### I SEMESTER

<table>
<thead>
<tr>
<th>Subject Code</th>
<th>Category</th>
<th>Subject Name</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>LE0101</td>
<td>G</td>
<td>English</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>MA0101</td>
<td>B</td>
<td>Mathematics – I</td>
<td>3</td>
<td>2</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>PH0101</td>
<td>B</td>
<td>Physics</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CY0101</td>
<td>B</td>
<td>Chemistry</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>GE0101</td>
<td>E</td>
<td>Basic Engineering – I</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Practical</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>PD0101</td>
<td>G</td>
<td>Personality Development -I</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>GE0107</td>
<td>G</td>
<td>NSS,NCC,NSO</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>GE0105</td>
<td>B</td>
<td>Computer Literacy</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>PH0103</td>
<td>B</td>
<td>Physics Laboratory</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>CY0103</td>
<td>B</td>
<td>Chemistry Lab</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>ME0120 /</td>
<td>E</td>
<td>Workshop Practice /</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ME0130</td>
<td></td>
<td>Engineering Graphics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>14</td>
<td>2</td>
<td>16</td>
<td>22</td>
</tr>
</tbody>
</table>

### II SEMESTER

<table>
<thead>
<tr>
<th>Subject Code</th>
<th>Category</th>
<th>Subject Name</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>GE0108</td>
<td>G</td>
<td>Value Education</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>GE0102</td>
<td>B</td>
<td>Biology for Engineers</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>GE0104</td>
<td>B</td>
<td>Principles of Environmental Science</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>MA0102</td>
<td>B</td>
<td>Mathematics II</td>
<td>3</td>
<td>2</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>PH0102</td>
<td>B</td>
<td>Material Science</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>GE0106</td>
<td>E</td>
<td>Basic Engineering- II</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>CS0102</td>
<td>P</td>
<td>Digital Computer Fundamentals</td>
<td>3</td>
<td>0</td>
<td>2</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Practical</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>PD0102</td>
<td>G</td>
<td>Personality Development - II</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>CS0112</td>
<td>B</td>
<td>Programming in C</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>ME0130 /</td>
<td>E</td>
<td>Engineering Graphics/ Workshop Practice</td>
<td>1/0</td>
<td>0</td>
<td>0/4</td>
<td>3/2</td>
</tr>
<tr>
<td>ME0120</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>20</td>
<td>2</td>
<td>8</td>
<td>26</td>
</tr>
</tbody>
</table>
### III SEMESTER

<table>
<thead>
<tr>
<th>Subject Code</th>
<th>Category</th>
<th>Subject Name</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>LE0201/</td>
<td>G</td>
<td>German Language Phase – I / Japanese Language Phase – I / French Language Phase – I</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>LE0203 /</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LE0205</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MA 0211</td>
<td>B</td>
<td>Mathematics –III</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>CS0201</td>
<td>P</td>
<td>Data Structures using C++</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0203</td>
<td>P</td>
<td>Design &amp; Analysis of Algorithms</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0205</td>
<td>P</td>
<td>Microprocessor &amp; Interfacing</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0207</td>
<td>P</td>
<td>Computer Organization &amp; Architecture</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td><strong>Practical</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PD0201</td>
<td>G</td>
<td>Personality Development - III</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>CS0211</td>
<td>P</td>
<td>Microprocessor Lab</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>CS0213</td>
<td>P</td>
<td>Data Structures &amp; Algorithms Lab (C &amp; C++)</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td>17</td>
<td>1</td>
<td>8</td>
<td>23</td>
</tr>
</tbody>
</table>

### IV SEMESTER

<table>
<thead>
<tr>
<th>Subject Code</th>
<th>Category</th>
<th>Subject Name</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>LE0202 /</td>
<td>G</td>
<td>German Language Phase – II / Japanese Language Phase – II / French Language Phase – II</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>LE0204 /</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LE0206</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MA0212</td>
<td>E</td>
<td>Probability &amp; Queuing Theory</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0202</td>
<td>P</td>
<td>Principles of Programming Languages</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0204</td>
<td>P</td>
<td>Theory of Computation</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0206</td>
<td>P</td>
<td>Operating Systems</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0210</td>
<td>P</td>
<td>Comprehension - I</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td><strong>Practical</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PD0202</td>
<td>G</td>
<td>Personality Development - IV</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>CS0212</td>
<td>P</td>
<td>Operating Systems Lab</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>CS0214</td>
<td>P</td>
<td>JAVA Programming</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>CS0216</td>
<td>P</td>
<td>Computer Skills</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td>17</td>
<td>2</td>
<td>9</td>
<td>23</td>
</tr>
</tbody>
</table>

### V SEMESTER

<table>
<thead>
<tr>
<th>Subject Code</th>
<th>Category</th>
<th>Subject Name</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS0305</td>
<td>E</td>
<td>Operations Research Techniques</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>EC0211</td>
<td>E</td>
<td>Principles of Communication</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0301</td>
<td>P</td>
<td>Compiler Design</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0303</td>
<td>P</td>
<td>Computer Networks</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>P</td>
<td>Elective – I</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td><strong>Practical</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PD0301</td>
<td>G</td>
<td>Personality Development - V</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>CS0311</td>
<td>P</td>
<td>Compiler Design Lab</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>CS0313</td>
<td>P</td>
<td>Networking Lab</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>CS0315</td>
<td>P</td>
<td>Industrial Training - I</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td>16</td>
<td>0</td>
<td>10</td>
<td>22</td>
</tr>
</tbody>
</table>
### VI SEMESTER

<table>
<thead>
<tr>
<th>Subject Code</th>
<th>Category</th>
<th>Subject Name</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS0302</td>
<td>P</td>
<td>Artificial Intelligence &amp; Expert Systems</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0304</td>
<td>P</td>
<td>Data Base Management Systems</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0306</td>
<td>P</td>
<td>Object Oriented Analysis &amp; Design</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0308</td>
<td>P</td>
<td>Logic for Computer Science</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>P</td>
<td>Elective – II</td>
<td>3/1</td>
<td>0</td>
<td>0/3</td>
<td>3</td>
</tr>
<tr>
<td>CS0310</td>
<td>P</td>
<td>Comprehension - II</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Practical</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>PD0302</td>
<td>G</td>
<td>Personality Development - VI</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>CS0312</td>
<td>P</td>
<td>Artificial Intelligence &amp; Expert Systems Lab</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>CS0314</td>
<td>P</td>
<td>Data Base Management Systems Lab</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
</tbody>
</table>

| Total        |          |                                     | 16/14| 2  | 8/11| 22 |

### VII SEMESTER

<table>
<thead>
<tr>
<th>Subject Code</th>
<th>Category</th>
<th>Subject Name</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>MB0403</td>
<td>G</td>
<td>Industrial Management &amp; Economics</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0401</td>
<td>P</td>
<td>Software Engineering</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0403</td>
<td>P</td>
<td>Parallel &amp; Distributed Computing</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0405</td>
<td>P</td>
<td>VLSI Design &amp; Embedded Systems</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>P</td>
<td>Elective – III</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>P</td>
<td>Elective – IV</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Practical</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>CS0411</td>
<td>P</td>
<td>Software Engineering Lab</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>CS0413</td>
<td>P</td>
<td>VLSI &amp; Embedded System Design Lab</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>CS0316</td>
<td>P</td>
<td>Industrial Training - II</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

| Total        |          |                                     | 18 | 0  | 7  | 22 |

### VIII SEMESTER

<table>
<thead>
<tr>
<th>Subject Code</th>
<th>Category</th>
<th>Subject Name</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS0402</td>
<td>P</td>
<td>Scripting Languages &amp; Web Technology</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>P</td>
<td>Elective – V</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>P</td>
<td>Elective – VI</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Practical</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>CS0414</td>
<td>P</td>
<td>Project</td>
<td>0</td>
<td>0</td>
<td>16</td>
<td>8</td>
</tr>
</tbody>
</table>

| Total        |          |                                     | 9  | 0  | 16 | 17 |

**TOTAL CREDITS TO BE EARNED : 177**

### Summary Table

<table>
<thead>
<tr>
<th>Semester</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
<th>VI</th>
<th>VII</th>
<th>VIII</th>
<th>Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>22/23</td>
<td>26/25</td>
<td>23</td>
<td>23</td>
<td>22</td>
<td>22</td>
<td>22</td>
<td>17</td>
<td>177</td>
<td>100</td>
</tr>
<tr>
<td>G</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>0</td>
<td>17</td>
<td>17</td>
<td>9.6</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>13</td>
<td>14</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>31</td>
<td>17.5</td>
</tr>
<tr>
<td>E</td>
<td>6/7</td>
<td>7/6</td>
<td>0</td>
<td>3</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>22</td>
<td>12.4</td>
</tr>
<tr>
<td>P</td>
<td>0</td>
<td>4</td>
<td>16</td>
<td>17</td>
<td>14</td>
<td>20</td>
<td>19</td>
<td>17</td>
<td>107</td>
<td>60.5</td>
</tr>
</tbody>
</table>
### Electives for Fifth Semester

<table>
<thead>
<tr>
<th>Subject Code</th>
<th>Subject Name</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS0321</td>
<td>System Modeling and Simulation</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0323</td>
<td>Digital Image Processing</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0325</td>
<td>Visual Programming</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0327</td>
<td>Soft Computing</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0329</td>
<td>Advanced Operating System</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0331</td>
<td>E-Commerce</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0333</td>
<td>TCP/IP Principles &amp; Architecture</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

### Electives for Sixth Semester

<table>
<thead>
<tr>
<th>Subject Code</th>
<th>Subject Name</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS0322</td>
<td>Advanced Networks</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0324</td>
<td>Virtual Reality</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0326</td>
<td>Advanced Databases</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0328</td>
<td>Neural Networks</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0330</td>
<td>Quantum Information Processing</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

### Electives for Seventh Semester

<table>
<thead>
<tr>
<th>Subject Code</th>
<th>Subject Name</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS0421</td>
<td>Genetic Algorithms</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0423</td>
<td>Speech Technology</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0425</td>
<td>Mobile Computing</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0427</td>
<td>Network Security</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0429</td>
<td>Fault Tolerant Computing</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0431</td>
<td>WINDOWS Internals</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0433</td>
<td>LINUX Internals</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0435</td>
<td>Computer Vision</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0437</td>
<td>Advanced Java Programming</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0439</td>
<td>Component Based Technology</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0441</td>
<td>Information Storage and Management</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

### Electives for Eighth Semester

<table>
<thead>
<tr>
<th>Subject Code</th>
<th>Subject Name</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS0422</td>
<td>ATM Networks</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0424</td>
<td>Data Mining</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0426</td>
<td>Grid Computing</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0428</td>
<td>Agent Based Systems</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0430</td>
<td>Human Computer Interaction</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0432</td>
<td>Real Time System Design</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0434</td>
<td>Pattern Recognition</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0436</td>
<td>Robotics</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0438</td>
<td>Decision Support System</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0440</td>
<td>Bioinformatics</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0442</td>
<td>Bluetooth Technology</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0444</td>
<td>Software Reliability</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0446</td>
<td>Firewall Architecture</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0448</td>
<td>Optimization Techniques</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>
SEMMESTER – I

<table>
<thead>
<tr>
<th>LE 0101</th>
<th>ENGLISH</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Prerequisite</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nil</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

PURPOSE
To provide an adequate mastery of communicative English Language training primarily - reading and writing skills, secondarily listening and speaking skills.

INSTRUCTIONAL OBJECTIVES
To provide language training to the engineering students which will enable them to understand and acquire knowledge in technical subjects.

UNIT 1 LISTENING
Listening Practice – Hints on Listening – Listening Practice

Note Taking: Note Taking Strategies

UNIT 2 SPEAKING

Phonetics: Pronunciation-Phonetic Transcription-Stress-Intonation

UNIT 3 READING
Comprehension: Skimming-scanning-close reading-Comprehension – Transferring Information – Exercise – An unseen passage should be given and questions may be asked in the form of True or False statements, MCQ, short answers.
Transcoding : Interpreting tables, flow charts, piechart, bar diagram, tree diagram, graphs.

UNIT 4 WRITING
Art of Writing : Writing Language – Rules for effective writing – Technical Essay Writing – Exercise

Report Writing : Technical Writing – Lab Report – Exercise


Dialogue Writing

UNIT 5 FOCUS ON AND COMMUNICATION AND “COMPUNICATION”

INTERNAL ASSESSMENT
Based on the submission of Assignments and test performance of the students marks will be awarded.

| PRACTICAL | 30 |
| TOTAL     | 45 |

TEXT BOOKS
REFERENCE BOOKS

<table>
<thead>
<tr>
<th>MA 0101</th>
<th>MATHEMATICS - I</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>L</td>
</tr>
<tr>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>

PREREQUISITE
Nil

PURPOSE
To impart analytical ability in solving mathematical problems as applied to the respective branches of Engineering.

INSTRUCTIONAL OBJECTIVES
At the end of the course, student should be able, To apply advanced matrix knowledge to Engineering problems. To improve their ability in solving geometrical applications of differential calculus problems to equip themselves familiar with the functions of several variables. To familiarize with the applications of differential equations. To expose to the concept of three dimensional analytical geometry.

UNIT 1 MATRICES

UNIT 2 GEOMETRICAL APPLICATIONS OF DIFFERENTIAL CALCULUS

UNIT 3 FUNCTIONS OF SEVERAL VARIABLES

UNIT 4 ORDINARY DIFFERENTIAL EQUATIONS
Simultaneous first order linear equations with constant coefficients – Linear equations of second order with constant and variable coefficients – Homogeneous equation of Euler type – Equations reducible to homogeneous form.

UNIT 5 THREE DIMENSIONAL ANALYTICAL GEOMETRY

TUTORIAL 30
TOTAL 75

TEXT BOOK

REFERENCE BOOKS

<table>
<thead>
<tr>
<th>PH 0101</th>
<th>PHYSICS</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Prerequisite</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

PURPOSE
The purpose of this course is to develop scientific temper and analytical capability through learning physical concepts and their applications in engineering and technology. Comprehension of some basic physical concepts will enable the students to logically solve engineering problems.

INSTRUCTIONAL OBJECTIVES
At the end of the course, the student will be able to:
1. Understand the general scientific concepts required for technology,
2. Apply the concepts in solving engineering problems,
3. Explain scientifically the new developments in engineering and technology, and
4. Get familiarized with the concepts, theories, and models behind many technological applications.

UNIT 1 PROPERTIES OF MATTER AND SOUND

UNIT 2 ELECTROMAGNETISM AND MICROWAVES

UNIT 3 OPTICS

UNIT 4 CRYSTAL PHYSICS AND CRYOGENICS

UNIT 5 ENERGY PHYSICS
Introduction to non-conventional energy sources – Solar cells – Thermoelectric power generators – Thermionic power generator – Magnetohydrodynamic power generator – Fuel cells (H₂O₂) – Solid state batteries (Lithium) – Low voltage and high voltage nuclear cells – Thermocouple based nuclear cell – Ultra capacitors.

TOTAL  45

TEXT BOOKS
REFERENCE BOOKS

<table>
<thead>
<tr>
<th>CY 0101 CHEMISTRY</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prerequisite</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nil</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

PURPOSE
To impart a sound knowledge on the principles of chemistry involving the different application oriented topics required for all engineering branches.

INSTRUCTIONAL OBJECTIVES
The students should be conversant with
1. The role of applied chemistry the field of engineering.
2. The knowledge of water quality parameters and the treatment of water.
3. The principles involves in corrosion and its inhibitions.
4. Important analytical techniques, instrumentation and the applications.
5. Knowledge with respect to the phase equilibria of different systems.

UNIT 1 TECHNOLOGY OF WATER

UNIT 2 CORROSION AND ITS CONTROL

UNIT 3 PHASEEQUILIBRIA
Phase rule: Statement – explanation of the terms involved - one component system (water system only). Condensed phase rule - thermal analysis – two component systems: simple eutectic, Pb-Ag; Br, Cd - solid solution Cu-Ni and compound formation Mg-Zn - applications of eutectics.

UNIT 4 POLYMERS AND REINFORCED PLASTICS
UNIT 5 INSTRUMENTAL METHODS OF ANALYSIS

Basic principles, instrumentation of potentiometry, flame photometry – applications. Elementary theory –
principle – instrumentation of UV – visible spectroscopy and atomic absorption spectroscopy and infrared
spectroscopy.

TEXT BOOKS
Delhi – 2002.
1986.

REFERENCE BOOKS

<table>
<thead>
<tr>
<th>GE 0101</th>
<th>BASIC ENGINEERING - I</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Prerequisite</td>
<td></td>
<td></td>
<td></td>
<td>4</td>
</tr>
</tbody>
</table>

PART A CIVIL ENGINEERING

PURPOSE
To get exposed to the glimpses of Civil Engineering topics that is essential for an Engineer.

INSTRUCTIONAL OBJECTIVES
1. To know about different materials and their properties.
2. Engineering aspects related to buildings.
3. To know about importance of Surveying.
4. To know about the transportation systems.
5. To get exposed to the rudiments of engineering related to Dams, Water Supply, Transportation system
and Sewage Disposal.

UNIT 1 BUILDING MATERIALS AND THEIR PROPERTIES
Introduction - Civil Engineering – Building Materials – Brick, Stone, Cement, Steel, Concrete, timber –
Properties – Uses. Units – Stress, strain and three modulii of elasticity – factor of safety - Centre of Gravity and
Moment of Inertia for rectangle and circular section – simple problems.

UNIT 2 BUILDINGS AND THEIR COMPONENTS
Buildings – Classification - Components of buildings and their functions Foundations - functions –
classification of foundations – Bearing capacity Floorings – functions - Types - Cement Concrete flooring –
Mosaic flooring - Marble flooring Roofs - Types – Requirements – Madras Terrace roof. Tall structure – types
of structural systems.

UNIT 3 UTILITY AND SERVICES
Surveying - Objective – Principles – Classification – Instruments used for Surveying. Dams - Purpose –
Selection of site – Classification – Gravity dam (cross-section details only) Transportation system -
Classification – Roadway - components – classification of roads - Railway – Cross-section of permanent way-
components parts and functions. Docks and Harbour – classification – Terminology Bridges -components of a
bridge - types of bridges Water supply - Sources - Standards of drinking water (BIS) – elementary

TOTAL 30
TEXT BOOKS

REFERENCE BOOKS

PART B MECHANICAL ENGINEERING

PURPOSE
To familiarize the students with the basics of Mechanical Engineering.

INSTRUCTIONAL OBJECTIVES
To familiarize with
1. The basic machine elements
2. The Sources of Energy and Power Generation
3. The various manufacturing processes

UNIT 1 MACHINE ELEMENTS   10

UNIT 2 ENERGY  10
Sources: Renewable and non-renewable (various types, characteristics, advantages/disadvantages). Power Generation: External and internal combustion engines - Hydro and nuclear power plants (layouts, element/component description, advantages, disadvantages, applications). Simple Problems.

UNIT 3 MANUFACTURING PROCESSES  10

TOTAL 30

TEXT BOOKS

REFERENCE BOOKS
4. Nagpal G. R., “Power Plant Engineering”, Khanna Publisher, Delhi,2004
PURPOSE
The purpose of this course is to build confidence and inculcate various soft skills and to help Students to identify and achieve their personal potential

INSTRUCTIONAL OBJECTIVES
1. To guide thought process.
2. To groom students’ attitude.
3. To develop communication skill.
4. To build confidence.

METHODOLOGY
The entire program is designed in such a way that every student will participate in the class room activities. The activities are planned to bring out the skills and talents of the students which they will be employing during various occasions in their real life.

1. Group activities + individual activities.
2. Collaborative learning.
3. Interactive sessions.
4. Ensure Participation
5. Empirical Learning

UNIT – 1                              6
Self-analysis SWOT - Time management - Creative chain story telling

UNIT – 2                              6
Vocabulary games I – Attitude - Interpersonal skills

UNIT – 3                              6
Motivation I - Vocabulary games II - Article review

UNIT – 4                              6
Team building exercise - Critical Thinking - Event Management

UNIT – 5                              6
Business situation - Leadership Qualities - Review

TOTAL     30

SCHEME OF INSTRUCTION
Marks allocated for regular participation in all oral activities in class

SCHEME OF EXAMINATION
Complete Internal evaluation on a regular Basis
I. YOGA SYLLABUS

<table>
<thead>
<tr>
<th>PRACTICE</th>
<th>LECTURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Meditation – Agnai, Asanas, Kiriyas, Bandas, Muthras</td>
<td>Benefits of Agnai Meditation</td>
</tr>
<tr>
<td>II. Meditation Santhi Physical Exercises (I &amp; II)</td>
<td>Benefits of santhi Meditation</td>
</tr>
<tr>
<td>III. Kayakalpa Yoga Asanas, Kiriyas, Bandas, Muthras</td>
<td>Lecture &amp; Practice</td>
</tr>
<tr>
<td>IV. Meditation Santhi Physical Exercises III &amp; IV</td>
<td>Analysis of Thought</td>
</tr>
<tr>
<td>V. Meditation Thuriyam Kayakalpa Asanas, Kiriyas, Bandas, Muthras</td>
<td>Benefits of Thuriyam</td>
</tr>
<tr>
<td>VI. Meditation Thuriyam Kayakalpa Asanas, Kiriyas, Bandas, Muthras</td>
<td>Attitude</td>
</tr>
<tr>
<td>VII. Meditation Thuriyam Kayakalpa Asanas, Kiriyas, Bandas, Muthras</td>
<td>Importance of Arukkapp &amp; Blessings</td>
</tr>
<tr>
<td>VIII. Meditation Santhi Kayakalpa Asanas, Kiriyas, Bandas, Muthras</td>
<td>Benefits of Blessings</td>
</tr>
</tbody>
</table>

Hours = 30

TEXT BOOKS:
1. Vedatri Maharshi, “Yoga for Modern Age”
2. Vedatri Maharshi, “Simplified Physical Exercises”

II. NATIONAL SPORTS ORGANISATION (NSO)

Each student must select two of the following games and practice for two hours per week. An attendance of 80% is compulsory to earn the credits specified in the curriculum.

List of games:
1. Basket Ball
2. Football
3. Volley Ball
4. Ball Badminton
5. Cricket
6. Throwball

III. NATIONAL CADET CORPS (NCC)

Any student enrolling as a member of National Cadet Core (NCC) will have to attend sixteen parades out of twenty parades each of four periods over a span of academic year.

Attending eight parades in first semester will qualify a student to earn the credits specified in the curriculum.

IV. NATIONAL SERVICE SCHEME (NSS)

A student enrolling as member of NSS will have to complete 60 hours of training / social service to be eligible to earn the credits specified in the curriculum.
PURPOSE
This Lab Course will enable the students to understand the basics of computer and to know the basics of MS-Office.

INSTRUCTIONAL OBJECTIVES
1. To learn the basics of computer.
2. To work on Ms-Word, Ms-Excel, Ms-Power Point and Ms-Access

EXPERIMENTS TO IMPLEMENT
1. Study experiment on evolution of computer programming languages.
2. Suggest some of the Network Topologies that can be incorporated in your campus. Justify your choice.
3. Experiments to demonstrate directory creation and file creation.
4. Create a document with all formatting effects.
5. Create a document with tables.
6. Create labels in MS word.
7. Create a document to send mails using mail merge option.
8. Create an Excel File to analyze the student’s performance. Create a chart for the above data to depict it diagrammatically.
10. Create Excel sheet to maintain employee information and use this data to send mails using mail merge.
11. Create a Power Point presentation for your personal profile with varying animation effects with timer.
12. Consider student information system which stores student personal data, mark information and non academic details.
   * Use MS Access to create Tables and execute SQL queries to do this following
   * Display all student records.
   * Display student details with respect to his identity.
   * Delete some records from the table.
   * Find total marks obtained by student in each list.

TOTAL 30

TEXT BOOK
**LIST OF EXPERIMENTS**

1. Determination of Young’s Modulus of the material – Uniform bending
2. Determination of Rigidity Modulus of the material – Torsion Pendulum
3. Determination of velocity of Ultrasonic waves in liquids
4. Determination of dispersive power of a prism using spectrometer
6. Particle size determination using laser
7. Study of attenuation and propagation characteristics of optical fiber cable
10. Construction and study of regulation properties of a given power supply using IC

**REFERENCE BOOKS**


**PURPOSE**

An integrated laboratory course consists of experiments from applied chemistry and is designed to illustrate the underlying principles of measurement techniques, synthesis, dynamics and chemical transformation.

**INSTRUCTIONAL OBJECTIVES**

Students should be able to understand the basic concept and its applications.

**LIST OF EXPERIMENTS**

1. Preparation of standard solutions.
2. Estimation of total hardness, permanent and temporary hardness by EDTA method.
3. Conductometric titration – determination of strength of an acid.
4. Estimation of iron by potentiometer – titration.
6. Determination of dissolved oxygen in a water sample by Winkler’s method
7. Determination of Na / K in water sample by Flame photometry.
8. Estimation of Copper in ore.
10. Determination of total alkalinity and acidity of a water sample.

**REFERENCE**


**PURPOSE**

To provide the students with hands on experience on different trades of engineering like fitting, carpentry, smithy, welding and sheet metal.
INSTRUCTIONAL OBJECTIVES
To familiarize with
1. The basics of tools and equipments used in fitting, carpentry, sheet metal, welding and smithy.
2. The production of simple models in the above trades.

LIST OF EXPERIMENTS

EMPHASIS TO BE LAID ON REAL LIFE APPLICATIONS WHEN FRAMING THE EXERCISES.

UNIT 1 FITTING  12
Tools & Equipments – Practice in Filing and Drilling.
Making Vee Joints, Square, dovetail joints, Key Making.

UNIT 2 CARPENTARY  12
Tools and Equipments- Planning practice. Making Half Lap, dovetail, Mortise & Tenon joints, a mini model of a single door window frame.

UNIT 3 SHEET METAL  12
Tools and equipments - Fabrication of a small cabinet, Rectangular Hopper, etc.

UNIT 4 WELDING  12
Tools and equipments - Arc welding of butt joint, Lap Joint, Tee Fillet. Demonstration of Gas welding, TIG & MIG.

UNIT 5. SMITHY  12
Tools and Equipments –Making simple parts like hexagonal headed bolt, chisel.

TOTAL  60

TEXT BOOKS

REFERENCE BOOKS

<table>
<thead>
<tr>
<th>ME 0130</th>
<th>ENGINEERING GRAPHICS</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Prerequisite</td>
<td>1</td>
<td>0</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Nil</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(Only First Angle Projection is to be followed)

PURPOSE
1. To draw and interpret various projections of 1D, 2D and 3D objects.
2. To prepare and interpret the drawings of buildings.

INSTRUCTIONAL OBJECTIVES
To familiarise with
1. The construction of geometrical figures
2. The projection of 1D, 2D & 3D elements
3. Sectioning of solids and development of surfaces
4. Preparation and interpretation of building drawing
**UNIT 1 FUNDAMENTALS OF ENGINEERING GRAPHICS**

Lettering, two dimensional geometrical constructions, conics, representation of three-dimensional objects – principles of projections – standard codes – projection of points.

**UNIT 2 PROJECTION OF LINES AND SOLIDS**

Projection of straight lines, projection of solids – auxiliary projections

**UNIT 3 SECTIONS AND DEVELOPMENTS**

Sections of solids and development of surfaces.

**UNIT 4 PICTORIAL PROJECTIONS**

Conversion of projections: Orthographic projection, isometric projection of regular solids & combination of solids.

**UNIT 5 BUILDING DRAWING**

Building Drawing – plan, elevation and section of single storied residential (or) office building with flat RCC roof and brick masonry walls having not more than 3 rooms (planning / designing is not expected in this course).

<table>
<thead>
<tr>
<th>PRACTICAL</th>
<th>60</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOTAL</td>
<td>75</td>
</tr>
</tbody>
</table>

**TEXT BOOKS**


**REFERENCE BOOKS**

SEMESTER – II

<table>
<thead>
<tr>
<th>GE 0108</th>
<th>VALUE EDUCATION</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

Prerequisite
Nil

PURPOSE
To provide guiding principles and tools for the development of the whole person, recognizing that the individual is comprised of Physical Intellectual, Emotional and Spiritual dimensions.

INSTRUCTIONAL OBJECTIVES

- To help individuals think about and reflect on different values.
- To deepen understanding, motivation and responsibility with regard to making personal and social choices and the practical implications of expressing them in relation to themselves, others, the Community and the world at large.
- To inspire individuals to choose their own personal, social, moral and spiritual values and be aware of practical methods for developing and deepening them.

UNIT 1

Values:

i) Personal values
ii) Social values
iii) Professional values
iv) Moral and spiritual values
v) Behavioral (common) values

UNIT 2

UNIT 3

UNIT 4

UNIT 5

TOTAL 15

REFERENCE BOOKS
2. Values(Collection of Essays)., Published by : Sri Ramakrishna Math., Chennai—4,(1996)
5. Tirukural (English Translation by Dr.G.U.Pope).
6. The Bible
7. The Kuran
8. The Bagavath Geetha
**GE 0102  BIOLOGY FOR ENGINEERS**  

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

**Prerequisite**  
Nil

**PURPOSE**  
To provide a basic understanding of biological mechanisms from the perspective of engineers.

**INSTRUCTIONAL OBJECTIVES**  
To familiarize the students with the basic organization of organisms and subsequent building to a living being. With this knowledge, the student will be then imparted with an understanding about the machinery of the cell functions that is ultimately responsible for various daily activities. Nervous and immune systems will be taught as examples of this signaling machinery.

**UNIT 1 FROM ATOMS TO ORGANISMS**  
6  
The Cell: the Basic Unit of Life - Molecular Components of Cells - Expression of Genetic Information - Protein Structure and Function - Cell Metabolism - Cells Maintain Their Internal Environments - Cells Respond to Their External Environments - Cells Grow and Reproduce - Cells Differentiate

**UNIT 2 THE MOLECULAR DESIGN OF LIFE**  
6  
Biochemistry and the Genomic Revolution - DNA Illustrates the Relation between Form and Function - Biochemical Unity Underlies Biological Diversity - Chemical Bonds in Biochemistry - Biochemistry and Human Biology - Protein Synthesis Requires the Translation of Nucleotide Sequences Into Amino Acid Sequences - Aminoacyl-Transfer RNA Synthetases Read the Genetic Code - A Ribosome Is a Ribonucleoprotein Particle (70S) Made of a Small (30S) and a Large (50S) Subunit-Protein Factors Play Key Roles in Protein Synthesis - Eukaryotic Protein Synthesis Differs from Prokaryotic Protein Synthesis Primarily in Translation Initiation

**UNIT 3 CATALYTIC STRATEGIES**  
6  

**UNIT 4 MECHANOCHEMISTRY**  
6  

**UNIT 5 SENSORY AND IMMUNO SYSTEMS**  
6  

**TOTAL** 30

**TEXT BOOKS**  
3. Frank H. Deis, Nancy Counts Gerber, Roger E. Koenpe, II *Molecular motors*

**REFERENCE BOOKS**  
1. Alberts, 2003 Molecular Biology of the cell  
2. Lodish, 2004 Molecular cell biology
PURPOSE
The course provides the comprehensive knowledge in environmental science, environmental issues and the management.

INSTRUCTIONAL OBJECTIVES
1. The importance of environmental education, ecosystem and ethics.
2. Knowledge with respect to biodiversity and its conservation.
3. To create awareness on the various environmental pollution aspects and issues.
4. To educate the ways and means to protect the environment.
5. Important environmental issues and protection

UNIT 1 ENVIRONMENT AND ECOSYSTEMS
Environmental education: definition - scope - objectives and importance. Concept of an ecosystem – types (terrestrial and aquatic ecosystems) – structure and function – ecological succession - food chains, food webs and ecological pyramids

UNIT 2 BIODIVERSITY
Introduction: definition - genetic, species and ecosystem diversity - value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values - threats to biodiversity: habitat loss, poaching of wildlife - endangered and endemic species of India, Conservation of biodiversity: in-situ and ex-situ conservations.

UNIT 3 POLLUTION AND WASTE MANAGEMENT

UNIT 4 CURRENT ENVIRONMENTAL ISSUES
Environmental ethics -issues and possible solutions- population explosion, climatic change, ozone layer depletion, global warming, acid rain and green house effect. Sustainable development: definition, objectives and environmental dimensions of sustainable development- environmental audit for sustainable development.

UNIT 5 ENVIRONMENTAL PROTECTION
National and international concern for environment: Important environmental protection acts in India – water, air (prevention and control of pollution) act, wild life conservation and forest act – functions of central and state pollution control boards - international effort – key initiatives of Rio declaration, Vienna convention, Kyoto protocol and Johannesburg summit.

TOTAL 30

TEXT BOOKS

REFERENCE BOOKS
PURPOSE
To impart analytical ability in solving mathematical problems as applied to the respective branches of Engineering.

INSTRUCTIONAL OBJECTIVES
At the conclusion of the course, students should have understood Multiple Integrals, Laplace Transforms, Vector Calculus and Functions of a complex variable including contour integration and able to apply to all their Engineering problems.

UNIT 1 MULTIPLE INTEGRALS
Double integration in Cartesian and polar coordinates – Change of order of integration – Area as a double integral – Triple integration in Cartesian coordinates.

UNIT 2 LAPLACE TRANSFORMS
Transforms of simple functions – Basic operational properties – Transforms of derivatives and integrals – Initial and final value theorems – Inverse transforms – Convolution theorem – periodic functions – Applications of Laplace transforms for solving linear ordinary differential equations up to second order with constant coefficients only.

UNIT 3 VECTOR CALCULUS
Gradient, divergence, curl – Solenoidal and irrotational fields – Vector identities (without proof) – Directional derivatives – Line, surface and volume integrals – Statements of Green’s, Gauss divergence and Stroke’s theorems only – Verification and applications to cubes and parallelopipeds only.

UNIT 4 ANALYTIC FUNCTIONS

UNIT 5 COMPLEX INTEGRATION
Line integral – Cauchy’s integral theorem (without proof) – Cauchy’s integral formulae (with proof) – application of Cauchy’s integral formulae – Taylor’s and Laurent’s expansions (statements only) – Singularities – Poles and Residues – Cauchy’s residue theorem (with proof) - Evaluation of line integrals.

TUTORIAL 30
TOTAL 75

TEXT BOOKS

REFERENCE BOOKS
PURPOSE
The purpose of this course is to develop comprehension of the rapidly changing technological scenario and the requisite expertise for appropriate selection of materials for specific engineering applications.

INSTRUCTIONAL OBJECTIVES
At the end of the course, the student will be able to:

1. Understand electrical properties of materials,
2. Understand the properties and applications of semi conducting materials,
3. Understand general properties and applications of magnetic and dielectric materials,
4. Understand the behaviour of materials on exposure to light,
5. Understand general properties and application of modern engineering and bio materials, and
6. Get familiarized with the concepts of Nano Science and Technology.

UNIT 1 ELECTRONIC AND PHOTONIC MATERIALS 6
Electronic materials: Importance of Classical and Quantum free electron theory of metals – Fermi energy and Fermi Dirac distribution function – Variation of Fermi level with temperature in intrinsic and extrinsic semiconductors – Hall effect – Dilute Magnetic Semiconductors (DMS) and their applications – High temperature Superconductivity.

Photonic materials: LED and LCD materials – Photo conducting materials – Nonlinear optical materials (elementary ideas) and their applications.

UNIT 2 MAGNETIC, DIELECTRIC AND MODERN ENGINEERING MATERIALS 6

Dielectric materials: Various polarization mechanisms in dielectrics (elementary ideas) and their frequency and temperature dependence – Dielectric loss – Piezo electric and ferro electric materials and their applications.

Modern engineering materials: Shape memory alloys – Metallic glasses – Advanced ceramics and composites.

UNIT 3 BIO MATERIALS 6
Classification of biomaterials – Comparison of properties of some common biomaterials – Effects of physiological fluid on the properties of biomaterials – Biological responses (extra and intra vascular system) – Metallic, Ceramic and Polymeric implant materials – Introduction to bio sensors and tissue engineering.

UNIT 4 NANO MATERIALS AND NANOTECHNOLOGY 6

UNIT 5 MECHANICAL PROPERTIES OF MATERIALS 6
Stress Strain diagram for different engineering materials – Engineering and true stress strain diagram – Ductile and brittle material – Tensile strength – Hardness – Impact strength – Fatigue – Creep – Fracture (Types and Ductile to brittle transition) – Factors affecting mechanical properties.

PRACTICALS 30
1. Band gap determination using Post office box.
2. Dielectric constant measurement.
3. Photoconductivity measurement.
4. Resistivity determination for a semiconductor wafer using Four probe method.
5. Determination of Hall coefficient and carrier type for a semiconductor material.
6. To trace the hysteresis loop for a magnetic material.
7. Magnetic susceptibility – Quincke’s method.
9. Visit to Nano Technology Laboratory (optional)

TOTAL 60
TEXT BOOKS

REFERENCE BOOKS

<table>
<thead>
<tr>
<th>GE 0106</th>
<th>BASIC ENGINEERING – II</th>
</tr>
</thead>
<tbody>
<tr>
<td>L</td>
<td>T</td>
</tr>
<tr>
<td>4</td>
<td>0</td>
</tr>
</tbody>
</table>

PART A ELECTRICAL ENGINEERING

PURPOSE
This course provides comprehensive idea about circuit analysis, working principles of machines and common measuring instruments. It also provides fundamentals of electronic devices, transducers and integrated circuits.

INSTRUCTIONAL OBJECTIVES

1. At the end of the course students will be able
2. To understand the basic concepts of magnetic, AC & DC circuits.
3. To explain the working principle, construction, applications of DC & AC machines & measuring instruments.
4. To gain knowledge about the fundamentals of electric components, devices, transducers & integrated circuits.

UNIT 1 ELECTRICAL MACHINES 12
Definition of mmf, flux and reluctance, leakage flux, fringing, magnetic materials and B-H relationship. Problems involving simple magnetic circuits. Faraday’s laws, induced emfs and inductances, brief idea on Hysteresis and eddy currents. Working principle, construction and applications of DC machines and AC machines (1-phase transformers, 3-phase induction motors, single phase induction motors – split phase, capacitor start and capacitor start & run motors).

UNIT 2 AC & DC CIRCUITS 10
Circuit parameters, Ohms law, Kirchhoff’s law. Average and RMS values, concept of phasor representation. RLC series circuits and series resonance, RLC parallel circuits (includes simple problems in DC & AC circuits) Introduction to three phase systems – types of connections, relationship between line and phase values. (qualitative treatment only)

UNIT 3 WIRING & LIGHTING 8
Types of wiring, wiring accessories, staircase & corridor wiring, Working and characteristics of incandescent, fluorescent, SV & MV lamps. Basic principles of earthing, simple layout of generation, transmission & distribution of power.

TOTAL 30

TEXT BOOKS
REFERENCE BOOKS

PART B ELECTRONICS ENGINEERING

PURPOSE:

This course provides comprehensive idea about circuit analysis, working principles of machines and common measuring instruments. It also provides all fundamentals of circuit components, electronic devices, transducers and integrated circuits.

OBJECTIVES
1. To understand the basic concept of magnetic, AC and DC circuits.
2. To explain the working principle, construction and applications of DC and AC machines.
3. To gain knowledge about the fundamentals of electric components, devices, transducers, measuring instruments and integrated circuits.

UNIT 1 ELECTRONIC COMPONENTS AND DEVICES

Passive components – Resistors, Inductors and Capacitors and their types.
Semiconductor: Energy band diagram, Intrinsic and Extrinsic semiconductors, PN junction diodes and Zener diodes – characteristics.

UNIT 2 TRANSUDCERS AND MEASURING INSTRUMENTS

Measuring Instruments: Basic principles and classification of instruments, Moving coil and moving iron instruments, CRO – Principle of operation.

UNIT 3 DIGITAL ELECTRONICS & LINEAR ICs


TEXT BOOKS

TOTAL 30

REFERENCE BOOKS
PURPOSE
This course is to develop a strong foundation in the field of digital electronics
To learn the fundamentals of digital Computer and its components

INSTRUCTIONAL OBJECTIVES
1. Number System and Boolean Algebra
2. Sequential and Combinational Logic
3. Synchronous and asynchronous circuits
4. State diagrams

UNIT 1 NUMBER SYSTEMS & BOOLEAN ALGEBRA 10
Digital Computers and digital systems-Review of binary number systems-Number conversion-Complements-Binary Arithmetic-Binary codes-Boolean Algebra and Theorems-Canonical and standard forms-Simplification of Boolean functions using Karnaugh map & tabulation methods

UNIT 2 IMPLEMENTATION OF COMBINATIONAL LOGIC DESIGN 9
Logic gates-Combinational Circuits-Analysis and design procedure-Binary Adder and Subtractor- Decimal adder -Encoder-Decoder-Multiplexer-Demultiplexer-Binary parallel adders- -Magnitude comparators-Read-Only Memory(ROM)-Programmable Logic Array(PLA)-Programmable Array Logic(PAL)

UNIT 3 DESIGN OF SYNCHRONOUS SEQUENTIAL CIRCUITS 9

UNIT 4 ASYNCHRONOUS SEQUENTIAL LOGIC 9
Analysis and design procedure-Reduction of state and flow tables-Race and Free State assignment-Hazards

UNIT 5 HARDWARE DESCRIPTION LOGIC 8
Introduction to Hardware Description Language (HDL)-HDL for combinational circuits

PRACTICAL
1. Verification of Gates & Flip Flops
2. Adders
3. Multiplexers & Demultiplexers
4. Counters
5. Shift registers
6. Encoders & Decoders

TEXT BOOKS
1. M.Morris Mano, “Digital Logic and Computer Design”, PHI,2001 (Chapter 1, 2, 3 for UNIT-I)
3. Chapter 5,6 for UNIT-III,Chapter 9 for UNIT-IV ,Chapter 3.9 and 4.11 for UNIT-V)

REFERENCE BOOKS

ONLINE REFERENCE
http://www.elec.gla.ac.uk/coursedb/7ltv.pdf
PURPOSE
The purpose of this course is to build confidence and inculcate various soft skills and to help Students to identify and achieve their personal potential

INSTRUCTIONAL OBJECTIVES
1. To guide thought process.
2. To groom students' attitude.
3. To develop communication skill.
4. To build confidence.

METHODOLOGY
The entire program is designed in such a way that every student will participate in the class room activities. The activities are planned to bring out the skills and talents of the students which they will be employing during various occasions in their real life.

1. Group activities + individual activities.
2. Collaborative learning.
3. Interactive sessions.
4. Ensure Participation.
5. Empirical Learning

UNIT – 1                             6
Puzzles I - Poster design/Caption/Slogan writing (Social issues) - Bone of contention I – debate

UNIT – 2                             6
Bone of contention II - Puzzle II - Survey and Reporting (favorite channel, music, food)

UNIT – 3                             6
Interpretation of Visuals of I & II - Vocabulary games III

UNIT – 4                             6
Book Review - Quiz I - Presentation Skills I

UNIT – 5                             6
Presentation Skills II - Analytical Thinking - Review

TOTAL 30

EVALUATION
1. Activities assessed by both group and individual participation
2. Continuous assessment based on daily participation

SCHEME OF INSTRUCTION
Marks allocated for regular participation in all oral activities in class

SCHEME OF EXAMINATION
Complete Internal evaluation on a regular Basis
CS0112 PROGRAMMING IN C

Prerequisite
NIL

PURPOSE
To familiarize the students with the fundamentals and programming basics of C language.

INSTRUCTIONAL OBJECTIVES
1. To learn the basics of C declarations, operators and expressions.
2. To work on all the elementary statements (Loop, Branch) and arrays.
3. To learn on the manipulation of strings, functions and pointers.

THEORY:


LIST OF EXPERIMENTS
Program to understand the basic data types.
Program on Fibonacci series.
Finding a factorial for a given number.
Programs using Built-in math functions.
Conversions: Hex to Decimal, Binary to Octal etc.
Matrix operations: Multiplication, Symmetric, Inverse.
Working on bitwise operators.
Student mark processing using structures.
Arithmetic operations using functions (with and without) return values.
Program on string manipulations (finding length, concatenation, comparison, etc).
Program to perform arithmetic operations (add, sub, mul, etc) through variables and pointers.
Program on basic file operations.

TOTAL 60

TEXT BOOK

REFERENCE BOOKS

ME 0130 ENGINEERING GRAPHICS

Prerequisite
Nil

(Only First Angle Projection is to be followed)

PURPOSE
1. To draw and interpret various projections of 1D, 2D and 3D objects.
2. To prepare and interpret the drawings of buildings.
INSTRUCTIONAL OBJECTIVES
To familiarize with
1. The construction of geometrical figures
2. The projection of 1D, 2D & 3D elements
3. Sectioning of solids and development of surfaces
4. Preparation and interpretation of building drawing

UNIT 1 FUNDAMENTALS OF ENGINEERING GRAPHICS 2
Lettering, two dimensional geometrical constructions, conics, representation of three-dimensional objects – principles of projections – standard codes – projection of points.

UNIT 2 PROJECTION OF LINES AND SOLIDS 4
Projection of straight lines, projection of solids – auxiliary projections

UNIT 3 SECTIONS AND DEVELOPMENTS 3
Sections of solids and development of surfaces.

UNIT 4 PICTORIAL PROJECTIONS 4
Conversion of projections: Orthographic projection, isometric projection of regular solids & combination of solids.

UNIT 5 BUILDING DRAWING 2
Building Drawing – plan, elevation and section of single storied residential (or) office building with flat RCC roof and brick masonry walls having not more than 3 rooms (planning / designing is not expected in this course).

PRACTICAL 60
TOTAL 75

TEXT BOOKS

REFERENCE BOOKS

<table>
<thead>
<tr>
<th>ME 0120</th>
<th>WORKSHOP PRACTICE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>L</td>
</tr>
<tr>
<td></td>
<td>0</td>
</tr>
</tbody>
</table>

Prerequisite

Nil

PURPOSE
To provide the students with hands on experience on different trades of engineering like fitting, carpentry, smithy, welding and sheet metal.

INSTRUCTIONAL OBJECTIVES
To familiarize with
1. The basics of tools and equipments used in fitting, carpentry, sheet metal, welding and smithy.
2. The production of simple models in the above trades.
LIST OF EXPERIMENTS

EMPHASIS TO BE LAI ST REAL LIFE APPLICATIONS WHEN FRAMING THE EXERCISES.

UNIT 1 FITTING 12
Tools & Equipments – Practice in Filing and Drilling.
Making Vee Joints, Square, dovetail joints, Key making.

UNIT 2 CARPENTRY 12

UNIT 3 SHEET METAL 12
Tools and equipments - Fabrication of a small cabinet, Rectangular Hopper, etc.

UNIT 4 WELDING 12
Tools and equipments - Arc welding of butt joint, Lap Joint, Tee Fillet. Demonstration of Gas welding, TIG & MIG.

UNIT 5 SMITHY 12
Tools and Equipments –Making simple parts like hexagonal headed bolt, chisel.

TOTAL 60

TEXT BOOK

REFERENCE BOOKS
SEMESTER – III

<table>
<thead>
<tr>
<th>LE0201</th>
<th>GERMAN LANGUAGE PHASE I</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
</tbody>
</table>

**Prerequisite**
Nil

**PURPOSE**
Enabling the Engineering Students to one more Foreign Language, especially German, which is scientific and technical language. This may be useful in the field of employment opportunities as well as helping them to develop projects on browsing German websites.

**INSTRUCTIONAL OBJECTIVES**
Developing pronunciation so that they can read the text and e-mail during their employment, instructing them to write their own C V and developing a fundamental conversation with any German national.

**UNIT 1 INTRODUCTION**
10
German Language, Alphabets and Pronunciation.

**THEMEN**
Name, Land, Leute, Beruf, Familie geschwister, Einkaufen, Reisen, Zahlen, Haus, Freunden, Essen and Stadium, Fest, Zeit.

**UNIT 2 LISTENING**
10
Listening to the cassette and pay special attention to the meaning and sounds. Listening Comprehension – Announcements / Airport / Station / General.

**UNIT 3 READING**
10
Listening to the cassette and reading it allowed.
READING COMPRENSION BASICS / STATION / NEWS / NOTICE BOARDS.

**TOTAL**
30

**GLOSSARY**
Technical Words Lesson (1-5)

**TEXT BOOK WITH CASSETTES**
1. Grundkurs Deutsch
2. Momentmal (Max Mueller Bhavan – Goethe Institute, Germany).

**SCHEME OF EVALUATION**
Internal 50 = Listening – 10 Marks, Speaking – 20 Marks, Reading – 10 Marks and Writing = 10 Marks

<table>
<thead>
<tr>
<th>LE0203</th>
<th>JAPANESE LANGUAGE PHASE I</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
</tbody>
</table>

**Prerequisite**
Nil

**PURPOSE**
In view of globalization, learning Foreign Language by Engineering graduates enhances their employment opportunities.
Get awareness of understanding of International culture.
Widening the Linguistic Skills of the Students.
INSTRUCTIONAL OBJECTIVES
To learn the scripts of Japanese Languages namely Hiragana, Katakana and Kanji, Vocabularies etc. To learn basic grammar and acquire basic communication skills. To understand Japanese culture.

UNIT 1 8
Alphabets (Hiragana ), Self Introduction, Greetings, Classroom expressions, Numbers, Conversation.

UNIT 2 8
Alphabets Hiragana (continued),Vocabularies. Counters .Time expression. Conversation

UNIT 3 8

UNIT 4 6

TOTAL 30

TEXT BOOKS
1. Nihongo Shoho I main Text sold in India by the Japanese Language Teachers Association Pune.
2. Hiragana and Katakana Work Book published by AOTS Japan
3. Grammar and Kotoba ( Work Book )
4. Japanese for Dummies.(Conversation) CD.

SCHEME OF EVALUATION
Internal 50 = Listening – 10 Marks, Speaking – 20 Marks, Reading – 10 Marks and Writing = 10 Marks

LE0205 FRENCH LANGUAGE PHASE I  2 0 0 2
Prerequisite
Nil

PURPOSE
1. As language skills are as valuable as technical skills a knowledge of French enables the engineering graduates in career orientation.
2. As a second international global Lang after English there is a wider choice of job opportunities in the inter national employment market and also multinationals in India and an understanding of French culture thro language.

INSTRUCTIONAL OBJECTIVE
Characterised by the Roman script, grammar, vocabulary and colloquial expressions are taught which enables them to communicate effectively with any native speaker.

UNIT 1 INTRODUCTION AND PRONUNCIATION 8
Introduction of the French Language, Alphabets and Pronunciation, Greetings (Wishing, Thanking and Bidding good bye), Introducing oneself & someone Presenter quelqu’un et se presenter - conversational French sentences based on the topics discussed above.

UNIT 2 VOCABULARY 6
Numbers and Dates, Days, Months and Seasons, Time, Nouns, Professions and Nationalities. C;onversational sentences on weather, time, and professions.

UNIT 3 GRAMMAR 5
Basic Verbs (Avoir, Etre, Aller, Faire) – Conjugation – Present tense, Affirmative, Negative, Interrogative, Adjectives (Qualitative), Subject Pronouns and Disjunctive Pronouns.
UNIT 4 CONVERSATION AND LISTENING
Conversational sentences on physical description and expressions with verbs like avoir, être and faire

UNIT 5 GRAMMAR
Prepositions (a, de, dans, en, sur, sous, pour….), Contracted Articles, Question Tag (Qui, Quel, Ou, ……etc)

TOTAL 30

Text book:
1. Panorama – Goyal Publishers
2. Apprenons le Francais I, Sarawathy publication.

SCHEME OF EVALUATION
Internal 50 = Listening – 10 Marks, Speaking – 20 Marks, Reading – 10 Marks and Writing = 10 Marks

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA0211</td>
<td>MATHEMATICS – III</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>MA0101, MA0102</td>
<td>(Common for EEE, ECE, IT, CSE, ICE &amp; EIE)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

PURPOSE
To inculcate the problem solving ability in the minds of students so as to apply the theoretical knowledge to the respective branches of Engineering.

INSTRUCTIONAL OBJECTIVES
At the end of the course, the student should be able to
1. Have thorough knowledge in fourier series.
2. Exposed to solving problems using partial differential equations.
3. Be familiar with one and two dimensional wave and heat equations.
4. Gain good knowledge in the application of fourier transforms.

UNIT 1 FOURIER SERIES

UNIT 2 PARTIAL DIFFERENTIAL EQUATIONS
Formation – Solution of standard types of first order equations – Lagrange’s equation – Linear homogeneous partial differential equations of second and higher order with constant coefficients - Classification of second order linear partial differential equations.

UNIT 3 ONE DIMENSIONAL WAVE & HEAT EQUATION
Boundary and initial value problems – Transverse vibrations of elastic string with fixed ends – Fourier series solutions – One dimensional heat equation - Steady and transient states – problems.

UNIT 4 TWO DIMENSIONAL HEAT EQUATION

UNIT 5 FOURIER TRANSFORMS

TUTORIAL 15
TOTAL 60
TEXT BOOKS

REFERENCE BOOKS

<table>
<thead>
<tr>
<th>CS0201</th>
<th>DATA STRUCTURES USING C++</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Prerequisite</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>NIL</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

PURPOSE
The purpose of this course is to impart knowledge on various data structure concepts to the students.

INSTRUCTIONAL OBJECTIVES
At the end of the course, student should be able to understand
1. Several data structures concepts like stack, queues, linked list, trees and files
2. Applications of data structures
3. Problem solving using data structure tools and techniques

UNIT 1 INTRODUCTION
Introductory concepts of C++-Data types-Control structures-Definitions of Data Structure and Algorithm -The Abstract Data Type-Algorithm efficiency-Searching-List structures-Hashed List structures-Basic concepts-Hashing methods

UNIT 2 LINKED LISTS
Linear and Linked List concepts-Linked List Algorithms-Processing a Linked List-List Applications-Complex Linked List Structures-Implementation-Case studies

UNIT 3 STACKS AND QUEUES

UNIT 4 TREES AND GRAPHS

UNIT 5 SORTING CONCEPTS
General Sort concepts-Insertion Sorts-Shell Sort-Selection Sorts-Heap Sort-Exchange Sorts-Bubble sort-Quick Sort-Case studies

TEXT BOOK:

REFERENCE BOOKS:

ONLINE REFERENCES
http://www.cmpe.boun.edu.tr/~akin/cmpe223/homepage.htm
http://www.csie.ndhu.edu.tw/~rschang/dscontent.htm

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS0203</td>
<td>DESIGN AND ANALYSIS OF ALGORITHMS</td>
<td>3</td>
</tr>
</tbody>
</table>

L | T | P | C
---|---|---|---
3 | 0 | 0 | 3

Prerequisite

MA 0102 & MA0211

PURPOSE
This course will provide an understanding of how to write algorithms for various problems and do an analysis of the same

INSTRUCTIONAL OBJECTIVES
1. Divide and Conquer, Dynamic Programming techniques
2. Backtracking, NP complete problems
3. Various analysis of algorithms

UNIT 1 ANALYSIS OF ALGORITHM

UNIT 2 DIVIDE AND CONQUER METHOD

UNIT 3 DYNAMIC PROGRAMMING
General Method–Multistage Graph – All Pairs Shortest Path Algorithm – 0/1 Knapsack Problem – Traveling Salesman Problem - Basic search techniques and traversal techniques –bi-connected components – Depth First Search – Breadth First Search.

UNIT 4 BACKTRACKING
The General Method – 8-Queens Problem- Sum of Subsets – Graph Coloring- Hamiltonian Cycle-Knapsack Problem – Branch and Bound Method – 0/1 Knapsack Problem – Traveling Salesman Problem

UNIT 5 P and NP
Polynomial time – Nondeterministic Algorithms and NP – Reducibility and NP completeness – NO complete Problems – More on NP completeness. Case studies

TOTAL 45

TEXT BOOKS
REFERENCE BOOKS

ONLINE RESOURCE
http://www.personal.kent.edu/~rmuhamma/Algorithms/algorithm.html

<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>CS0205</td>
<td>MICROPROCESSOR AND INTERFACING</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Prerequisite</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Same as IT0202</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

PURPOSE
The purpose of this course is to impart knowledge of microprocessor architecture and programming, interfacing and coprocessors which gives foundation to advanced microprocessor architecture and programming.

INSTRUCTIONAL OBJECTIVES
In this course, students learn the following topics:
1. Architecture of 8086 & 8088 microprocessors
2. Instruction sets of 8086/88 and programming.
3. Math Coprocessor & I/O processor and multiprocessor configuration
4. Interfacing of microprocessor with various peripheral devices

UNIT 1 INTEL 8085 ARCHITECTURE
Introduction to 8085 - 8085 architecture- Instruction Set & Assembler Directives- Assembly Language Programming with 8085.

UNIT 2 INTEL 8086/8088 ARCHITECTURE
Introduction to 8086/8088 - 8086/8088 architecture- Instruction Set & Assembler Directives- Assembly Language Programming with 8086/8088 - Special Architectural Features.

UNIT 3 COMMUNICATION INTERFACES
Basic Peripherals & their interfacing with 8086/8088-Semiconductor Memory Interfacing-Dynamic RAM Interfacing-Interfacing I/O Ports-PIO 8255-Modes of Operation-Interfacing Analog to Digital Data Converters-Stepper Motor Interfacing

UNIT 4 PERIPHERAL INTERFACES
Special Purpose Programmable Peripheral Devices & their Interfacing-Programmable Interval Timer 8253-Programmable Interrupt Controller 8259A-DMA Controller 8257-DMA Transfers & Operations-Programmable DMA Interface 8237.

UNIT 5 MULTIPROCESSOR SYSTEMS

TOTAL 45

TEXT BOOK

REFERENCE BOOKS
PURPOSE
The purpose of this course is to give a strong foundation of the computer organization and its internal architecture.

INSTRUCTIONAL OBJECTIVES
1. Gives a knowledge of various architectures
2. CPU, Control unit, I/O Processing
3. Memory and its types
4. Design of the above components

UNIT 1 INTRODUCTION
Evolution of Computer Systems-Computer Types-Functional units-Basic operational concepts-Bus structures-
Memory location and addresses-memory operations- Addressing modes-Design of a computer system-
Instruction and instruction sequencing, RISC versus CISC.

UNIT 2 CENTRAL PROCESSING UNIT
Introduction-Arithmetic Logic Unit - Fixed point arithmetic, floating point arithmetic-Execution of a complete
instruction-Basic concepts of pipelining.

UNIT 3 CONTROL UNIT DESIGN
Introduction-Control Transfer-Fetch cycle - Instruction Interpretation & Execution - Hardwired control -
Microprogrammed control.

UNIT 4 MEMORIES AND SUBSYSTEMS
Semiconductor memory - Static and Dynamic -Associative memory- Cache memory- Virtual memory-
Secondary memories-Optical magnetic tape & magnetic disks & controllers.

UNIT 5 I/O PROCESSING
Introduction-Data transfer techniques- Bus Interface- I/O Channel-I/O Processor, I/O devices -Direct memory
access.

TEXT BOOK

REFERENCE BOOKS

ONLINE REFERENCES:
www.amazon.com
www.freebookcentre.com
PURPOSE
The purpose of this course is to build confidence and inculcate various soft skills and to help Students to identify and achieve their personal potential.

INSTRUCTIONAL OBJECTIVES
1. To guide thought process.
2. To groom students' attitude.
3. To develop communication skill.
4. To build confidence.

METHODOLOGY
The entire program is designed in such a way that every student will participate in the class room activities. The activities are planned to bring out the skills and talents of the students which they will be employing during various occasions in their real life.

1. Group activities + individual activities.
2. Collaborative learning.
3. Interactive sessions.
4. Ensure Participation.
5. Empirical Learning

UNIT – 1 6
Goal Setting - Problem Solving - Emotional Quotient

UNIT – 2 6
Assertiveness - Stress Management - Quiz II

UNIT – 3 6
Lateral Thinking (Situational) - Team Work (Role Plays) Impromptu - Text Analysis

UNIT – 4 6
Business plan presentation I - Business plan presentation II - Chinese Whisper

UNIT – 5 6
Picture Perfect - Case Studies - Review

TOTAL 30

SCHEME OF INSTRUCTION
Marks allocated for regular participation in all oral activities in class

SCHEME OF EXAMINATION
Complete Internal evaluation on a regular Basis

PURPOSE
This Lab Course will enable the students to implement the small logic at assembly language level.
INSTRUCTIONAL OBJECTIVES
To do any kind of operations (8 bit addition, subtraction, Multiplication and division) with 8085 microprocessor
To implement interfacing of 8086 with various peripheral devices

LIST OF EXERCISES

1. Study of Peripherals & interfacing.
   8085 Experiments:
   - 8-bit Addition, Multiplication & Division.
   - 16-bit Addition, Multiplication & Division.
   - Counters and Time Delay
   - BCD to Hexadecimal & vice-versa.
   - Traffic light control.
   - Stepper motor control.

   8086 Experiments:
   - Basic arithmetic & Logical operations.
   - Sorting & searching algorithms.
   - Data transfer instructions.
   - RAM size & system date.
   - Digital clock
   - Key board & printer status.
   - Password checking.
   - Serial interface & parallel interface
   - Trouble shooting.

TOTAL 45

REFERENCE: Laboratory manual

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS0213</td>
<td>DATA STRUCTURES AND ALGORITHMS LAB (C &amp; C++)</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
</tbody>
</table>

Prerequisite
CS0112

PurposE
This laboratory course gives a thorough understanding of the concepts of various Data Structures and its applications. It also gives a comprehensive understanding of the various algorithms for problems given

INSTRUCTIONAL OBJECTIVES
1. Implementing Stack, Queue, Linked List, Binary tree
2. Sorting and Searching Techniques
3. Divide and Conquer, Dynamic Programming methods
4. Greedy method, Traversals and Backtracking

LIST OF EXERCISES

CYCLE – I
1. Implementation of stack & Queue
2. Singly Linked List
3. Doubly linked list
4. Binary tree Implementations and traversals.
5. Sorting Techniques: Insertion, Selection Sort
6. Sorting Techniques: Quick sort, Merge sort
1. Divide and Conquer Method
   - Binary Search
   - Max Min Problem
2. Greedy Method
   - Knapsack Problem
3. Traversal Technique
   - Depth First Search
   - Breadth First Search
4. Backtracking
   - 8-Queens Problem

REFERENCE: Laboratory Manual
SEMESTER – IV

<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>LE0202</td>
<td>GERMAN LANGUAGE PHASE - II</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Prerequisite</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>GERMAN LANGUAGE PHASE - I</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**PURPOSE**
Enabling the Engineering Students to one more Foreign Language, especially German, which is scientific and technical language. This may be useful in the field of employment opportunities as well as helping them to develop projects on browsing German websites.

**INSTRUCTIONAL OBJECTIVES**
Developing pronunciation so that they can read the text and e-mail during their employment, instructing them to write their own C V and developing a fundamental conversation with any German national.

**UNIT 1 SPEAKING:**
Dialogue – Questioning / Basic queries / Conversational with practical exposure.

**UNIT 2 GRAMMATIK (WRITING)**

**TOTAL**
30

**GLOSSARY**
Technical words. Lesson (6-10)

**TEXT BOOK WITH CASSETTES**
A. Grundkurs Deutsch
B. Momentmal
(Prescribed by Max Mueller Bhavan – Goethe Institute, Germany).

**SCHEME OF EVALUATION**
Internal 50 = Listening – 10 Marks, Speaking – 20 Marks, Reading – 10 Marks and Writing = 10 Marks

---

<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>LE0204</td>
<td>JAPANESE LANGUAGE PHASE II</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Prerequisite</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>JAPANESE LANGUAGE PHASE I</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**PURPOSE**
In view of globalization, learning Foreign Language by Engineering graduates enhances their employment opportunities.
Get awareness of understanding of International culture.
Widening the Linguistic Skills of the Students.

**INSTRUCTIONAL OBJECTIVES**
To learn the scripts of Japanese Languages namely Hiragana, Katakana and Kanji, Vocabularies etc. To learn basic grammar and acquire basic communication skills. To understand Japanese culture.

**UNIT 1**
Lesson 2- {Korewa Tsukue desu } – Grammar, Sentence pattern, Marume . Conversation

**UNIT 2**

**UNIT 3**
Lesson 4– {Asokoni hito ga imasu} - Grammar, Sentence pattern, Marume .
Lesson 5– {Akairingo wa ikutsu arimasu ka}-Grammar, Sentence pattern, Marume . Conversation.
UNIT 4
Lesson 6– {Barano hana wa ippon ikura desu ka}- Grammar, Sentence pattern.Marume.Conversation

TOTAL 30

TEXT BOOKS
1. Nihongo Shoho Imain Text sold in India by the Japanese Language Teachers Association Pune.
2. Hiragana and Katakana Work Book published by AOTS Japan
3. Grammar and Kotoba (Work Book)
4. Japanese for Dummies.(Conversation) CD.

SCHEME OF EVALUATION
Internal 50 = Listening – 10 Marks, Speaking – 20 Marks, Reading – 10 Marks and Writing = 10 Marks

<table>
<thead>
<tr>
<th>LE0206</th>
<th>FRENCH LANGUAGE PHASE II</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Prerequisite</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>FRENCH LANGUAGE PHASE I</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

PURPOSE
1. As language skills are as valuable as technical skills a knowledge of French enables the engineering graduates in career orientation.
2. As a second international global Lang after English there is a wider choice of job opportunities in the international employment market and also multinationals in India and an understanding of French culture thro language.

INSTRUCTIONAL OBJECTIVE
Characterised by the Roman script, grammar, vocabulary and colloquial expressions are taught which enables them to communicate effectively with any native speaker.

UNIT 1
Sports (Ski, natation, tennis, Tour de France), Cuisine (French dishes), Cinema (Review of a film) – Articles on these topics and group discussion will be followed.

UNIT 2 GRAMMAR
Possessive Adjectives, Demonstrative Adjectives, Past tense – Passé Compose (Verbe Auxiliare: Etre et Avoir)

UNIT 3
Culture and Civilization French Monuments (Tres celebres), French History (Jeanne d’Arc, Louis XIV, Prise de la Bastille), Culture and Civilisation (vin, fromage, mode, parfums)

UNIT 4
Transport system, government and media in France – articles on these topics.

UNIT 5
Comprehension and Grammar Comprehension passages and conversational sentences in different situations (at the restaurant, at the super market)

TOTAL 30

TEXT BOOK:
1. Panorama – Goyal Publishers
2. Apprenons le Francais II, Sarawathy Publications

SCHEME OF EVALUATION
Internal 50 = Listening – 10 Marks, Speaking – 20 Marks, Reading – 10 Marks and Writing = 10 Marks
MA0212 PROBABILITY AND QUEUEING THEORY

<table>
<thead>
<tr>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

Prerequisite: Nil

(Common for CSE, IT & ICE)

PURPOSE

To impart statistical techniques using probability and distributions.

INSTRUCTIONAL OBJECTIVES

At the end of the course, students should be able to

1. Be thorough with probability concepts and the corresponding distributions.
2. Get exposed to the testing of hypothesis using distributions.
3. Gain strong knowledge in principles of queuing theory.

UNIT 1 PROBABILITY AND RANDOM VARIABLES


UNIT 2 THEORETICAL DISTRIBUTIONS

Discrete: Binomial, Poisson, Geometric, Negative Binomial; Continuous: Exponential and Normal Distributions.

UNIT 3 TESTING OF HYPOTHESES

Large sample tests based on Normal Distribution – Small sample tests based on t, F distributions – Chi square tests for goodness of fit and independence of attributes.

UNIT 4 PRINCIPLES OF QUEUEING THEORY

Introduction to Markovian queueing models – Single server model with finite and infinite system capacity – Characteristics of the model; Applications of queueing theory to computer science and engineering.

UNIT 5 MARKOV CHAINS


TOTAL 60

TEXT BOOKS

   (Unit I – Chapter 1 Pages 1.1-1.20, Chapter 2 Pages 2.1 – 2.3, Chapter 3 Pages 3.1, Chapter 4 Pages 4.36
   Unit II – Chapter 5 Pages 5.1 – 5.8, 5.38, 5.39, 5.44 – 5.53, Unit IV – Chapter 8 Pages 8.1-8.10, 8.15, Unit V – Chapter 6 Pages 6.1 – 6.3, Chapter 7 Pages 7.45 – 7.49)

   (Unit III – Chapter 12 Section 12.1, 12.3,12.4,12.6-12.42, Chapter 13 Section 13.5, 13.39, 13.49, Chapter 14 Section 14.16- 14.24, 14.57).

REFERENCE BOOKS

CS0202 PRINCIPLES OF PROGRAMMING LANGUAGES

Prerequisite

CS0201, CS0203

PURPOSE
The purpose of this course is to impart concepts of Programming Languages

INSTRUCTIONAL OBJECTIVES
1. Concepts of High level languages and its grammar
2. Study of Imperative languages (Pascal and C)
3. Study of Object oriented Programming (C++ and JAVA)
4. Study of Functional Programming (Haskell / Lisp)
5. Study of Logic Programming (Prolog and SQL)

UNIT 1 PRELIMINARY CONCEPTS

UNIT 2 IMPERATIVE LANGUAGES
Structured Programming — Need and Design issues. Block Structures (Pascal), types arrays, records, sets, pointers, procedures, parameter passing, scope rules (in C).

UNIT 3 OBJECT ORIENTED LANGUAGES
Grouping of data and Operations — Constructs for Programming Structures, abstraction
Information Hiding, Program Design with Modules, Defined types, Object oriented programming — concept of Object, inheritance, Derived classes and Information hiding – Templates- Exception handling (Using C++ and Java as example language).

UNIT 4 FUNCTIONAL PROGRAMMING
Functional Programming — Features, Implementation, Types — values and operations, Product of types. Lists and Operations on Lists, Functions from a domain to a range, Function Application, Lexical Scope. Bindings of values and functions (Using Haskell / Lisp as example language)

UNIT 5 LOGIC PROGRAMMING
Formal Logic Systems, Working with relations and their implementation (Using Prolog as example). Database query Languages, Exception handling (Using SQL as example)

TEXT BOOK

REFERENCE BOOKS

ONLINE REFERENCES
PURPOSE
The purpose of this course is to impart concepts of Theory of Computation

INSTRUCTIONAL OBJECTIVES
1. Study of Finite Automata, Regular Expressions, Grammars.
2. Pushdown Automata, Turing Machines
3. Undecidability problems.

UNIT 1  FINITE AUTOMATA  10

UNIT 2  GRAMMARS  10

UNIT 3  PUSHDOWN AUTOMATA  9

UNIT 4  TURING MACHINE  8
Turing Machines- Introduction – Formal definition of Turing machines – Instantaneous descriptions- Turing Machine as Acceptors – Turing Machine as Transducers Computable Languages and functions – Turing Machine constructions – Modifications of Turing Machines.

UNIT 5  COMPUTATIONAL COMPLEXITY  8

TOTAL 45

TEXT BOOK

REFERENCE BOOKS

ONLINE REFERENCES
1. http://www.cis.upenn.edu/~cis511/
L T P C
CS0206 OPERATING SYSTEMS 3 0 0 3
Prerequisite
CS0201, CS0203

PURPOSE
Every computer professional should have a basic understanding of how an operating system controls the computing resources and provide services to the users. This course provides an introduction to the operating system functions, design and implementation. It serves as strong foundation for other courses like networks, compiler design, data base systems.

INSTRUCTIONAL OBJECTIVES
The students learn about:
1. Structure and functions of OS
2. Process scheduling, Deadlocks
3. Device management
4. Memory management
5. File systems

UNIT 1 INTRODUCTION
Computer system overview-basic elements, Instruction execution, Interrupts, memory hierarchy, I/O communication techniques, operating system overview-objectives and functions, Evolution of OS Microsoft windows overview.

UNIT 2 PROCESSES
Process description and control - process states, process description, process control; Processes and Threads, Symmetric Multiprocessing and microkernels. Windows Thread and SMP Management. Case studies-UNIX, SOLARIS thread management

UNIT 3 CONCURRENCY AND SCHEDULING

UNIT 4 MEMORY
Memory management requirements, partitioning, paging, and segmentation; Virtual memory - Hardware and control structures, operating system software, Linux memory management, case studies- WINDOWS memory management, UNIX and SOLARIS Memory management

UNIT 5 INPUT/OUTPUT AND FILE SYSTEMS
I/O management and disk scheduling – I/O devices, organization of I/O functions; OS design issues, I/O buffering, disk scheduling, Disk cache, File management – organization, directories, file sharing, record blocking, secondary storage management; case studies-LINUX I/O, UNIX File management.

TOTAL 45

TEXT BOOK

REFERENCE BOOKS

ONLINE REFERENCES
www.oreilly.com
www.eclipse.org
www.refdesk.com
CS 0210  COMPREHENSION I

Prerequisite
Should have studied the Computer Science and Engineering Subjects
Prescribed / opted for upto IV SEMESTER

<table>
<thead>
<tr>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>2</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

PURPOSE
To provide a compete picture of Computer Science and engineering topics covered in I to IV semesters so that a comprehensive understanding of Computer Science and engineering is achieved so that students are well prepared to face job interviews and subjects related competitive examinations.

INSTRUCTIONAL OBJECTIVES
To provide overview of all Computer Science and engineering topics covered I to IV semesters given below.
To assess the overall knowledge level of Computer Science and engineering standards and guide them to take corrective measures where deficiencies are detected.

COMPREHENSION

A. Review of the following topics of Computer Science and engineering:
Digital Computer Fundamentals
1. Programming in C
2. Data Structures
3. Design and Analysis of algorithms
4. Microprocessor and Interfacing
5. Principles of Programming Languages
6. Theory of Computation
7. Operating Systems
8. Java Programming

B. Seminar/group discussion
Students shall have seminar/group discussion sessions on the topics listed under A above under the guidance of staff.

TOTAL 30

(Evaluation shall consist of a 3 hour duration end semester examination consisting of objective type as well as conventional questions)

PD 0202  PERSONALITY DEVELOPMENT - IV

Prerequisite
Nil

<table>
<thead>
<tr>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>2</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

PURPOSE
The purpose of this course is to build confidence and inculcate various soft skills and to help Students to identify and achieve their personal potential

INSTRUCTIONAL OBJECTIVES
1. To guide thought process.
2. To groom students' attitude.
3. To develop communication skill.
4. To build confidence.

METHODOLOGY
The entire program is designed in such a way that every student will participate in the class room activities. The activities are planned to bring out the skills and talents of the students which they will be employing during various occasions in their real life.
1. Group activities + individual activities.
2. Collaborative learning.
3. Interactive sessions.
4. Ensure Participation.
5. Empirical Learning

UNIT – 1
Motivation II - Interpretation of Visuals of I & II

UNIT – 2
Humor in real life - Body language - Collage and poster designing and slogan writing

UNIT – 3
Brain Teasers – JAM - Current News Update I

UNIT – 4
Current News Update II - Enactment (SKIT –I) - Enactment (SKIT – II)

UNIT – 5
Survey and Reporting (heroes, sports persons etc.) - Quiz III - Review

EVALUATION:
1. Activities assessed by both group and individual participation
2. Continuous assessment based on daily participation

SCHEME OF INSTRUCTION
Marks allocated for regular participation in all oral activities in class

SCHEME OF EXAMINATION
Complete Internal evaluation on a regular Basis

<table>
<thead>
<tr>
<th>CS0212</th>
<th>OPERATING SYSTEMS LAB</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Prerequisite</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>CS0201, CS0203</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

PURPOSE
This laboratory course gives a complete understanding of the operating systems principles and its implementations

INSTRUCTIONAL OBJECTIVES
1. Scheduling algorithms
2. Deadlock algorithms and page replacement algorithms
3. Memory management schemes, Thread and synchronization

LIST OF EXPERIMENTS
1. Simulate the following CPU scheduling algorithms
   a) Round Robin
   b) SJF
   c) FCFS
   d) Priority
2. Simulate all file allocation strategies
   a) Sequential
   b) Indexed
   c) Linked
3. Simulate MVT and MFT
4. Simulate all File Organization Techniques
   a) Single level directory
   b) Two level
   c) Hierarchical
   d) DAG
5. Simulate Bankers Algorithm for Dead Lock Avoidance
6. Simulate an Algorithm for Dead Lock Detection
7. Simulate all page replacement algorithms
   a) FIFO   b) LRU   c) LFU
8. Shared memory and IPC
9. Simulate Paging Technique of memory management.
10. Threading & Synchronization Applications
11. Write a collection of sufficient no. of processes which carry out the following different types of tasks independently:
   1. Only computation
   2. Only printfs
   Tune each of the above process to run for 30 seconds when it runs standalone.
   Then run them simultaneously with different combinations.
   Gather per process and system statistics
   e.g. required cpu time, turnaround time, wait time, in each test combination
12. Write a collection of programs p1, p2, p3 such that they execute sequentially with the same process-id, and each program should also print its PID. (process id) The user should be able to invoke any combination of these programs, to achieve the required functionality.
   For example consider three programs twice, half, square which accept only one integer as argument and does some specific operation.

   a) twice 10 prints 20 and some int which is its process-id as output
   b) square 10 prints 100 and some int which is its process-id as output
   c) half 10 prints 5 and some int which is its process-id as output

   Now the user should be able to combine these programs in any combination to achieve the required result. For example:
   a) twice square half twice half 10 should calculate half(twice(half(square(twice(10))))) and print 200 as result. It should also print the process ids of each program as it executes. Note that the process-id printed by each of these programs should be the same, in this case.

REFERENCE:
Laboratory Manual

<table>
<thead>
<tr>
<th></th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS0214 JAVA PROGRAMMING</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

PURPOSE
To learn and Practice the basics of JAVA language

INSTRUCTIONAL OBJECTIVES
1. To learn & practice the Object Oriented concepts like Inheritance, Overloading etc.
2. To learn & practice Interfaces and Packages
3. To learn &practice Java applet programming

THEORY
Java Basics – Data types- methods – class – objects- overloading- Inheritance-types of inheritance- overriding- Exception handling – Strings - Interfaces- Packages- Threads- Applets- Exception handling

PRACTICAL

JAVA BASICS
1. Programs illustrating various data types in Java
2. Programs illustrating class, objects and methods
3. Programs for addition and multiplication of Matrices
4. Programs illustrating Overloading in Java
5. Programs illustrating the implementation of Various forms of Inheritance( Single, Hierarchical, Multilevel )
6. Programs illustrating Overriding methods in Java
7. Programs illustrating Exception Handling
8. Programs to manipulate strings

JAVA INTERFACES, PACKAGES and THREADS

9. Programs illustrating Interfaces in Java
10. Programs to create Packages in Java
11. Programs illustrating Threads in Java

JAVA APPLETS
12. Programs to write applets to draw the various shapes
13. Programs to manipulate labels, lists, text fields and panels
14. Programs to handle mouse events
15. Programs using layout managers

REFERENCE: Laboratory Manual
SEMESTER V

<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>CS0305</td>
<td>OPERATIONS RESEARCH TECHNIQUES</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

Prerequisite
MA 0102 & MA0211

PURPOSE
To enlighten the students with the various optimized techniques

INSTRUCTIONAL OBJECTIVES
At the end of the course the students will be able to know

1. Concepts of Linear programming technique
2. Applications and use of Assignment, Transportation and Replacement models
3. Techniques of PERT, CPM
4. Detailed knowledge of Inventory control
5. Advanced Linear Programming

UNIT – 1 LINEAR PROGRAMMING
Operations research and decision making, Types of mathematical models and constructing the model, Formulation of linear programming problem, Simplex method (Analytical & Graphical), Two phase and Big M methods

UNIT – 2 ASSIGNMENT & TRANSPORTATION MODELS

UNIT – 3 SCHEDULING AND NETWORK ANALYSIS
Problem of sequencing – Processing ‘n’ jobs through two machines and three machines, Processing two jobs through ‘m’ machines. Network analysis – PERT and CPM, Total slack, free slack, Probability of achieving completion date, Cost analysis

UNIT – 4 INVENTORY CONTROL
Inventory models – Deterministic models – Economic ordering quantity, Reorder level, optimum cost – Instantaneous and Non-instantaneous receipt of goods with or without shortages.

UNIT – 5 ADVANCED LINEAR PROGRAMMING

TOTAL 45

TEXT BOOK

REFERENCE BOOKS
PURPOSE
The subject Communication Engineering is offered for EIE, ICE, EEE & CSE branch students who are expected to know about the basics of communication engineering such as Analog modulation methods (AM, FM, PM Transmission, Reception), PCM and finally Digital modulation techniques.

INSTRUCTIONAL OBJECTIVES
1. AM Modulation and Demodulation – DSB-FC, DSB-SC, SSB, VSB.
2. FM Modulation and Demodulation
3. Data Transmission – ASK, FSK, PSK.
4. PAM, PPM, PWM, PCM, TDM AND FDM.
5. Fundamentals of Radar, TV, satellite and fiber optical communication.

UNIT 1 AM MODULATION

UNIT 2 TRANSMITTERS AND RECEIVERS

UNIT 3 FM MODULATION AND DEMODULATION

UNIT 4 PULSE MODULATION

UNIT 5 COMMUNICATION SERVICES (ELEMENTARY TREATMENT ONLY)

TOTAL 45

TEXT BOOKS

REFERENCE BOOKS
PURPOSE
To learn the Design aspects of a Compiler, and study other system software tools

INSTRUCTIONAL OBJECTIVES
1. To study the concepts of Assembler, Macro Processor, Loader and Linker
2. To learn about the various phases of compiler and syntax analysis
3. To learn the various parsing techniques
4. To learn the semantic analysis, translation of statements
5. To learn about Generating and Optimizing codes

UNIT 1 ASSEMBLER, MACRO, LOADER & LINKER
Assembler: Overview of the assembly process - Design of two pass assembler - Single pass assembler - Macros : Macro definition and usage- schematics for macro expansion - Design of a Macro pre-processor - Design of a Macro assembler ; Introduction to Loaders and Linkers.

UNIT 2 INTRODUCTION TO COMPILERS
Compiler: Introduction - Analysis of the source program - phases of a compiler - Compiler construction tools- Lexical analysis - Role of the lexical analyzer - Specification of tokens –Recognition of tokens -Lexical analyzer generators- Design aspects of Lexical Analyzer

UNIT 3 SYNTAX ANALYSIS – PARSING
Syntax Analysis: Role of the parser - Context free grammars - Top-down parsing: shift reduce- predictive parsing; Bottom-up parsing: Operator precedence, LR parsers (SLR, Canonical LR,LALR) - Parser generators- Design aspects of Parser.

UNIT 4 SEMANTIC ANALYSIS – TRANSLATION & RUNTIME STORAGE
Syntax-directed translation: Syntax-directed definitions - S-attributed definition - L-attributed definition -Top-down and bottom-up translation- Type checking - Type systems -Specification of a type checker; Run time environment -Source language issues -Storage organization –Storage allocation strategies - Access to non-local names - Parameter passing - Symbol tables- Design aspects of Syntax Directed Translation

UNIT 5 CODE GENERATION & OPTIMIZATION

TEXT BOOKS

REFERENCE BOOKS

ONLINE RESOURCES:
http://lambda.uta.edu/cse5317/notes/notes.html
www.cs.bilkent.edu.tr/~ilyas/courses/cs416/

TOTAL : 45
PURPOSE
To study the various layer in Computer Networking and its Protocol design

INSTRUCTIONAL OBJECTIVES
3. To understand the concepts of data communications.
4. To study the functions of different layers.
5. To make the students to get familiarized with different protocols and network components.

UNIT 1 INTRODUCTION

UNIT 2 PHYSICAL AND DATA LINK LAYERS

UNIT 3 MAC & NETWORK LAYERS
Media access control and LANs: The channel allocation – Methods and protocols for LANs – IEEE 802 standards and LAN technologies – Ethernet, token ring – hardware addressing - Network layer design issues—Routing Algorithms—Congestion Control Algorithms

UNIT 4 TRANSPORT LAYER

UNIT 5 APPLICATION LAYER
DNS—E-mail—WWW-Multimedia—Introduction to Cryptography–basic concepts-firewalls.

TEXT BOOK

REFERENCE BOOKS

ONLINE REFERENCES:
1. www.cs.purdue.edu
2. ocw.mit.edu/
4. http://authors.phptr.com/tanenbaumcn4
5. cs.umass.edu
6. www.csee.usf.edu
7. www.cs.cmu.edu
**PD0 301 PERSONALITY DEVELOPMENT - V**

<table>
<thead>
<tr>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

**Prerequisite**

Nil

**PURPOSE**

The purpose of this course is to build confidence and inculcate various soft skills and to help Students to identify and achieve their personal potential.

**INSTRUCTIONAL OBJECTIVES**

At the end of the course the students will be able to

1. Acquire the important soft skills for employment
2. Take part in group discussions and job interviews confidently
3. Appear for placement aptitude tests confidently
4. Gain self confidence to face the placement process

**METHODOLOGY**

The entire program is designed in such a way that every student will participate in the class room activities. The activities are planned to bring out the skills and talents of the students which they will be employing during various occasions in their real life.

1. Group activities + individual activities.
2. Collaborative learning.
3. Interactive sessions.
4. Ensure Participation.
5. Empirical Learning

**UNIT – 1**

Syllogism - Binary Logic [cause & effect] - Assertive & Counter Argument - Simple Interest - Time & Work - Time & Distance

**UNIT – 2**

Upstream &Downstream Reasoning - Verbal Comprehension I - Verbal Comprehension II- Compound InterestLogarithms - Surds & Indices

**UNIT – 3**

Verbal Reasoning I - Verbal Reasoning II - Verbal Reasoning III – Percentage – Test – Averages

**UNIT – 4**

Deductive Reasoning I - Deductive Reasoning II - Language Usage I - Decimal Fractions - Profit & Loss - Probability

**UNIT – 5**

Language Usage II - Logic Games I - Logic Games II – Area - Pipes & Cisterns - Test

**TOTAL 45**

**SCHEME OF INSTRUCTION**

Marks allocated for regular participation in all oral activities in class

**SCHEME OF EXAMINATION**

Complete Internal evaluation on a regular Basis

**CS0311 COMPILER DESIGN LAB**

<table>
<thead>
<tr>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
</tbody>
</table>

**Prerequisite**

CS0204

**PURPOSE**

To Practice and implement the system software tools and compiler design techniques
INSTRUCTIONAL OBJECTIVES
1. To implement Loader, Linker, Assembler & Macro processor
2. To implement the NFA,DFA, First & Follow procedures
3. To implement Top down and Bottom up parsing techniques

LIST OF EXPERIMENTS
1. Implementation of a Linker
2. Implementation of a Loader
3. Implementation of an Assembler
4. Implementation of Macro processor
5. Implementation of a Lexical Analyser
6. Converting a regular expression to NFA
7. Converting NFA to DFA
8. Computation of FIRST and FOLLOW sets
9. Construction of Predictive Parsing Table
10. Implementation of Shift Reduce Parsing
11. Computation of Leading and Trailing Sets
12. Computation of LR(0) items
13. Construction of DAG
15. Design of Simple Compiler using Tamil words
16. Trace the execution of another program - debugger

TOTAL 45

REFERENCE: Laboratory Manual

Prerequisite
CS0313 NETWORKING LAB
Prerequisite
0 0 3 2

PURPOSE
This laboratory course deals with the complete implementation aspects of Networking and their applications

INSTRUCTIONAL OBJECTIVES
1. TCP Socket Programming, UDP applications, File transfer
2. RMI and Routing Algorithms.

LIST OF EXPERIMENTS
1. Write a socket Program for Echo/Ping/Talk commands.
2. Create a socket (TCP) between two computers and enable file transfer between them.
3. Write a program to implement Remote Command Execution (Two M/Cs may be used)
4. Create a socket (UDP)
5. Write a code simulating ARP/RARP.
6. Create a socket for HTTP for web page upload & Download.
7. Write a program for TCP module Implementation (TCP services)
8. Write a program for File Transfer in client-server architecture using following methods.
   (a) USING RS232C (b) TCP/IP
9. Write a program to implement RMI (Remote Method Invocation)
10. Perform a case study about the different routing algorithms to select the network path with its optimum and economical during data transfer.
11. Implement client in C and server in Java.
12. Using QUAL NET 4.0
   a) Create a scenario with the following specifications.
      • No of subnets - 2
      • No. of nodes - 40
      • Traffic
        FTP - 11 to 21
        FTP - 30 to 40
        UDP - 5 to 7
      • Routing Protocol – AODV
      • 802.16
      Show the throughput using different bandwidths i.e., 10 Mbps and 100 Mbps respectively.
   b) Create a scenario as described below.
      No of students – 2
      SN -1 Nodes – 15
      SN -2 Nodes - 10
      Generate FTP Traffic & HTTP traffic between
      Nodes 1 to 11 (FTP)
      14 to 7 (HTTP / Gen FTP)
      Trace the packet with in the Simulation time and display the Trace file.

REFERENCE : Laboratory Manual

<table>
<thead>
<tr>
<th>CS 0315</th>
<th>INDUSTRIAL TRAINING I</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>L</td>
</tr>
<tr>
<td>Prerequisite</td>
<td>0</td>
</tr>
<tr>
<td>Nil</td>
<td></td>
</tr>
</tbody>
</table>

(Training to be undergone after IV Semester)

PURPOSE
To provide hands-on experience at site where Computer Science and engineering projects are executed.

INSTRUCTIONAL OBJECTIVES
1. To enable the students to gather a first hand experience on site.

INDUSTRIAL TRAINING I
1. Students have to undergo two weeks practical training in Computer Science and Engineering related project sites. At the end of the training they have to submit a report together with a certificate in the format prescribed and make a presentation which shall be evaluated.
SEMESTER VI

<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>CS0302</td>
<td>ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEMS</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

Prerequisite
MA 0211

PURPOSE
The purpose of this course is to impart concepts of Artificial Intelligence and Expert System

INSTRUCTIONAL OBJECTIVES
1. To study the concepts of Artificial Intelligence
2. Methods of solving problems using Artificial Intelligence

UNIT 1 INTRODUCTION TO AI AND PRODUCTION SYSTEMS 10
Introduction to AI — Problem formulation, Problem Definition — Production systems, Control strategies, Search strategies. Problem characteristics, Production system characteristics — Specialized production systems — Problem solving methods — Problem graphs, Matching, Indexing and Heuristic functions — Hill Climbing, Depth first and Breath first, Constraint satisfaction — Related algorithms, Measure of performance and analysis of search algorithms.

UNIT 2 REPRESENTATION OF KNOWLEDGE 10
Game playing — Knowledge representation, Knowledge representation using Predicate logic, Introduction to predicate calculus, Resolution, Use of predicate calculus, Knowledge representation using other logic — Structured representation of knowledge.

UNIT 3 FUNDAMENTALS OF EXPERT SYSTEMS 9

UNIT 4 KNOWLEDGE INFERENCE 8
Knowledge representation — Production based system, Frame based system. Inference — Backward chaining, Forward chaining, Rule value approach, Fuzzy reasoning — Certainty factors, Bayesian probability.

UNIT 5 MACHINE LEARNING 8

TOTAL 45

TEXT BOOKS

REFERENCE BOOKS:

ONLINE REFERENCES:
1. http://library.thinkquest.org/2705/
<table>
<thead>
<tr>
<th>COURSE</th>
<th>DATABASE MANAGEMENT SYSTEMS</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS0304</td>
<td></td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

**Prerequisite**
CS0201, Maths I

**PURPOSE**
To study the concepts of Relational Database design and query languages

**INSTRUCTIONAL OBJECTIVES**
1. To provide a general introduction to relational model
2. To learn about ER diagrams
3. To learn about Query Processing and Transaction Processing

**UNIT 1 INTRODUCTION**

**UNIT 2 THE RELATIONAL DATA MODEL & ALGEBRA**

**UNIT 3 SQL**

**UNIT 4 INDEX STRUCTURE, QUERY PROCESSING**

**UNIT 5 FAILURE RECOVERY AND CONCURRENCY CONTROL**

**TOTAL 45**

**TEXT BOOK**

**REFERENCE BOOKS**

**ONLINE RESOURCES**
http://www.cs.helsinki.fi/u/laine/tikape/k03/material03.html
http://infolab.stanford.edu/~ullman/dscb.html
http://cs.nyu.edu/courses/spring06/G22.2433-001/
PURPOSE
This course separates and makes explicit the decisions that make up an object oriented analysis and design. We show how to use the UML notations most effectively both to discuss designs with colleagues, and in documents.

INSTRUCTIONAL OBJECTIVES
To provide the students with sufficient knowledge for
1. Understanding Object Basics, Classes and Objects, Inheritance
2. How software objects are altered to build software systems that are more robust
3. Gaining enough competence in object-oriented analysis and design (OOAD) to tackle a complete object oriented project
4. Understanding the issues and options in reuse
5. Using UML, a common language for talking about requirements, designs, and component interfaces

UNIT 1 INTRODUCTION 8
Categories of Information systems – traditional paradigm Vs Object oriented paradigm – Objects and Classes – Inheritance – Object relationship – Examples of UML class modeling – Unified Process – Iteration and incrementation within the unified process

UNIT 2 UML AND THE UNIFIED PROCESS 9
Overview of requirements – Initial understanding of the domain – Business Model – Requirements workflow – Osbert Oglesby case study- MSG Foundation case study – revising the requirements – MSG Foundation case study – Continuing the requirements workflow – MSG Foundation case study - Refining the revised requirements – MSG Foundation case study

UNIT 3 OBJECT ORIENTED ANALYSIS 10
Extracting entity classes – Initial dynamic model – Extracting control classes- refining use cases – incrementing the class diagram – Initial dynamic model – MSG Foundation case study – revising the entity classes- Extracting – USE case realization – MSG Foundation case study – incrementing the class diagram – more on use cases - risk

UNIT 4 OBJECT ORIENTED DESIGN WORKFLOW 10

UNIT 5 TESTING AND MANAGEMENT ISSUES 8

TOTAL 45

TEXT BOOKS

REFERENCE BOOKS
ONLINE REFERENCES
http://www.ooad.org/
http://www2.enel.ucalgary.ca/People/far/Lectures/SENG609-23/
http://www.cs.virginia.edu/~horton/cs494/

<table>
<thead>
<tr>
<th>CS0308</th>
<th>LOGIC FOR COMPUTER SCIENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>L  T  P  C</td>
</tr>
<tr>
<td>3 0 0 3</td>
<td></td>
</tr>
<tr>
<td>3 0 0 3</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Prerequisite</td>
</tr>
<tr>
<td></td>
<td>MA 0101, MA 0102 &amp; MA 0211</td>
</tr>
</tbody>
</table>

PURPOSE
To study important concepts in Logic

INSTRUCTIONAL OBJECTIVES
4. To provide main notions of Mathematical Logic
5. To learn Formal framework to construct logic arguments
6. To student deductive systems along with completeness

UNIT 1 PROPOSITIONAL LOGIC
Declarative sentences – Natural deduction – Popositional logic as a Formal Language – Semantics of Propositional Logic – Normal Forms – SAT Solvers

UNIT 2 PREDICATE LOGIC
Predicate Logic as a formal Language - Proof Theory of Prediacte Logic - Semantics of Prediacte Logic – Undecidability of Predicate Logic - Expressiveness of Predicate Logic Models – Micromodels of Software

UNIT 3 VERIFICATION BY MODEL CHECKING
Motivation for Verification – Linear Time Temporal Logic – Model Checking : systems, Tools and Properties – Branching Time temporal Logic – Model Checking algorithms – CTL+ and the expressive power of LTL and CTL – Fixed point characterization of CTL

UNIT 4 PROGRAM VERIFICATION AND MODAL LOGIC
A Framework for software verification – Proof calculus for partial correctness – Proof calculus for total correctness – Basic Modal logic – Logic Engineering – Natural Deduction – Reasoning about knowledge in a multi-agent system

UNIT 5 BINARY DECISION DIAGRAMS
Representing Boolean functions – Algoritms for reduced OBBDs - Geometric Templates from Spatial Relations – Application – Image Based Rendering – Symbolic Model Checking – A relational Mu – calculus – Coding CTL models and specifications

TOTAL 45

TEXT BOOK
Huth M and Ryan M ,” Logic in Computer Science : Modeling and Reasoning about systems”, Cambridge University Pres 2005

REFERENCE BOOKS

ONLINE REFERENCES
http://www.cs.swan.ac.uk/~csetzer/logic-server/
http://www.cis.upenn.edu/~jean/gbooks/logic.html
http://arxiv.org/list/cs.LO/recent
http://www.cs.rice.edu/~vardi/comp409/
PURPOSE
To provide a complete picture of Computer Science and engineering topics covered in I to IV semesters including the related topics covered in I to IV semesters so that a comprehensive understanding of Computer Science and engineering is achieved so that students are well prepared to face job interviews and subjects related competitive examinations.

INSTRUCTIONAL OBJECTIVES
1. To provide overview of all Computer Science and engineering topics covered in V and VI semesters including the related topics covered in I to IV semesters as given below.
2. To assess the overall knowledge level of Computer Science and engineering standards and guide them to take corrective measures where deficiencies are detected.
3. Review of the following topics of Computer Science and engineering:
   1. Data Structures
   2. Design and Analysis of Algorithms
   3. Operating Systems
   4. Theory of Computation
   5. Compiler Design
   6. Computer Networks
   7. Artificial Intelligence and Expert Systems
   8. Data Base Management Systems
   9. Object Oriented Analysis and Design
   10. Logic for Computer Science

B. Seminar/group discussion
Students shall have seminar/group discussion sessions on the topics listed under A above under the guidance of staff.

TOTAL 30
(Evaluation shall consist of a 3 hour duration end semester examination consisting of objective type as well as conventional questions)

PURPOSE
The purpose of this course is to build confidence and inculcate various soft skills and to help Students to identify and achieve their personal potential

INSTRUCTIONAL OBJECTIVES
At the end of the course the students will be able to
1. Acquire the important soft skills for employment
2. Take part in group discussions and job interviews confidently
3. Appear for placement aptitude tests confidently
4. Gain self confidence to face the placement process

METHODOLOGY
The entire program is designed in such a way that every student will participate in the class room activities. The activities are planned to bring out the skills and talents of the students which they will be employing during various occasions in their real life.
1. Group activities + individual activities.
2. Collaborative learning.
3. Interactive sessions.
4. Ensure Participation.
5. Empirical Learning

UNIT – 1                              9
Self Introduction - Narration - Current News Update – Numbers - Height & Distance - Square & Cube Roots

UNIT – 2                              9
Current Tech Update - Verbal Aptitude Test I - GD –I - Odd man out series - Permutation & Combination - Problems on ages

UNIT – 3                              9
GD –II - Resume Writing - Mock Interview I / reading comprehension - Problems on trains – Allegation of Mixtures - Test

UNIT – 4                              9

UNIT – 5                              9
GD – IV - Verbal Aptitude Test II – Review – Partnership – Puzzles - Test

TOTAL 45

SCHEME OF INSTRUCTION
Marks allocated for regular participation in all oral activities in class

SCHEME OF EXAMINATION
Complete Internal evaluation on a regular Basis

<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>CS0312</td>
<td>ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEMS LAB</td>
<td></td>
<td></td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Prerequisite</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>MA 0211</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

PURPOSE
To learn & implement the various concepts & algorithms of AI & Expert Systems

INSTRUCTIONAL OBJECTIVES
1. To implement Heuristic functions & Prepositional Logic
2. To implement A* & AO* algorithms
3. To implement an Expert system for medical diagnosis

LIST OF EXPERIMENTS
1. Water Jug Problem (Using DFS And BFS)
2. Single Player Game(Using Heuristic Function)
3. Two Player Game(Using Heuristic Function)
4. A* Algorithm
5. AO* Algorithm
6. Predicate To Prepositional Logic
8. Develop an Expert system for Medical diagnosis.
9. Develop any Rule based system for an application of your choice.
10. Develop an algorithm for morphological derivation / verb derivation and implement it.

TOTAL 45

REFERENCE : Laboratory Manual
PURPOSE
This laboratory course gives a thorough understanding of the concepts of database design model and its applications. It also gives a comprehensive understanding of using a query language.

INSTRUCTIONAL OBJECTIVES
1. Designing a database
2. Using DDL and DML commands
3. Backing up of files

LIST OF EXPERIMENTS
1. Data Definition Language (DDL) commands in RDBMS
2. Data Manipulation Language (DML) and Data Control Language (DCL)
3. High level language extensions with cursors
4. High level language extension with Triggers
5. Procedures and Functions
6. Embedded SQL
7. Database design using E-R model and Normalization
8. Design and implementation of payroll processing system
9. Design and implementation of Banking system
10. Design and implementation of Library Information System
11. Design and implementation of Student Information System
12. Automatic Backup of Files and Recovery of Files

REFERENCE: Laboratory Manual
### SEMESTER VII

<table>
<thead>
<tr>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>MB0403</td>
<td>INDUSTRIAL MANAGEMENT AND ECONOMICS</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td><strong>Prerequisite</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Nil</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**PURPOSE**
To expose the students on Economics and management aspects.

**INSTRUCTIONAL OBJECTIVES**
To apply theoretical economic concepts to practical business situation and to take decision in the Industrial Engineering Situation.

#### UNIT 1 INTRODUCTION

#### UNIT 2 PRODUCTION AND MANAGEMENT

#### UNIT 3 MANAGERIAL ECONOMICS
Managerial economics for Industry-Demand-Types-Supply-Factors-Determining Demand-Elasticity of Demand-Forecasting Methods-Utility-Theories of Utility – Pricing – Methods of Pricing.

#### UNIT 4 ENGINEERING ETHICS

#### UNIT 5 ACCOUNTING AND FINANCE

**TOTAL** 45

**TEXT BOOKS**

**REFERENCE BOOKS**
2. Vaishney, sundaram,“Managerial economics”, sultan Chand, New Delhi.

<table>
<thead>
<tr>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS0401</td>
<td>SOFTWARE ENGINEERING</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td><strong>Prerequisite</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Nil</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**PURPOSE**
This course in Software Engineering provides an in-depth understanding of the Software Engineering principles and methodologies.
INSTRUCTIONAL OBJECTIVES

1. Planning and Estimation of Software projects
2. Software Requirements Specification, Software Design Concepts
3. Implementation issues, Validation and Verification Procedures
4. Maintenance of Software and methodologies

UNIT 1 SOFTWARE PROJECT MANAGEMENT

UNIT 2 SOFTWARE REQUIREMENTS ANALYSIS

UNIT 3 SOFTWARE DESIGN CONCEPTS
User interface Design- principles- SCM- Need for SCM- Version control – Introduction to SCM process – software configuration items

UNIT 4 IMPLEMENTATION AND TESTING
Software testing – levels – test activities – types of s/w test – black box testing – testing boundary conditions – structural testing – test coverage criteria based on data flow mechanisms – regression testing – testing in the large. S/W testing strategies – strategic approach and issues - unit testing – integration testing – validation testing – system testing and debugging

UNIT 5 SOFTWARE MAINTENANCE & RELIABILITY ISSUES
Software reliability – issues- Software reliability Vs Hardware reliability – Failures and Faults - Classification of Failures – Components and Operational Models

TEXT BOOKS

REFERENCE BOOKS

ONLINE REFERENCES :
PURPOSE
The purpose of this course is to provide the basics of parallel computing, algorithm design and parallel programming.

INSTRUCTIONAL OBJECTIVES
1. An introduction about parallel computing.
2. Parallel programming platforms
3. Principles of parallel algorithm design
4. Principles of message passing
5. Shared address space platforms

UNIT 1 INTRODUCTION TO PARALLEL COMPUTING
Motivating Parallelism-Scope of parallel computing-Parallel programming platforms-Implicit Parallelism-Limitations of Memory System Performance-Dichotomy of Parallel computing platforms-Physical organization of parallel platforms-Communication costs in parallel machines-Routing mechanisms for inter connection networks.

UNIT 2 PRINCIPLES OF PARALLEL ALGORITHM DESIGN
Preliminaries- Decomposition techniques-characteristics of tasks and interactions-mapping techniques for load balancing-methods for containing interaction overheads-parallel algorithm models.

UNIT 3 BASIC COMMUNICATION OPERATIONS
One to all broadcast and all to one reduction-all to all broadcast and reduction-scatter and gather-sources of overhead in parallel programs-performance metrics for parallel systems-the effect of granularity on performance.

UNIT 4 PROGRAMMING USING MESSAGE PASSING PARADIGM
Principles of message passing programming-Building blocks-Message passing interface-Topologies and embedding-Overlapping computation with communication-Collective communication and computation operation.

UNIT 5 PROGRAMMING SHARED ADDRESS SPACE PLATFORMS

TOTAL 45

TEXT BOOKS
2. Cameron Hughes, Tracey Hughes, "Parallel and Distributed Programming using C++", Pearson education, 2005

REFERENCE BOOK

ONLINE REFERENCES:
www.ebooks.com
www.freebookcentre.com
PURPOSE

- VLSI provides improved solutions for high speed networking, high performance computers, and special applications of integrated circuits, requiring the use of multiple disciplines
- There is urgent need to absorb and assimilate the latest development in the VLSI and embedded system design field
- VLSI industry needs VLSI design engineers and Embedded system design engineers

INSTRUCTIONAL OBJECTIVES

In this course, the students will be able to

1. Study the physics of MOSFETs at an elementary level, derive their I/V characteristics, describe the second-order effects, and derive small-signal model.
2. Acquire working knowledge of basic digital design paradigms and the necessary Verilog HDL constructs that would help to build small digital circuits
3. Learn the concepts of embedded processors, embedded programming and Real-Time Operating Systems.

UNIT –1
Basic MOS device physics (Elementary treatment only)
MOSFET as a switch - MOSFET structure, symbols, operation – logic gates in CMOS, transmission gate circuits.

UNIT -2
Electrical characteristics of MOSFETs and CMOS Logic gates
Threshold voltage, derivation of I/V characteristics – short-channel effects – MOS device models – DC characteristics, switching characteristics and power dissipation of CMOS inverter.

UNIT -3
Digital system design with Verilog HDL (Elementary treatment only)
Basic concepts, modules and ports – gate-level modeling, dataflow modeling, behavioural modeling, switch-level modelling, UDPs.

UNIT -4
Introduction to embedded systems (Elementary treatment only)
Challenges of Embedded Systems – Embedded system design process. Embedded processors – 8051 Microcontroller, ARM processor – Architecture, Instruction sets and embedded programming in Assembly Language (ALP) and in High-Level Language ‘C’

UNIT -5
Real-Time Operating System (Elementary treatment only)
Concept of tasks, task states, task and data, hard and soft real time systems - task scheduling like SJF, RR, EDF, RM - Process, Process table, Inter process communication, Interrupts, clock synchronization, deadlocks - semaphores, shared data, semaphore functions, message queue functions, mailbox functions, pipe functions, timer functions, events, memory management, interrupt routines in RTOS environment, basic design using an RTOS

Total 45

TEXT BOOKS
REFERENCE BOOKS

<table>
<thead>
<tr>
<th>CS0411</th>
<th>SOFTWARE ENGINEERING LAB</th>
<th>L T P C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Prerequisite</td>
<td>0 0 2 1</td>
</tr>
<tr>
<td></td>
<td>NIL</td>
<td></td>
</tr>
</tbody>
</table>

PURPOSE
To understand the concepts and implement the software engineering methodologies in the list of applications given below.

INSTRUCTIONAL OBJECTIVES
Develop two or three of the following applications using the software engineering methodologies given below using Visual tools as front end and MS-ACCESS as Backend.
- Requirements Analysis
- Design Concepts
- Function Point Analysis
- Implementation
- Software Testing Techniques
- Error Tracking

Suggested List of Applications:
1. Library Management System
2. Bank Management System
3. Inventory System
4. Software for a Game
5. Text Editor
6. Natural Language Based Grammar Checker
7. Airline Reservation System
8. Online Survey

REFERENCE: Laboratory Manual

<table>
<thead>
<tr>
<th>CS0413</th>
<th>VLSI AND EMBEDDED SYSTEM DESIGN LAB</th>
<th>L T P C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Prerequisite</td>
<td>0 0 3 2</td>
</tr>
<tr>
<td></td>
<td>CS0205, CS0211</td>
<td></td>
</tr>
</tbody>
</table>

PURPOSE
- Almost all embedded systems are designed with microcontrollers as an essential basic part.
  This subject provides basic knowledge of typical microcontrollers.
- HDL programming is fundamental for VLSI design and hence this course is given.

INSTRUCTIONAL OBJECTIVES
To make the students
- To learn two typical microcontrollers and how to use it in practical applications. The lab component gives hands on training on the design, development and microcontroller applications.
- To write programs in VHDL and verilog for modeling digital circuits.
LIST OF EXPERIMENTS

1. Design with 8 bit Microcontrollers 8051/PIC Microcontrollers
   i) I/O Programming, Timers, Interrupts, Serial port programming
   ii) PWM Generation, Motor Control, ADC/DAC, LCD and RTC Interfacing, Sensor Interfacing
   iii) Both Assembly and C programming
2. Design with ARM Processors - I/O programming, ADC/DAC, Timers, Interrupts
3. Study of one type of Real Time Operating Systems (RTOS)
4. Design and Implementation of simple Combinational/Sequential Circuits
5. Design with Programmable Logic Devices using Xilinx/Altera FPGA and CPLD

<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>CS0316</td>
<td>INDUSTRIAL TRAINING – II</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

(Training to be undergone after VI Semester)

PURPOSE
To provide hands-on experience at site where Computer Science and engineering projects are executed.

INSTRUCTIONAL OBJECTIVES
1. To enable the students to gather a first hand experience on site.

INDUSTRIAL TRAINING II

1. Students have to undergo two weeks practical training in Computer Science and Engineering related project sites. At the end of the training they have to submit a report together with a certificate in the format prescribed and make a power point presentation which shall be evaluated.
# SEMESTER VIII

<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>CS0402</td>
<td>SCRIPTING LANGUAGES AND WEB TECHNOLOGY</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

**Prerequisite**
CS0202, CS0303

**PURPOSE**
Uses of web sites and portals have become common for knowledge sharing and business. The course focuses on the fundamentals of CGI, SCRIPTING LANGUAGES, Web Applications

**INSTRUCTIONAL OBJECTIVES**
This course introduces the students to
1. Basic web concept and Internet protocols.
2. CGI Concepts & CGI Programming
3. SCRIPTING LANGUAGES
4. Study of DHTML, XML
5. Study of On-Line web application & Internet Concepts

**UNIT 1: INTRODUCTION**

**UNIT 2: COMMON GATEWAY INTERFACE PROGRAMMING**

**UNIT 3: SCRIPTING LANGUAGES**
JavaScript Programming-Dynamic HTML-Cascading style sheets-Object model and Event model- Filters and Transitions-Active X Controls-Multimedia-Client side script- VB Script programming – Forms – Scripting Object

**UNIT 4: SERVER SIDE PROGRAMMING**

**UNIT 5: ON-LINE APPLICATIONS**

**TOTAL 45**

**TEXT BOOKS**

**REFERENCE BOOKS**

**ONLINE REFERENCES**
http://books.google.com
http://en.wikipedia.org/wiki/scriptinglanguage
PURPOSE
To simulate real life situations related to Computer Science and engineering and impact adequate training so that confidence to face and tackle any problem in the field is developed.

INSTRUCTIONAL OBJECTIVES
1. To guide the students such a way that the students carry out a comprehensive work on the chosen topic which will stand them in good stead as they face real life situations.

PROJECT
Each student is given an exercise which will cover all the aspects (to the extent possible) like investigation, planning, designing, detailing and estimating of a Computer Science and engineering structure in which the aspects like analysis, application of relevant codes, etc., will find a place. Alternately, a few research problems also may be identified for investigation and the use of laboratory facilities to the fullest extent may be taken as a project work. Alternately, a student is encouraged to take an industrial project with any Computer Science and engineering organization or firm. A project report is to be submitted on the topic which will be evaluated.
ELECTIVES FOR FIFTH SEMESTER

<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>CS0321</td>
<td>SYSTEM MODELLING AND SIMULATION</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

**Prerequisite**
Nil

**PURPOSE**
This course provides a complete understanding of the various mathematical models, simulation techniques and its applications

**INSTRUCTIONAL OBJECTIVES**
1. Mathematical models for simulation
2. Random numbers generation
3. Analysis of simulation data and modeling
4. Applications of Simulation, and, simulation software

**UNIT 1  INTRODUCTION**
9
Systems & Environment – Discrete & Continuous systems- model of a system – Types- Discrete event system simulation – steps; Simulation Example – Queuing systems – Inventory systems – other examples; General Principles – concepts in Discrete event simulation – List processing

**UNIT 2  MATHEMATICAL & STATISTICAL MODELS**
9
Statistical models – Discrete & Continuous distributions – Poisson process; Queueing models – Characteristics – notations; long run measure of performance of queueing systems – server utilization – costs in queueing problems; steady-state behavior of infinite population Markovian models- Multiserver Queue: \(M/M/c/\infty/\infty\) , \(M/M/c/k/k\)

**UNIT 3  RANDOM NUMBERS**
9

**UNIT 4 ANALYSIS OF SIMULATION DATA**
9
Input modeling – Identifying the distribution – parameter estimations – Goodness of Fit test – Fitting a non stationery poisson process – selecting input models without data; Verification and Validation of simulation models- model building – verification of models – calibration and validation of models – output analysis for a single model.

**UNIT 5  APPLICATION & SIMULATION SOFTWARES**
9
History of Simulation Software - Simulation in Java, GPSS, SSF; Introduction to various simulation softwares

**TOTAL** 45

**TEXT BOOK**

**REFERENCE BOOKS**

**ONLINE REFERENCES**
1. Simulation Software Development Framework
   www.topology.org/soft/sim.html
2. Simulation in Python
   www.simpy.sourceforge.net
3. C++ Simulation :  http://cxxsim.ncl.ac.uk
<table>
<thead>
<tr>
<th>CS0323</th>
<th>DIGITAL IMAGE PROCESSING</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>

**Prerequisite**

Nil

**PURPOSE**

This course provides a complete understanding of the various image processing techniques

**INSTRUCTIONAL OBJECTIVES**

- Image fundamentals and techniques
  - To learn various Image enhancement, restoration and compression techniques
  - To learn various Image segmentation, representation and description methods

**UNIT 1 INTRODUCTION**


**UNIT 2 IMAGE ENHANCEMENT**

Spatial Domain: Gray level transformation – Histogram processing – Arithmetic / Logic operations- Spatial filtering – smoothing filters – sharpening filters

Frequency Domain: Fourier transform – smoothing frequency domain filters – sharpening filters – Homographic filtering

**UNIT 3 IMAGE RESTORATION**


**UNIT 4 IMAGE COMPRESSION**


**UNIT 5 IMAGE SEGMENTATION, REPRESENTATION & DESCRIPTION**

Segmentation: Detection of discontinuities – Edge linking & Boundary detection – Thresholding – region based segmentation

Representation & Description: Chain codes – Polygonal approximations – signatures – Boundary segments – Skeletons; Boundary Descriptors – Regional descriptors

**TOTAL**

45

**TEXT BOOK**


**REFERENCE BOOKS**


**ONLINE REFERENCES**

http://eeweb.poly.edu/~onur/lectures/lectures.html
www.caen.uiowa.edu/~dip/LECTURE/lecture.html
PURPOSE
This course gives a strong foundation to the Visual Programming concepts

INSTRUCTIONAL OBJECTIVES
1. Basics of Windows Programming
2. Visual Basic, Visual C++ and Visual JAVA Programming
3. Java Applets and Networking concepts

UNIT 1 INTRODUCTION TO WINDOWS PROGRAMMING 8

UNIT 2 VISUAL BASIC PROGRAMMING 10

UNIT 3 VISUAL C++ PROGRAMMING 9
Visual C++ components – Developing simple applications – Microsoft Foundation classes – Controls – Message handling - Document-view architecture – Dialog based applications – Mouse and keyboard events.

UNIT 4 VISUAL JAVA – INTRODUCTION 9

UNIT 5 JAVA APPLETS AND NETWORKING 9

TEXT BOOKS

REFERENCE BOOKS

ONLINE RESOURCES
http://www.hitmill.com/programming/vb.htm
http://www.programmersheaven.com/
http://www.austinlinks.com/CPlusPlus/
http://support.microsoft.com/kb/305326

TOTAL 45
PURPOSE
This course provides a way to understand the concepts of Artificial Intelligence, ANN, Genetic Algorithms and Fuzzy systems and its applications.

INSTRUCTIONAL OBJECTIVES
1. Basics of AI and ANN
2. Neuro-fuzzy systems and its applications
3. Genetics algorithms and its applications

UNIT 1 BASICS OF NEUROSCIENCE AND ANN MODELS

UNIT 2 FUZZY SYSTEMS

UNIT 3 NEURO-FUZZY SYSTEMS

UNIT 4 GENETIC ALGORITHMS

UNIT 5 ARTIFICIAL INTELLIGENCE
AI technique-Level of the Model – Problems, Problem Spaces and Search – Issues in the Design of Search Programs – Heuristic Search Techniques – Knowledge Representations and Mappings

TOTAL 45

TEXT BOOKS
1. N. K. Bose and P. Liang, “Neural Network Fundamentals”

REFERENCE BOOKS

ONLINE REFERENCE
www.cs.nthu.edu.tw/~jang/nfsc.htm
CS0329         ADVANCED OPERATING SYSTEMS

L | T | P | C
---|---|---|---
3 | 0 | 0 | 3

Prerequisite
Nil

PURPOSE
To learn the Advances concepts of Operating Systems

INSTRUCTIONAL OBJECTIVES
1. To learn the Multiprocessor and Network Operating Systems
2. To learn the Distributed OS, Database OS and Real time OS

UNIT 1 MULTIPROCESSOR OPERATING SYSTEMS

UNIT 2 NETWORK OPERATING SYSTEMS (NOS)
Types of NOS – NOS to LANs – Choosing and NOS – Multiple NOS on a single Network – NOS and Network management – Future Trends.

UNIT 3 DISTRIBUTED OPERATING SYSTEMS

UNIT 4 DATABASE OPERATING SYSTEMS

UNIT 5 REAL TIME OPERATING SYSTEMS

TOTAL 45

TEXT BOOKS

REFERENCE BOOKS

ONLINE REFERENCES
http://cactus.eas.asu.edu/partha/Teaching/Archive/531.1999/
http://redwood.snu.ac.kr/bbs/zboard.php?id=Conference

75
CS0331 - E-COMMERCE

<table>
<thead>
<tr>
<th></th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prerequisite</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

**PURPOSE**

This course provides a better understanding of the concepts of Electronic Commerce.

**INSTRUCTIONAL OBJECTIVES**

1. E-Commerce Framework, EDI
2. Security in E-Commerce
3. Intelligent Agents

**UNIT 1 INTRODUCTION**

9


**UNIT 2 E-COMMERCE**

9

Consumer oriented E-Commerce applications – Mercantile process models; Electronic Payment Systems – Digital Token based EPS – Smart cards – Credit cards – Risks – designing EPS.

**UNIT 3 ORGANIZATIONAL COMMERCE AND EDI**

9

Electronic Data Interchange – EDI applications in Business – EDI and e Commerce – EDI standardization and implementation – Internet based EDI.

**UNIT 4 SECURITY**

9


**UNIT 5 INTELLIGENT AGENTS**

9


**TOTAL 45**

**TEXT BOOKS**

1. Ravi Kalakota and Andrew B Whinston, “Frontiers of Electronic Commerce”, Pearson Education Asia, 1999.(Chapters 1,2,3,6-10,16)

**REFERENCE BOOKS**

Judy Strauss and Raymond Frost, “E Marketing”, PHI, 2002

**ONLINE REFERENCES**

http://www.techtutorials.info/ecommerce.html(Unit-1,2)
http://en.wikipedia.org/wiki/Electronic_data_interchange(Unit-3)
http://cs.anu.edu.au/student/comp3410/lectures/security/symmetric-4up.pdf(Unit-4)
http://www.iscca.org/mirrors/sans.org/4-37.pdf
http://www.cs.berkeley.edu/~russell/aimale/chapter02.pdf(unit-5)
CS0333  TCP/IP PRINCIPLES AND ARCHITECTURE  

<table>
<thead>
<tr>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

Prerequisite
Nil

**PURPOSE**

To learn the principles of TCP/IP and its Architecture.

**INSTRUCTIONAL OBJECTIVES**

1. Network Layer and Applications
2. UDP and TCP applications
3. Transport Layer Reliability
4. To understand the basic concepts of TCP/IP Architecture

**UNIT 1 INTRODUCTION**


**UNIT 2 NETWORK LAYER AND APPLICATION**


**UNIT 3 UDP AND APPLICATIONS**

Introduction- UDP header- UDP checksum- examples-IP fragmentation - ICMP unreachable errors – Path MTU discovery- Interaction between UDP and ARP-UDP datagram size- ICMP source quench error- Broad casting and Multi casting - IGMP- NFS- -TFTP-BOOTP

**UNIT 4 TCP**


**UNIT 5 TRANSPORT LAYER RELIABILITY AND APPLICATION**


**TOTAL 45**

**TEXT BOOKS**


**REFERENCE BOOKS**

3. Richard Stevens, “ TCP/IP Illustrated”, Vol 1,2,3 Pearson education India, 1996

**ONLINE REFERENCES**

[http://ckp.made-it.com/ieee8023.html](http://ckp.made-it.com/ieee8023.html)
ELECTIVES FOR SIXTH SEMESTER

<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>CS0322</td>
<td>ADVANCED NETWORKS</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

**Prerequisite**
Nil

**PURPOSE**
This course gives an overview of advanced computer networks and TCP/IP protocols and also covers security and network management aspects.

**INSTRUCTIONAL OBJECTIVES**
1. IPV4 and IPV6 protocols routing
2. Resource allocation and service management
3. Network security and example security systems
4. Network management and its protocols
5. Advanced network protocol applications

**UNIT 1 HIGH SPEED NETWORKS**
Performance modeling and estimation – Queuing analysis – self similarity and self similar traffic.

**UNIT 2 CONGESTION, TRAFFIC MANAGEMENT AND INTERNET ROUTING**

**UNIT 3 PRINCIPLES OF WIRELESS NETWORK OPERATION**

**UNIT 4 LOCAL AND BROADBAND AND AD HOC NETWORKS**

**UNIT 5 NETWORK MANAGEMENT**
Advanced Applications – IP encapsulation – VPNs – Mobile IP – Header Compression – Voice over IP – IP and ATM IP over dial-up links
Case Study: Design of Cluster Networks

**TOTAL** 45

**TEXT BOOKS**
3. Adrian Farrel, “*The Internet and its Protocols*” First India Reprint 2005, Elsevier publications (Units V)

**REFERENCE BOOKS**

**ONLINE REFERENCES**
- [www.utdallas.edu/~metin/SuNet](http://www.utdallas.edu/~metin/SuNet)
- [www.rivier.edu/faculty/vriabov](http://www.rivier.edu/faculty/vriabov)
- [ce.sharif.edu/courses](http://ce.sharif.edu/courses)
- [http://williamstallings.com/HsNet2e.html](http://williamstallings.com/HsNet2e.html)
PURPOSE
This course provides a detailed understanding of the concepts of Virtual Reality and its application.

INSTRUCTIONAL OBJECTIVES
1. Geometric modeling and Virtual environment.
2. Virtual Hardware and Software.
3. Virtual Reality applications.

UNIT 1 INTRODUCTION

UNIT 2 GEOMETRIC MODELLING

UNIT 3 VIRTUAL ENVIRONMENT

UNIT 4 VR HARDWARES & SOFTWARES

UNIT 5 VR APPLICATION

TEXT BOOKS

REFERENCE BOOKS

ONLINE REFERENCES
www.vresources.org
www.vrac.iastate.edu
www.w3.org/MarkUp/VRML/
**CS0326 ADVANCED DATABASES**

<table>
<thead>
<tr>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

**Prerequisite**
Nil

**PURPOSE**
The purpose of this course is to impart knowledge on various data structure concepts to the students.

**INSTRUCTIONAL OBJECTIVES**
At the end of the course, student should be able to understand
1. Several Database concepts like Distributed Database, Spatial Database, Mobile Database, Temporal Database
2. Applications of Databases
3. Analysis of Database design and Methodology

**UNIT 1 INTRODUCTION**
Introduction to Database – Database Environment – Relational Model – Relational Algebra and Relational Calculus – Introduction to SQL – Commercial RDBMS – Ms Access 2000, Oracle 8i.

**UNIT 2 DATABASE ANALYSIS & DESIGN TECHNIQUES**

**UNIT 3 METHODOLOGY**

**UNIT 4 OBJECT ORIENTED AND DISTRIBUTED DATABASES**

**UNIT 5 CURRENT TRENDS**

**TEXT BOOK**

**REFERENCE BOOKS**

**ONLINE RESOURCES**
http://www.doc.ic.ac.uk/~pjm/adb/index.html
http://www.cs.manchester.ac.uk/postgraduate/taught/programmes/fulllist/index.html#COMP60362

80
PURPOSE
To study the Artificial Neural Networks and its applications in computer field

INSTRUCTIONAL OBJECTIVES
1. To learn the basics of ANN and comparing with Human brain
2. To learn the various architectures of building an ANN and its applications
3. To learn the pattern classification techniques, advanced methods of representing information in ANN

UNIT 1 INTRODUCTION
Definition of ANN-Biological Neural Networks-Applications of ANN-Typical Architectures-Setting the weights-Common Activation functions-Development Of Neural Networks-McCulloch-Pitts Neuron

UNIT 2 SIMPLE NEURAL NETS FOR PATTERN CLASSIFICATION
General discussion - Hebb net – Perceptron- Adaline - Backpropagation neural net- Architecture- Algorithm-Applications

UNIT 3 PATTERN ASSOCIATION
Training Algorithm for Pattern Association-Heteroassociative memory neural network-Autoassociative net-Iterative Autoassociative net-Bidirectional Associative Memory

UNIT 4 NEURAL NETS BASED ON COMPETITION
Fixed Weights Competitive Nets- Kohonen’s Self-Organizing Map – Learning Vector Quantization-Counter Propagation Network.

UNIT 5 ADAPTIVE RESONANCE THEORY AND NEOCOGNITRON

TOTAL 45

TEXT BOOK

REFERENCE BOOKS

ONLINE REFERENCES
http://www.cs.stir.ac.uk/~lss/NNIntro/InvSlides.html
http://www.willamette.edu/~gorr/classes/cs449/intro.html
PURPOSE
This course aims to exploit genuine quantum features to envisage novel forms of information processing.

INSTRUCTIONAL OBJECTIVES
To provide the students sufficient knowledge for
1. quantum mechanics
2. gate and measurement based models of quantum computation
3. to complement the traditional approaches of computation

UNIT 1 INTRODUCTION

UNIT 2 QUANTUM MECHANICS
Linear operators and matrices – adjoints and Hermitian operators – tensor products – polar and singular value decomposition - state space – quantum measurement – projective measurements – superdense coding – ensembles of quantum states – EPR and Bell inequality

UNIT 3 QUANTUM COMPUTATION

UNIT 4 QUANTUM SEARCH ALGORITHMS
The oracle – the procedure – Geometric visualization – Quantum counting – Speeding up the solution of NP complete problems – Quantum search of an unstructured database – Optimality of the search algorithms

UNIT 5 QUANTUM INFORMATION THEORY
Distinguishing quantum states and the accessible information – Schumacher’s quantum noiseless channel coding theorem for data compression – communication over noisy quantum channel – Entanglement distillation and Quantum error correction – quantum key distribution – security of quantum key distribution.

TEXT BOOK
M. A. Nielsen and I. L. Chuang, Quantum Computation and Quantum information, Cambridge University Press 2000

REFERENCE BOOKS

ONLINE REFERENCES
http://www.qubit.org/
http://www.hpl.hp.com/research/qip/
http://www.qipirc.org/links.php
ELECTIVES FOR SEVENTH SEMESTER

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS0421</td>
<td>GENETIC ALGORITHMS</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

**Prerequisite**

Nil

**PURPOSE**

This course enables us to understand the concepts of Genetic Algorithms and its applications.

**INSTRUCTIONAL OBJECTIVES**

1. Genetic Operators and modeling
2. Applications of Genetic Algorithms
3. Genetic Based Machine Learning

**UNIT 1 INTRODUCTION TO GENETIC ALGORITHM**


**UNIT 2 GA OPERATORS**


**UNIT 3 GENETIC MODELLING**


**UNIT 4 APPLICATIONS OF GA**


**UNIT 5 GENETICS-BASED MACHINE LEARNING**

Genetics – Based Machined learning – Classifier system – Rule & Message system – Apportionment of credit: The bucket brigade – Genetic Algorithm – A simple classifier system in Pascal. – Results using the simple classifier system-The Rise of GBMC – Development of CS-1, the first classifier system. – Smith’s Poker player–Current Applications.

**Total 45**

**TEXT BOOKS**


**REFERENCE BOOK**


**ONLINE REFERENCES**

www.ai-depot.com
www.cscs.umich.edu/links/evocomp.html
CS0423 SPEECH TECHNOLOGY

L  T  P  C
3  0  0  3

Prerequisite
Nil

PURPOSE
To study important concepts in Speech technology

INSTRUCTIONAL OBJECTIVES
To provide a general introduction to speech technology
1. To study about text to speech conversion, speech recognition
2. To study about machine translation

UNIT 1 INTRODUCTION AND FINITE STATE TRANSDUCERS
9
Introduction: Knowledge in Speech and Language processing – Ambiguity – Models and algorithms –
Language, thought and understanding - Regular expressions – Finite state automata – Regular Languages –
Morphology: Survey of English morphology – Morphological parsing – Combining FST Lexicon and rules –
The porter stemmer – Human morphological processing

UNIT 2 TEXT TO SPEECH AND PROBABILISTIC MODELS
9
Speech Sounds and Phonetic Transcription – Phonological Rules – Transducers – Advanced issues in
computational phonology – Mapping text to phones for TTS – prosody in TTS – Probabilistic models: Spelling
errors – Detecting Non-word errors – Bayesian method to spelling and pronunciation. Minimum Edit Distance –

UNIT 3 SPEECH RECOGNITION AND GRAMMER
9
Architecture – Overview of Hidden Markov Models - Viterbi Algorithm - Acoustic processing – Acoustic
probabilities – Speech Recognizer – Speech synthesis – English word classes – Part of Speech Tagging – Rule
Based POS tagging – Transformation Based Tagging – issues- Context Free Rules and Trees – Sentence Level

UNIT 4 PARSING
9
Parsing as Search – Top Down Parser – Problems – Earley Algorithm – Finite State Parsing Methods –
Probabilistic Context Free Grammars – Problems with PCFGs – Probabilistic Lexicalized CFGs – Dependency
Grammars – Human Parsing – Computational Desiderata for Representations - First Order Predicate Calculus –
Linguistically Relevant Concepts – Alternative Approaches to Meaning.

UNIT 5 SEMANTIC ANALYSIS AND MACHINE TRANSLATION
9
Syntax Driven Semantic Analysis – Attachments – Robust Semantic Analysis – Dialogue and Conversational
Statistical Techniques – Usability and System Development.

TOTAL 45

TEXT BOOK

REFERENCE BOOKS

ONLINE REFERENCES
http://www.stanford.edu/class/cs224s/2006/
http://www.cs.colorado.edu/%7Emartin/SLP/slp-web-resources.html
http://www.speech.cs.cmu.edu/comp.speech/
http://www.speech.cs.cmu.edu/comp.speech/
CS0425 MOBILE COMPUTING

Prerequisite

Nil

PURPOSE
To learn the standards and issues in Wireless and Mobile Computing

INSTRUCTIONAL OBJECTIVES
1. Wireless transmission basics
2. Different architectures of Telecommunication Systems
3. Medium Access control Techniques
5. Ad Hoc networks

UNIT 1 INTRODUCTION

UNIT 2 MAC, TELECOMMUNICATION AND SATELLITE SYSTEMS

UNIT 3 WIRELESS LAN

UNIT 4 MOBILE NETWORK LAYER AND TRANSPORT LAYER

UNIT 5 ADHOC WIRELESS NETWORKS

TOTAL 45

TEXT BOOKS

REFERENCE BOOKS

ONLINE REFERENCES
www.interscience.wiley.com/jpages/1530-8669
www.cambridge.org/us/catalogue/catalogue.asp

CS0427 NETWORK SECURITY

Prerequisite

Nil

PURPOSE
This course provides a way to understand the various security techniques in network.
INSTRUCTIONAL OBJECTIVES
1. Encryption techniques and key generation techniques
2. Authentication and security measures
3. Intrusion and filtering analysis

UNIT 1 CONVENTIONAL AND MODERN ENCRYPTION

UNIT 2 PUBLIC KEY ENCRYPTION
Number Theory – Prime number – Modular arithmetic – Euclid’s algorithm - Fermat’s and Euler’s theorem – Primality – Chinese remainder theorem – Discrete logarithm – Public key cryptography and RSA – Key distribution – Key management – Diffie Hellman key exchange – Elliptic curve cryptography

UNIT 3 AUTHENTICATION

UNIT 4 SECURITY PRACTICE
Authentication applications – Kerberos – X.509 Authentication services - E-mail security – IP security - Web security

UNIT 5 SYSTEM SECURITY
Intruder – Intrusion detection system – Virus and related threats – Countermeasures – Firewalls design principles – Trusted systems – Practical implementation of cryptography and security

TOTAL 45

TEXT BOOK

REFERENCE BOOKS

ONLINE REFERENCES
1. www.williamstallings.com/Security2e.html

<table>
<thead>
<tr>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS0429</td>
<td>FAULT TOLERANT COMPUTING</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Prerequisite</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nil</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

PURPOSE
This course gives a detailed design of fault tolerant systems and self checking systems

INSTRUCTIONAL OBJECTIVES
1. Basics of failures and faults
2. Fault tolerant design and Fail safe design
3. Designing testable combinational logic circuits

UNIT 1 BASIC CONCEPTS
Failure and Faults, Reliability and failure rate, relation between eligibility and Mean-time Between failures, maintainability and availability, reliability of series and parallel systems, Modeling of faults, stuck at, Bridging (short-circuit), stuck open, transient and intermittent faults.

Test Generation: Fault diagnosis of digital systems, Test generation for combinational logic circuits – conventional methods, Random testing, transition count testing and signature analysis.

UNIT 2 FAULT TOLERANT DESIGN
Basic concepts – static, dynamic, Hybrid, and self-purging redundancy, shift-over Modular Redundancy (SMR). Triple Modular redundancy, SMR. Reconfiguration, use of error correcting codes. Time redundancy, software redundancy, fail soft-operation, examples of practical fault tolerant systems, Introduction to fault Tolerant Design of VLSI Chips.

UNIT 3 SELF CHECKING CIRCUITS & FAIL SAFE DESIGN

UNIT 4 DESIGN FOR TESTABLE COMBINATION LOGIC CIRCUITS
Basic concepts of test ability, controllability and observability. The read-muller expansion technique, three level OR-AND-OR design, use of control logic and syndrome-testable design.

UNIT 5 DESIGN OF TESTABLE SEQUENTIAL CIRCUITS
The scan-path technique – level sensitive scan design (LSSD) and Random Access scan technique, built-in-test, built-in-test of VLSI chips, design for autonomous self-Test, Designing Testability into logic Boards.

TEXT BOOK

REFERENCE BOOKS

ONLINE REFERENCE
http://books.google.co.in

<table>
<thead>
<tr>
<th>CS0431</th>
<th>WINDOWS INTERNALS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>L</td>
</tr>
<tr>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>

Prerequisite
Nil

PURPOSE
The purpose of this course is to make the students familiar with Windows programming techniques and concepts in windows environment.

INSTRUCTIONAL OBJECTIVES
1. Windows architecture
2. Windows Programming 2000
3. Windows driver programming
4. DLL and Security

UNIT 1 OVERVIEW OF WINDOWS

UNIT 2 MENUS, CONTROLS AND PROGRAMS 10
Application essentials- messages & basic I/O, Menu basics, Menu programming, Dialog box and sample programs, scroll bar programs, Listbox, radiobutton and static controls, Working with Bitmaps, solving the repaint problem.

UNIT 3 TEXT AND CONTROLS 10
Working with text, using graphics- drawing arcs, rectangles, world-coordinate transforms, mapping modes to view ports, experiments with GDI, More common controls- up-down control, Track bars, Progress bar, status windows, tab controls, tree views.

UNIT 4 MULTITASK VS MULTIPROGRAM 9
Multi Programming, multi tasking concepts, Thread-based Multitasking, Using Header month, calendar control programs, Property sheets & Wizards.

UNIT 5 WINDOWS HELP PROGRAMMING AND DLL SECURITY 8
Context Sensitive vs Reference Help, WM_Help, WinHelp demonstration program, printer device context, system registry and creation of screen savers, DLL’s and Security.

TOTAL 45

TEXT BOOK

REFERENCE BOOKS
1. Win32 API Programming with Visual Basic, published by O’Reilly and Associates, Inc. – Steve Roman - 1999 (Chapter – 9) (Unit -1)
2. Developing Drivers with the Microsoft Windows Driver Foundation – Penny Orwick; Guy Smith - MS Press – 2007 (Unit 5)

ONLINE REFERENCES
http://www.microsoft.com/technet/archive/ntwrkstn/evaluate/featfunc/winarch.mspx
http://www.microsoft.com/whdc/driver/wdf/wdf-intro.mspx
www.chapters.indigo.ca/.../item/books-978007212189/0072121890/Windows-2000-Programming-from-the-Ground-Up
www.codepedia.com/1/Herbert+Schildt
www.ecampus.com/isbnbrowser2/isbnstart/00721

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS0433</td>
<td>LINUX INTERNALS</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

Prerequisite
Nil

PURPOSE
To study the basic and administration concepts in Linux.

INSTRUCTIONAL OBJECTIVES
1. To provide a general introduction to Linux server.
2. To teach user administration, internet and intranet services.
3. To introduction of process and shell programming.

UNIT 1 INSTALLING LINUX AS A SERVER 9

UNIT 2 SINGLE – HOST ADMINISTRATION

UNIT 3 INTERNET SERVICES

UNIT 4 INTRANET SERVICES

UNIT 5 LINUX PROCESS CONTROL & SHELL PROGRAMMING

TEXT BOOK

REFERENCE BOOKS
3. Christopher Negus , “Red Hat Linux 9 Bible “, Wiley Dreamtech India Pvt Ltd.2002

ONLINE REFERENCES
www.linuxhomenetworking.com
www.google.com/linux
www.linux.org
http://www.oreillynet.com/linux/cmd/
http://tldp.org/FAQ/Linux-FAQ/

<table>
<thead>
<tr>
<th>CS0435</th>
<th>COMPUTER VISION</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Prerequisite</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Nil</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

PURPOSE
To study important concepts in Computer Vision

INSTRUCTIONAL OBJECTIVES
1. To provide a general introduction in the field of Computer Vision
2. To teach mathematical concepts and techniques
3. To solve real vision problems

UNIT 1 IMAGE FORMATION AND IMAGE MODELS
Geometric Camera Models - Geometric Camera Calibration - Radiometry - Measuring Light – Shadows and shading - Color
UNIT 2 EARLY VISION - MULTIPLE IMAGES
The Geometry of Multiple Views - Stereopsis - Affine Structure from Motion - Projective Structure from Motion

UNIT 3 MID LEVEL VISION
Segmentation by Clustering - Segmentation by Fitting a Model - Segmentation and Fitting using Probabilistic Methods - Tracking with Linear Dynamic Models

UNIT 4 HIGH LEVEL VISION – GEOMETRIC METHODS
Model-Based Vision - Smooth Surfaces and their Outlines - Aspect Graphs - Range Data

UNIT 5 HIGH LEVEL VISION - PROBABILISTIC AND INFERENTIAL METHODS
Recognition by Relations between Templates - Geometric Templates from Spatial Relations – Application – Image Based Rendering

TOTAL 45

TEXT BOOKS

REFERENCE BOOKS
1. Y Shirai Three Dimensional Computer Vision Springer Verlag 1987
3. Haralick R M And Shapiro L G Computer And Robot Vision Vo I and II Addison Wesley 1993

ONLINE REFERENCES
http://kercd.free.fr/linksKCD.html
http://www.cs.ubc.ca/spider/lowe/vision.html
http://www.teiauth.gr/seyp/optics/Vision.htm
http://www.visionscience.com/

CS0437 ADVANCED JAVA PROGRAMMING
Prerequisite
Nil

<table>
<thead>
<tr>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

PURPOSE
To learn the different concepts of Advanced Java and techniques

INSTRUCTIONAL OBJECTIVES
1. To learn Java Applets, Beans and Networking concepts
2. To learn Advanced Java Networking concepts
3. To learn the JDBC and Graphics in Java

UNIT 1 INTRODUCTION TO ADVANCED JAVA
Java Streaming – Components and events handling – Threading concepts – Networking features – Byte code interpretation – Media Techniques.

UNIT 2 JAVA APPLETS AND BEANS
Applets and HTML – Bean Concepts – Events in Bean Box – Bean customization and persistence – JavaScript – Combining scripts and Applets – Applets over web - Animation techniques – Animating images.

UNIT 3 ADVANCED NETWORKING
Client-Sever computing – Sockets – Content and Protocols handlers – Developing distributed applications – RMI – Remote objects – Object serialization

UNIT 4 JAVA DATABASE PROGRAMMING
UNIT 5 RELATED JAVA TECHNIQUES
3D graphics – JAR file format and creation – Internationalization – Swing Programming – Advanced Java Scripting Techniques.

TEXT BOOKS

REFERENCE BOOKS

ONLINE REFERENCES
http://javaboutique.internet.com/tutorials/Basics
http://java.sun.com/developer/onlineTraining/Programming/JDCBook
http://lists.xcf.berkeley.edu/mailman/listinfo/advanced-java
http://java.sun.com/docs/books/tutorial/networking/TOC.html

L T P C
CS0439 COMPONENT BASED TECHNOLOGY 3 0 0 3
Prerequisite
Nil

PURPOSE
The course contains concepts of software components and deals with the design of ORB applications.

INSTRUCTIONAL OBJECTIVES
The main aim of this course is to teach the students
1. Fundamentals of COM and DCOM
2. Advanced concepts of COM
3. Concepts of CORBA, building ORB applications in Java

UNIT 1 COM BASICS Components-Components benefits-components requirements-COM-interface-implementing COM interface-Behinds interface-Query interface- Query interface rules and regulating- query interface defines the component-handling new versions of components- Dynamic linking-Distributed COM.

UNIT 2 ADVANCED CONCEPTS OF COM Class factory- Cocreate instance – Class features-Implementing the class factory-Multiple components in DLL-Unloading the DLL- Component reuse: Containment and aggregation – Implementing containment – Implementing interface-Implementing aggregation-Multiple threads-COM threads-Implementing apartment and free threading.

UNIT 3 JAVA VS CORBA Benefits of java programming with CORBA – CORBA overview-object management group- object management architecture, CORBA –OMG IDL

UNIT 4 JAVA ORB Overview of java and java ORB’s- Interface, class, and object –Java applets – Java servlets- java beans- Java ORB terminology- Clients and servers as Java application- Client as Java applets- Client as Servlets- servers as Java Applets-Clients and servers implemented using non-java ORB-First java ORB application -OMG IDL Java mapping.

UNIT 5 SERVICES AND EVENTS
Discovering services: CORBA naming service- Trading service-Overview of trading
service interface-Binding application-Advanced features- The any type and type codes- Interface repositioning and dynamic invocation and interface-Dynamic skeleton interface-Events-CORBA event service concepts-Notifications service-Java events and CORBA.

TOTAL 45

TEXT BOOKS

REFERENCE BOOKS

ONLINE REFERENCES
http://www.sei.cmu.edu/str/descriptions/com_body.html
http://java.sun.com/developer/technicalArticles/RMI/rmi_corba/
http://ei.cs.vt.edu/~cs6704/CORBA.ppt

CS0441 / IT0362 INFORMATION STORAGE AND MANAGEMENT

<table>
<thead>
<tr>
<th></th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prerequisite</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

PURPOSE
Information Storage and Management has highly developed into a sophisticated pillar of information technology, provides a variety of solutions for storing, managing, accessing, protecting, securing, sharing and optimizing information.

INSTRUCTIONAL OBJECTIVES
After successful completion of the course, the students should be able to
• Evaluate storage architectures, including storage subsystems, DAS, SAN, NAS, CAS
• Define backup, recovery, disaster recovery, business continuity, and replication
• Examine emerging technologies including IP-SAN
• Understand logical and physical components of a storage infrastructure
• Identify components of managing and monitoring the data center
• Define information security and identify different storage virtualization technologies

UNIT 1
Introduction to Information Storage Management - Intelligent Storage System - Direct Attached - Storage - Introduction to SCSI - Introduction to parallel SCSI, SCSI Command Model – Storage Area Networks - Fiber Channel Connectivity, Login types, Topologies.

UNIT 2
Network-Attached Storage- General purpose servers vs NAS Devices - Benefits of NAS,NAS File I/O - NAS Components, Implementation, File Sharing protocols, I/O operations - IPSAN,ISCSI, Components of ISCSI- Content-Addressed Storage

UNIT 3
Fixed Content and Archives, Types, Features, Benefits, CAS Architecture, object storage and Retrieval, examples - Storage Virtualization-forms of virtualization, SNIA Taxonomy – Storage virtualization configurations, challenges, Types of storage virtualization - Business Continuity
UNIT 4  
Information Availability, BC Terminology, Life cycle, Failure analysis - Backup and Recovery -  
Backup purpose, considerations, Backup Granularity, Recovery considerations - Backup methods,  
process, backup and restore operations, Securing the Storage infrastructure  

UNIT 5  
Storage security framework, Risk triad - Managing the storage infrastructure, Monitoring the storage  
infrastructure, storage management activities.  

Total 45

REFERENCES:  
1. EMC Corporation, Information Storage and Management, WileyIndia, 9788126521470.  
2003.  
ELECTIVES FOR EIGHTH SEMESTER

<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>CS0422</td>
<td>ATM NETWORKS</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

**Prerequisite**
Nil

**PURPOSE**
This course provides an introduction to ATM Networks, various layers in ATM, ATM Protocols and routing issues.

**INSTRUCTIONAL OBJECTIVES**
1. To study the various topologies, Protocol Architectures and basics of ATM cells.
2. To learn about the routing issues and various algorithms to control congestion.
3. To study about wireless ATM and the current trends in ATM.

**UNIT 1  INTRODUCTION**

**UNIT 2 ATM PROTOCOL**

**UNIT 3 ROUTING ISSUES**
Routing for high speed networks – RSVP, Traffic and Congestion control – Traffic shaping – Peak cell rate algorithms – Rate based congestion control – Connection admission control.

**UNIT 4 HIGH SPEED LANS**
Fast Ethernet – ATM LAN’s – LAN Emulation (LANE)

**UNIT 5 PROTOCOLS OVER ATM**
Multiple protocols over ATM, IP over ATM, TCP over ATM – Real time transport protocol – Wireless ATM – Current trends.

**TOTAL 45**

**TEXT BOOK**

**REFERENCE BOOKS**

**ONLINE REFERENCES**
http://williamstallings.com/HsNet2e.html
http://williamstallings.com/DCC/DCC7e.html
www.cs.wisc.edu

<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>CS0424</td>
<td>DATA MINING</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

**Prerequisite**
Nil

**PURPOSE**
This course enable us to understand the concepts of Data Mining and its applications.

**INSTRUCTIONAL OBJECTIVES**
1. Data mining techniques and algorithms
2. Data Mining environments and applications
UNIT 1 INTRODUCTION
Data Mining Tasks, Data mining Issues, Decision Support System, Dimensional Modelling, Data warehousing, Data warehousing, OLAP & its tools, OLTP

UNIT 2 MINING TECHNIQUES & CLASSIFICATION
Introduction, statistical Perspective of data mining, Decision tree, Neural networks, Genetic algorithms, Issues in classification, Statistical based algorithm (regression), Distance based algorithm (simple approach), Decision Tree based algorithm (C4.5), Neural network based (propagation)

UNIT 3 CLUSTERING AND ASSOCIATION RULES
Introduction to clustering, Similarity and distance measures, Hierarchical algorithm (divisive clustering), Partitional algorithm (Minimum Spanning tree, nearest neighbour), Clustering large database (CURE), Introduction to association, basic algorithm (Apriori), parallel & distributed (data parallelism), Incremental rules, Association rule techniques (Generalised, multiple level)

UNIT 4 ADVANCED MINING
Web mining, Web content mining, Introduction to Spatial mining & its primitives, spatial classification algorithm (ID3 extension), Spatial clustering algorithm (SD), Introduction to temporal mining, Time series, Temporal association rule

UNIT 5 DATA MINING ENVIRONMENT
Case study in building business environment, Application of data mining in Government, National data warehouse and case studies

TEXT BOOK
1. Margaret H. Dunham, S. Sridhar “Data Mining Introductory & Advance Topics” (Unit – 1, 2, 3, 4) -2006

REFERENCE BOOK

ONLINE REFERENCE
http://www.data-miners.com/

CS0426 GRID COMPUTING
Prerequisite
Nil

L T P C
3 0 0 3

PURPOSE
To understand the technology application and tool kits for grid computing

INSTRUCTIONAL OBJECTIVES
1. To understand the genesis of grid computing
2. To know the application of grid computing
3. To understand the technology and tool kits for facilitating grid computing

UNIT 1 INTRODUCTION AND OVERVIEW OF GRID COMPUTING
Early Grid Activities-Current Grid Activities-An Overview of Grid Business Areas-Grid Applications-Grid Infrastructure

UNIT 2 WEB SERVICES AND RELATED TECHNOLOGIES

UNIT 3 DISTRIBUTED OBJECT TECHNOLOGY FOR GRID COMPUTING (OGSA)
Introduction to Open Grid Services Architecture (OGSA)- Commercial Data Center- National Fusion Collaboratory- The OGSA Platform Components
UNIT 4 OPEN GRID SERVICES INFRASTRUCTURE (OGSI) 9

UNIT 5 OGSA BASIC SERVICES AND THE GRID COMPUTING TOOLKITS 9

TOTAL 45

TEXTBOOK

REFERENCE BOOK

ONLINE REFERENCES
http://www.cs.uiowa.edu/~jni/GC/
The TeraGrid: http://www.teragrid.org
The NSF Middleware initiative: http://www.nsf-middleware.org
The Globus Project: http://www.globus.org
The Grid Portal Toolkit (Grid Port): http://www.gridport.net
The Open Grid Computing Environments Consortium: http://www.ogce.org
The GridSphere Project: http://www.gridsphere.org
IBM Grid Pages: http://www-1.ibm.com/grid/
Univeristy of Texas UT Grid: http://utgrid.utexas.edu

GRID STANDARDS AND ORG
The Web Services Resource Framework:
OASIS: http://www.oasis-open.org/
WSRF Technical Committee: http://www.oasis-open.org/committees/wsrf/charter.php
Globus: http://www.globus.org
From the Oasis WSRF Pages:
The WSRF TC takes, as its starting point, the set of specifications and the papers:
http://devresource.hp.com/drc/specifications/wsrf/WSRF_overview-1-0.pdf) recently published by IBM, the Globus Alliance, HP, Fujitsu and CA.
The above papers describe how state associated with a Web service can be modeled in terms of a WS-Resource and give an overview of the specifications that comprise the framework.
World Wide Web Consortium (W3C): http://www.w3.org

<table>
<thead>
<tr>
<th>CS0428</th>
<th>AGENT BASED SYSTEMS</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Prerequisite</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

PURPOSE
The purpose of this course is to impart concepts of agents and multi agent systems

INSTRUCTIONAL OBJECTIVES
1. To provide a comprehensive introduction to agents and multiagent systems.
2. It covers a broad range of distributed artificial intelligence topics including agent architectures, agent interaction and communication, and applications of agent-based systems.
3. It lays the foundations for advanced courses such as Multi-Agent Semantic Web Systems.
UNIT 1 BASICS

Basics: definitions of agency; properties of agents; agents vs. objects-

Agent Architectures: reactive/deliberative/hybrid agents; BDI and practical reasoning agents; deductive reasoning agents.

UNIT 2 RATIONAL REASONING

Rational Reasoning: decision-theoretic/game-theoretic foundations- bounded rationality; means-ends reasoning - planning

UNIT 3 INTERACTION

Interaction: non-communicative interaction; agent communication languages; interaction protocols.

UNIT 4 AGENT COORDINATION

Agent coordination: distributed problem solving, planning and task sharing; teamwork and coalition formation; negotiation (game-theoretic/heuristic/argumentation-based); matchmaking and brokering.

UNIT 5 ADVANCED TOPICS

Advanced Topics: distributed search/distributed constraint satisfaction; multiagent learning; agent-oriented software engineering; trust/norms/institutions, organisational approaches.

TOTAL 45

TEXT BOOK


REFERENCE BOOK


ONLINE REFERENCES

http://www.inf.ed.ac.uk/teaching/courses/abs/
http://www.sics.se/isl/abc/survey.html
http://en.wikipedia.org/wiki/Multi-agent_system
http://www.des.warwick.ac.uk/research/absg/

<table>
<thead>
<tr>
<th></th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS0430 HUMAN COMPUTER INTERACTION</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

Prerequisite

Nil

PURPOSE

This course provides a thorough understanding of the user interaction with computers

INSTRUCTIONAL OBJECTIVES

1. Software process and Design rules
2. Implementation and user support
3. Different models for cognition and collaboration
4. Introduction to Ubiquitous computing

UNIT 1 FOUNDATIONS


UNIT 2 SOFTWARE PROCESS & DESIGN RULES

UNIT 3 IMPLEMENTATION & USER SUPPORT

UNIT 4 COGNITIVE, COMMUNICATION & COLLABORATIVE MODELS
Cognitive models – Goal & task hierarchies – Linguistic models – Physical & device models – architectures; communication & collaboration models – Face-to-face communication – conversation – text based – group working; Task analysis – difference between other techniques – task decomposition – Knowledge based analysis – ER based techniques – uses

UNIT 5 UBIQUITOUS COMPUTING, HYPERTEXT, WWW

TOTAL 45

TEXT BOOK

REFERENCE BOOK

ONLINE REFERENCES
www.scis.nova.edu/nova/hci/notes.html
http://courses.iicm.tugraz.at/hci/hci.pdf
www.ida.liu.se/~miker/hci/course.html

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS0432</td>
<td>REAL TIME SYSTEM DESIGN</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Prerequisite</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nil</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

PURPOSE
This course enables us to understand the concepts of Real time systems and its applications

INSTRUCTIONAL OBJECTIVES
1. Basics of Real time systems
2. Real time memory and design considerations
3. Integration of Hardware and software in real time applications

UNIT 1 INTRODUCTION

UNIT 2 DESIGN TECHNIQUES
Real time specification and design techniques – structure of an RTOS - real time kernels – intertask communication and synchronization.

UNIT 3 MEMORY MANAGEMENT
Real time memory management. System performance analysis and optimization.

UNIT 4 QUEUING MODELS AND FAULT TOLERANT ARCHITECTURES
Queuing models – Reliability, testing and fault tolerance, HW/SW faults, diagnosis, functional testing. Fault tolerant architectures: TMR systems - multiprocessing systems.
UNIT 5 APPLICATIONS
Hardware/Software integration, real time applications- case studies

TEXT BOOKS

REFERENCE BOOKS

ONLINE REFERENCES
www.eventhelix.com/realtimemantra/basics
wwwunix.ecs.umass.edu/~krishna
http://infoweb.vub.ac.be/infoef/ulbarch/
www.augustana.ab.ca/~mohrj/courses/2005.winter/cs380/slides.7e

<table>
<thead>
<tr>
<th>CS0434</th>
<th>PATTERN RECOGNITION</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Prerequisite</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Nil</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

PURPOSE
This course provide a way to learn the various pattern recognition techniques and their applications

INSTRUCTIONAL OBJECTIVES
1. Pattern features and Statistical techniques
2. Cluster analysis and synthetic pattern recognition
3. Feature extraction techniques and advances in the field

UNIT 1 INTRODUCTION

UNIT 2 STATISTICAL PATTERN RECOGNITION

UNIT 3 CLUSTER ANALYSIS
Unsupervised learning – Clustering for unsupervised learning and classification – C-means algorithm – Hierarchical clustering procedures – Graph theoretic approach to pattern clustering – Validity of clustering solutions.

UNIT 4 SYNTACTIC PATTERN RECOGNITION
Elements of formal grammar – String generation as pattern description – Recognition of syntactic description – Parsing – Stochastic grammar and applications – Graph based structural representation.

UNIT 5 FEATURES EXTRACTION AND RECENT ADVANCES

TOTAL 45
TEXT BOOK

REFERENCE BOOKS

ONLINE REFERENCES:
www.amazon.com
www.oclc.org
www.electricalengineeringnetbase.com
iris.usc.edu
cgm.cs.mcgill.ca

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Lectures</th>
<th>Theory</th>
<th>Practical</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS0436</td>
<td>ROBOTICS</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Prerequisite</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nil</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

PURPOSE
To study some topics relevant to designing robots controlled by microcontrollers

INSTRUCTIONAL OBJECTIVES
1. To use microcontrollers for robotics
2. To use different type of sensors for robots
3. To design robots in a real time environment

UNIT 1 MICROCONTROLLERS IN ROBOTS
Support Components – Memory and Device Programming – Interrupts – Built in Peripherals – Interfacing the controller to Robots

UNIT 2 SOFTWARE DEVELOPMENT
Source files, Object Files, Libraries, Linkers and Hex files – Assemblers – Interpreters- Compilers – Simulators and Emulators – Integrated development Environments

UNIT 3 THE MICROCHIP PICmicro(R) MICROCONTROLLER
Different PICmicro MCU devices and features – application development tools – Basic circuit requirements – The PIC16F627 – EL Cheapo PICmicro MCU Programmer Circuit

UNIT 4 THE MICROCONTROLLER CONNECTIONS

UNIT 5 BRINGING ROBOTS TO LIFE
Real Time Operating Systems (RTOS) – Example application running in an RTOS – State Machines – Randomly moving a Robot application with IR Remote Control – Behavioral Programming – Neural Networks and Artificial Intelligence

TOTAL 45
TEXT BOOKS :

REFERENCE BOOKS

ONLINE REFERENCES
http://www.ifi.unizh.ch/groups/ailab/links/robotic.html
http://www.robotics.com/robots.html
http://prime.jsc.nasa.gov/ROV/olinks.html
http://www.idi.ntnu.no/grupper/ai/eval/lego_links.html

L T P C
CS0438 DECISION SUPPORT SYSTEMS 3 0 0 3
Prerequisite
Nil

PURPOSE
The purpose of this course is to impart concepts of decision, decision processes and its implementation

INSTRUCTIONAL OBJECTIVES
1. DSS and its Characteristics
2. Decision Makers and styles
3. Decision processes and its modeling
4. Executive Information System
5. Perspective of DSS
6. Implementation of DSS

UNIT 1 INTRODUCTION
Introduction : DSS definition- characteristics- History of DSS- Components of DSS- Data and Model Management-DSS knowledge base- user interfaces- DSS user- categories and classes of DSS’s- Decision and Decision Makers : Decision Makers- Decision styles- Decision effectiveness- Hardness of Decisions

UNIT 2 DECISION MAKING

UNIT 3 DECISION PROCESSES

UNIT 4 SYSTEM PERSPECTIVE OF DSS
Perspective of DSS: System – DSS in the context of information system- Information quality issues in DSS design- DSS information system architecture- role of Internet in DSS development and use- Designing and Building DSS: Strategies of DSS Analysis and Design- DSS Developer-tools for DSS development- DSS user Interface Issues
UNIT 5 IMPLEMENTATION OF DSS
Implementing DSS - DSS Implementation - Patterns of Implementation - System Evaluation - Importance of Integration - Creativity Decision making: Definition of creativity - occurrence of creativity - creative problem solving techniques - introduction to intelligent DSS (AI, Expert system and Knowledge based systems) - DSS in the 21st century - future of DSS, EIS and DSS technologies

TOTAL 45

TEXT BOOK

REFERENCE BOOK

ONLINE REFERENCES
http://en.wikipedia.org/wiki/Decision_support_system
http://www.uky.edu/BusinessEconomics/dssakba/bkpg1.htm
http://dssresources.com/history/dsshistory.html

<table>
<thead>
<tr>
<th>CS0440</th>
<th>BIO INFORMATICS</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Prerequisite</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Nil</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

PURPOSE
To explore how biological information could be stored in digital form to create bioinformatics resources and how the same may be processed.

INSTRUCTIONAL OBJECTIVES
1. To study the different coding techniques and standards
2. To know about the different biological network of resources available
3. To learn how to analyze DNA and Protein sequences
4. To learn and understand the multiple sequence analysis techniques
5. To understand protein classification and Structure prediction

UNIT 1 INTRODUCTION

UNIT 2 DNA and PROTEIN SEQUENCES
DNA: working with single DNA sequence - removing vector sequences - verifying restriction maps - PCR design - GC content - counting words - internal repeats - protein coding regions - ORFing - Genomescan Protein: predicting properties - primary structure analysis - transmembrane segments - PROSITE patterns - interpreting scanprosite results - finding domains - CD server results - pfscan results.

UNIT 3 ALIGNMENT OF PAIR OF SEQUENCES
Terminology - Global and Local alignment - Dot matrix - dynamic programming - using scoring matrices - PAM matrices - BLOSUM.

UNIT 4 MULTIPLE SEQUENCE ALIGNMENT
Criteria for Multiple sequence alignment - applications - choosing the right sequences; FASTA, ClustalW, TCofee methods - interpreting multiple sequence alignment - getting in right format - converting formats - using Jalview - preparing for publication.
UNIT 5 PROTEIN CLASSIFICATION & STRUCTURE PREDICTION

TOTAL 45

TEXT BOOKS

REFERENCE BOOKS

ONLINE REFERENCES
3. Protein Structure Databases www.rcsb.org/pdb

UNIT 1 THE BLUETOOTH MODULE

UNIT 2 THE LINK CONTROLLER
The link controller-link control protocol-link controller operation-Pico net, scatter net operation-master/slave role switching-base band/link controller architectural overview -link manager-the host controller interface.

UNIT 3 THE BLUE TOOTH HOST
The blue tooth host-logical link control and adaptation protocol –RFCOMM- the service discovery protocol – the wireless access protocol-OBEX and IrDA-telephony control protocol.

UNIT 4 CROSS LAYER FUNCTIONS
Cross layer functions-Encryption and security-low power operations-controlling low power modes-hold mode-sniff mode-park mode-quality of service-managing Bluetooth devices.
UNIT 5 TEST AND QUALIFICATION

Test and qualification- test mode-qualification and type approval-implementation – related standards and technologies.

TOTAL 45

TEXT BOOK


REFERENCE BOOKS

2. Discovering Bluetooth M. Miller (paperback 2001)

ONLINE REFERENCES

safari.informit.com
www.pearsoned.com
www.pearsoned.co.in

<table>
<thead>
<tr>
<th></th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS0444 SOFTWARE RELIABILITY</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

PREREQUISITE

This course gives a thorough knowledge of providing software reliability.

INSTRUCTIONAL OBJECTIVES

1. Software Reliability.
2. Reliability approaches
3. Reliability models

UNIT 1 INTRODUCTION TO RELIABILITY ENGINEERING

Reliability — Repairable and Non Repairable systems — Maintainability and Availability — Designing for higher reliability — Redundancy — MTBF — MTTF MDT - MTTR— k out of in systems

UNIT 2 INTRODUCTION TO SOFTWARE RELIABILITY


UNIT 3 SOFTWARE RELIABILITY APPROACHES

Fault Avoidance — Passive Fault detection — Active Fault Detection — Fault Tolerance - Fault Recovery - Fault Treatment

UNIT 4 SOFTWARE RELIABILITY MODELING

Introduction to Software Reliability Modeling – Parameter Determination and Estimation - Model Selection – Markovian Models – Finite and Infinite failure category Models – Comparison of Models – Calendar Time Modeling

UNIT 5 SPECIAL TOPICS IN SOFTWARE RELIABILITY


TEXT BOOKS


REFERENCE BOOKS


104

ONLINE RESOURCES
http://www.cs.colostate.edu/~cs630/software.html
http://www2.enel.ucalgary.ca/People/far/Lectures/SENG635/index.html

<table>
<thead>
<tr>
<th></th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS0446</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FIREWALL ARCHITECTURE</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Prerequisite</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nil</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

PURPOSE
To study the firewall architecture and design concepts.

INSTRUCTIONAL OBJECTIVES:
1. Types of firewall architecture.
2. Design and implementation of firewall
3. Firewall maintenance.

UNIT 1 NETWORK SECURITY

UNIT 2 FIREWALL TECHNOLOGIES AND ARCHITECTURE

UNIT 3 FIREWALL DESIGN

UNIT 4 PROXY SYSTEMS AND BASTION HOSTS
Case study - screened subnet architecture – merged routers and bastion host.

UNIT 5 MAINTAINING FIREWALLS
Maintaining firewalls - housekeeping – monitoring your systems – keeping up to date – two sample firewalls – screened subnet architecture - merged routers and bastion host using general purpose hardware.

TOTAL 45

TEXT BOOK

REFERENCE BOOK

ONLINE REFERENCES
www.okcforum.org
www.microsoft.com
www.networkcomputing.com

105
<table>
<thead>
<tr>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

**Purpose**
To study design aspects of complex systems

**Instructional Objectives**
1. To learn about Problem Formulation and set up
2. To learn the optimization and search methods
3. To learn multi objective and stochastic challenges
4. To study implementation issues and Real world applications

**Unit 1 Optimization Models**
Mathematical Modeling – Design Optimization – Feasibility and boundedness – Topography of the design space – Modeling data – Modeling considerations prior to computation

**Unit 2 Model Boundedness**

**Unit 3 Optima**

**Unit 4 Parametric and Discrete Optima**
Branching – Parametric tests – Functional monotonicity analysis – Discrete design activity and optimality – constraint derivation

**Unit 5 Computations**

**Text Books**

**Reference Books**

**Online References**
http://www.mat.univie.ac.at/~neum/glopt/techniques.html
http://www.mit.jyu.fi/miettine/lista.html
http://www.ing.unlp.edu.ar/cetad/mos/geometric.html
http://www.stanford.edu/~boyd/cvxbook/