALS
Double integrals – Change of order of integration – Double integrals in polar coordinates – Area
enclosed by plane curves – Triple integrals – Volume of solids – Change of variables in double
and triple integrals – Applications: Moments and centres of mass, moment of inertia

COURSE OUTCOMES:
At the end of the course the students will be able to
CO1: Use the matrix algebra methods for solving practical problems.
CO2: Apply differential calculus tools in solving various application problems.
CO3: Able to use differential calculus ideas on several variable functions.
CO4: Apply different methods of integration in solving practical problems.
CO5: Apply multiple integral ideas in solving areas, volumes and other practical problems.

TEXT BOOKS:
3. James Stewart, “Calculus: Early Transcendentals”, Cengage Learning, 8th Edition, New Delhi, 2015. [For Units II & IV - Sections 1.1, 2.2, 2.3, 2.5, 2.7 (Tangents problems only), 2.8, 3.1 to 3.6, 3.11, 4.1, 4.3, 5.1 (Area problems only), 5.2, 5.3, 5.4 (excluding net change theorem), 5.5, 7.1 - 7.4 and 7.8 ].

REFERENCES:

PH3151

ENGINEERING PHYSICS

COURSE OBJECTIVES

- To make the students effectively to achieve an understanding of mechanics.
- To enable the students to gain knowledge of electromagnetic waves and its applications.
- To introduce the basics of oscillations, optics and lasers.
- Equipping the students to be successfully understand the importance of quantum physics.
- To motivate the students towards the applications of quantum mechanics.

UNIT I MECHANICS


UNIT II ELECTROMAGNETIC WAVES

The Maxwell’s equations - wave equation; Plane electromagnetic waves in vacuum, Conditions on the wave field - properties of electromagnetic waves: speed, amplitude, phase, orientation and waves in matter - polarization - Producing electromagnetic waves - Energy and momentum in EM waves: Intensity, waves from localized sources, momentum and radiation pressure - Cellphone reception. Reflection and transmission of electromagnetic waves from a non-conducting medium-vacuum interface for normal incidence.

UNIT III OSCILLATIONS, OPTICS AND LASERS

UNIT IV BASIC QUANTUM MECHANICS
Photons and light waves - Electrons and matter waves –Compton effect - The Schrodinger equation (Time dependent and time independent forms) - meaning of wave function - Normalization –Free particle - particle in a infinite potential well: 1D,2D and 3D Boxes- Normalization, probabilities and the correspondence principle.

UNIT V APPLIED QUANTUM MECHANICS
The harmonic oscillator(qualitative)- Barrier penetration and quantum tunneling(qualitative)- Tunneling microscope - Resonant diode - Finite potential wells (qualitative)- Bloch’s theorem for particles in a periodic potential –Basics of Kronig-Penney model and origin of energy bands.

TOTAL: 45 PERIODS

COURSE OUTCOMES
After completion of this course, the students should be able to
CO1 : Understand the importance of mechanics.
CO2 : Express their knowledge in electromagnetic waves.
CO3 : Demonstrate a strong foundational knowledge in oscillations, optics and lasers.
CO4 : Understand the importance of quantum physics.
CO5 : Comprehend and apply quantum mechanical principles towards the formation of energy bands.

TEXT BOOKS:
2. E.M.Purcell and D.J.Morin, Electricity and Magnetism, Cambridge Univ.Press, 2013.

REFERENCES:
5. N.Garcia, A.Damask and S.Schwarz. Physics for Computer Science Students. Springer-Verlag,

CY3151 ENGINEERING CHEMISTRY

COURSE OBJECTIVES:
• To inculcate sound understanding of water quality parameters and water treatment techniques.
• To impart knowledge on the basic principles and preparatory methods of nanomaterials.
• To introduce the basic concepts and applications of phase rule and composites.
To facilitate the understanding of different types of fuels, their preparation, properties and combustion characteristics.

To familiarize the students with the operating principles, working processes and applications of energy conversion and storage devices.

UNIT I  WATER AND ITS TREATMENT  9

UNIT II  NANO CHEMISTRY  9
Basics: Distinction between molecules, nanomaterials and bulk materials; Size-dependent properties (optical, electrical, mechanical and magnetic); Types of nanomaterials: Definition, properties and uses of – nanoparticle, nanocluster, nanorod, nanowire and nanotube. Preparation of nanomaterials: sol-gel, solvothermal, laser ablation, chemical vapour deposition, electrochemical deposition and electro spinning. Applications of nanomaterials in medicine, agriculture, energy, electronics and catalysis.

UNIT III  PHASE RULE AND COMPOSITES  9
Phase rule: Introduction, definition of terms with examples. One component system - water system; Reduced phase rule; Construction of a simple eutectic phase diagram - Thermal analysis; Two component system: lead-silver system - Pattinson process.
Composites: Introduction: Definition & Need for composites; Constitution: Matrix materials (Polymer matrix, metal matrix and ceramic matrix) and Reinforcement (fiber, particulates, flakes and whiskers). Properties and applications of: Metal matrix composites (MMC), Ceramic matrix composites and Polymer matrix composites. Hybrid composites - definition and examples.

UNIT IV  FUELS AND COMBUSTION  9
Fuels: Introduction: Classification of fuels; Coal and coke: Analysis of coal (proximate and ultimate), Carbonization, Manufacture of metallurgical coke (Otto Hoffmann method). Petroleum and Diesel: Manufacture of synthetic petrol (Bergius process), Knocking - octane number, diesel oil - cetane number; Power alcohol and biodiesel.
Combustion of fuels: Introduction: Calorific value - higher and lower calorific values, Theoretical calculation of calorific value; Ignition temperature: spontaneous ignition temperature, Explosive range; Flue gas analysis - ORSAT Method. CO₂ emission and carbon foot print.

UNIT V  ENERGY SOURCES AND STORAGE DEVICES  9
Stability of nucleus: mass defect (problems), binding energy; Nuclear energy: light water nuclear power plant, breeder reactor. Solar energy conversion: Principle, working and applications of solar cells; Recent developments in solar cell materials. Wind energy; Geothermal energy; Batteries: Types of batteries, Primary battery - dry cell, Secondary battery - lead acid battery and lithium-ion-battery; Electric vehicles; working principles; Fuel cells: H₂-O₂ fuel cell, microbial fuel cell; Supercapacitors: Storage principle, types and examples.

TOTAL: 45 PERIODS
COURSE OUTCOMES
At the end of the course, the students will be able:
CO1 : To infer the quality of water from quality parameter data and propose suitable treatment methodologies to treat water.
CO2 : To identify and apply basic concepts of nanoscience and nanotechnology in designing the synthesis of nanomaterials for engineering and technology applications.
CO3 : To apply the knowledge of phase rule and composites for material selection requirements.
CO4 : To recommend suitable fuels for engineering processes and applications.
CO5 : To recognize different forms of energy resources and apply them for suitable application in energy sectors.

TEXT BOOKS:

REFERENCES:

GE3151 PROBLEM SOLVING AND PYTHON PROGRAMMING

OBJECTIVES:
- To understand the basics of algorithmic problem solving.
- To learn to solve problems using Python conditionals and loops.
- To define Python functions and use function calls to solve problems.
- To use Python data structures - lists, tuples, dictionaries to represent complex data.
- To do input/output with files in Python.

UNIT I COMPUTATIONAL THINKING AND PROBLEM SOLVING
developing algorithms (iteration, recursion). Illustrative problems: find minimum in a list, insert a card in a list of sorted cards, guess an integer number in a range, Towers of Hanoi.

UNIT II DATA TYPES, EXPRESSIONS, STATEMENTS
Python interpreter and interactive mode, debugging; values and types: int, float, boolean, string, and list; variables, expressions, statements, tuple assignment, precedence of operators, comments; Illustrative programs: exchange the values of two variables, circulate the values of n variables, distance between two points.

UNIT III CONTROL FLOW, FUNCTIONS, STRINGS
Conditionals: Boolean values and operators, conditional (if), alternative (if-else), chained conditional (if-elif-else); Iteration: state, while, for, break, continue, pass; Fruitful functions: return values, parameters, local and global scope, function composition, recursion; Strings: string slices, immutability, string functions and methods, string module; Lists as arrays. Illustrative programs: square root, gcd, exponentiation, sum an array of numbers, linear search, binary search.

UNIT IV LISTS, TUPLES, DICTIONARIES
Lists: list operations, list slices, list methods, list loop, mutability, aliasing, cloning lists, list parameters; Tuples: tuple assignment, tuple as return value; Dictionaries: operations and methods; advanced list processing - list comprehension; Illustrative programs: simple sorting, histogram, Students marks statement, Retail bill preparation.

UNIT V FILES, MODULES, PACKAGES
Files and exception: text files, reading and writing files, format operator; command line arguments, errors and exceptions, handling exceptions, modules, packages; Illustrative programs: word count, copy file, Voter’s age validation, Marks range validation (0-100).

OUTCOMES:
Upon completion of the course, students will be able to
CO1: Develop algorithmic solutions to simple computational problems.
CO2: Develop and execute simple Python programs.
CO3: Write simple Python programs using conditionals and looping for solving problems.
CO4: Decompose a Python program into functions.
CO5: Represent compound data using Python lists, tuples, dictionaries etc.
CO6: Read and write data from/to files in Python programs.

TEXT BOOKS:

REFERENCES:
5. https://www.python.org/
TEXT-CUM-REFERENCE BOOKS
2. Historical Heritage of the Tamils (Dr.S.V.Subatamanian, Dr.K.D. Thirunavukkarasu) (Published by: International Institute of Tamil Studies).
3. The Contributions of the Tamils to Indian Culture (Dr.M.Valarmathi) (Published by: International Institute of Tamil Studies.)
4. Keeladi – 'Sangam City Civilization on the banks of river Vaigai’ (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)
5. Social Life of the Tamils - The Classical Period (Dr.S.Singaravelu) (Published by: International Institute of Tamil Studies).
6. Social Life of Tamils (Dr.K.K.Pillay) A joint publication of TNTB & ESC and RMRL – (in print)
7. Social Life of Tamils - The Classical Period with Special Reference to Tamil Nadu (Dr.K.K.Pillay) (Published by: The Author)
8. Porunai Civilization (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)

UNIT I LANGUAGE AND LITERATURE

UNIT II HERITAGE - ROCK ART PAINTINGS TO MODERN ART – SCULPTURE
UNIT III FOLK AND MARTIAL ARTS
Therukoottu, Karagattam, Villu Pattu, Kaniyan Koothu, Oyillattam, Leather puppetry, Silambattam, Valari, Tiger dance - Sports and Games of Tamils.

UNIT IV THINAI CONCEPT OF TAMILS
Flora and Fauna of Tamils & Aham and Puram Concept from Tholkappiyam and Sangam Literature - Aram Concept of Tamils - Education and Literacy during Sangam Age - Ancient Cities and Ports of Sangam Age - Export and Import during Sangam Age - Overseas Conquest of Cholas.

UNIT V CONTRIBUTION OF TAMILS TO INDIAN NATIONAL MOVEMENT AND INDIAN CULTURE
Contribution of Tamils to Indian Freedom Struggle - The Cultural Influence of Tamils over the other parts of India – Self-Respect Movement - Role of Siddha Medicine in Indigenous Systems of Medicine – Inscriptions & Manuscripts – Print History of Tamil Books.

TOTAL : 15 PERIODS

TEXT-CUM-REFERENCE BOOKS
1. தமிழக வரலைத் - மக்கள் பல்வைமுன் -  சக.சக. பிள்ளையார் (தூற்றி: தமிழ்நாட்டு பல்வைமுன் கல்விபெயர் பலிக்கும் குறுகம்).
2. தாயாரியல் சுற்று - புதுசுமுன் பெயர் குறுகம். (மையாரு பத்திரக்).
3. வேளாகத் - வல்லாகத் தொகைக்காலம் செங்களாக இடாத்தரையும் (தூற்றி: சுற்றிய சுற்றிய பத்திரக்).
4. எம்பைரியல் - அரியாளிக்கான தர்க்கம். (தூற்றி: சுற்றிய பத்திரக்).
5. Social Life of Tamils (Dr.K.K.Pillay) A joint publication of TNTB & ESC and RMRL – (in print)
6. Social Life of the Tamils - The Classical Period (Dr.S.Singaravelu) (Published by: International Institute of Tamil Studies.
7. Historical Heritage of the Tamils (Dr.S.V.Subatamanian, Dr.K.D. Thirunavukkarasu) (Published by: International Institute of Tamil Studies).
8. The Contributions of the Tamils to Indian Culture (Dr.M.Valarmathi) (Published by: International Institute of Tamil Studies.)
9. Keeladi - 'Sangam City Civilization on the banks of river Vaigai' (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)
10. Studies in the History of India with Special Reference to Tamil Nadu (Dr.K.K.Pillay) (Publishedby: The Author)
11. Porunai Civilization (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)
OBJECTIVES:
- To understand the problem solving approaches.
- To learn the basic programming constructs in Python.
- To practice various computing strategies for Python-based solutions to real world problems.
- To use Python data structures - lists, tuples, dictionaries.
- To do input/output with files in Python.

EXPERIMENTS:
Note: The examples suggested in each experiment are only indicative. The lab instructor is expected to design other problems on similar lines. The Examination shall not be restricted to the sample experiments listed here.
1. Identification and solving of simple real life or scientific or technical problems, and developing flow charts for the same. (Electricity Billing, Retail shop billing, Sin series, weight of a motorbike, Weight of a steel bar, compute Electrical Current in Three Phase AC Circuit, etc.)
2. Python programming using simple statements and expressions (exchange the values of two variables, calculate the values of n variables, distance between two points).
3. Scientific problems using Conditionals and Iterative loops. (Number series, Number Patterns, pyramid pattern)
4. Implementing real-time/technical applications using Lists, Tuples. (Items present in a library/Components of a car/ Materials required for construction of a building — operations of list & tuples)
5. Implementing real-time/technical applications using Sets, Dictionaries. (Language, components of an automobile, Elements of a civil structure, etc.- operations of Sets & Dictionaries)
6. Implementing programs using Functions. (Factorial, largest number in a list, area of shape)
7. Implementing programs using Strings. (reverse, palindrome, character count, replacing characters)
8. Implementing programs using written modules and Python Standard Libraries (pandas, numpy, Matplotlib, scipy)
9. Implementing real-time/technical applications using File handling. (copy from one file to another, word count, longest word)
10. Implementing real-time/technical applications using Exception handling. (divide by zero error, voter’s age validity, student mark range validation)
12. Developing a game activity using Pygame like bouncing ball, car race etc.

TOTAL: 60 PERIODS

OUTCOMES:
On completion of the course, students will be able to:
CO1: Develop algorithmic solutions to simple computational problems
CO2: Develop and execute simple Python programs.
CO3: Implement programs in Python using conditionals and loops for solving problems.
CO4: Deploy functions to decompose a Python program.
CO5: Process compound data using Python data structures.
CO6: Utilize Python packages in developing software applications.
TEXT BOOKS:

REFERENCES:
5. https://www.python.org/

BS3171 PHYSICS AND CHEMISTRY LABORATORY

PHYSICS LABORATORY : (Any Seven Experiments)

COURSE OBJECTIVES:
• To learn the proper use of various kinds of physics laboratory equipment.
• To learn how data can be collected, presented and interpreted in a clear and concise manner.
• To learn problem solving skills related to physics principles and interpretation of experimental data.
• To determine error in experimental measurements and techniques used to minimize such error.
• To make the student as an active participant in each part of all lab exercises.

LIST OF EXPERIMENTS
1. Torsional pendulum - Determination of rigidity modulus of wire and moment of inertia of regular and irregular objects.
2. Simple harmonic oscillations of cantilever.
3. Non-uniform bending - Determination of Young’s modulus
4. Uniform bending – Determination of Young’s modulus
5. Laser - Determination of the wave length of the laser using grating
6. Air wedge - Determination of thickness of a thin sheet/wire
7. a) Optical fibre - Determination of Numerical Aperture and acceptance angle
b) Compact disc- Determination of width of the groove using laser.
8. Acoustic grating- Determination of velocity of ultrasonic waves in liquids.
9. Ultrasonic interferometer – determination of the velocity of sound and compressibility of liquids
11. Photoelectric effect
12. Michelson Interferometer.
13. Melde’s string experiment
14. Experiment with lattice dynamics kit.

TOTAL: 30 PERIODS

COURSE OUTCOMES:
Upon completion of the course, the students should be able to
CO1 : Understand the functioning of various physics laboratory equipment.
CO2 : Use graphical models to analyze laboratory data.
CO3 : Use mathematical models as a medium for quantitative reasoning and describing physical reality.
CO4 : Access, process and analyze scientific information.
CO5 : Solve problems individually and collaboratively.

CHEMISTRY LABORATORY: (Any seven experiments )

OBJECTIVES:
- To inculcate experimental skills to test basic understanding of water quality parameters, such as, acidity, alkalinity, hardness, DO, chloride and copper.
- To induce the students to familiarize with electroanalytical techniques such as, pH metry, potentiometry and conductometry in the determination of impurities in aqueous solutions.
- To demonstrate the analysis of metals and alloys.
- To demonstrate the synthesis of nanoparticles

CHEMISTRY LABORATORY: (Any seven experiments to be conducted)

1. Preparation of Na₂CO₃ as a primary standard and estimation of acidity of a water sample using the primary standard
2. Determination of types and amount of alkalinity in water sample.
   - Split the first experiment into two
3. Determination of total, temporary & permanent hardness of water by EDTA method.
4. Determination of DO content of water sample by Winkler’s method.
5. Determination of chloride content of water sample by Argentometric method.
6. Estimation of copper content of the given solution by Iodometry.
7. Estimation of TDS of a water sample by gravimetry.
8. Determination of strength of given hydrochloric acid using pH meter.
9. Determination of strength of acids in a mixture of acids using conductivity meter.
10. Conductometric titration of barium chloride against sodium sulphate (precipitation titration)
11. Estimation of iron content of the given solution using potentiometer.
13. Preparation of nanoparticles (TiO₂/ZnO/CuO) by Sol-Gel method.
14. Estimation of Nickel in steel
15. Proximate analysis of Coal

TOTAL : 30 PERIODS

OUT COMES :
To analyse the quality of water samples with respect to their acidity, alkalinity, hardness and DO.
To determine the amount of metal ions through volumetric and spectroscopic techniques
To analyse and determine the composition of alloys.
To learn simple method of synthesis of nanoparticles
To quantitatively analyse the impurities in solution by electroanalytical techniques

TEXT BOOKS:

GE3172 ENGLISH LABORATORY L T P C
0 0 2 1

OBJECTIVES:
• To improve the communicative competence of learners
• To help learners use language effectively in academic /work contexts
• To develop various listening strategies to comprehend various types of audio materials like lectures, discussions, videos etc.
• To build on students’ English language skills by engaging them in listening, speaking and grammar learning activities that are relevant to authentic contexts.
• To use language efficiently in expressing their opinions via various media.

UNIT I INTRODUCTION TO FUNDAMENTALS OF COMMUNICATION 6
Listening for general information-specific details- conversation: Introduction to classmates - Audio / video (formal & informal); Telephone conversation; Listening to voicemail & messages; Listening and filling a form. Speaking - making telephone calls-Self Introduction; Introducing a friend; - politeness strategies- making polite requests, making polite offers, replying to polite requests and offers- understanding basic instructions( filling out a bank application for example).

UNIT II NARRATION AND SUMMATION 6
Listening - Listening to podcasts, anecdotes / stories / event narration; documentaries and interviews with celebrities. Speaking - Narrating personal experiences / events-Talking about current and temporary situations & permanent and regular situations* - describing experiences and feelings- engaging in small talk- describing requirements and abilities.

UNIT III DESCRIPTION OF A PROCESS / PRODUCT 6
Listening - Listen to product and process descriptions; a classroom lecture; and advertisements about products. Speaking – Picture description- describing locations in workplaces- Giving instruction to use the product- explaining uses and purposes- Presenting a product- describing shapes and sizes and weights- talking about quantities(large & small)-talking about precautions.

UNIT IV CLASSIFICATION AND RECOMMENDATIONS 6
Listening – Listening to TED Talks; Listening to lectures - and educational videos. Speaking – Small Talk; discussing and making plans-talking about tasks-talking about progress- talking
about positions and directions of movement-talking about travel preparations- talking about transportation-

UNIT V  EXPRESSION  6
Listening – Listening to debates/ discussions; different viewpoints on an issue; and panel discussions. Speaking –making predictions- talking about a given topic-giving opinions-understanding a website-describing processes

TOTAL : 30 PERIODS

LEARNING OUTCOMES:
At the end of the course, learners will be able
- To listen and comprehend complex academic texts
- To speak fluently and accurately in formal and informal communicative contexts
- To express their opinions effectively in both oral and written medium of communication

ASSESSMENT PATTERN
- One online / app based assessment to test listening /speaking
- End Semester ONLY listening and speaking will be conducted online.
- Proficiency certification is given on successful completion of listening and speaking internal test and end semester exam.

HS3251  PROFESSIONAL ENGLISH -II  L T P C  2 0 0 2

OBJECTIVES :
- To engage learners in meaningful language activities to improve their reading and writing skills
- To learn various reading strategies and apply in comprehending documents in professional context.
- To help learners understand the purpose, audience, contexts of different types of writing
- To develop analytical thinking skills for problem solving in communicative contexts
- To demonstrate an understanding of job applications and interviews for internship and placements

UNIT I  MAKING COMPARISONS  6
Reading - Reading advertisements, user manuals, brochures; Writing – Professional emails, Email etiquette - Compare and Contrast Essay; Grammar – Mixed Tenses, Prepositional phrases

UNIT II  EXPRESSING CAUSAL RELATIONS IN SPEAKING AND WRITING  6
Reading - Reading longer technical texts– Cause and Effect Essays, and Letters / emails of complaint, Writing - Writing responses to complaints. Grammar - Active Passive Voice transformations, Infinitive and Gerunds

UNIT III  PROBLEM SOLVING  6
Reading - Case Studies, excerpts from literary texts, news reports etc. Writing – Letter to the Editor, Checklists, Problem solution essay / Argumentative Essay. Grammar – Error correction; If conditional sentences
UNIT IV REPORTING OF EVENTS AND RESEARCH

UNIT V THE ABILITY TO PUT IDEAS OR INFORMATION COGENTLY
Reading – Company profiles, Statement of Purpose, (SOP), an excerpt of interview with professionals; Writing – Job / Internship application – Cover letter & Resume; Grammar – Numerical adjectives, Relative Clauses.

OUTCOMES:
At the end of the course, learners will be able
• To compare and contrast products and ideas in technical texts.
• To identify cause and effects in events, industrial processes through technical texts
• To analyse problems in order to arrive at feasible solutions and communicate them orally and in the written format.
• To report events and the processes of technical and industrial nature.
• To present their opinions in a planned and logical manner, and draft effective resumes in context of job search.

TEXT BOOKS:
3. Authored by Dr. Veena Selvam, Dr. Sujatha Priyadarshini, Dr. Deepa Mary Francis, Dr. KN. Shoba, and Dr. Lourdes Joevani, Department of English, Anna University.

REFERENCE BOOKS:

ASSESSMENT PATTERN
Two internal assessments and an end semester examination to test students’ reading and writing skills along with their grammatical and lexical competence.
OBJECTIVES:

- This course aims at providing the necessary basic concepts of a few statistical and numerical methods and give procedures for solving numerically different kinds of problems occurring in engineering and technology.
- To acquaint the knowledge of testing of hypothesis for small and large samples which plays an important role in real life problems.
- To introduce the basic concepts of solving algebraic and transcendental equations.
- To introduce the numerical techniques of interpolation in various intervals and numerical techniques of differentiation and integration which plays an important role in engineering and technology disciplines.
- To acquaint the knowledge of various techniques and methods of solving ordinary differential equations.

UNIT I  TESTING OF HYPOTHESIS  9+3
Sampling distributions - Tests for single mean, proportion and difference of means (Large and small samples) – Tests for single variance and equality of variances – Chi square test for goodness of fit – Independence of attributes.

UNIT II  DESIGN OF EXPERIMENTS  9+3
One way and two way classifications - Completely randomized design – Randomized block design – Latin square design - $2^2$ factorial design.

UNIT III  SOLUTION OF EQUATIONS AND EIGENVALUE PROBLEMS  9+3

UNIT IV  INTERPOLATION, NUMERICAL DIFFERENTIATION AND NUMERICAL INTEGRATION  9+3
Lagrange’s and Newton’s divided difference interpolations – Newton’s forward and backward difference interpolation – Approximation of derivates using interpolation polynomials – Numerical single and double integrations using Trapezoidal and Simpson’s 1/3 rules.

UNIT V  NUMERICAL SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS  9+3

TOTAL: 60 PERIODS

OUTCOMES:
Upon successful completion of the course, students will be able to:

- Apply the concept of testing of hypothesis for small and large samples in real life problems.
- Apply the basic concepts of classifications of design of experiments in the field of agriculture.
- Appreciate the numerical techniques of interpolation in various intervals and apply the numerical techniques of differentiation and integration for engineering problems.
• Understand the knowledge of various techniques and methods for solving first and second order ordinary differential equations.
• Solve the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with engineering applications.

TEXT BOOKS:

REFERENCES:

FT3201 FIBRE SCIENCE L T P C
3 0 0 3

COURSE OBJECTIVES
• To enable the students to learn about the types of fibre and its properties

UNIT I INTRODUCTION TO TEXTILE FIBRES 9
Definition of various forms of textile fibres - staple fibre, filament, bicomponent fibres. Classification of Natural and Man-made fibres, essential and desirable properties of Fibres. Production and cultivation of Natural Fibers: Cotton, Silk, Wool -Physical and chemical structure of the above fibres.

UNIT II REGENERATED FIBRES 9
Production Sequence of Regenerated Cellulosic fibres: Viscose Rayon, Acetate rayon – High wet modulus fibres: Modal and Lyocel ,Tencel

UNIT III SYNTHETIC FIBRES 9
Production Sequence of Synthetic Fibers: polymer-Polyester, Nylon, Acrylic and polypropylene. Mineral fibres: fibre glass ,carbon .Introduction to spin finishes and texturization

UNIT IV SPECIALITY FIBRES 9
Properties and end uses of high tenacity and high modulus fibres, high temperature and flame retardant fibres, Chemical resistant fibres

UNIT V FUNCTIONAL SPECIALITY FIBRES 9
Properties and end uses: Fibres for medical application – Biodegradable fibres based on PLA
Super absorbent fibres elastomeric fibres, ultra-fine fibres, electrospun nano fibres, metallic fibres – Gold and Silver coated.

TOTAL : 45 PERIODS

COURSE OUTCOMES
Upon completion of this course, the student would be able to
- Understand the process sequence of various fibres
- Understand the properties of various fibres

TEXT BOOKS:

REFERENCES:

BE3252 BASIC ELECTRICAL, ELECTRONICS AND INSTRUMENTATION ENGINEERING

OBJECTIVES:
- To introduce the basics of electric circuits and analysis
- To impart knowledge in domestic wiring
- To impart knowledge in the basics of working principles and application of electrical machines
- To introduce analog devices and their characteristics
- To introduce the functional elements and working of sensors and transducers.

UNIT I ELECTRICAL CIRCUITS
DC Circuits: Circuit Components: Conductor, Resistor, Inductor, Capacitor – Ohm’s Law - Kirchhoff’s Laws – Simple problems- Nodal Analysis, Mesh analysis with Independent sources only (Steady state)
Introduction to AC Circuits and Parameters: Waveforms, Average value, RMS Value, Instantaneous power, real power, reactive power and apparent power, power factor – Steady state analysis of RLC circuits (Simple problems only), Three phase supply – star and delta connection – power in three-phase systems
UNIT II MAGNETIC CIRCUITS AND ELECTRICAL INSTALLATIONS
Magnetic circuits-definitions-MMF, flux, reluctance, magnetic field intensity, flux density, fringing, self and mutual inductances-simple problems.
Domestic wiring, types of wires and cables, earthing, protective devices-switch fuse unit-Miniature circuit breaker-moulded case circuit breaker-earth leakage circuit breaker, safety precautions and First Aid.

UNIT III ELECTRICAL MACHINES

UNIT IV ANALOG ELECTRONICS

UNIT V SENSORS AND TRANSDUCERS
Sensors, solenoids, pneumatic controls with electrical actuator, mechatronics, types of valves and its applications, electro-pneumatic systems, proximity sensors, limit switches, piezoelectric, hall effect, photo sensors, Strain gauge, LVDT, differential pressure transducer, optical and digital transducers, Smart sensors, Thermal Imagers.

TOTAL : 45 PERIODS

COURSE OUTCOMES:
After completing this course, the students will be able to
CO1: Compute the electric circuit parameters for simple problems
CO2: Explain the concepts of domestics wiring and protective devices
CO3: Explain the working principle and applications of electrical machines
CO4: Analyze the characteristics of analog electronic devices
CO5: Explain the types and operating principles of sensors and transducers

TEXT BOOKS:
3. S.K. Bhattacharya, Basic Electrical Engineering, Pearson Education, 2019
4. James A Svoboda, Richard C. Dorf, Dorf’s Introduction to Electric Circuits, Wiley, 2018

REFERENCES:

GE3251 ENGINEERING GRAPHICS

COURSE OBJECTIVES:
The main learning objective of this course is to prepare the students for:
- Drawing engineering curves.
- Drawing freehand sketch of simple objects.
- Drawing orthographic projection of solids and section of solids.
- Drawing development of solids
- Drawing isometric and perspective projections of simple solids.

CONCEPTS AND CONVENTIONS (Not for Examination)
Importance of graphics in engineering applications — Use of drafting instruments — BIS conventions and specifications — Size, layout and folding of drawing sheets — Lettering and dimensioning.

UNIT I PLANE CURVES
Basic Geometrical constructions, Curves used in engineering practices: Conics — Construction of ellipse, parabola and hyperbola by eccentricity method — Construction of cycloid — construction of involutes of square and circle — Drawing of tangents and normal to the above curves.

UNIT II PROJECTION OF POINTS, LINES AND PLANE SURFACE
Orthographic projection- principles-Principal planes-First angle projection-projection of points. Projection of straight lines (only First angle projections) inclined to both the principal planes - Determination of true lengths and true inclinations by rotating line method and traces. Projection of planes (polygonal and circular surfaces) inclined to both the principal planes by rotating object method.

UNIT III PROJECTION OF SOLIDS AND FREEHAND SKETCHING
Projection of simple solids like prisms, pyramids, cylinder, cone and truncated solids when the axis is inclined to one of the principal planes and parallel to the other by rotating object method. Visualization concepts and Free Hand sketching: Visualization principles — Representation of Three Dimensional objects — Layout of views- Freehand sketching of multiple views from pictorial views of objects. Practicing three dimensional modeling of simple objects by CAD Software(Not for examination)

UNIT IV PROJECTION OF SECTIONED SOLIDS AND DEVELOPMENT OF SURFACES
Sectioning of above solids in simple vertical position when the cutting plane is inclined to the one of the principal planes and perpendicular to the other — obtaining true shape of section. Development of lateral surfaces of simple and sectioned solids — Prisms, pyramids cylinders
and cones.
Practicing three dimensional modeling of simple objects by CAD Software (Not for examination)

UNIT V  ISOMETRIC AND PERSPECTIVE PROJECTIONS  6+12
Principles of isometric projection — isometric scale — isometric projections of simple solids and truncated solids - Prisms, pyramids, cylinders, cones- combination of two solid objects in simple vertical positions - Perspective projection of simple solids - Prisms, pyramids and cylinders by visual ray method.
Practicing three dimensional modeling of isometric projection of simple objects by CAD Software (Not for examination)

TOTAL: (L=30+P=60) 90 PERIODS

OUTCOMES:
On successful completion of this course, the student will be able to
• Use BIS conventions and specifications for engineering drawing.
• Construct the conic curves, involutes and cycloid.
• Solve practical problems involving projection of lines.
• Draw the orthographic, isometric and perspective projections of simple solids.
• Draw the development of simple solids.

TEXT BOOKS:

REFERENCES:

Publication of Bureau of Indian Standards:
2. IS 9609 (Parts 0 & 1) — 2001: Technical products documentation — Lettering.

Special points applicable to University Examinations on Engineering Graphics:
1. There will be five questions, each of either or type covering all units of the syllabus.
2. All questions will carry equal marks of 20 each making a total of 100.
3. The answer paper shall consist of drawing sheets of A3 size only. The students will be permitted to use appropriate scale to fit solution within A3 size.
4. The examination will be conducted in appropriate sessions on the same day.

CY3252 CHEMISTRY FOR TEXTILE TECHNOLOGISTS  L T P C
3 0 0 3

OBJECTIVES:
The course aims to
- Gain proper understanding on spectroscopic and surface analytical techniques.
- Impart knowledge to students on the chemistry of surface and interfaces.
- Make students well versed on the chemical analysis of oils, fats, soaps & lubricants.
- Firmly establish a sound understanding on the student’s mind about chemicals and auxiliaries.
- Familiarize students with the identification and characteristics of dyes and their applications.

UNIT I SPECTROSCOPIC TECHNIQUES
Spectroscopy: Electromagnetic spectrum - absorption of radiation - electronic, vibrational and rotational transitions. Width and intensities of spectral lines. Flame photometer, Atomic absorption spectroscopy, UV-Vis, IR spectroscopy, Scanning Electron Microscope (SEM) and Transmission Electron Microscope (TEM) - principles, instrumentation (Block diagram) and applications.

UNIT II CHEMISTRY OF INTERFACES

UNIT III WATER TECHNOLOGY
Water: Sources and impurities; Significance and estimation (only mention of methods) of turbidity, colour, pH, acidity, alkalinity, hardness, solids, chlorides, residual chlorine, sulphates, fluorides, phosphates, iron and manganese, DO, BOD, COD, nitrogen, grease, volatile acids. Treatment of water: Zeolites process and ion exchange demineralization; Desalination of water: Reverse osmosis and Electro dialysis; Municipal water treatment: Primary treatment and Disinfection (UV, Ozonation, break-point chlorination).

UNIT IV OILS, FATS, SOAPS & LUBRICANTS
Chemical constitution, Chemical analysis of oils and fats – acid, saponification and iodine values, Definitions, determinations and significance. Definition, mechanism of lubrication, preparation of petrolubes, desirable characteristics – viscosity, viscosity index, carbon residue, oxidation stability, flash and fire points, cloud and pour points, aniline point. Semisolid lubricant
– greases, preparation of sodium, lithium, calcium and axle greases and uses, consistency test and drop point test. Solid lubricants – graphite and molybdenum disulphide.

UNIT V CHEMICALS AND AUXILIARIES

TOTAL : 45 PERIODS

COURSE OUTCOMES:
At the end of the course, the students will be able to:

CO1 : Understand and apply spectroscopic techniques for the analysis of engineering materials for their end use applications.

CO2 : Make use of the applications of adsorption in detergency, wetting, spreading, foaming, de-foaming, and water repellence and separation processes.

CO3 : Analyse and estimate oils, fats, lubricants and soap for their intended applications.

CO4 : Distinguish and demonstrate the role of different types of chemicals and auxiliaries.

CO5 : Realize the chemical structures, properties and relationships of different types of dyes and their applications

TEXTBOOKS:

REFERENCES:

GE3252 கருப்பு சிவப்பு பொண்டங்கள் பின் கொலத்தில் தநெவுத் தொழில் நுட்பம் L T P C 1 0 0 1
அங்கெ I தொழில் இருப்பதன் பாதுகாக்க வசதிகள் பிப்பின் கொலம்: 3 கருப்பு சிவப்பு பொண்டங்கள் - பாதுகாக்க தொழில்நுட்பம் - கருப்பு சிவப்பு பாதுகாக்க வசதிகள் - பாதுகாக்கான வசதிகள் நூறு கருப்பு சிவப்பு பொண்டங்கள்.

அங்கெ II வடிவமைப்பு பாதுகாக்க வசதிகள் கொலம் 3 கருப்பு சிவப்பு பொண்டங்கள் வடிவமைப்பு பாதுகாக்க வசதிகள் வடிவமைப்பு வசதிகள் வடிவமைப்பு வசதிகள் வடிவமைப்பு வசதிகள்
வீட்டுப் தபொருட்களில் வடிவமமப்பு - எங்க கொலத்தில் கட்டுமொன தபொருட்களும் நடுகல்லும் – சிலப்பதிகொரத்தில் மணமட அமமப்பு பற்றிய விவரங்கள் - மொமல்லபுச் சிற்பங்களும், மகொவில்களும் – மெொழர் கொலத்துப் தபருங்மகொயில்களும் மற்றும் பிரிட்டிஷ் கட்டமமப்புகள் பற்றி அறிதல், மதுமர மீனொட்சி அம்மன ஆலயம் மற்றும் திருமமல்லிக்குறித்து வீடுகளும் – பிரிட்டிஷ் கட்டமமப்புகளும் மிதிகார தபொருட்களில் திமி஝ா-சானகாதாரம் காலத்திற்கான.

அலகு III  மரும்பானிசுப்பு காலம்: 3

அலகு IV  சானகாதார காலம் கிளம்பப்பட்ட நிலைச் சுழலிகள்: 3
அனைவர், காலங்கள், மக்கள் - வெளியுறு தமிழ் தமிழகில் - தமிழகம் பொருளில் குணமைத்தில் காலமட்டம் - வெளியுறு தமிழகம் மற்றும் குணமைத்தில் காலமட்டத்திற்கு குணமை பொருளில் - மக்கள் உற்பத்திரின் - பொருளில் மற்றும் - பொருளில் மற்றும் தவளியீடுகள் - பொருளில் நூல்கள் காலமட்டம் அறியும் - அறியும் காலம.

அலகு V  அறிவியல் காலம் குருதந்தி: 3
அறிவியல் தமிழில் வரலொறுகள் - கல்விகளின் வரலொறுகள் - தமிழ் காலமட்ட பொருளில் பொருளில் - தமிழ் காலமட்ட பொருளில் பொருளில் - தமிழ் காலமட்ட பொருளில் பொருளில். 

TOTAL : 15 PERIODS

TEXT-CUM-REFERENCE BOOKS
2. கல்விகள் மற்றும் - பதிகக்க விளைவிய குழும (பதிப்பிடி: பதிப்புகள்).
3. கல்வி - தமிழ் குருதந்திகள் தமிழகம் குருதந்தி (பதிப்பிடி: குருதந்தி பதிப்பிடி).
4. பொருளில் அறிவியல் காலமட்டம் (பதிப்பிடி: குருதந்தி பதிப்பிடி).
5. Social Life of Tamils (Dr.K.K.Pillay) A joint publication of TNTB & ESC and RMRL – (in print)
6. Social Life of the Tamils - The Classical Period (Dr.S.Singaravelu) (Published by: International Institute of Tamil Studies).
7. Historical Heritage of the Tamils (Dr.S.V.Subatamanian, Dr.K.D. Thirunavukkarasu) (Published by: International Institute of Tamil Studies).
8. The Contributions of the Tamils to Indian Culture (Dr.M.Valarmathil) (Published by: International Institute of Tamil Studies.)
9. Keeladi - ‘Sangam City Civilization on the banks of river Vaigai’ (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)
10. Studies in the History of India with Special Reference to Tamil Nadu (Dr.K.K.Pillay) (Publishedby: The Author)
11. Porunai Civilization (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)

GE3252 TAMILS AND TECHNOLOGY L T P C
1 0 0 1

UNIT I WEAVING AND CERAMIC TECHNOLOGY 3
Weaving Industry during Sangam Age – Ceramic technology – Black and Red Ware Potteries (BRW) – Graffiti on Pottery.

UNIT II DESIGN AND CONSTRUCTION TECHNOLOGY 3
Designing and Structural construction House & Designs in household materials during Sangam Age - Building materials and Hero stones of Sangam age – Details of Stage Constructions in Silappathikaram - Sculptures and Temples of Mamallapuram - Great Temples of Cholas and other worship places - Temples of Nayaka Period - Type study (Madurai Meenakshi Temple)-Thirumalai Nayakkar Mahal - Chetti Nadu Houses, Indo - Saracenic architecture at Madras during British Period.

UNIT III MANUFACTURING TECHNOLOGY 3

UNIT IV AGRICULTURE AND IRRIGATION TECHNOLOGY 3
Dam, Tank, ponds, Sluice, Significance of Kumizhi Thoompu of Chola Period, Animal Husbandry - Wells designed for cattle use - Agriculture and Agro Processing - Knowledge of Sea - Fisheries – Pearl - Conche diving - Ancient Knowledge of Ocean - Knowledge Specific Society.

UNIT V SCIENTIFIC TAMIL & TAMIL COMPUTING 3

TOTAL : 15 PERIODS

TEXT-CUM-REFERENCE BOOKS
1. தமிழ் வரலை – மக்களும் பண பொடும் – ஆ. கே. பிரசுரம் (தவளியீடு: தமிழ்நொடு பொடநூல் மற்றும் கல்வியியல் பணிகள் கழகம்).
2. கணினித் தமிழ் – முமனவர் இல. சுந்தரம் (விகடன் பிரசுரம்).
3. சீத்தூர் – செஞ்சு முனிசங்களால் சம்மகசான் காரண கல்விகள் (தகவுதிவுப் துறை திருச்சிப்பு).
4. பார்சுகுட அறைக்கற நாருற்று. (ததொல்லியல் துமற்தவளியீடு)
5. Social Life of Tamils (Dr.K.K.Pillay) A joint publication of TNTB & ESC and RMRL – (in print)
6. Social Life of the Tamils - The Classical Period (Dr.S.Singaravelu) (Published by: International Institute of Tamil Studies.
7. Historical Heritage of the Tamils (Dr.S.V.Subatamanian, Dr.K.D. Thirunavukkarasu) (Published by: International Institute of Tamil Studies).
8. The Contributions of the Tamils to Indian Culture (Dr.M.Valarmathi) (Published by: International Institute of Tamil Studies.)
9. Keeladi - ‘Sangam City Civilization on the banks of river Vaigai’ (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)
10. Studies in the History of India with Special Reference to Tamil Nadu (Dr.K.K.Pillay) (Published by: The Author)
11. Porunai Civilization (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)
## NCC Credit Course Level 1*

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>NX3251</td>
<td>(ARMY WING) NCC Credit Course Level - I</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
</tbody>
</table>

### NCC GENERAL

1. **NCC 1** Aims, Objectives & Organization of NCC  
2. **NCC 2** Incentives  
3. **NCC 3** Duties of NCC Cadet  
4. **NCC 4** NCC Camps: Types & Conduct

### NATIONAL INTEGRATION AND AWARENESS

1. **NI 1** National Integration: Importance & Necessity  
2. **NI 2** Factors Affecting National Integration  
3. **NI 3** Unity in Diversity & Role of NCC in Nation Building  
4. **NI 4** Threats to National Security

### PERSONALITY DEVELOPMENT

1. **PD 1** Self-Awareness, Empathy, Critical & Creative Thinking, Decision Making and Problem Solving  
2. **PD 2** Communication Skills  
3. **PD 3** Group Discussion: Stress & Emotions

### LEADERSHIP

1. **L 1** Leadership Capsule: Traits, Indicators, Motivation, Moral Values, Honour Code  
2. **L 2** Case Studies: Shivaji, Jhasi Ki Rani

### SOCIAL SERVICE AND COMMUNITY DEVELOPMENT

1. **SS 1** Basics, Rural Development Programmes, NGOs, Contribution of Youth  
2. **SS 4** Protection of Children and Women Safety  
3. **SS 5** Road / Rail Travel Safety  
4. **SS 6** New Initiatives  
5. **SS 7** Cyber and Mobile Security Awareness

**TOTAL: 30 PERIODS**
### NCC Credit Course Level 1*

**NX3252**
**(NAVAL WING)**

<table>
<thead>
<tr>
<th>Code</th>
<th>Subject</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>202</td>
<td><strong>NCC GENERAL</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Aims, Objectives &amp; Organization of NCC</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Incentives</td>
<td></td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>1</td>
<td>Duties of NCC Cadet</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>NCC Camps: Types &amp; Conduct</td>
<td></td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td><strong>NATIONAL INTEGRATION AND AWARENESS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>National Integration: Importance &amp; Necessity</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Factors Affecting National Integration</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>Unity in Diversity &amp; Role of NCC in Nation Building</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>Threats to National Security</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td><strong>PERSONALITY DEVELOPMENT</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Self-Awareness, Empathy, Critical &amp; Creative Thinking, Decision Making and Problem Solving</td>
<td></td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>Communication Skills</td>
<td></td>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>Group Discussion: Stress &amp; Emotions</td>
<td></td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td><strong>LEADERSHIP</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Leadership Capsule: Traits, Indicators, Motivation, Moral Values, Honour Code</td>
<td></td>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>Case Studies: Shivaji, Jhasi Ki Rani</td>
<td></td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>8</td>
<td><strong>SOCIAL SERVICE AND COMMUNITY DEVELOPMENT</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Basics, Rural Development Programmes, NGOs, Contribution of Youth</td>
<td></td>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>1</td>
<td>Protection of Children and Women Safety</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>Road / Rail Travel Safety</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>New Initiatives</td>
<td></td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>1</td>
<td>Cyber and Mobile Security Awareness</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td></td>
<td><strong>TOTAL</strong></td>
<td></td>
<td></td>
<td></td>
<td>30</td>
</tr>
</tbody>
</table>

*TOTAL : 30 PERIODS*
### NCC Credit Course Level 1*

**NX3253 (AIR FORCE WING) NCC Credit Course Level - I**

<table>
<thead>
<tr>
<th></th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
</tbody>
</table>

#### NCC GENERAL

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>NCC 1</td>
<td>Aims, Objectives &amp; Organization of NCC</td>
<td>1</td>
</tr>
<tr>
<td>NCC 2</td>
<td>Incentives</td>
<td>2</td>
</tr>
<tr>
<td>NCC 3</td>
<td>Duties of NCC Cadet</td>
<td>1</td>
</tr>
<tr>
<td>NCC 4</td>
<td>NCC Camps: Types &amp; Conduct</td>
<td>2</td>
</tr>
</tbody>
</table>

#### NATIONAL INTEGRATION AND AWARENESS

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>NI 1</td>
<td>National Integration: Importance &amp; Necessity</td>
<td>1</td>
</tr>
<tr>
<td>NI 2</td>
<td>Factors Affecting National Integration</td>
<td>1</td>
</tr>
<tr>
<td>NI 3</td>
<td>Unity in Diversity &amp; Role of NCC in Nation Building</td>
<td>1</td>
</tr>
<tr>
<td>NI 4</td>
<td>Threats to National Security</td>
<td>1</td>
</tr>
</tbody>
</table>

#### PERSONALITY DEVELOPMENT

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>PD 1</td>
<td>Self-Awareness, Empathy, Critical &amp; Creative Thinking, Decision Making and Problem Solving</td>
<td>2</td>
</tr>
<tr>
<td>PD 2</td>
<td>Communication Skills</td>
<td>3</td>
</tr>
<tr>
<td>PD 3</td>
<td>Group Discussion: Stress &amp; Emotions</td>
<td>2</td>
</tr>
</tbody>
</table>

#### LEADERSHIP

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>L 1</td>
<td>Leadership Capsule: Traits, Indicators, Motivation, Moral Values, Honour Code</td>
<td>3</td>
</tr>
<tr>
<td>L 2</td>
<td>Case Studies: Shivaji, Jhasi Ki Rani</td>
<td>2</td>
</tr>
</tbody>
</table>

#### SOCIAL SERVICE AND COMMUNITY DEVELOPMENT

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>SS 1</td>
<td>Basics, Rural Development Programmes, NGOs, Contribution of Youth</td>
<td>3</td>
</tr>
<tr>
<td>SS 4</td>
<td>Protection of Children and Women Safety</td>
<td>1</td>
</tr>
<tr>
<td>SS 5</td>
<td>Road / Rail Travel Safety</td>
<td>1</td>
</tr>
<tr>
<td>SS 6</td>
<td>New Initiatives</td>
<td>2</td>
</tr>
<tr>
<td>SS 7</td>
<td>Cyber and Mobile Security Awareness</td>
<td>1</td>
</tr>
</tbody>
</table>

**TOTAL : 30 PERIODS**
COURSE OBJECTIVES:

- Drawing pipe line plan; laying and connecting various pipe fittings used in common household plumbing work; Sawing; planing; making joints in wood materials used in common household wood work.
- Wiring various electrical joints in common household electrical wire work.
- Welding various joints in steel plates using arc welding work; Machining various simple processes like turning, drilling, tapping in parts; Assembling simple mechanical assembly of common household equipments; Making a tray out of metal sheet using sheet metal work.
- Soldering and testing simple electronic circuits; Assembling and testing simple electronic components on PCB.

GROUP – A (CIVIL & ELECTRICAL)

PART I CIVIL ENGINEERING PRACTICES 15

PLUMBING WORK:

a) Connecting various basic pipe fittings like valves, taps, coupling, unions, reducers, elbows and other components which are commonly used in household.
b) Preparing plumbing line sketches.
c) Laying pipe connection to the suction side of a pump
d) Laying pipe connection to the delivery side of a pump.
e) Connecting pipes of different materials: Metal, plastic and flexible pipes used in household appliances.

WOOD WORK:

a) Sawing,
b) Planing and
c) Making joints like T-Joint, Mortise joint and Tenon joint and Dovetail joint.

Wood Work Study:

a) Studying joints in door panels and wooden furniture
b) Studying common industrial trusses using models.

PART II ELECTRICAL ENGINEERING PRACTICES 15

a) Introduction to switches, fuses, indicators and lamps - Basic switch board wiring with lamp, fan and three pin socket
b) Staircase wiring
c) Fluorescent Lamp wiring with introduction to CFL and LED types.
d) Energy meter wiring and related calculations/calibration
e) Study of Iron Box wiring and assembly
f) Study of Fan Regulator (Resistor type and Electronic type using Diac/Triac/quadrac)
g) Study of emergency lamp wiring/Water heater

GROUP – B (MECHANICAL AND ELECTRONICS)

PART III MECHANICAL ENGINEERING PRACTICES 15

WELDING WORK:

a) Welding of Butt Joints, Lap Joints, and Tee Joints using arc welding.
b) Practicing gas welding.

**BASIC MACHINING WORK:**
- a) (simple) Turning.
- b) (simple) Drilling.
- c) (simple) Tapping.

**ASSEMBLY WORK:**
- a) Assembling a centrifugal pump.
- b) Assembling a household mixer.
- c) Assembling an air conditioner.

**SHEET METAL WORK:**
- a) Making of a square tray

**FOUNDRY WORK:**
- a) Demonstrating basic foundry operations.

**PART IV ELECTRONIC ENGINEERING PRACTICES**

**SOLDERING WORK:**
- a) Soldering simple electronic circuits and checking continuity.

**ELECTRONIC ASSEMBLY AND TESTING WORK:**
- a) Assembling and testing electronic components on a small PCB.

**ELECTRONIC EQUIPMENT STUDY:**
- a) Study an elements of smart phone..
- b) Assembly and dismantle of LED TV.
- c) Assembly and dismantle of computer/laptop

**COURSE OUTCOMES:**
Upon completion of this course, the students will be able to:

**CO1:**
- Draw pipe line plan; lay and connect various pipe fittings used in common household plumbing work; Saw; plan; make joints in wood materials used in common household wood work.

**CO2:**
- Wire various electrical joints in common household electrical wire work.

**CO3:**
- Weld various joints in steel plates using arc welding work; Machine various simple processes like turning, drilling, tapping in parts; Assemble simple mechanical assembly of common household equipments; Make a tray out of metal sheet using sheet metal work.

**CO4:**
- Solder and test simple electronic circuits; Assemble and test simple electronic components on PCB.

**TOTAL: 60 PERIODS**
COURSE OBJECTIVES:
- To train the students in conducting load tests electrical machines
- To gain practical experience in experimentally obtaining the characteristics of electronic devices and rectifiers
- To train the students to measure three phase power and displacement

LIST OF EXPERIMENTS
1. Verification of ohms and Kirchhoff’s Laws.
2. Three Phase Power Measurement
3. Load test on DC Shunt Motor.
4. Load test on Self Excited DC Generator
5. Load test on Single phase Transformer
6. Load Test on Induction Motor
7. Characteristics of PN and Zener Diodes
8. Characteristics of BJT, SCR and MOSFET
9. Design and analysis of Half wave and Full Wave rectifiers
10. Measurement of displacement of LVDT

COURSE OUTCOMES:
After completing this course, the students will be able to
CO1: Use experimental methods to verify the Ohm’s law and Kirchhoff’s Law and to measure three phase power
CO2: Analyze experimentally the load characteristics of electrical machines
CO3: Analyze the characteristics of basic electronic devices
CO4: Use LVDT to measure displacement

TOTAL: 60 PERIODS

OBJECTIVES
- To identify varied group discussion skills and apply them to take part in effective discussions in a professional context.
- To be able to communicate effectively through writing.

UNIT I
Speaking: Role Play Exercises Based on Workplace Contexts, - talking about competition-discussing progress toward goals-talking about experiences- talking about events in life-discussing past events-Writing: writing emails (formal & semi-formal).

UNIT II
Speaking: discussing news stories-talking about frequency-talking about travel problems-discussing travel procedures-talking about travel problems- making arrangements-describing arrangements-discussing plans and decisions-discussing purposes and reasons-understanding common technology terms-Writing: - writing different types of emails.
UNIT III 12
Speaking: discussing predictions-describing the climate-disscussing forecasts and scenarios-
talking about purchasing-discussing advantages and disadvantages- making comparisons-
discussing likes and dislikes- discussing feelings about experiences-discussing imaginary
scenarios Writing: short essays and reports-formal/semi-formal letters.

UNIT IV 12
Speaking: discussing the natural environment-describing systems-describing position and
movement- explaining rules-( example- discussing rental arrangements)- understanding
technical instructions-Writing: writing instructions-writing a short article.

UNIT V 12
Speaking: describing things relatively-describing clothing-discussing safety issues( making
recommendations) talking about electrical devices-describing controlling actions- Writing:
job application( Cover letter + Curriculum vitae)-writing recommendations.

TOTAL: 60 PERIODS

LEARNING OUTCOMES
• Speak effectively in group discussions held in a formal/semi formal contexts.
• Write emails and effective job applications.

Assessment Pattern
• One online / app based assessment to test speaking and writing skills
• Proficiency certification is given on successful completion of speaking and writing.

MA3357 PROBABILITY AND STATISTICAL METHODS L T P C
3 1 0 4

COURSE OBJECTIVES:
• To develop Probability techniques in manufacturing and quality evaluation process.
• To familiarize the students with two dimensional random variables.
• To familiarize the student with Differential Equations.
• To make the students to understand various techniques of Correlation and Time series
  Analysis.
• To acquaint the student with mathematical tools needed in evaluating Statistical quality
  control and to apply in the textile manufacturing industry.

UNIT I PROBABILITY AND RANDOM VARIABLES 9+3
Probability – axioms of probability – Conditional probability – Baye’s theorem - Discrete and
continuous random variables – Moments – Moment Generating functions – Binomial, Poisson,
Geometric, Uniform, Exponential, Gamma and Normal distributions.

UNIT II TWO DIMENSIONAL RANDOM VARIABLES 9+3
Join distributions – Marginal distributions and conditional distributions –Moments - Covariance -
Transforms of random variables – Central limit theorem.
UNIT III  DIFFERENTIAL EQUATIONS


UNIT IV  CORRELATION, REGRESSION, INDEX NUMBERS AND TIMES SERIES ANALYSIS

Correlation analysis, estimation of regression line. Time series analysis: Variations in time series, trend analysis, cyclical variations, seasonal variations and irregular variations. Index Numbers – Laspeyre’s, Paasche’s and Fisher’s Ideal Index.

UNIT V  STATISTICAL QUALITY CONTROL

Control charts for measurements (X and R chart) – Control charts for attributes (p, C and np) charts – Tolerance limits – acceptance Sampling.

TOTAL PERIODS: 60

COURSE OUTCOMES:
At the end of the course the students will be able to
CO1: Use the Probability techniques for solving practical problems.
CO2: Apply two dimensional random variable tools in solving various problems.
CO3: Able to solve differential Equations by applying various techniques.
CO4: Apply different methods of Correlation, Regression, Index Numbers and Times series analysis in solving practical problems.
CO5: Apply statistical techniques in solving manufacturing and management related problems

TEXTBOOKS:

REFERENCES:
OBJECTIVES
To enable the students to understand the

- Physical characteristics of textile fibres

UNIT I STRUCTURE AND INVESTIGATION TECHNIQUES OF FIBRES 9
Classification of fibres; study of morphological structures of fibers; Transmission and Scanning electron microscopes-principle; construction and working; X-ray diffraction techniques – estimation of crystallinity; Infrared radiation and dichroism techniques

UNIT II MOISTURE ABSORPTION CHARACTERISTICS 9
Theories of moisture sorption; moisture absorption behavior of natural and man-made fibres; influence of fibre structure, humidity and temperature on the moisture absorption; conditioning of fibres –mechanism of conditioning and factors influencing conditioning .moisture diffusion in fibres; heat of sorption – factors influencing heat of sorption - measurement of heat of sorption

UNIT III TENSILE AND ELONGATION CHARACTERISTICS OF FIBRES 9
Tensile characteristics –study of strength, elongation, work of rupture, initial modulus, work factor and yield point – determination of yield point. stress-strain relations of natural and manmade fibres - influence of fibre structure, humidity and temperature on tensile characteristics. time effects- study of creep phenomena.

UNIT IV ELASTIC RECOVERY BEHAVIOUR OF FIBRES 9
Elastic recovery and its relation to stress and strain of fibres; mechanical conditioning of fibres and its influence on elastic recovery .load cycling and extension cycling-their effect on elastic recovery. introduction about torsional and flexural rigidity of fibers

UNIT V OPTICAL, FRICTIONAL, AND THERMAL CHARACTERISTICS 9
Reflexion and lustre-objective and subjective methods of measurement - refractive index and its measurement - friction – its measurement, comparison of fibres, directional friction in wool – friction. thermal transitions of fibres - thermal conductivity, thermal expansion and contraction, Tg, melting; static electricity in textile fibres

TOTAL: 45 PERIODS

Course Outcomes

| CO1 | Investigate and identify fibers based on their morphological structure |
| CO2 | Identify the factors influencing moisture and heat sorption behavior of fibres |
| CO3 | Identify the factors influencing tensile and elongation behavior of fibres |
| CO4 | Understand the elastic recovery behaviour of fibres |
| CO5 | Understand and measure the optical, frictional, and thermal characteristics of fibres |

TEXTBOOKS
REFERENCES


<table>
<thead>
<tr>
<th>Course Outcomes</th>
<th>Statement</th>
<th>Program Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO1</td>
<td>Investigate and identify fibers based on their morphological structure</td>
<td>3 3 3 3 2 - - - - - - 2 3 1 2</td>
</tr>
<tr>
<td>CO2</td>
<td>Identify the factors influencing moisture and heat sorption behaviour of fibres</td>
<td>3 3 3 3 2 - - - - - - 2 3 1 2</td>
</tr>
<tr>
<td>CO3</td>
<td>Identify the factors influencing tensile and elongation behaviour of fibres</td>
<td>3 3 3 3 2 - - - - - - 2 3 1 2</td>
</tr>
<tr>
<td>CO4</td>
<td>Understand the elastic recovery behaviour of fibres</td>
<td>3 3 3 3 2 - - - - - - 2 3 1 2</td>
</tr>
<tr>
<td>CO5</td>
<td>Understand and measure the optical, frictional, and thermal characteristics of fibres</td>
<td>3 3 3 3 2 - - - - - - 2 3 1 2</td>
</tr>
<tr>
<td>Overall CO</td>
<td></td>
<td>3 3 3 3 2 - - - - - - 2 3 1 2</td>
</tr>
</tbody>
</table>
OBJECTIVE:
To enable the students to understand various processes involved in conversion of fibre to yarn by various spinning system and other modern spinning systems.

UNIT I  PREPARATORY FOR YARN SPINNING 10
Linear density systems for textile materials; – objectives, types, working principle of Ginning , blow room, Carding, drawing machine, roving machine, Ring spinning

UNIT II  OUTLINE & PASSAGE FLOW OF LONG STAPLE SPINNING 4
Comber preparation – objectives, principles of sliver lap ribbon lap and super lap formers; comber- principle of combing, sequence of combing operation.

UNIT III  OUTLINE & PASSAGE FLOW OF OPEN END SPINNING 6
Principles of yarn formation and material flow – rotor, friction, air-jet and air vortex spinning machines; core, wrap spinning system, comparison of yarn properties

UNIT IV  OUTLINE & PASSAGE FLOW OF SEWING THREAD AND SPECIALITY YARNS: 5

UNIT V  OUTLINE & PASSAGE FLOW OF SPECIALITY SPINNING 5
Melt spinning, Dry spinning, Sol gel spinning, Hollow spinning, specialized non-circular cross section fibres, spinning for - nonwovens, Optical fibres, thermotropic liquid-crystal polymers, Electro spinning.

OUTCOMES:
Upon completion of this course, the student shall
- Infer the short staple spinning process and machineries
- Infer the long staple spinning process and machineries
- Outline the process of open-end spinning.
- Apply the spinning concepts in fancy yarns and product diversifications.
- Outline the process of specialty spinning

TEXT BOOKS:
1. Lawrence C.A. Advances in Yarn Spinning Technology, Woodhead publishing, 2010
4. Bin Ding, Xianfeng Wang and Jianyong Yu, Electrospinning: Nanofabrication and Applications, Woodhead publishing, 2019
REFERENCES:

### Course Articulation Matrix:

<table>
<thead>
<tr>
<th>Course Outcomes</th>
<th>Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CO1</strong></td>
<td>Infer the short staple spinning process and machineries</td>
</tr>
<tr>
<td><strong>CO2</strong></td>
<td>Infer the long staple spinning process and machineries</td>
</tr>
<tr>
<td><strong>CO3</strong></td>
<td>Outline the process of open-end spinning</td>
</tr>
<tr>
<td><strong>CO4</strong></td>
<td>Apply the spinning concepts in fancy yarns and product diversifications.</td>
</tr>
<tr>
<td><strong>CO5</strong></td>
<td>Outline the process of speciality spinning</td>
</tr>
<tr>
<td><strong>Overall CO</strong></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>PO1</th>
<th>PO2</th>
<th>PO3</th>
<th>PO4</th>
<th>PO5</th>
<th>PO6</th>
<th>PO7</th>
<th>PO8</th>
<th>PO9</th>
<th>PO10</th>
<th>PO11</th>
<th>PO12</th>
<th>PSO1</th>
<th>PSO2</th>
<th>PSO3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CO1</strong></td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td><strong>CO2</strong></td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td><strong>CO3</strong></td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td><strong>CO4</strong></td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td><strong>CO5</strong></td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>3</td>
</tr>
</tbody>
</table>

1, 2 and 3 are correlation levels with weightings as Slight (Low), Moderate (Medium) and Substantial (High) respectively.
OBJECTIVES:

- To teach preparatory processes, primary and secondary mechanisms auxiliary, additional mechanisms of shuttle looms; weft insertion principles of shuttle less looms
- To teach knitting process, principles of weft and warp knitting machines,
- To teach principles involved in the manufacturing of nonwoven fabric

UNIT I

**Basics of Woven Fabrics:** Different kinds of fabrics, Woven fabrics, Warp, Weft, Weaving; Preparatory processes for single and folded yarn

**Yarn Winding Machines:** Objectives, yarn passage in Cone Winding machine and Pirn Winding machine.

**Warping Machines:** Objectives, warp passage in Back beam warping machine and Sectional warping machine.

**Sizing and Gaiting:** Objects of sizing, sizing ingredients and its function; Drawing-in, Denting, and Knotting or Piecing; Gaiting

UNIT II

**Basic Concepts of Loom:** Loom, Parts of Loom, Path of Warp in loom; Motions of Weaving – Primary, Secondary, and Auxiliary motions; Types of looms, Loom speed and Efficiency

**Primary Mechanisms:** Basic working principles of Tappet Shedding, Cone over Picking, Cone under Picking, Side lever Under Picking, Crank Beat-up, Timings of Primary Motions

**Secondary Mechanisms:** Negative Let-off mechanism, Positive Seven wheels Take-up mechanism.

**Objectives of Auxiliary Motions:** Temple, Brake/Starting handle, Warp stop, Warp protecting, Weft stop, Drop box

UNIT III

**Other Shedding Devices:** Basic working principles Climax Dobby and Single lift single cylinder Jacquard

**Shuttle less looms:** Basic principles of weft insertion by Projectile, Single Rapier, Double Rapier, Air jet, water jet; Multi-phase weaving; Principles 3D fabric weaving

**Defects and Inspection:** Woven fabric Defects, Causes and Remedies; Fabric inspection, 4-points system, Classification of defects, Inspection procedure

UNIT IV

**Classification of knitting processes** – weft knit and warp knit; yarn quality requirements for knitting; principles of knitting; types of knitting needles – Bearded, Latch &Compound needle; Weft

**knitting machines:** Principles of Flat knitting machine and Circular knitting machine, - Circular bearded needle single-jersey fabric machine, Revolving cylinder latch needle machine, Circular garment length machine

**Warp knitting machines:** needle bar, sinker bar, guide bar –pattern wheel –chain link-Warp knitting fundamentals- Knitting cycle for warp knitting- closed lap and open lap stitches – Raschel, compound needle and Tricot knitting machines- Comparison of raschel and tricot knitting machines
UNIT V

Web preparation for nonwovens – Principle, machines, processes for web preparation by dry laid, wet laid and air laid; web preparation by polymeric solution, Spun bonding and Melt blown process.

Bonding of nonwoven: Bonding methods- principles, machine; processes for mechanical, thermal, chemical bonding; Finishes, Properties and uses of nonwoven fabrics

TOTAL: 45 PERIODS

OUTCOMES:

Upon completion of this course, the student shall be able to

CO1: Describe the objectives and principles of winding, warping machines and the objectives of sizing

CO2: Explain the basic concepts of loom and the working principle of primary, secondary, and auxiliary mechanisms of power loom

CO3: Explain the working principle of dobby, jacquard, and shuttle less looms; Describe the fabric defects, causes and remedies, procedure for fabric inspection

CO4: Describe the classification of knitted fabrics and explain the working principle of warp and weft knitting machines

CO5: Explain the principles involved in web preparation, bonding and finishing of nonwoven fabrics

TEXT BOOKS:


REFERENCES:


## Course Articulation Matrix:

<table>
<thead>
<tr>
<th>Course Outcomes</th>
<th>Statement</th>
<th>PO 1</th>
<th>PO 2</th>
<th>PO 3</th>
<th>PO 4</th>
<th>PO 5</th>
<th>PO 6</th>
<th>PO 7</th>
<th>PO 8</th>
<th>PO 9</th>
<th>PO 10</th>
<th>PO 11</th>
<th>PO 12</th>
<th>PS O 1</th>
<th>PSO 2</th>
<th>PS O 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO1</td>
<td>Describe the objectives and principles of winding, warping machines and the objectives of sizing</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>CO2</td>
<td>Explain the basic concepts of loom and the working principle of primary, secondary, and auxiliary mechanisms of power loom</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>CO3</td>
<td>Explain the working principle of dobby, jacquard, and shuttle less looms; Describe the fabric defects, causes and remedies, procedure for fabric inspection</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>CO4</td>
<td>Describe the classification of knitted fabrics and explain the working principle of warp and weft knitting machines</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>CO5</td>
<td>Explain the principle involved in web preparation, bonding and finishing of nonwoven fabrics</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>Overall CO</td>
<td></td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>-</td>
<td>2</td>
</tr>
</tbody>
</table>

1, 2 and 3 are correlation levels with weightings as Slight (Low), Moderate (Medium) and Substantial (High) respectively.
OBJECTIVES:
- Structures of basic, simple and compound weaves
- Structures of pile and leno structures; graphing for spot and jacquard figuring
- Different weft knit and warp knit structures

UNIT I
Basic Weaves: Plain, Twill, Sateen, Warp Rib, Weft Rib, Mat; Draft and peg-plan of these weaves
Simple Weaves: Wavy Twill, Herring Bone, Diamond, Diaper; Ordinary Honey comb, Brighton Honey comb, Mock-leno, Huck-a-back, Crepe; Colour and weave effect; Draft and peg-plan of basic and simple weaves

UNIT II
Compound Weaves: Basic construction of – Plain face Bedford cord, Plain face welt, Twill face Warp Backed, Weft Backed structures; Plain face Extra Warp, Extra Weft structures produced by heald; Twill face self-stitched Double Cloth, Interchanging plain double cloth;

UNIT III
Pile Weaves and Leno: Basic construction of - Warp pile-Velvet, Terry Pile, Weft Pile- Velveteen and Corduroy; Basic Leno structure
Dobby and Jacquard Design: Spot Figure graphing, Steps involved in graphing for figured fabrics, Basics of computer Aided Graph Designing.
Characteristics, Commercial names and end uses of the fabrics woven with different weaves of the course

UNIT IV
Weft knit structures: Representation and characteristics of weft knit fabric structures -Single jersey, Rib, Purl, Interlock. Derivatives of single and double jersey structures: Accordion type of fabrics, plaited fabrics, 2X2 rib structure, half cardigan, full cardigan, eight lock, Ponte-di-Roma, Ottoman rib, Bourrelet, Texi-pique, Pin-tuck, Milano rib, French pique, Swiss pique.

UNIT V
Warp knit structures: Representation and characteristics of warp knit fabric structures. Point Paper, Chain-Link Notation, single fabrics, Chain stitch, Tricot lap, Full tricot, Lock Knit, Reverse Lock Knit, satin, Loop raided fabrics, Queen's cord, Sharkskin, Blind lap, open work effects, Marquisette, sand-flair net, Hexagonal net.
Characteristics, Commercial names and end uses of the fabrics/garments woven with different weft and warp knit structures

OUTCOMES:
Upon completion of this course, the student shall be able to
- Design and describe the construction of basic weaves and simple weaves
- Design and describe the construction of compound weaves
- Design and describe the construction of pile weaves, jacquard designs, and define the commercial names of woven fabrics
- Design and describe the weft knit structures
- Design and describe the warp knit structures and define the commercial names of knitted fabrics

TEXTBOOKS

REFERENCES
<table>
<thead>
<tr>
<th>Course Outcomes</th>
<th>Statement</th>
<th>PO 1</th>
<th>PO 2</th>
<th>PO 3</th>
<th>PO 4</th>
<th>PO 5</th>
<th>PO 6</th>
<th>PO 7</th>
<th>PO 8</th>
<th>PO 9</th>
<th>PO 10</th>
<th>PO 11</th>
<th>PO 12</th>
<th>PSO 1</th>
<th>PSO 2</th>
<th>PSO 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO1</td>
<td>Design and describe the construction of basic weaves and simple weaves</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>CO2</td>
<td>Design and describe the construction of compound weaves</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>CO3</td>
<td>Design and describe the construction of pile weaves, jacquard designs, and define the commercial names of woven fabrics</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>CO4</td>
<td>Design and describe the weft knit structures</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>CO5</td>
<td>Design and describe the warp knit structures and define the commercial names of woven fabrics</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>Overall CO</td>
<td></td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>Course Outcomes</td>
<td>Statement</td>
<td>Program outcome</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----------------</td>
<td>---------------------------------------------------------------------------------------------</td>
<td>-----------------</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CO1</td>
<td>Describe the objectives and principles of winding, warping machines and the objectives of sizing</td>
<td>PO 1 PO 2 PO 3 PO 4 PO 5 PO 6 PO 7 PO 8 PO 9 PO 10 PO 11 PO 12 PSO 1 PSO 2 PSO 3</td>
<td>3 2 2 1 2 - - - 1 2 2 3 - 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CO2</td>
<td>Explain the basic concepts of loom and the working principle of primary, secondary, and auxiliary mechanisms of power loom</td>
<td>3 2 2 1 2 - - - 1 2 2 3 - 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CO3</td>
<td>Explain the working principle of dobby, jacquard, and shuttle less looms; Describe the fabric defects, causes and remedies, procedure for fabric inspection</td>
<td>3 2 2 1 2 - - - 1 2 2 3 - 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CO4</td>
<td>Describe the classification of knitted fabrics and explain the working principle of warp and weft knitting machines</td>
<td>3 2 2 1 2 - - - 1 2 2 3 - 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CO5</td>
<td>Explain the principle involved in web preparation, bonding and finishing of nonwoven fabrics</td>
<td>3 2 2 1 2 - - - 1 2 2 3 - 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall CO</td>
<td></td>
<td>3 2 2 1 2 - - - 1 2 2 3 - 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
OBJECTIVES:
- To introduce briefly the basic concepts of fashion and design to the students.
- To acquaint the student with the history of fashion, its elements, traditional costumes of various cultures of the world.

UNIT I
Development of Figured Motif: Forms – Natural, Geometrical, Artificial, and Abstract; Bases – Diamond, Ogee, and Diagonal; Arrangement – Plain, Twill, and Sateen; Principles – Half Drop Straight, and Half Drop Reverse.
Garment design – Classification - structural, decorative and functional.

UNIT II
Elements of Design – line, shape, form, size, colour, texture and pattern;
Principles of design – Harmony, Balance, Rhythm, Emphasis and Proportion; introducing elements and principles of design in apparels.
Colour – definition; dimensions of colour-hue, value and intensity; colour harmonies, warm and cool colours; advancing and receding colours; colour theories – Prang colour system and Munsell colour system.

UNIT III
Fashion fundamentals – definition, tangibles and intangibles of fashion; fashion life cycle; factors influencing fashion; fashion adoption theories.
Fashion terminology - street fashion, recurring fashion, mass fashion, fashion trend, fashion shows, style, chic, boutique, Haute Couture; role of a fashion designer.

UNIT IV
History of world costumes – principle garments and textiles of Egyptian, Greek, medieval English, Renaissance French costumes
History of Indian costumes – Ancient garments during the Mauryan and Guptha period
Traditional Indian costumes - Tamil Nadu, Kerala, Gujarat, Rajasthan, Bengal, Manipur, Jammu & Kashmir, Manipur, Orissa, Maharashtra

UNIT V

OUTCOMES:
Upon the completion of this course, the students shall understand the
- Development of textile designs and garment designs
- Adapt elements & principles of design in context to Textiles and Apparels
- Basic concepts of fashion fundamental and terminology
- Identify the traditional world costumes and textiles of India.
- Summarize the traditional Indian textiles, embroideries and printing
TEXT BOOKS:

REFERENCES:
<table>
<thead>
<tr>
<th>Course Outcomes</th>
<th>Statement</th>
<th>Program outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO1</td>
<td>Development of textile designs and garment designs</td>
<td>3 2 2 1 2 - - - 1 2 2 3 - 2</td>
</tr>
<tr>
<td>CO2</td>
<td>Adapt elements &amp; principles of design in context to Textiles and Apparels</td>
<td>3 2 2 1 2 - - - 1 2 2 3 - 2</td>
</tr>
<tr>
<td>CO3</td>
<td>Basic concepts of fashion fundamental and terminology</td>
<td>3 2 2 1 2 - - - 1 2 2 3 - 2</td>
</tr>
<tr>
<td>CO4</td>
<td>Identify the traditional world costumes and textiles of India.</td>
<td>3 2 2 1 2 - - - 1 2 2 3 - 2</td>
</tr>
<tr>
<td>CO5</td>
<td>Summarize the traditional Indian textiles, embroideries and printing</td>
<td>3 2 2 1 2 - - - 1 2 2 3 - 2</td>
</tr>
<tr>
<td>Overall CO</td>
<td></td>
<td>3 2 2 1 2 - - - 1 2 2 3 - 2</td>
</tr>
</tbody>
</table>
OBJECTIVE:
- To train the students in analyzing the cloth to identify construction parameters and structure of woven, knitted and nonwoven fabrics.

Analysis of construction details of the following fabric structure
1. Plain and its derivatives
2. Twill and its derivatives
3. Satin & Sateen (Regular and irregular)
4. Honeycomb (ordinary and brighton)
5. Huck-a-back & Mock-leno
6. Extra warp and extra weft figuring
7. Pile fabrics (warp and weft)
8. Bedford cord & Backed fabrics
9. Gauze and Leno
10. Double cloth
11. Crepe
12. Tapestry
13. Basic Weft knitted structures
14. Basic Warp knitted structure
15. Basic Non Wovens structures

TOTAL: 60 PERIODS

OUTCOMES:
Upon completion of the laboratory course, the student will be able
- Identify the constructional parameters of woven fabric
- Construct design, draft and peg plan for woven fabrics
- Analyze the construction of Weft and warp knitted structures
- Analyze the structure of nonwoven fabrics
- Analysis of the non-woven structures

LAB EQUIPMENTS:
LIST OF EQUIPMENT FOR BATCH OF 30 STUDENTS
1. GSM Cutter – 3 Nos.
3. Crimp Tester – 2 Nos.
4. Electronic balance – 1 No.
<table>
<thead>
<tr>
<th>Course Outcomes</th>
<th>Program Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PO1</td>
</tr>
<tr>
<td>CO1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
</tr>
<tr>
<td>CO2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
</tr>
<tr>
<td>CO3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
</tr>
<tr>
<td>CO4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Overall CO</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>
COURSE OBJECTIVES

- To train the students in fashion illustration

LIST OF EXPERIMENTS

2. Object Drawing and Shading concepts.
3. Drape of fabrics and shading with different mediums.
4. Preparing swatches for dimensions of colour, different colour theories and harmonies.
5. Rendering prints and textures with various fabric constructions (wovens, non-wovens and knit).
6. Drawing different Silhouettes and garment components - sleeves, collars, necklines, cuffs, skirts, pants.
7. Human Anatomy - Figure basics, Constant proportions, Shapes and parts of human body. Study of different postures - Head, Face, Hand, Leg.
8. Normal Drawing - Eight head theory. Fashion Figure Drawing - Drawing croqui figures-stick, geometric, flesh - 8 ½ and 10 head figures.
10. Drawing croqui figures using template, model, imagination and photograph.
11. Create a mood board based on a selected theme.
12. Develop garments on croqui figures (Male and female) deriving inspirations from the developed mood board.

TOTAL: 60 PERIODS

COURSE OUTCOMES

Upon completion of this course, the student would be able

- To develop motifs, draw objects and shade them
- To illustrate fabric drapes and shading with different color mediums.
- To illustrate different fabric swatches and garment components
- To understand human anatomy and illustrate basic figures
- To create a mood board based on a selected theme and develop garment designs

LIST OF EQUIPMENT REQUIRED FOR 30 STUDENTS

Drawing tables - 15 Nos.
<table>
<thead>
<tr>
<th>Course Outcomes</th>
<th>Statement</th>
<th>Program Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO1</td>
<td>To develop motifs, draw objects and shade them</td>
<td>PO1  PO2  PO3  PO4  PO5  PO6  PO7  PO8  PO9  PO10  PO11  PO12  PSO1  PSO2  PSO3</td>
</tr>
<tr>
<td>CO2</td>
<td>To illustrate fabric drapes and shading with different color mediums.</td>
<td>1   1   1   1   3   1   2   1   1   3   1   2   3   3   3</td>
</tr>
<tr>
<td>CO3</td>
<td>To illustrate different fabric swatches and garment components</td>
<td>1   1   1   1   3   1   2   1   1   3   1   2   3   3   3</td>
</tr>
<tr>
<td>CO4</td>
<td>To understand human anatomy and illustrate basic figures</td>
<td>1   1   1   3   3   1   2   1   3   3   1   2   3   3   3</td>
</tr>
<tr>
<td>CO5</td>
<td>To create a mood board based on a selected theme and develop garment designs</td>
<td>1   1   1   3   3   1   2   1   3   3   1   2   3   3   3</td>
</tr>
<tr>
<td>Overall CO</td>
<td></td>
<td>1   1   1   2   3   -   2   -   -   3   1   2   3   3   3   3</td>
</tr>
</tbody>
</table>
OBJECTIVES:

To be proficient in important Microsoft Office tools: MS WORD, EXCEL, POWERPOINT.
- To be proficient in using MS WORD to create quality technical documents, by using standard templates, widely acceptable styles and formats, variety of features to enhance the presentability and overall utility value of content.
- To be proficient in using MS EXCEL for all data manipulation tasks including the common statistical, logical, mathematical etc., operations, conversion, analytics, search and explore, visualize, interlink, and utilizing many more critical features offered.
- To be able to create and share quality presentations by using the features of MS PowerPoint, including: organization of content, presentability, aesthetics, using media elements and enhance the overall quality of presentations.

MS WORD: 10 Hours
Create and format a document
Working with tables
Working with Bullets and Lists
Working with styles, shapes, smart art, charts
Inserting objects, charts and importing objects from other office tools
Creating and Using document templates
Inserting equations, symbols and special characters
Working with Table of contents and References, citations
Insert and review comments
Create bookmarks, hyperlinks, endnotes footnote
Viewing document in different modes
Working with document protection and security
Inspect document for accessibility

MS EXCEL: 10 Hours
Create worksheets, insert and format data
Work with different types of data: text, currency, date, numeric etc.
Split, validate, consolidate, Convert data
Sort and filter data
Perform calculations and use functions: (Statistical, Logical, Mathematical, date, Time etc.)
Work with Lookup and reference formulae
Create and Work with different types of charts
Use pivot tables to summarize and analyse data
Perform data analysis using own formulae and functions
Combine data from multiple worksheets using own formulae and built-in functions to generate results
Export data and sheets to other file formats
Working with macros
Protecting data and Securing the workbook

MS POWERPOINT: 10 Hours
Select slide templates, layout and themes
Formatting slide content and using bullets and numbering
Insert and format images, smart art, tables, charts
Using Slide master, notes and handout master
Working with animation and transitions
Organize and Group slides

86
Import or create and use media objects: audio, video, animation
Perform slideshow recording and Record narration and create presentable videos

TOTAL: 30 PERIODS

OUTCOMES:
On successful completion the students will be able to
- Use MS Word to create quality documents, by structuring and organizing content for their day to day technical and academic requirements
- Use MS EXCEL to perform data operations and analytics, record, retrieve data as per requirements and visualize data for ease of understanding
- Use MS PowerPoint to create high quality academic presentations by including common tables, charts, graphs, interlinking other elements, and using media objects.

FT3401 APPAREL PRODUCTION MACHINERY

COURSE OBJECTIVES
- To impart knowledge on the machineries and equipments used for garment production latest developments in the garment production machineries.

UNIT I SPREADING MACHINES

UNIT II CUTTING MACHINES

UNIT III SEWING MACHINES

UNIT IV MULTI THREAD SEWING MACHINES

UNIT V SPECIALISED SEWING MACHINES
Special sewing machines – Button hole and button sewing machines. Parts and their Functions. Threading diagram. Rib cutting machine-Zig zag and feed off the arm machine Parts and their functions. Threading diagram; automation in sewing machine; Functions and merits of
computerized sewing machines; usage of special attachments and tools for operation simplifications. Maintenance & safety measures of machines

TOTAL: 45 PERIODS

COURSE OUTCOMES
Upon completion of this course, the student would be able to
- Understand different types of fabric laying methods, spreading machines and its control methods
- Understand different types of cutting machines and its control methods
- Introduction to sewing machine and its basic parts, functions and its safety measures
- Introduction to different types of multi thread sewing machines and its purpose
- Understand special sewing machines, its purpose and control measures

TEXT BOOKS:

REFERENCES:
2. Laing R.M. and Webster J, "Stitches and Seams," The Textile Institute, Manchester, 1999
<table>
<thead>
<tr>
<th>Course Outcome</th>
<th>Statement</th>
<th>PO1</th>
<th>PO2</th>
<th>PO3</th>
<th>PO4</th>
<th>PO5</th>
<th>PO6</th>
<th>PO7</th>
<th>PO8</th>
<th>PO9</th>
<th>PO10</th>
<th>PO11</th>
<th>PO12</th>
<th>PSO1</th>
<th>PSO2</th>
<th>PSO3</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO1</td>
<td>Understand different types of fabric laying methods, spreading machines and its control methods</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>CO2</td>
<td>Understand different types of cutting machines and its control methods</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>CO3</td>
<td>Introduction to sewing machine and its basic parts, functions and its safety measures</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>CO4</td>
<td>Introduction to different types of multi thread sewing machines and its purpose</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>CO5</td>
<td>Understand special sewing machines, its purpose and control measures</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Overall CO</td>
<td></td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>
OBJECTIVE:
- To impart knowledge on quality evaluation of fabrics and garments

UNIT I CONSTRUCTION CHARACTERISTICS & SAMPLING TECHNIQUES 9
Basic fabric particulars – Measurement of ends and picks per inch, count of warp and weft, determination of the type of weave, measurement of length, width, thickness and Area density (GSM); warp and weft crimp measurements for spun and filament yarn fabrics, the cover factor calculations;

UNIT II MECHANICAL PROPERTIES 9

UNIT III COMFORT PROPERTIES 9
Fabric stiffness – principle of measurement of flexural rigidity; Drapeability – measurement of drape coefficient; Crease recovery measurement techniques. Wrinkle recovery assessment using standard grades; Principle and functioning of air permeability testers, water repellency, contact angle and fabric shrinkage testing.

ACCESSORY TESTING

UNIT IV LOW STRESS CHARACTERISTICS 9
Fabric bending hysteresis testing; Shear hysteresis measurements; Fabric compression and decompression behaviour; Fabric surface roughness and friction measurements; Fabric tensile hysteresis measurements; Fabric flame resistance testing methods; Moisture and thermal characteristics.

UNIT V FABRIC AND GARMENT INSPECTION 9
Fabric inspection – 4-point system, 10 point system, classification of fabric defects, independent product quality certification, acceptable quality level, Inspection of garments and garment defects - sewing, pressing, finishing and packaging defects.

TOTAL: 45 PERIODS

OUTCOMES:
Upon completion of the course, the student will gain knowledge on
- Identification of construction characteristics and sampling methods
- Evaluation of mechanical characteristics
- Evaluation of apparel comfort and accessories characteristics
- Evaluation of low stress and thermal characteristics
- Evaluation of fabric and garment inspection
TEXT BOOKS:

REFERENCES:

TOTAL: 30 PERIODS

LIST OF EXPERIMENTS:
1. Determination of Yarn Count and Lea Strength
2. Determination of Single / Ply Yarn Twist
3. Determination of Yarn Appearance Grade
4. Determination of Fabric Abrasion Resistance and pilling
5. Determination of Fabric Tensile Strength
6. Determination of Color Fastness to Rubbing - Crock meter
7. Determination of Fabric Stiffness and Crease Recovery Angle
10. Determination of colorfastness to perspiration.
11. Determination of shrinkage of woven and knitted fabrics.
12. Determination of Seam Strength, Seam Slippage, zipper strength, button pull strength
13. Determination of Peel bond strength of fusible interlinings
14. Determination of Wickability and wettability of fabric
15. Determination of Spirality and Course length of Knitted fabrics

LIST OF EQUIPMENT FOR BATCH OF 30 STUDENTS
- Baer Sorter - 1 No.
- Fibre Fineness tester - 1 No.
- Projection Microscope - 1 No.
- Wrap Reel - 1 No.
- Wrap Block - 1 No.
- Yarn Twist Tester - 1 No.
- Weighing balance - 1 No.
- Yarn appearance Board Winder - 1 No.
- Yarn appearance Board (Standards) - 1 No.
- Fabric tensile strength tester -1 No.
- Fabric tearing strength tester -1 No.
- Fabric Thickness Tester -1 No.
- Fabric Stiffness Tester -1 No.
- Fabric Crease Recovery Tester -1 No.
- Fabric Bursting Strength Tester -1 No.
- Fabric Abrasion Resistance Tester -1 No.
- Fabric Pilling resistance tester -1 No.
- Fabric air permeability tester -1 No.
- Fabric Drape meter -1 No.
- Universal Testing machine - 1 No.
- Spirality Equipment – 1 No
- Seam strength, Slippage, Peel bond, zipper strength, button pull strength Jaws – 1 No
## Course Articulation Matrix:

<table>
<thead>
<tr>
<th>Course Outcomes</th>
<th>Statement</th>
<th>Program Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>PO 1</td>
</tr>
<tr>
<td>CO1</td>
<td>Identification of fabric construction characteristics and understand various sampling methods</td>
<td>3</td>
</tr>
<tr>
<td>CO2</td>
<td>Evaluation of mechanical characteristics</td>
<td>3</td>
</tr>
<tr>
<td>CO3</td>
<td>Evaluation of apparel comfort and accessories characteristics</td>
<td>3</td>
</tr>
<tr>
<td>CO4</td>
<td>Evaluation of low stress and thermal characteristics</td>
<td>3</td>
</tr>
<tr>
<td>CO5</td>
<td>Evaluation of fabric and garment inspection</td>
<td>3</td>
</tr>
<tr>
<td>Overall CO</td>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>

1, 2 and 3 are correlation levels with weightings as Slight (Low), Moderate (Medium) and substantial (High) respectively.
OBJECTIVES:
To introduce briefly the fundamentals of garment manufacture to the students.

UNIT I APPAREL INDUSTRY PROCESS FLOW 9
Introduction to Indian apparel industry. Structure of an apparel industry-work flow, Pre production planning; types of samples and sample approval; Technical pack, Specification sheet – preparation, analysing and approvals. Preparation of proto pattern and developing production pattern.

UNIT II RAW MATERIAL SELECTION 9
Types and applications of garment accessories and trims – Labels, linings, inter-linnings, waddings, lace, braid, elastic, hook and loop fastners, shoulder pads, eyelets, zip fastners, buttons, rivets. Characteristics of sewing threads, types, construction and seam performance. Stitch types and uses; seam types and uses; Stitches and seam defects.

UNIT III PATTERN LAYOUT PLANNING 9

UNIT IV PRODUCTION SYSTEMS 9
Production systems- individual system; Factory production system- Progressive Bundle System, Unit Production System, Modular Production System. Quality control in swing section, assembly of garment components and operational break down.

UNIT V APPAREL FINISHING PROCESS 9
Fusing requirements and process; stain removal process and machine, ironing and pressing process and machines. Packaging – types, functions and suitable machines- types of packaging forms.

OUTCOMES:
Upon completion of this course, the students shall have knowledge on:
- Understanding the structure of apparel industry and production planning
- Define and Classify the types accessories, trims, stitches, seams
- Acquire knowledge on Inspection, spreading and cutting process
- Discuss the production systems
- Understanding apparel finishing process and packaging

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:
<table>
<thead>
<tr>
<th>Course Outcomes</th>
<th>Program Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PO 1</td>
</tr>
<tr>
<td>CO1 Understanding the structure of apparel industry and production planning</td>
<td>3</td>
</tr>
<tr>
<td>CO2 Define and Classify the types accessories, trims, stitches, seams</td>
<td>3</td>
</tr>
<tr>
<td>CO3 Acquire knowledge on Inspection, spreading and cutting process</td>
<td>3</td>
</tr>
<tr>
<td>CO4 Discuss the production systems</td>
<td>3</td>
</tr>
<tr>
<td>CO5 Understanding apparel finishing process and packaging</td>
<td>3</td>
</tr>
<tr>
<td>Overall CO</td>
<td>3</td>
</tr>
</tbody>
</table>
COURSE OBJECTIVES

- To enhance the fundamental knowledge in human anthropometrics from the scientific and technological viewpoint
- To equip students with comprehensive pattern making skills

UNIT I STUDEY OF BODY MEASUREMENTS AND SIZING SYSTEMS 6

UNIT II BASICS OF PATTERN MAKING 15
Introduction to pattern making and methods. Functions of pattern making tools, Preparing and Measuring the Form, Pattern making terminologies, Development of pattern - Drafting and draping methods - Basic men’s block - bodice, sleeves trousers, and women’s block - bodice, sleeves, trousers, skirt.

UNIT III PATTERN ALTERATIONS AND GRADING 6
Pattern alteration for fit, Factors affecting the pattern making process. Grading process, grade rules, and types of grading system.

UNIT IV TECHNIQUES OF PATTERN MAKING 9

UNIT V PATTERNS FOR COLLARS AND SLEEVES 9
Collar classification and terms, basic shirt collar, Peter Pan collar, sailor collar, mandarin collar, built-up neck lines, Cowls, Sleeve cap, sleeve cuffs, puff, petal, lantern and leg-of-mutton sleeves.

COURSE OUTCOMES

Upon completion of this course, the student would be able to
CO1: Understand Anthropometry related concepts and important body measurements
CO2: Prepare patterns for basic blocks using drafting and draping techniques
CO3: Develop knowledge on the techniques involved in grading and in pattern alteration
CO4: Apply dart manipulation techniques to design, variation in garment components
CO5: Prepare patterns for basic collar and sleeve components

TEXT BOOKS:
REFERENCES:
<table>
<thead>
<tr>
<th>Course Outcomes</th>
<th>Program Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PO 1</td>
</tr>
<tr>
<td>CO1</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>CO2</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>CO3</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>CO4</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>CO5</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall CO</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
TEXTILE CHEMICAL PROCESSING

OBJECTIVES:
To enable the students to learn about pre-treatments involved in the wet processing of textiles, dyeing and printing of textiles

UNIT I PREPARATORY PROCESSES

UNIT II DYEING

UNIT III PRINTING:

UNIT IV FINISHING

UNIT V COMPUTER COLOR MATCHING CONCEPTS
Color; Electromagnetic spectrum - visible range, measurement of color strength - color matching - theory and applications. Spectrophotometer and color matching systems. Quality control using color matching systems, color difference - pass / fail system and shade sorting

TOTAL: 45 PERIODS

COURSE OUTCOMES
CO1 Understand the preparatory process in chemical processing
CO2 Explain the classes, machines, stages, and application of dyes
CO3 Discuss about the ingredients, types and machines and faults of printing
CO4 Understand the various methods and application of finishing
CO5 Understand the measurement of strength of colour and colour difference

TEXT BOOKS: