REGULATIONS – 2011

DEPARTMENT OF
INFORMATION TECHNOLOGY

CURRICULUM AND SYLLABI OF
B.Tech.- INFORMATION TECHNOLOGY
REGULATIONS 2011

CURRICULUM AND SYLLABI FOR FULL TIME

B.Tech. - INFORMATION TECHNOLOGY

SEMESTER – I

Common to all B.E. / B.Tech. Degree Programmes)

<table>
<thead>
<tr>
<th>S.No</th>
<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></td>
<td></td>
<td><strong>THEORY</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>BEG101</td>
<td>Technical English – I</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>BMA101</td>
<td>Mathematics – I</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>BPH101</td>
<td>Engineering Physics – I</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>BCY101</td>
<td>Engineering Chemistry – I</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>BCS101</td>
<td>Fundamentals of Computing and Programming</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>6</td>
<td>BME101</td>
<td>Engineering Graphics</td>
<td>2</td>
<td>3</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>PRACTICAL</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>BCS131</td>
<td>Computer Practice Laboratory – I</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>8</td>
<td>BPC131</td>
<td>Physics and Chemistry Laboratory – I</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>9</td>
<td>BME131</td>
<td>Engineering Practices Laboratory</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
</tbody>
</table>

**Total Number of Credits :** 27
## SEMESTER – II

<table>
<thead>
<tr>
<th>S.No</th>
<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></td>
<td></td>
<td><strong>THEORY</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>BEG201</td>
<td>Technical English – II*</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>2.</td>
<td>BMA201</td>
<td>Mathematics – II*</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>3.</td>
<td>BPH201</td>
<td>Engineering Physics – II *</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>4.</td>
<td>BCY201</td>
<td>Engineering Chemistry – II *</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>5. a.</td>
<td>BME201</td>
<td>Engineering Mechanics</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(For Mechanical &amp; Civil branches)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. b.</td>
<td>BEE201</td>
<td>Circuit Theory</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(For EEE &amp; EIE branches)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. c.</td>
<td>BEC201</td>
<td>Electric Circuits and Electron Devices</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(For CSE, IT &amp; ECE branches)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. a.</td>
<td>BEE202</td>
<td>Basic Electrical &amp; Electronics Engineering</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(For Mechanical &amp; Civil branches)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. b.</td>
<td>BME202</td>
<td>Basic Civil &amp; Mechanical Engineering</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(For CSE, IT, EEE, EIE &amp; ECE branches)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>PRACTICAL</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>BCS231</td>
<td>Computer Practice Laboratory – II*</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>8.</td>
<td>BPC231</td>
<td>Physics &amp; Chemistry Laboratory – II*</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>9. a.</td>
<td>BME231</td>
<td>Computer Aided Drafting and Modeling Laboratory</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(For Mechanical &amp; Civil branches)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. b.</td>
<td>BEE231</td>
<td>Electrical Circuits Laboratory</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(For EEE &amp; EIE branches)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. c.</td>
<td>BEC231</td>
<td>Circuits and Devices Laboratory</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(For ECE, CSE &amp; IT branches)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>BEG231</td>
<td>English Language Skill Laboratory*</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Skill of Listening)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Total Number of Credits:</strong></td>
<td><strong>29</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- *Common to all B.E. / B.Tech. Programmes*
## SEMESTER – III

<table>
<thead>
<tr>
<th>S.No</th>
<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></td>
<td></td>
<td><strong>THEORY</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>BMA301</td>
<td>Transforms and Partial Differential Equations</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>2.</td>
<td>BCE301</td>
<td>Environmental Science and Engineering</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>3.</td>
<td>BIT301</td>
<td>Data Structures and Algorithms using C</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>4.</td>
<td>BEI303</td>
<td>Digital Principles and System Design</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>5.</td>
<td>BCS302</td>
<td>Object Oriented Programming</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>6.</td>
<td>BIT302</td>
<td>Principles of Communication</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>PRACTICAL</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>BEI332</td>
<td>Digital Laboratory</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>8.</td>
<td>BIT331</td>
<td>Data Structures and Algorithms using C Laboratory</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>9.</td>
<td>BCS332</td>
<td>Object Oriented Programming Laboratory</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>10.</td>
<td>BEG331</td>
<td>Communication Skills and Technical Seminar – I</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>TOTAL</strong></td>
<td>18</td>
<td>3</td>
<td>12</td>
<td>29</td>
</tr>
</tbody>
</table>

## SEMESTER – IV

<table>
<thead>
<tr>
<th>S.No</th>
<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></td>
<td></td>
<td><strong>THEORY</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>BIT401</td>
<td>Software Engineering and Quality Assurance</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>2.</td>
<td>BCS402</td>
<td>Microprocessors and Microcontrollers</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>3.</td>
<td>BCS403</td>
<td>Computer Organization and Architecture</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>4.</td>
<td>BMA402</td>
<td>Probability and Queueing Theory</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>5.</td>
<td>BCS404</td>
<td>Operating Systems</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>6.</td>
<td>BCS405</td>
<td>Database Management Systems</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>PRACTICAL</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>BCS431</td>
<td>Operating Systems Laboratory</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>8.</td>
<td>BCS432</td>
<td>Database Management Systems Laboratory</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>9.</td>
<td>BCS433</td>
<td>Microprocessors Laboratory</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>10.</td>
<td>BEG431</td>
<td>Communication Skills and Technical Seminar – II</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>TOTAL</strong></td>
<td>18</td>
<td>2</td>
<td>12</td>
<td>28</td>
</tr>
</tbody>
</table>
## SEMESTER – V

<table>
<thead>
<tr>
<th>S.No</th>
<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></td>
<td></td>
<td><strong>THEORY</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>BIT501</td>
<td>System Software</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>2.</td>
<td>BIT502</td>
<td>Principles of Object Oriented Analysis and Design</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>3.</td>
<td>BCS502</td>
<td>Computer Networks</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>4.</td>
<td>BCS503</td>
<td>Theory of Computation</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>5.</td>
<td>BCS005</td>
<td>C# and .NET Technologies</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>6.</td>
<td>BGE501</td>
<td>Professional Ethics and Human Values</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>PRACTICAL</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>BIT531</td>
<td>System Software Laboratory</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>8.</td>
<td>BIT532</td>
<td>CASE Tools Laboratory</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>TOTAL</strong></td>
<td>18</td>
<td>2</td>
<td>6</td>
<td>24</td>
</tr>
</tbody>
</table>

## SEMESTER – VI

<table>
<thead>
<tr>
<th>S. No</th>
<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></td>
<td></td>
<td><strong>THEORY</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>BIT601</td>
<td>Network Programming and Network Management</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>2.</td>
<td>BIT602</td>
<td>Digital Signal Processing</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>3.</td>
<td>BIT603</td>
<td>Principles of Compiler Design</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>4.</td>
<td>BIT604</td>
<td>Embedded Systems</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>5.</td>
<td>BIT605</td>
<td>Object Oriented Programming using Java</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>6.</td>
<td>E1</td>
<td>Elective I</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>PRACTICAL</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>BIT631</td>
<td>Network Programming Laboratory</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>8.</td>
<td>BIT632</td>
<td>Java Laboratory</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>9.</td>
<td>BIT633</td>
<td>Comprehension</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>TOTAL</strong></td>
<td>18</td>
<td>5</td>
<td>6</td>
<td>25</td>
</tr>
</tbody>
</table>
### SEMESTER VII

<table>
<thead>
<tr>
<th>Sl. No.</th>
<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><strong>THEORY</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>BIT701</td>
<td>Information Theory and Coding</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>2.</td>
<td>BIT702</td>
<td>Computer Graphics and Multimedia</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>3.</td>
<td>BIT703</td>
<td>Web Technology</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>4.</td>
<td>BCS006</td>
<td>Cryptography and Network Security</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>5.</td>
<td>E3</td>
<td>Elective III</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>6.</td>
<td>BIT731</td>
<td>Computer Graphics and Multimedia Laboratory</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>7.</td>
<td>BIT732</td>
<td>Web Technology Laboratory</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>8.</td>
<td>BIT733</td>
<td>Mobility with Android *</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total No. of Credits</strong></td>
<td></td>
<td></td>
<td>24</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### SEMESTER VIII

<table>
<thead>
<tr>
<th>Sl. No.</th>
<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><strong>THEORY</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>BIT801</td>
<td>Mobile Communication</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>2.</td>
<td>BMG601</td>
<td>Principles of Management</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>3.</td>
<td>E4</td>
<td>Elective IV</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>4.</td>
<td>E5</td>
<td>Elective V</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>5.</td>
<td>BIT831</td>
<td>Project Work</td>
<td>0</td>
<td>0</td>
<td>18</td>
<td>12</td>
</tr>
<tr>
<td><strong>Total No. of Credits</strong></td>
<td></td>
<td></td>
<td>24</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* - Elective Lab

**TOTAL CREDITS TO BE EARNED FOR THE AWARD OF THE DEGREE – 210**

### Elective I

<table>
<thead>
<tr>
<th>S. No.</th>
<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>1.</td>
<td>BIT001</td>
<td>Information Storage and Management</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>2.</td>
<td>BIT002</td>
<td>Distributed Systems</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>3.</td>
<td>BIT003</td>
<td>Mobility Engineering</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>4.</td>
<td>BCS003</td>
<td>Unix Internals</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>5.</td>
<td>BCS007</td>
<td>Data Warehousing and Data Mining</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>
### Elective II (PRACTICAL COURSE)

<table>
<thead>
<tr>
<th>Sl. No.</th>
<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>1.</td>
<td>BIT733</td>
<td>Mobility with Android *</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
</tbody>
</table>

### Elective III

<table>
<thead>
<tr>
<th>Sl. No.</th>
<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>1.</td>
<td>BIT007</td>
<td>Software Project Management</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>2.</td>
<td>BIT008</td>
<td>Wireless Sensor Networks</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>3.</td>
<td>BIT009</td>
<td>User Interface Design</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>4.</td>
<td>BCS010</td>
<td>Advanced Java Programming</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>5.</td>
<td>BGE003</td>
<td>Intellectual Property Rights</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

### Elective IV

<table>
<thead>
<tr>
<th>Sl. No.</th>
<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>1.</td>
<td>BIT010</td>
<td>Parallel Computing</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>2.</td>
<td>BIT011</td>
<td>Cloud Computing</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>3.</td>
<td>BCS025</td>
<td>Green Computing</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>4.</td>
<td>BCS009</td>
<td>High Speed Networks</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>5.</td>
<td>BCS018</td>
<td>Service Oriented Architecture</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

### Elective V

<table>
<thead>
<tr>
<th>Sl. No.</th>
<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>1.</td>
<td>BIT012</td>
<td>Knowledge Management</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>2.</td>
<td>BIT013</td>
<td>Information Security</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>3.</td>
<td>BCS013</td>
<td>M-Commerce</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>4.</td>
<td>BCS015</td>
<td>Adhoc Networks</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>5.</td>
<td>BCS027</td>
<td>Nature and Bio Inspired Computing</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>
UNIT I 12

Suggested activities:
2. Changing sentences from active to passive voice & vice versa.
3. Skimming, cloze exercises, exercises transferring information from text to graphic form – bar charts, flow charts.
4. Writing descriptions using descriptive words & phrases, and technical vocabulary.
5. Role play, conversation exercises, discussions, oral reporting exercises.
Any other related relevant classroom activity.

UNIT II 12

Suggested Activities:
1. a. Vocabulary activities using prefixes and suffixes.
   b. Exercises using questions – asking & answering questions.
2. Scanning the text for specific information.
4. Discussion activities and exploring creative ideas.
Any other related relevant classroom activity.

UNIT III 12

Suggested activities:
1. Providing appropriate context for the use of tenses
2. Listening and note-taking
3. (a) Writing sentence definitions and instructions
   (b) Identifying the discourse links and sequencing jumbled sentences.
4. Speaking exercises, discussions, role play exercises using explaining, convincing and persuasive Strategies.
Any other related relevant classroom activity.

UNIT IV 12
Modal verbs and Probability – Concord subject verb agreement (Correction of errors) – Cause and effect expressions – Extended Definition – Speaking about the future plans.
Suggested activities:
1. a. Making sentences using modal verbs to express probability
   b. Gap filling using relevant grammatical form of words.
2. Writing extended definitions
3. Speaking – role play activities, discussions, extempore speaking exercises speculating about the future.
   Any other related relevant classroom activity

UNIT V 12

Suggested activities:
1. a) Sentence completion exercises using ‘If’ conditionals.
   b) Gap filling exercises using gerunds and present participle forms
2. Reading comprehension exercises.
3. Role play, discussion, debating and speaking activities for stating, discussing problems and suggesting solutions.
4. Writing letters to officials and to the editor in formal/official contexts.
   Any other related relevant classroom activity.

TOTAL: 60 PERIODS

AREAS TO BE COVERED UNDER DIFFERENT HEADINGS:

A) Language focus
1. Suffixes and Prefixes
2. Transformation of words from one form to another (Derivatives from root words)
3. Matching words & meanings (synonyms)
4. Compound nouns
5. Degrees of comparison
6. Active and passive voice-impersonal passive
7. Tenses: simple present, simple past, simple future, present continuous, past continuous, Present Perfect.
8. Modal verbs
9. ‘Wh’ Question forms
10. Conditional clause
11. Gerunds and infinitives
12. Expressing Cause and effect
13. Concord
14. Punctuation
15. Writing definitions

B) Reading
1. Reading in context
2. Skimming and scanning
3. Scanning the text for specific information
4. Reading and note-making
5. Intensive reading for making inferences
6. Reading comprehension

C) Listening:
1. Listening and transfer of information
2. Listening & note taking
D) Writing:
1. Transformation of information from graphical data to written form and from written form to graphical Form.
2. Paragraph writing – Description
3. Paragraph Writing – comparison and contrast.
4. Note-making
5. Writing Instructions
6. Jumbled sentences
7. Letter writing – Formal letters (Invitation, Accepting, Declining, Permission Letters) Letters to the editor

E) Speaking:
1. Discussing as a group and making oral reports,
2. Role play-Conversation techniques – convincing others
3. Creative thinking and speaking, Exploring creative ideas
4. Persuasive strategies
5. Speaking about the future plans
6. Extempore speech – Speaking exercises speculating about the future
7. Presentation of problems and solutions
8. Debates

TEXT BOOK:

REFERENCES:

Extensive Reading:
UNIT I MATRICES

UNIT II THREE DIMENSIONAL ANALYTICAL GEOMETRY

UNIT III DIFFERENTIAL CALCULUS
Curvature in Cartesian co-ordinates – Centre and radius of curvature – Circle of curvature – Evolutes – Envelopes – Evolute as envelope of normals.

UNIT IV FUNCTIONS OF SEVERAL VARIABLES

UNIT V MULTIPLE INTEGRALS
Double integration – Cartesian and polar co-ordinates – Change of order of integration – Change of variables between Cartesian and polar co-ordinates – Triple integration in Cartesian co-ordinates – Area as double integral – Volume as triple integral.

TOTAL: 60 PERIODS

TEXT BOOK:

REFERENCES:
UNIT I  ULTRASONICS

UNIT II  LASERS

UNIT III  FIBER OPTICS & APPLICATIONS

UNIT IV  QUANTUM PHYSICS

UNIT V  CRYSTAL PHYSICS
Lattice – Unit cell – Bravais lattice – Lattice planes – Miller indices – d spacing in cubic lattice – Calculation of number of atoms per unit cell – Atomic radius – Coordination number – Packing factor for SC, BCC, FCC and HCP structures – NaCl, ZnS, diamond and graphite structures – Polymorphism and allotropy – Crystal defects – point, line and surface defects – Burger vector.

TOTAL: 45 PERIODS

TEXT BOOKS:
REFERENCES:

UNIT I  WATER TECHNOLOGY

UNIT II  POLYMERS AND COMPOSITES

UNIT III  SURFACE CHEMISTRY

UNIT IV  NON-CONVENTIONAL ENERGY SOURCES AND STORAGE DEVICES

UNIT V  ENGINEERING MATERIALS

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:
BCS101  FUNDAMENTALS OF COMPUTING AND PROGRAMMING

UNIT I  INTRODUCTION TO COMPUTERS

UNIT II  COMPUTER SOFTWARE

UNIT III  PROBLEM SOLVING AND OFFICE AUTOMATION

UNIT IV  INTRODUCTION TO “C”
Overview of “C” – Constants, Variables and Data Types – Operators and Expressions – Managing Input and Output operators – Decision Making – Branching and Looping.

UNIT V  FUNCTIONS AND POINTERS

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:
BME101   ENGINEERING GRAPHICS   L T P C
2 3 0 4

UNIT I     PLANE CURVES AND FREE HAND SKETCHING   12
CURVES USED IN ENGINEERING PRACTICES:
Conics – Construction of ellipse, Parabola and hyperbola by eccentricity method – Construction of
cycloid – construction of involutes of square and circle – Drawing of tangents and normal to the
above curves.
FREE HAND SKETCHING:
Representation of Three Dimensional objects – General principles of orthographic projection – Need
for importance of multiple views and their placement – First angle projection – layout views –
Developing visualization skills through free hand sketching of multiple views from pictorial views of
objects.

UNIT II   PROJECTION OF POINTS, LINES AND PLANE SURFACES   12
Projection of points and straight lines located in the first quadrant – Determination of true lengths and
true inclinations – Projection of polygonal surface and circular lamina inclined to both reference
planes.

UNIT III   PROJECTION OF SOLIDS   12
Projection of simple solids like prisms, pyramids, cylinder and cone when the axis is inclined to one
reference plane by change of position method.

UNIT IV  SECTION OF SOLIDS AND DEVELOPMENT OF SURFACES   12
Sectioning of above solids in simple vertical position by cutting planes inclined to one reference plane
and perpendicular to the other – Obtaining true shape of section. Development of lateral surfaces of
simple and truncated solids – Prisms, pyramids, cylinders and cones – Development of lateral surfaces
of solids with cylindrical cutouts, perpendicular to the axis.

UNIT V   ISOMETRIC AND PERSPECTIVE PROJECTIONS   12
Principles of isometric projection – isometric scale – isometric projections of simple solids, truncated
prisms, pyramids, cylinders and cones, Combination of any two simple solids. Perspective projection
of prisms, pyramids and cylinders by visual ray method and vanishing point method.

TOTAL: 60 PERIODS

TEXT BOOK:

REFERENCES:
   (2008).
BCS131 COMPUTER PRACTICE LABORATORY – I  L T P C  0 0 3 2

LIST OF EXERCISES

I. MS Office

a) WORD PROCESSING
   1. Document creation, Text manipulation with Scientific notations.
   2. Table creation, Table formatting and Conversion.

b) SPREAD SHEET
   1. Chart - Line, XY, Bar and Pie.
   2. Formula - formula editor.
   4. Sorting and Import / Export features.

II SIMPLE C PROGRAMMING
   1. Data types, Expression evaluation, Conditional statements.
   2. Arrays.
   4. Functions.

TOTAL: 45 PERIODS

For programming exercises Flow chart and pseudocode are essential.

HARDWARE / SOFTWARE REQUIRED FOR A BATCH OF 60 STUDENTS

HARDWARE
- LAN System with 66 nodes (OR) Standalone PCs – 66 Nos.
- Printers – 3 Nos.

SOFTWARE
- OS – Windows / UNIX Clone
- Application Package – Office suite
- Compiler – “C”
PHYSICS LABORATORY – I

LIST OF EXPERIMENTS

1.  (a) Particle size determination using Diode Laser.
    (b) Determination of Laser parameters – Wavelength and angle of divergence.
    (c) Determination of acceptance angle in an optical fiber.
2.  Determination of thickness of a thin wire – Air wedge method.
6.  Determination of Hysteresis loss in a ferromagnetic material.

B. CHEMISTRY LABORATORY – I

LIST OF EXPERIMENTS

1.  Estimation of hardness of Water by EDTA method.
2.  Estimation of Copper in brass by EDTA method.
3.  Determination of DO in water (Winkler’s method)
4.  Estimation of Chloride in Water sample (Argentometric)
5.  Estimation of alkalinity of Water sample
6.  Determination of molecular weight and degree of polymerization using viscometry.
GROUP A (CIVIL & MECHANICAL)

I CIVIL ENGINEERING PRACTICE

BUILDINGS:
(a) Study of plumbing and carpentry components of residential and industrial buildings. Safety aspects.

PLUMBING WORKS:
(a) Study of pipeline joints, its location and functions: valves, taps, couplings, unions, reducers, elbows in household fittings.
(b) Study of pipe connections requirements for pumps and turbines.
(c) Preparation of plumbing line sketches for water supply and sewage works.
(d) Hands-on-exercise:
   Basic pipe connections – Mixed pipe material connection – Pipe connections with different joining components.
(e) Demonstration of plumbing requirements of high-rise buildings.

CARPENTRY USING POWER TOOLS ONLY:
(a) Study of the joints in roofs, doors, windows and furniture.
(b) Hands-on-exercise:
   Wood work, joints by sawing, planing and cutting.

II MECHANICAL ENGINEERING PRACTICE

WELDING:
(a) Preparation of arc welding of butt joints, lap joints and tee joints.
(b) Gas welding practice.

BASIC MACHINING:
(a) Simple Turning and Taper turning.
(b) Drilling Practice.

SHEET METAL WORK:
(a) Forming & Bending:
(b) Model making – Trays, funnels, etc.
(c) Different type of joints.

MACHINE ASSEMBLY PRACTICE:
(a) Study of centrifugal pump.
(b) Study of air conditioner.

DEMONSTRATION ON:
(a) Smithy operations, upsetting, swaging, setting down and bending. Example – Exercise – Production of hexagonal headed bolt.
(b) Foundry operations like mould preparation for gear and step cone pulley.
(c) Fitting – Exercises – Preparation of square fitting and vee – fitting models.
GROUP B (ELECTRICAL & ELECTRONICS)

III ELECTRICAL ENGINEERING PRACTICE
1. Residential house wiring using switches, fuse, indicator, lamp and energy meter.
2. Fluorescent lamp wiring.
3. Stair-case wiring
5. Measurement of energy using single phase energy meter.

IV ELECTRONICS ENGINEERING PRACTICE
1. Study of Electronic components and equipments – Resistor colour coding, measurement of AC signal parameters (peak-peak value, rms value period, frequency) using CRO.
2. Study of logic gates AND, OR, EX-OR and NOT.
4. Soldering practice – Components Devices and Circuits – Using general purpose PCB.
5. Measurement of ripple factor for HWR and FWR.

TOTAL: 45 PERIODS

REFERENCES:
BEG201  TECHNICAL ENGLISH – II  L  T  P  C  3  0  0  3
(Common to all branches)

AIM
To encourage students to actively involve in participative learning of English and to help them acquire communication skills.

OBJECTIVES
- To help the students to develop listening skills for academic and professional purposes.
- To help the students to acquire the ability of effective speaking in English in real-life situations.
- To inculcate reading habit and to develop effective reading skills.
- To help the students to improve their active and passive vocabulary.
- To familiarize the students with different rhetorical functions of scientific English.
- To enable the students to write letters and reports effectively in formal and business situations.

UNIT I  10
Technical Vocabulary – meanings in context, sequencing words, Articles – Prepositions, intensive reading and predicting content, Reading and interpretation, extended definitions, process description.

Suggested activities
1. Exercises on word formation using the prefix ‘self’ – Gap filling with preposition
   Exercises – Using sequence words
2. Reading comprehension exercise with questions based on inference – Reading heading and predicting the content – reading advertisements and interpretation
3. Writing extended definitions – Writing description of processes – Writing paragraphs based on discussions – Writing paragraphs describing the future

UNIT II  10

Suggested Activities
1. Reading comprehension exercises with questions on overall content – Discussions analyzing stylistic features (creative and factual description) – Reading comprehension exercises with texts including graphic communication – Exercises in interpreting non-verbal communication.
2. Listening comprehension exercises to categories data in tables.
3. Writing formal letters – quotations, placing orders, clarification, and complaint, Letter seeking permission for industrial visits, writing analytical paragraphs on different debatable issues.

UNIT III  10

Suggested Activities
1. Exercises combining sentences using cause and effect expressions – Gap filling exercises using the appropriate tense forms – Making sentences using different grammatical forms of the same word.
2. Speaking exercises involving the use of stress and intonation – Group discussions – analysis of problems and offering solutions.
3. Reading comprehension exercises with critical questions, multiple choice questions.

UNIT IV 10

Suggested Activities
1. Rewriting exercises using numerical adjectives.
2. Reading comprehension exercises with analytical questions on content – Evaluation of content.
3. Listening comprehension – entering information in tabular form, intensive listening exercise and completing the steps of a process.
4. Speaking – Role Play – group discussions – Activities giving oral instructions.
5. Writing descriptions, expanding hints – writing argumentative paragraphs – Writing formal letters – writing letter of application with CV/Bio-data – Writing general and safety instructions – Preparing checklists – Writing e-mail messages

UNIT V 5
Speaking – Discussion of problems and solutions – Creative and critical thinking – writing an essay, Writing a proposal.

Suggested Activities
1. Case Studies on problems and solutions
2. Brain storming and discussion
3. Writing Critical essays
4. Writing short proposals of 2 pages for starting a project, solving problems, etc.
5. Writing advertisements

TOTAL 45 periods

AREAS TO BE COVERED UNDER DIFFERENT HEADINGS
A. Language Focus
1. Technical vocabulary
2. Sequencing words
3. Articles
4. Prepositions
5. Word formation using prefixes
6. Phrases / Structure indicating purpose
7. Adverbs
8. Cause and effect expressions
9. Tense forms
10. Different grammatical forms of the same word
11. Numerical adjectives
12. Extended definitions
B. Reading
   1. Intensive reading and predicting content
   2. Reading and interpretation
   3. Skimming
   4. Critical reading
   5. Reading comprehension exercises

C. Listening
   1. Correlating verbal and non-verbal communication
   2. Listening comprehension

D. Speaking
   1. Group Discussions
   2. Stress and intonation
   3. Role plays and giving oral instructions
   4. Discussion of problems and solutions

E. Writing
   1. Process description
   2. Formal letter writing
   3. Writing analytical paragraphs
   4. Report Writing
   5. Descriptive writing
   6. Argumentative paragraphs
   7. Letter of application
   8. Instructions
   9. Recommendations
   10. Checklists preparation
   11. Email Communication
   12. Writing critical essays
   13. Writing proposals

TEXT BOOK:

REFERENCES:

Extensive Reading:
Note:
The book listed under Extensive Reading is meant for inculcating the reading habit of the students. They need not be used for testing purposes.
BMA201 MATHEMATICS – II
(Common to all branches)

UNIT I ORDINARY DIFFERENTIAL EQUATIONS 12
Higher order linear differential equations with constant coefficients – Method of variation of parameters – Cauchy’s and Legendre’s linear equations – Simultaneous first order linear equations with constant coefficients.

UNIT II VECTOR CALCULUS 12
Gradient Divergence and Curl – Directional derivative – Irrotational and solenoidal vector fields – Vector integration – Green’s theorem in a plane, Gauss divergence theorem and stoke’s theorem (excluding proofs) – Simple applications involving cubes and rectangular parallepipeds.

UNIT III ANALYTIC FUNCTIONS 12
Functions of a complex variable – Analytic functions – Necessary conditions, Cauchy – Riemann equation and Sufficient conditions (excluding proofs) – Harmonic and orthogonal properties of analytic function – Harmonic conjugate – Construction of analytic functions – Conformal mapping : w= z+c, cz, 1/z and bilinear transformation.

UNIT IV COMPLEX INTEGRATION 12

UNIT V LAPLACE TRANSFORM 12

TOTAL: 60 PERIODS

TEXT BOOK:

REFERENCES:
BPH201  ENGINEERING PHYSICS – II  
(Common to all branches)  
L T P C  
3 0 0 3

UNIT I  CONDUCTING MATERIALS  

UNIT II  SEMICONDUCTING MATERIALS  

UNIT III  MAGNETIC AND SUPERCONDUCTING MATERIALS  

UNIT IV  DIELECTRIC MATERIALS  

UNIT V  MODERN ENGINEERING MATERIALS  

TOTAL: 45 PERIODS

TEXT BOOKS:
2. Charles P. Poole and Frank J. Owen, ‘Introduction to Nanotechnology’, Wiley India (2007) (for Unit V)
REFERENCES:
BCY201 ENGINEERING CHEMISTRY – II
(Common to all branches)

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

OBJECTIVES
- The student should be conversant with the principles of electrochemistry, electrochemical cells, emf and applications of emf measurements.
- Principles of corrosion control.
- Chemistry of Fuels and combustion.
- Industrial importance of Phase rule and alloys.
- Analytical techniques and their importance.

UNIT I ELECTROCHEMISTRY
Electrochemical cells – reversible and irreversible cells – EMF – measurement of emf – Single electrode potential – Nernst equation (problem) – reference electrodes – Standard Hydrogen electrode – calomel electrode – Ion selective electrode – glass electrode and measurement of pH – electrochemical series – significance – potentiometric titrations (redox Fe\textsuperscript{2+} vs dichromate and precipitation – Ag\textsuperscript{+} vs Cl\textsuperscript{-} titration) and conductometric titrations – acid-base (HCl vs NaOH) titrations.

UNIT II CORROSION AND CORROSION CONTROL

UNIT III FUELS AND COMBUSTION

UNIT IV PHASE RULE AND ALLOYS

UNIT V ANALYTICAL TECHNIQUES

TOTAL: 45 PERIODS
TEXT BOOKS:

REFERENCES:
(a) BME201    ENGINEERING MECHANICS  
(For Mechanical & Civil Branches)  
L   T   P   C  
3   1   0   4  

OBJECTIVE  
At the end of this course the student should be able to understand the vectorial and scalar 
representation of forces and moments, static equilibrium of particles and rigid bodies both 
in two dimensions and also in three dimensions. Further, he should understand the principle 
of work and energy. He should be able to comprehend the effect of friction on equilibrium. 
He should be able to understand the laws of motion, the kinematics of motion and the 
interrelationship. He should also be able to write the dynamic equilibrium equation. All these 
should be achieved both conceptually and through solved examples.

UNIT I  BASICS & STATICS OF PARTICLES  
Introduction – Units and Dimensions – Laws of Mechanics – Lami’s theorem, Parallelogram and 
triangular Law of forces – Vectors – Vectorial representation of forces and moments – Vector 
operations: additions, subtraction, dot product, cross product – Coplanar Forces – Resolution and 
Composition of forces – Equilibrium of a particle – Forces in space – Equilibrium of a 
particle in space – Equivalent systems of forces – Principle of transmissibility – Single 
equivalent force.

UNIT II  EQUILIBRIUM OF RIGID BODIES  
Free body diagram – Types of supports and their reactions – requirements of stable 
equilibrium – Moments and Couples – Moment of a force about a point and about an axis – Vectorial 
representation of moments and couples – Scalar components of a moment – Varignon’s 
theorem – Equilibrium of Rigid bodies in two dimensions – Equilibrium of Rigid bodies in three 
dimensions – Examples.

UNIT III  PROPERTIES OF SURFACES AND SOLIDS  
Determination of Areas and Volumes – First moment of area and the Centroid of sections – 
Rectangle, circle, triangle from integration – T section, I section, Angle section, Hollow 
section by using standard formula – second and product moments of plane area – Rectangle, 
triangle, circle from integration – T section, I section, Angle section, Hollow section by using 
standard formula – Parallel axis theorem and perpendicular axis theorem – Polar moment of inertia 
– Principal moments of inertia of plane areas – Principal axes of inertia – Mass moment of inertia 
– Derivation of mass moment of inertia for rectangular section, prism, sphere from first 
principle – Relation to area moments of inertia.

UNIT IV  DYNAMICS OF PARTICLES  
Displacements, Velocity and acceleration, their relationship – Relative motion – Curvilinear motion 
– Newton’s law – Work Energy Equation of particles – Impulse and Momentum – Impact of 
estatic bodies.

UNIT V  FRICTION AND ELEMENTS OF RIGID BODY DYNAMICS  
Frictional force – Laws of Coloumb friction – simple contact friction – Rolling resistance – Belt 
friction. Translation and Rotation of Rigid Bodies – Velocity and acceleration – General Plane 
motion.

TOTAL: 60 PERIODS

TEXT BOOK:  
REFERENCES:
(b) BEE201  CIRCUIT THEORY  L T P C
(For EEE & EIE Branches)  3 1 0 4

UNIT I  BASIC CIRCUITS ANALYSIS  12
Ohm’s Law – Kirchoffs laws – DC and AC Circuits – Resistors in series and parallel circuits – Mesh
current and node voltage method of analysis for D.C and A.C. circuits.

UNIT II  NETWORK REDUCTION AND NETWORK THEOREMS FOR DC AND
AC CIRCUITS  12
Network reduction: voltage and current division, source transformation – star delta
conversion. Thevenins and Norton Theorem – Superposition Theorem – Maximum power
transfer theorem – Reciprocity Theorem.

UNIT III  RESONANCE AND COUPLED CIRCUITS  12
Series and parallel resonance – their frequency response – Quality factor and Bandwidth – Self and

UNIT IV  TRANSIENT RESPONSE FOR DC CIRCUITS  12
Transient response of RL, RC and RLC Circuits using Laplace transform for DC input and A.C.
input (Sinusoidal).

UNIT V  ANALYSING THREE PHASE CIRCUITS  12
Three phase balanced / unbalanced voltage sources – analysis of three phase 3-wire and 4- wire
circuits with star and delta connected loads, balanced & unbalanced loads – phasor diagram of
voltages and currents – power and power factor measurements in three phase circuits.

TOTAL: 60 PERIODS

TEXT BOOKS:

REFERENCES:
   (2010)
4. Paranjothi SR, “Electric Circuits Analysis,” New Age International Ltd., New Delhi,
   (1996).
   (1999).
(c) BEC201 ELECTRIC CIRCUITS AND ELECTRON DEVICES
(For ECE, CSE and IT Branches)

UNIT I CIRCUIT ANALYSIS TECHNIQUES 12
Kirchhoff’s current and voltage laws – series and parallel connection of independent sources – R, L
and C – Network Theorems – Thevenin, Superposition, Norton, Maximum power transfer and
duality – Star-delta conversion.

UNIT II TRANSIENT & RESONANCE IN RLC CIRCUITS 12
Basic RL, RC and RLC circuits and their responses to pulse and sinusoidal inputs –
frequency response – Parallel and series resonances – Q factor – single tuned and double tuned
circuits.

UNIT III SEMICONDUCTOR DIODES 12
Review of intrinsic & extrinsic semiconductors – Theory of PN junction diode – Energy band
structure – current equation – space charge and diffusion capacitances – Effect of temperature
and breakdown mechanism – Zener diode and its characteristics.

UNIT IV TRANSISTORS 12
Principle of operation of PNP and NPN transistors – study of CE, CB and CC configurations and
comparison of their characteristics – Breakdown in transistors – operation and comparison of
N-Channel and P-Channel JFET – drain current equation – MOSFET – Enhancement and
depletion types – structure and operation – comparison of BJT with MOSFET – thermal effect
on MOSFET.

UNIT V SPECIAL SEMICONDUCTOR DEVICES (Qualitative Treatment only) 12
Tunnel diodes, PIN diode, varactor diode – SCR characteristics and two transistor equivalent
model – UJT – Diac and Triac – Laser, CCD, Photodiode, Phototransistor, Photoconductive and
Photovoltaic cells – LED, LCD.

TOTAL: 60 PERIODS

TEXT BOOKS:
   Hill (2001)
2. Salivahanan, N. Suresh kumar and A.Vallavaraj, “Electronic Devices and Circuits”, Tata

REFERENCES:
2. A.Sudhakar, Shyammohan S Palli, “Circuits and Networks-Analysis and Synthesis”, Tata
UNIT I  ELECTRICAL CIRCUITS & MEASUREMENTS  

UNIT II  ELECTRICAL MACHINES  

UNIT III  SEMICONDUCTOR DEVICES AND APPLICATIONS  

UNIT IV  DIGITAL ELECTRONICS  

UNIT V  FUNDAMENTALS OF COMMUNICATION ENGINEERING  

TOTAL: 60 PERIODS

TEXT BOOKS:

REFERENCES:
A – CIVIL ENGINEERING

UNIT I SURVEYING AND CIVIL ENGINEERING MATERIALS


UNIT II BUILDING COMPONENTS AND STRUCTURES


TOTAL: 30 PERIODS

B – MECHANICAL ENGINEERING

UNIT III POWER PLANT ENGINEERING


UNIT IV IC ENGINES

Internal combustion engines as automobile power plant – Working principle of Petrol and Diesel Engines – Four stroke and two stroke cycles – Comparison of four stroke and two stroke engines – Boiler as a power plant.

UNIT V REFRIGERATION AND AIR CONDITIONING SYSTEM


TOTAL: 30 PERIODS

REFERENCES:

BCS231 COMPUTER PRACTICE LABORATORY – II
(Common to all branches)
L  T  P  C
0  1  2  2

LIST OF EXPERIMENTS

1. UNIX COMMANDS

Study of Unix OS – Basic Shell Commands – Vi Editor.

2. SHELL PROGRAMMING


3. C PROGRAMMING ON UNIX

Dynamic Storage Allocation – Pointers – Functions – File Handling.

TOTAL: 45 PERIODS

HARDWARE / SOFTWARE REQUIREMENTS FOR A BATCH OF 30 STUDENTS

Hardware

- UNIX Clone Server – 1 No
- Nodes (thin client or PCs) – 33 Nos
- Printer – 3 Nos.

Software

- OS – UNIX Clone (33 user license or License free Linux)
- Compiler - C
LIST OF EXPERIMENTS

1. Determination of Young’s modulus of the material – non uniform bending.
2. Determination of Band Gap of a semiconductor material.
3. Determination of specific resistance of a given coil of wire – Carey Foster Bridge.
5. Spectrometer dispersive power of a prism.
6. Determination of Young’s modulus of the material – uniform bending.

A minimum of FIVE experiments shall be offered.
Laboratory classes on alternate weeks for Physics and Chemistry.

LIST OF EXPERIMENTS

1. Conductometric titration (Simple acid base)
2. Conductometric titration (Mixture of weak and strong acids)
3. Conductometric titration using BaCl₂ Vs Na₂SO₄
4. Potentiometric Titration (Fe²⁺ Vs K₂Cr₂O₇)
5. pH Titration (Acid & Base)
6. Determination of water of crystallization of a crystalline salt (CuSO₄)
7. Estimation of Ferric ion by spectrophotometry.

A minimum of FIVE experiments shall be offered.
Laboratory classes on alternate weeks for Physics and Chemistry.
(a) BME231 COMPUTER AIDED DRAFTING AND MODELING LABORATORY  L  T  P  C  
(For Mechanical & Civil Branches)  0  1  2  2

List of Exercises using software capable of Drafting and Modeling

1. Study of capabilities of software for Drafting and Modeling – Coordinate systems (absolute, relative, polar, etc.) – Creation of simple figures like polygon and general multi-line figures.
2. Drawing of a Title Block with necessary text and projection symbol.
3. Drawing of curves like parabola, spiral, involute using Bspline or cubic spline.
4. Drawing of front view and top view of simple solids like prism, pyramid, cylinder, cone, etc, and dimensioning.
5. Drawing front view, top view and side view of objects from the given pictorial views (eg. V-block, Base of a mixie, Simple stool, Objects with hole and curves).
6. Drawing of a plan of residential building (Two bed rooms, kitchen, hall, etc.)
7. Drawing of a simple steel truss.
8. Drawing sectional views of prism, pyramid, cylinder, cone, etc,
10. Creation of 3-D models of simple objects and obtaining 2-D multi-view drawings from 3-D model.

Note: Plotting of drawings must be made for each exercise and attached to the records written by students.

List of Equipments for a batch of 30 students:

1. Pentium IV computer or better hardware, with suitable graphics facility – 30 Nos.
2. Licensed software for Drafting and Modeling – 30 Licenses
3. Laser Printer or Plotter to print / plot drawings – 2 Nos.
(b) BEE231 ELECTRICAL CIRCUITS LABORATORY
(For EEE & EIE branches)  L T P C
0 0 3 2

LIST OF EXPERIMENTS

• Verification of ohm’s laws and kirchoff’s laws.
• Verification of Thevenin’s and Norton’s Theorem
• Verification of superposition Theorem
• Verification of maximum power transfer theorem.
• Verification of reciprocity theorem
• Measurement of self inductance of a coil
• Verification of mesh and nodal analysis.
• Transient response of RL and RC circuits for DC input.
• Frequency response of series and parallel resonance circuits.
• Frequency response of single tuned circuits.

TOTAL: 45 PERIODS
(c) BEC231 CIRCUITS AND DEVICES LABORATORY
(For ECE, CSE & IT branches)

- Verification of KVL and KCL
- Verification of Thevenin and Norton Theorems.
- Verification of superposition Theorem.
- Verification of Maximum power transfer and reciprocity theorems.
- Frequency response of series and parallel resonance circuits.
- Characteristics of PN and Zener diode
- Characteristics of CE configuration
- Characteristics of CB configuration
- Characteristics of UJT and SCR
- Characteristics of JFET and MOSFET
- Characteristics of Diac and Triac.
- Characteristics of Photodiode and Phototransistor.

TOTAL: 45 PERIODS
BEG231  ENGLISH LANGUAGE SKILL LABORATORY (Skill of Listening)  L  T  P  C
(Common to all branches)  0  0  3   2

UNIT I (Micro Skills I)
Tasks (Type I): Lexical word identification
A. Identifying the homophones/words with silent letters/often mispronounced words
B. Identifying the missing words in native speech (Native accent)

Tasks (Type II): Decompressing structures
A. Expanding sound units into word clusters (Ex: verbs with multiple auxiliaries/contracted forms)
B. Identifying the constituent words in collocations/compound words/idiomatic phrases

UNIT II (Micro Skills II): Identifying tonal variations for meaning making
Tasks:
A. Punctuating the script after listening to it.
B. Marking word chunks/tone groups in transcript after listening to it.
C. Marking syllable stress in words.
D. Identifying tonal variations expressing rhetorical questions/ information seeking Questions / Exclamations / General statements.

UNIT III Content Comprehension and Making Inferences
Tasks:
A. Listening and filling in the chart
B. Multiple choice questions (Negative/factual)
C. True/False questions
D. Questions with multiple answers (choosing two/three correct answers)
E. Matching information
F. Filling the blanks (not more than three words)
G. Comprehending the text organization

UNIT IV Listening and act
Tasks:
A. Locating spots in a map following the given directions
B. Transferring data to graphs/diagrams/flow charts
C. Diagram/Picture completing tasks
D. Finding the answer through the process of elimination

TOTAL: 30 PERIODS
BMA301 TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS (Common to all branches)  

L T P C 3 1 0 4

OBJECTIVES

The course objective is to develop the skills of the students in the areas of Transforms and Partial Differential Equations. This will be necessary for their effective studies in a large number of engineering subjects like heat conduction, communication systems, electro-optics and electromagnetic theory. The course will also serve as a prerequisite for post graduate and specialized studies and research.

UNIT I FOURIER SERIES (9L+3T)

UNIT II FOURIER TRANSFORMS (9L+3T)

UNIT III PARTIAL DIFFERENTIAL EQUATIONS (9L+3T)
Formation of partial differential equations – Lagrange’s linear equation – Solutions of standard types of first order partial differential equations - Linear partial differential equations of second and higher order with constant coefficients.

UNIT IV APPLICATIONS OF PARTIAL DIFFERENTIAL EQUATIONS (9L+3T)
Solutions of one dimensional wave equation – One dimensional equation of heat conduction – Steady state solution of two-dimensional equation of heat conduction (Insulated edges excluded) – Fourier series solutions in Cartesian coordinates.

UNIT V Z - TRANSFORMS AND DIFFERENCE EQUATIONS (9L+3T)

Lectures: 45  Tutorials: 15  Total: 60 Periods

TEXT BOOK


REFERENCES

BCE301 ENVIRONMENTAL SCIENCE AND ENGINEERING 
(3rd Sem – Civil, CSE, IT, EEE and EIE 
5th Sem – Mechanical, 7th Sem - ECE)

AIM
The aim of this course is to create awareness in every engineering graduate about the importance of environment, the effect of technology on the environment and ecological balance and make them sensitive to the environment problems in every professional endeavour that they participates.

OBJECTIVE
At the end of this course the student is expected to understand what constitutes the environment, what are precious resources in the environment, how to conserve these resources, what is the role of a human being in maintaining a clean environment and useful environment for the future generations and how to maintain ecological balance and preserve bio-diversity. The role of government and non-government organization in environment managements.

UNIT I ENVIRONMENT, ECOSYSTEMS AND BIODIVERSITY
Definition, scope and importance of environment – need for public awareness – concept of an ecosystem – structure and function of an ecosystem – producers, consumers and decomposers – energy flow in the ecosystem – ecological succession – food chains, food webs and ecological pyramids – Introduction, types, characteristic features, structure and function of the (a) forest ecosystem (b) grassland ecosystem (c) desert ecosystem (d) aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) – Introduction to biodiversity definition: genetic, species and ecosystem diversity – biogeographical classification of India – value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values – Biodiversity at global, national and local levels – India as a mega-diversity nation – hot-spots of biodiversity – threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts – endangered and endemic species of India – conservation of biodiversity: In-situ and ex-situ conservation of biodiversity. Field study of common plants, insects, birds - Field study of simple ecosystems – pond, river, hill slopes, etc.

UNIT II ENVIRONMENTAL POLLUTION
Definition – causes, effects and control measures of: (a) Air pollution (b) Water pollution (c) Soil pollution (d) Marine pollution (e) Noise pollution (f) Thermal pollution (g) Nuclear hazards – soil waste management: causes, effects and control measures of municipal solid wastes – role of an individual in prevention of pollution – pollution case studies – disaster management: floods, earthquake, cyclone and landslides. Field study of local polluted site – Urban / Rural / Industrial / Agricultural.

UNIT III NATURAL RESOURCES
Forest resources: Use and over-exploitation, deforestation, case studies – timber extraction, mining, dams and their effects on forests and tribal people – Water resources: Use and over – utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems – Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies – Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer – pesticide problems, water logging, salinity, case studies – Energy resources: Growing energy needs, renewable and non renewable energy
sources, use of alternate energy sources. case studies – Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification – role of an individual in conservation of natural resources – Equitable use of resources for sustainable lifestyles. Field study of local area to document environmental assets – river / forest / grassland / hill / mountain.

UNIT IV  SOCIAL ISSUES AND THE ENVIRONMENT  7

UNIT V  HUMAN POPULATION AND THE ENVIRONMENT  6

TOTAL:  45

TEXT BOOKS:

REFERENCES:
BIT301 DATA STRUCTURES AND ALGORITHMS USING C L T P C 3 0 0 3

UNIT I LINEAR STRUCTURES 9
Abstract Data Types (ADT) - List ADT - array-based implementation - linked list implementation -
cursor-based linked lists - doubly-linked lists - applications of lists - Stack ADT - Queue ADT -
circular queue implementation - Applications of stacks and queues

UNIT II TREE STRUCTURES 9
Tree ADT - tree traversals - left child right sibling data structures for general trees - Binary Tree ADT -
expression trees - applications of trees - binary search tree ADT - AVL trees - binary heaps

UNIT III HASHING AND SETS 9
Hashing - Separate chaining - open addressing - rehashing - extendible hashing - Disjoint Set ADT -
dynamic equivalence problem - smart union algorithms - path compression - applications of Sets

UNIT IV GRAPHS 9
Definitions - Topological sort - breadth-first traversal - shortest-path algorithms - minimum spanning

tree - Prim's and Kruskal's algorithms - Depth-first traversal -biconnectivity - Euler circuits -
applications of graphs

UNIT V ALGORITHM DESIGN AND ANALYSIS 9
Introduction to algorithm design techniques: Greedy algorithms, Divide and conquer, Dynamic
programming, backtracking, branch and bound, Randomized algorithms - Introduction to algorithm
analysis: asymptotic notations, recurrences - Introduction to NP-complete problems

TEXT BOOK

REFERENCES

Education, 1983.


Ltd., 2000

BEI303 DIGITAL PRINCIPLES AND SYSTEM DESIGN (Common to CSE & IT) 3 1 0 4

UNIT I BOOLEAN ALGEBRA AND LOGIC GATES 8+3

UNIT II COMBINATIONAL LOGIC 9+3
Combinational circuits – Analysis and design procedures - Circuits for arithmetic operations - Code conversion – Introduction to Hardware Description Language (HDL).

UNIT III DESIGN WITH MSI DEVICES 8+3
Decoders and encoders – Multiplexers and demultiplexers – Memory and programmable logic – HDL for combinational circuits

UNIT IV SYNCHRONOUS SEQUENTIAL LOGIC 10+3

UNIT V ASYNCHRONOUS SEQUENTIAL LOGIC 10+3
Analysis and design of asynchronous sequential circuits - Reduction of state and flow tables – Race-free state assignment – Hazards – ASM Chart.

LECTURE: 45 TUTORIAL: 15 TOTAL: 60

TEXT BOOK

REFERENCES
BCS302 OBJECT ORIENTED PROGRAMMING  L T P C
(Common to 3rd Sem – CSE & IT,
5th Sem – EIE, 6th Sem – EEE)

3 0 0 3

UNIT I BASICS OF OBJECT – ORIENTED PROGRAMMING 9
Object oriented programming concepts – objects – classes – methods and messages – abstraction and
encapsulation – inheritance – abstract classes – polymorphism. Introduction to C++ – classes – access
specifiers – function and data members – default arguments – function overloading – friend functions
– const and volatile functions – static members – Objects - pointers and objects – constant objects –
nested classes – local classes.

UNIT II CONSTRUCTORS AND FUNCTION OVERLOADING 9
Constructors – default constructor – Parameterized constructors – Constructor with dynamic
allocation – copy constructor – destructors – operator overloading – overloading through friend
functions – overloading the assignment operator – type conversion – explicit constructor.

UNIT III TEMPLATES AND EXCEPTION HANDLING 9
Function and class templates – Exception handling – try-catch-throw paradigm – exception
specification – terminate and unexpected functions – Uncaught exception.

UNIT IV INHERITANCE 9
Inheritance – public, private and protected derivations – multiple inheritance – virtual base class –
abstract class – composite objects – Runtime polymorphism – virtual functions – pure virtual

UNIT V I/O STREAMS 9
Streams and formatted I/O – I/O manipulators – file handling – random access – object serialization –

TOTAL: 45

TEXT BOOK

REFERENCES
   2004.
   2005.
BIT302 PRINCIPLES OF COMMUNICATION L T P C 3 1 0 4

UNIT I FUNDAMENTALS OF ANALOG COMMUNICATION 9
Principles of amplitude modulation, AM envelope, frequency spectrum and bandwidth, modulation index and percent modulation, AM Voltage distribution, AM power distribution, Angle modulation - FM and PM waveforms, phase deviation and modulation index, frequency deviation and percent modulation, Frequency analysis of angle modulated waves. Bandwidth requirements for Angle modulated waves.

UNIT II DIGITAL COMMUNICATION 9
Introduction, Shannon limit for information capacity, digital amplitude modulation, frequency shift keying, FSK bit rate and baud, FSK transmitter, BW consideration of FSK, FSK receiver, phase shift keying - binary phase shift keying - QPSK, Quadrature Amplitude modulation, bandwidth efficiency, carrier recovery - squaring loop, Costas loop, DPSK.

UNIT III DIGITAL TRANSMISSION 9
Introduction, Pulse modulation, PCM - PCM sampling, sampling rate, signal to quantization noise rate, companding - analog and digital - percentage error, delta modulation, adaptive delta modulation, differential pulse code modulation, pulse transmission - Intersymbol interference, eye patterns.

UNIT IV SPREAD SPECTRUM AND MULTIPLE ACCESS TECHNIQUES 9
Introduction, Pseudo-noise sequence, DS spread spectrum with coherent binary PSK, processing gain, FH spread spectrum, multiple access techniques – wireless communication, TDMA and CDMA in wireless communication systems, source coding of speech for wireless communications.

UNIT V SATELLITE AND OPTICAL COMMUNICATION 9

Lectures: 45 Tutorials: 15 Total: 60

TEXT BOOKS

REFERENCES
LIST OF EXPERIMENTS
1. Verification of Boolean theorems using digital logic gates
2. Design and implementation of combinational circuits using basic gates for arbitrary functions, code converters, etc.
3. Design and implementation of 4-bit binary adder / subtractor using basic gates and MSI Devices.
4. Design and implementation of parity generator / checker using basic gates and MSI Devices.
5. Design and implementation of magnitude comparator.
6. Design and implementation of application using multiplexers/ demultiplexers.
7. Design and implementation of Shift registers.
8. Design and implementation of Synchronous and Asynchronous counters.
9. Simulation of combinational circuits using Hardware Description Language (VHDL/Verilog HDL software required).
10. Simulation of sequential circuits using HDL (VHDL/ Verilog HDL software required)

TOTAL: 45
List of equipments and components for a batch of 30 students

<table>
<thead>
<tr>
<th>S.NO</th>
<th>Name of equipment/ component</th>
<th>Quantity Req</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Dual power supply/ single mode power supply</td>
<td>15/30</td>
<td>+12/-12V</td>
</tr>
<tr>
<td>2</td>
<td>IC Trainer</td>
<td>15</td>
<td>10 bit</td>
</tr>
<tr>
<td>3</td>
<td>Bread Boards</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Multimeter</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>IC 7400</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>IC7402</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>IC 7404</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>IC 7486</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>IC 7408</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>IC 7432</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>IC 7483</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>IC 74150</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>IC74151</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>IC74147</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>IC7445</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>IC7476</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>IC7491</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>IC555</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>IC7494</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>IC7447</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>IC74180</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>IC7485</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>IC7473</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>IC74138</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>IC7411</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>IC7474</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>Computer with HDL software</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>Seven segment display</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>Assembled LED board/LEDs</td>
<td>40/200</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>Wires Single strand</td>
<td></td>
<td>Single Strand</td>
</tr>
</tbody>
</table>
BIT331 DATA STRUCTURES AND ALGORITHMS USING C L T P C
LABORAOTRY 0 0 3 2

OBJECTIVE
To develop programming skills in design and implementation of data structures and their
applications

LIST OF EXPERIMENTS

1. Implement singly and doubly linked lists.
2. Represent a polynomial as a linked list and write functions for polynomial addition.
3. Implement stack and use it to convert infix to postfix expression
4. Implement array-based circular queue and use it to simulate a producer-consumer problem.
5. Implement an expression tree. Produce its pre-order, in-order, and post-order traversals.
6. Implement binary search tree.
7. Implement priority queue using heaps
8. Implement hashing techniques.
9. Implement Dijkstra's algorithm using priority queues
10. Implement a backtracking algorithm for Knapsack problem

Total: 45

List of Equipments and components for A Batch of 30 students (1 per batch)

1. SOFTWARE REQUIRED - TURBOC version 3 or GCC version 3.3.4.
2. OPERATING SYSTEM - WINDOWS 2000 / XP / NT or LINUX
3. COMPUTERS REQUIRED - 30 Nos. (Minimum Requirement: Pentium III or
Pentium IV with 256 RAM and 40 GB hard disk)
BCS332  OBJECT ORIENTED PROGRAMMING LABORATORY

(Common to 3rd Sem – CSE & IT, 5th Sem – EIE, 6th Sem – EEE)  L T P C  0 0 3 2

1. Design C++ classes with static members, methods with default arguments, friend functions. (For example, design matrix and vector classes with static allocation, and a friend function to do matrix-vector multiplication)
2. Implement complex number class with necessary operator overloading and type conversions such as integer to complex, double to complex, complex to double etc.
3. Implement Matrix class with dynamic memory allocation and necessary methods. Give proper constructor, destructor, copy constructor, and overloading of assignment operator.
4. Overload the new and delete operators to provide custom dynamic allocation of memory.
5. Develop a template of linked-list class and its methods.
6. Develop templates of standard sorting algorithms such as bubble sort, insertion sort, merge sort, and quick sort.
7. Design stack and queue classes with necessary exception handling.
8. Define Point class and an Arc class. Define a Graph class which represents graph as a collection of Point objects and Arc objects. Write a method to find a minimum cost spanning tree in a graph.
9. Develop with suitable hierarchy, classes for Point, Shape, Rectangle, Square, Circle, Ellipse, Triangle, Polygon, etc. Design a simple test application to demonstrate dynamic polymorphism and RTTI.
10. Write a C++ program that randomly generates complex numbers (use previously designed Complex class) and writes them two per line in a file along with an operator (+, -, *, or /). The numbers are written to file in the format (a + ib). Write another program to read one line at a time from this file, perform the corresponding operation on the two complex numbers read and write the result to another file (one per line).

TOTAL: 45

LIST OF EQUIPMENTS AND SOFTWARE FOR A BATCH OF 30 STUDENTS

HARDWARE:
- 30 Personal Computers
- Processor – 2.0 GHz or higher
- RAM – 256 MB or higher
- Hard disk – 20 GB or higher

SOFTWARE:
- Turbo C (freeware) – to be installed in all PC’s.
- OS - Windows 2000/ Windows XP/ NT
BEG331 COMMUNICATION SKILLS AND TECHNICAL SEMINAR – I (Common to all branches)  L T P C 0 0 3 2
(To be conducted as a Practical Paper by the Dept of English for 3 hrs per week)

OBJECTIVES
- To improve the learners’ oral fluency in English
- To help the learners acquire the readiness to speak in English
- To develop the sub-skills required for paper presentations and group discussions
- To help the learners improve their vocabulary related to specific fields of technology
- To facilitate the development of the learners’ proficiency in meaningful interaction
- To provide them linguistic support for managing vital sub-functions of Communication

COURSE CONTENT:
A) Phonetic practice (7 hrs)
- English phonemes with special emphasis on the diphthongs

B) Speech practice (8 hrs)
- Speaking on the themes by developing the hints provided.
  The themes are:
  1. Cloning
  2. Artificial satellites
  3. Renewable sources
  4. Telecommunication
  5. Cyber Revolution
  6. Space research
  7. Polythene pollution
  8. Fossil fuels
  9. Climate change
  10. Ecological threats
  11. Water resources
  12. Nuclear technology
  13. Scientific farming
  14. Thermal power plants
  15. Natural calamities
  16. Robotics
  17. Artificial intelligence
  18. Role of Fibre Optics
  19. Exploration of Mars
  20. Gas turbines

C) Group Quiz on technical aspects related to the themes (4hrs)

D) Language Functions (8 hrs)
  1. comparing and contrast
  2. reporting the conversation of others.
  3. talking about future plans and intentions
  4. giving reasons
  5. expressing preferences
  6. quantifying
  7. expressing certainty and uncertainty
  8. expressing opinions and impressions
  9. making suggestions
10. expressing assumptions  
11. evaluating options  
12. hypothesing/deducing  
13. defending a point of view  

E) Seminar presentation on the themes allotted (18 hrs)  

PROCEDURE:  
A) Phonetic practice  
All the speech sounds should be taught. The learners should be given drills in the pronunciation of at least 30 words for each sound. While practicing stress patterns, they should be encouraged to identify as many words as possible for each suffix ending.  

B) Speech practice  
Every student should be allowed to choose one theme to specialize in. (However not more than 4 students in a section can choose the same theme). The teacher has to prepare at least 4 hints development tasks on each theme and should provide chance to each learner to speak on those hints related to his/her theme (5 minutes). The hints may be supplied to the students in advance. When a student speaks, the class should be encouraged to ask questions as well as note down the words related to the different fields.  

C) Group Quiz on technical phrases related to the themes.  
The class should be divided into groups that specialize on a particular theme. Each group should conduct a quiz (question & answer session) which will be answered by the other groups.  

D) Language Functions  
The teacher should build micro activities to develop the use of language required to handle these sub-functions of communication. In the process, the learners should get used to the linguistic elements needed for these functions.  

E) Seminar presentation on the themes allotted  
Each student should collect materials from books, journals and newspapers for his/her theme and prepare a short seminar paper. The presentation should be for 10 minutes. It should be followed ‘open house’ during which others should come forward to question, clarify, supplement or evaluate.  

RECORD LAY OUT:  
Every student has to maintain a record in which he/she has to incorporate the following details.  
- First page containing learner details and the topic of specialization.  
- Twenty words for each phoneme  
- Twenty words with stress marks for each suffix ending  
- Vocabulary list (technical words and compound words) related to the 20 themes identified for this semester.  
- Three newspaper items, two journal items and three internet sources related to the special theme selected by the student. (To be pasted on the pages)  
- The Quiz questions of the group with expected answers.  
- The seminar paper presented by the learner with details about the open house.  
- Notes of observation. (Details about any three seminar paper presentations by others)  
- The record should be duly signed by the course teacher and submitted to the External Examiner for verification during the semester practicals.  

P = 45 Total = 45

BIT401 SOFTWARE ENGINEERING AND QUALITY ASSURANCE L T P C 3 0 0 3

UNIT I SOFTWARE PRODUCT AND PROCESS 9

UNIT II SOFTWARE REQUIREMENTS 9

UNIT III ANALYSIS, DESIGN CONCEPTS AND PRINCIPLES 9

UNIT IV TESTING 9

UNIT V SOFTWARE QUALITY ASSURANCE 9

TOTAL = 45

TEXT BOOKS

REFERENCES
BCS402 MICROPROCESSORS AND MICROCONTROLLERS
(Common to CSE & IT)  3 0 0 3

UNIT I  8085 MICROPROCESSORS  9
8085 Microprocessor architecture – Addressing modes – Instruction set – Programming the 8085.

UNIT II  8086 SOFTWARE ASPECTS  9
Intel 8086 microprocessor – Architecture – Signals – Instruction Set – Addressing Modes –
Assembler Directives – Assembly Language Programming – Procedures – Macros – Interrupts And
Interrupt Service Routines – BIOS function calls.

UNIT III MULTIPROCESSOR CONFIGURATIONS  9
Coprocessor Configuration – Closely Coupled Configuration – Loosely Coupled Configuration – 8087
Numeric Data Processor – Architecture – Data Types – 8089 I/O Processor – Architecture –
Communication between CPU and IOP

UNIT IV I/O INTERFACING  9
Memory interfacing and I/O interfacing with 8085 – parallel communication interface – serial
communication interface – timer-keyboard/display controller – interrupt controller –DMA controller
(8237) – applications – stepper motor – temperature control.

UNIT V MICROCONTROLLERS  9
data I/O – interrupts-Interfacing -keyboard, LCD,ADC and DAC.

TOTAL: 45

TEXT BOOKS
1. Ramesh S. Gaonkar, “Microprocessor – Architecture, Programming and Applications with the
2. Yu-cheng Liu, Glenn A.Gibson, “Microcomputer systems: The 8086 / 8088 Family

REFERENCES
2. A.K.Ray and K.M Bhurchandi, “Advanced Microprocessor and Peripherals – Architecture,
BCS403  COMPUTER ORGANIZATION AND ARCHITECTURE  
(Common to CSE & IT)  
L T P C  
3 1 0 4

UNIT I  BASIC STRUCTURE OF COMPUTERS  
12  
Functional units – Basic operational concepts – Bus structures – Performance and metrics – 
Instructions and instruction sequencing – Hardware – Software Interface – Instruction set architecture – 
Addressing modes – RISC – CISC – ALU design – Fixed point and floating point operations.

UNIT II  BASIC PROCESSING UNIT  
12  
Fundamental concepts – Execution of a complete instruction – Multiple bus organization – Hardwired 
control – Micro programmed control – Nano programming.

UNIT III  PIPELINING  
12  
Basic concepts – Data hazards – Instruction hazards – Influence on instruction sets – Data path and 
control considerations – Performance considerations – Exception handling.

UNIT IV  MEMORY SYSTEM  
12  
Basic concepts – Semiconductor RAM – ROM – Speed – Size and cost – Cache memories – 
Improving cache performance – Virtual memory – Memory management requirements – Associative 
memories – Secondary storage devices.

UNIT V  I/O ORGANIZATION  
12  
Accessing I/O devices – Programmed Input/Output – Interrupts – Direct Memory Access – Buses – 
Interface circuits – Standard I/O Interfaces (PCI, SCSI, USB), I/O devices and processors.

LECTURE: 45 TUTORIAL: 15 TOTAL: 60

TEXT BOOK

REFERENCES:
1998.
BMA402 PROBABILITY AND QUEUEING THEORY L T P C Common to CSE & IT 3 1 0 4

AIM
The probabilistic models are employed in countless applications in all areas of science and engineering. Queueing theory provides models for a number of situations that arise in real life. The course aims at providing necessary mathematical support and confidence to tackle real life problems.

OBJECTIVES
At the end of the course, the students would
• Have a fundamental knowledge of the basic probability concepts.
• Have a well – founded knowledge of standard distributions which can describe real life phenomena.
• Acquire skills in handling situations involving more than one random variable and functions of random variables.
• Understand and characterize phenomena which evolve with respect to time in a probabilistic manner.
• Be exposed to basic characteristic features of a queueing system and acquire skills in analyzing queueing models.

UNIT I RANDOM VARIABLES (9L+3T)
Discrete and continuous random variables - Moments - Moment generating functions and their properties. Binomial, Poisson , Geometric, Negative binomial, Uniform, Exponential, Gamma, and Weibull distributions.

UNIT II TWO DIMENSIONAL RANDOM VARIABLES (9L+3T)
Joint distributions - Marginal and conditional distributions – Covariance - Correlation and regression - Transformation of random variables - Central limit theorem.

UNIT III MARKOV PROCESSES AND MARKOV CHAINS (9L+3T)
Classification - Stationary process - Markov process - Markov chains – Transition probabilities - Limiting distributions - Poisson process

UNIT IV QUEUEING THEORY (9L+3T)
Markovian models – Birth and Death Queueing models- Steady state results: Single and multiple server queueing models- queues with finite waiting rooms-Finite source models-Little’s Formula

UNIT V NON-MARKOVIAN QUEUES AND QUEUE NETWORKS (9L+3T)
M/G/1 queue- Pollaczeck- Khintchine formula, series queues- open and closed networks.

Lectures: 45 Tutorials: 15 Total: 60 Periods

TEXT BOOKS
1. O.C. Ibe, “Fundamentals of Applied Probability and Random Processes”, Elsevier, 1st Indian Reprint, 2007 (For units 1, 2 and 3).

REFERENCES
BCS404 OPERATING SYSTEMS (Common to 4th Sem - CSE& IT, 6th Sem - ECE) 3 0 0 3

UNIT I PROCESSES AND THREADS 9

UNIT II PROCESS SCHEDULING AND SYNCHRONIZATION 10

UNIT III STORAGE MANAGEMENT 9

UNIT IV FILE SYSTEMS 9

UNIT V I/O SYSTEMS 8

TOTAL: 45

TEXT BOOK

REFERENCES
UNIT I  INTRODUCTION

UNIT II  RELATIONAL MODEL

UNIT III  DATABASE DESIGN

UNIT IV  TRANSACTIONS

UNIT V  IMPLEMENTATION TECHNIQUES

TOTAL: 45

TEXT BOOKS

REFERENCES
BCS431 OPERATING SYSTEMS LABORATORY L T P C
(Common to CSE & IT) 0 0 3 2

(Implement the following on LINUX or other UNIX like platform. Use C for high level language implementation)

1. Write programs using the following system calls of UNIX operating system: fork, exec, getpid, exit, wait, close, stat, opendir, readdir
2. Write programs using the I/O system calls of UNIX operating system (open, read, write, etc)
3. Write C programs to simulate UNIX commands like ls, grep, etc.
4. Given the list of processes, their CPU burst times and arrival times, display/print the Gantt chart for FCFS and SJF. For each of the scheduling policies, compute and print the average waiting time and average turnaround time. (2 sessions)
5. Given the list of processes, their CPU burst times and arrival times, display/print the Gantt chart for Priority and Round robin. For each of the scheduling policies, compute and print the average waiting time and average turnaround time (2 Sessions).
6. Developing Application using Inter Process communication (using shared memory, pipes or message queues)
8. Implement some memory management schemes – I
9. Implement some memory management schemes – II
10. Implement any file allocation technique (Linked, Indexed or Contiguous)

Example for exercises 8 & 9:
Free space is maintained as a linked list of nodes with each node having the starting byte address and the ending byte address of a free block. Each memory request consists of the process-id and the amount of storage space required in bytes. Allocated memory space is again maintained as a linked list of nodes with each node having the process-id, starting byte address and the ending byte address of the allocated space. When a process finishes (taken as input) the appropriate node from the allocated list should be deleted and this free disk space should be added to the free space list. [Care should be taken to merge contiguous free blocks into one single block. This results in deleting more than one node from the free space list and changing the start and end address in the appropriate node]. For allocation use first fit, worst fit and best fit.

TOTAL: 45

HARDWARE AND SOFTWARE REQUIRED FOR A BATCH OF 30 STUDENTS

HARDWARE:
• 30 Personal Computers

SOFTWARE:
• Linux: Ubuntu / OpenSUSE / Fedora / Red Hat / Debian / Mint OS Linux could be loaded in individual PCs.
  (OR)
• A single server could be loaded with Linux and connected from the individual PCs.
BCS432 DATABASE MANAGEMENT SYSTEMS LABORATORY L T P C
(Common to CSE & IT) 0 0 3 2

1. Data Definition, Table Creation, Constraints,
2. Insert, Select Commands, Update & Delete Commands.
3. Nested Queries & Join Queries
4. Views
5. High level programming language extensions (Control structures, Procedures and Functions).
6. Front end tools
7. Forms
8. Triggers
9. Menu Design
10. Reports.
11. Database Design and implementation (Mini Project).

TOTAL: 45

HARDWARE AND SOFTWARE REQUIRED FOR A BATCH OF 30 STUDENTS:

HARDWARE:

- 30 Personal Computers

SOFTWARE:

- Front end: VB/VC ++/JAVA
- Back end: Oracle 11g, MY SQL, DB2
- Platform: Windows 2000 Professional/XP

Oracle server could be loaded and can be connected from individual PCs.
AIM
To learn the assembly language programming of 8085, 8086 and 8051 and also to give a practical training of interfacing the peripheral devices with the processor.

OBJECTIVES
• To implement the assembly language programming of 8085, 8086 and 8051.
• To study the system function calls like BIOS/DOS.
• To experiment the interface concepts of various peripheral device with the processor.

EXPERIMENTS IN THE FOLLOWING
1. Programming with 8085.
2. Programming with 8086 - experiments including BIOS/DOS calls: Keyboard control, Display, File Manipulation.
3. Interfacing with 8085/8086-8255, 8253.
4. Interfacing with 8085/8086-8279, 8251.
5. 8051 Microcontroller based experiments for Control Applications.
6. Mini- Project.

TOTAL: 45

LIST OF EQUIPMENTS/COMPONENTS FOR 30 STUDENTS (2 PER BATCH)
1. 8085 Trainer Kit with onboard 8255, 8253, 8279 and 8251 – 15 nos.
2. TASM/MASTM simulator in PC (8086 programs) – 30 nos.
3. 8051 trainer kit – 15 nos.
4. Interfacing with 8086 – PC add-on cards with 8255, 8253, 8279 and 8251 – 15 nos.
5. Stepper motor interfacing module – 5 nos.
7. ADC, DAC interfacing module – 5 nos.
8. CRO’s – 5 nos.
BEG431 COMMUNICATION SKILLS AND TECHNICAL SEMINAR – II  L  T  P  C
(Common to all branches)  0  0  3  2
(To be conducted as a Practical Paper by the Dept of English for 3 hrs per week)

OBJECTIVES
1. To improve the learners’ oral fluency in English
2. To help the learners acquire the readiness to speak in English
3. To develop the sub-skills required for paper presentations and group discussions
4. To help the learners improve their vocabulary related to specific fields of technology
5. To facilitate the development of the learners’ proficiency in meaningful interaction
6. To provide them linguistic support for managing vital sub-functions of communication.

COURSE CONTENT:
A) Phonetic practice (7 hrs)
All the English phonemes with special emphasis on the following
1. /æ/ and /ei/
2. /e/ and /i/
3. First syllable and second syllable stress
4. Three different ways of pronouncing ‘ed’ past tense endings eg. ‘played’, ‘walked’, ‘wanted’
5. Correct pronunciation of commonly used words ( A list of 1000 words will be suggested by the university)
6. Silent letters

B) Speech practice (8 hrs)
Speaking on the themes by developing the hints provided.
The themes are:
1. Indian space missions
2. Converting agricultural wastes for useful purposes
3. Developments in transportation
4. Technology and agriculture
5. Impact of global warming
6. Desalination of water
7. Technology for national security
8. Industrial development and ecological issues
9. Applications of nano technology
10. Hazards of e-waste

C) Preparation of power point frames on the given topic (2 hrs)
(Only pictures, graphs, equations should be given through power point and not the text of the presentation as such)

D) Language Functions (14 hrs)
Reporting the conversation of others
Using the third conditional
Expressing agreement and disagreement
Numerical expressions
Describing manner and frequency
Evaluating different standpoints
Developing an argument
Describing daily routines, events, and weather
E) Seminar presentation on the themes allotted using power point frames (14 hrs)
PROCEDURE:
A) Phonetic practice
The learners should be given drills in the pronunciation of at least 30 words for each sound. While practicing stress patterns, they should be encouraged to identify as many words as possible for each pattern.

B) Speech practice
Every student should be allowed to choose one theme to specialize in. (However not more than 7 students in a section can choose the same theme). The teacher has to prepare at least 4 hints development tasks on each theme and should provide chance to each learner to speak on those hints related to his/her theme (5 minutes). The hints may be supplied to the students in advance. When a student speaks, the class should be encouraged to ask questions as well as note down the words related to the different fields.

C) Language Functions
The teacher should build micro activities to develop the use of language required to handle these sub-functions of communication. In the process, the learners should get used to the linguistic elements needed for these functions.

D) Seminar presentation on the themes allotted
Each student should collect materials from books, journals and newspapers for his/her theme and prepare a short seminar paper. The presentation should be for 10 minutes using power point frames. It should be followed by an ‘open house’ during which others should come forward to question, clarify, supplement or evaluate.

RECORD LAY OUT:
Every student has to maintain a record in which he/she has to incorporate the following details.

- First page containing learner details and the topic of specialization.
- Twenty words for each phoneme /æ/, /ei/, /i/ and /e/
- Fifty words with first syllable stress and fifty for second syllable stress (The learner will be required to pronounce some of these words during the practical exam)
- Vocabulary list (technical words and compound words) related to the 10 themes identified for this semester.
- Three newspaper items, two journal items and three internet sources related to the special theme selected by the student. (To be pasted on the pages)
- The seminar paper presented by the learner with a soft copy of the power point frames.
- Notes of observation. (Details about any two seminar paper presentations by others)
- The record should be duly signed by the course teacher and submitted to the External Examiner for verification during the semester practicals.

\[ P = 45 \text{ Total} = 45 \]
BIT501          SYSTEM SOFTWARE          L T P C
                                           3 1 0 4

OBJECTIVES
- To understand the relationship between system software and machine architecture.
- To know the design and implementation of assemblers
- To know the design and implementation of linkers and loaders.
- To have an understanding of macro processors.
- To have an understanding of system software tools.

UNIT I  INTRODUCTION  8
System software and machine architecture – The Simplified Instructional Computer (SIC and
SIC/XE) - Machine architecture - Data and instruction formats - Addressing modes - Instruction sets –
Input and Output – SIC and SIC/XE Programming examples

UNIT II  ASSEMBLERS  10
Basic assembler functions - A simple SIC assembler – Assembler algorithm and data structures -
Machine dependent assembler features - Instruction formats and addressing modes – Program
relocation - Machine independent assembler features - Literals – Symbol-defining statements –
Expressions - One pass assemblers and Multi pass assemblers - Implementation example - MASM
assembler

UNIT III  LOADERS AND LINKERS  9
Basic loader functions - Design of an Absolute Loader – A Simple Bootstrap Loader -Machine
dependent loader features - Relocation – Program Linking – Algorithm and Data Structures for
Linking Loader - Machine-independent loader features – Automatic Library Search – Loader Options
- Loader design options - Linkage Editors – Dynamic Linking – Bootstrap Loaders - Implementation
example - MSDOS linker

UNIT IV  MACRO PROCESSORS  9
Basic macro processor functions - Macro Definition and Expansion – Macro Processor Algorithm and
data structures - Machine-independent macro processor features - Concatenation of Macro Parameters
– Generation of Unique Labels – Conditional Macro Expansion – Keyword Macro Parameters-Macro
within Macro-Implementation example - MASM Macro Processor – ANSI C Macro language.

UNIT V  SYSTEM SOFTWARE TOOLS  9
Text editors - Overview of the Editing Process - User Interface – Editor Structure - Interactive
debugging systems - Debugging functions and capabilities – Relationship with other parts of the
system – User-Interface Criteria

TUTORIAL: 15
TOTAL: 60

TEXT BOOK

REFERENCES
BIT502     PRINCIPLES OF OBJECT ORIENTED ANALYSIS AND DESIGN

OBJECTIVES

• To learn basic OO analysis and design skills through an elaborate case study.
• To use the UML design diagrams
• To apply the appropriate design patterns

UNIT I  INTRODUCTION
Introduction to OOAD – What is OOAD? – What is UML? - What are the United process(UP) phases? - Case study – the NextGen POS system, Inception - Use case Modeling - Relating Use cases – include, extend and generalization.

UNIT II  DOMAIN MODELS AND CLASS RELATIONS
Elaboration - Domain Models - Finding conceptual classes and description classes – Associations – Attributes – Domain model refinement – Finding conceptual class hierarchies- Aggregation and Composition- UML activity diagrams and modeling

UNIT III  LOGICAL ARCHITECTURE AND SSD
System sequence diagrams - Relationship between sequence diagrams and use cases - Logical architecture and UML package diagram – Logical architecture refinement - UML class diagrams - UML interaction diagrams

UNIT IV DESIGNING OBJECTS WITH RESPONSIBILITIES

UNIT V  OPERATION CONTRACTS
UML state diagrams and modeling - Operation contracts- Mapping design to code –UML deployment and component diagrams

TOTAL: 45

TEXT BOOK

REFERENCES
BCS502  COMPUTER NETWORKS  L T P C
(Common to CSE & IT)  3 0 0 3

OBJECTIVES
• To study the concepts of communications and network architecture.
• To understand the network classifications and design principles.
• To study about the switching concepts and routing protocols.
• To learn about the various layering protocols.

UNIT I  INTRODUCTION  9
Communication model - Data communications networking - Data transmission concepts and terminology - Transmission media - Data encoding - Data link control.

UNIT II  NETWORK FUNDAMENTALS  9

UNIT III  NETWORK LAYER  9

UNIT IV  TRANSPORT LAYER  9
Transport layer - Reliable delivery service - Congestion control - Connection establishment - Flow control - Transmission control protocol - User datagram protocol.

UNIT V  APPLICATION LAYER  9
Applications - Sessions and presentation aspects - DNS, Telnet - rlogin - FTP - SMTP - WWW - Security - SNMP.

TOTAL: 45

TEXT BOOKS

REFERENCES
BCS503  THEORY OF COMPUTATION  (Common to CSE & IT)  L T P C  3 1 0 4

OBJECTIVES
• To have an understanding of finite state and pushdown automata.
• To have a knowledge of regular languages and context free languages.
• To know the relation between regular language, context free language and corresponding recognizers.

UNIT I  AUTOMATA  7+3
Introduction to formal proof - Additional forms of proof - Inductive proofs - Finite Automata (FA) - Deterministic Finite Automata (DFA) - Non-deterministic Finite Automata (NFA) - Finite Automata with Epsilon transitions.

UNIT II  REGULAR EXPRESSIONS AND LANGUAGES  10+3
Regular Expression - FA and Regular Expressions - Proving languages not to be regular - Closure properties of regular languages - Equivalence and minimization of Automata.

UNIT III  CONTEXT-FREE GRAMMARS AND LANGUAGES  10+3
Context-Free Grammar (CFG) - Parse Trees - Ambiguity in grammars and languages - Definition of the Pushdown automata - Languages of a Pushdown Automata - Equivalence of Pushdown automata and CFG - Deterministic Pushdown Automata.

UNIT IV  PROPERTIES OF CONTEXT-FREE LANGUAGES  9+3
Normal forms for CFG - Pumping Lemma for CFL - Closure Properties of CFL – Turing Machines - Programming Techniques for TM.

UNIT V  UNDECIDABILITY  9+3
A language that is not Recursively Enumerable (RE) - An un-decidable problem that is RE- Undecidable problems about Turing Machine - Post’s Correspondence Problem - The classes P and NP.

TOTAL: 60

TEXT BOOK

REFERENCES
BCS005  C# AND .NET TECHNOLOGIES  
(Common to CSE & IT)  
L  T  P  C  
3  0  0  3

OBJECTIVES

- To provide an awareness of the .NET Environment.
- To deliver C# program based on the Microsoft .Net Framework including console applications and class libraries.
- To study about the applications of XML in .NET and ADO.NET.

UNIT I  OVERVIEW OF .NET  

UNIT II  CONCEPTS OF C#  

UNIT III  FILE I/O AND OBJECTS  

UNIT IV  ADO.NET  
ADO.NET Architecture - ADO.NET Connected and Disconnected layers – Entity frame work – Introducing LINQ to XML.

UNIT V  ASP.NET  

TOTAL: 45

TEXT BOOKS


REFERENCES

OBJECTIVES:

- To create awareness on Engineering Ethics and Human Values.
- To instill Moral and Social Values and Loyalty
- To appreciate the rights of others

UNIT I  HUMAN VALUES         10

UNIT II  ENGINEERING ETHICS        9

UNIT III  ENGINEERING AS SOCIAL EXPERIMENTATION    9
Engineering as experimentation - engineers as responsible experimenters - codes of ethics - a balanced outlook on law - the challenger case study

UNIT IV  SAFETY, RESPONSIBILITIES AND RIGHTS     9

UNIT V  GLOBAL ISSUES         8
Multinational corporations - Environmental ethics - computer ethics - weapons development - engineers as managers-consulting engineers-engineers as expert witnesses and advisors - Moral leadership - sample code of Ethics like ASME, ASCE, IEEE, Institution of Engineers (India), Indian Institute of Materials Management, Institution of electronics and telecommunication engineers (IETE), India, etc.

TOTAL: 45

TEXT BOOKS

REFERENCES
2. Charles E Harris, Michael S. Protchard and Michael J Rabins, “Engineering Ethics – Concepts and Cases”, Wadsworth Thompson Learning, United States, 2000 (Indian Reprint now available)
1. Implement a symbol table with functions to create, insert, modify, search, and display.
2. Implement pass one of a two pass assembler.
3. Implement pass two of a two pass assembler.
4. Implement a single pass assembler.
5. Implement a macro processor.
6. Implement an absolute loader.
7. Implement a relocating loader.
8. Implement pass one of a direct-linking loader.
10. Implement a simple text editor with features like insertion / deletion of a character, word, and sentence.
To develop a mini-project following the 12 exercises listed below.

1. To develop a problem statement.
2. Develop an IEEE standard SRS document. Also develop risk management and project plan (Gantt chart).
3. Identify Use Cases and develop the Use Case model.
4. Identify the business activities and develop an UML Activity diagram.
5. Identify the conceptual classes and develop a domain model with UML Class diagram.
6. Using the identified scenarios find the interaction between objects and represent them using UML Interaction diagrams.
7. Draw the State Chart diagram.
8. Identify the User Interface, Domain objects, and Technical services. Draw the partial layered, logical architecture diagram with UML package diagram notation.
9. Implement the Technical services layer.
10. Implement the Domain objects layer.
11. Implement the User Interface layer.
12. Draw Component and Deployment diagrams.

Suggested domains for Mini-project

1. Passport automation system.
2. Book bank
3. Exam Registration
4. Stock maintenance system.
5. Online course reservation system
6. E-ticketing
7. Software personnel management system
8. Credit card processing
9. e-book management system
10. Recruitment system
11. Foreign trading system
12. Conference Management System
13. BPO Management System

Suggested Software Tools

ArgoUML, Eclipse IDE, Visual Paradigm, Visual case, and Rational Suite
BIT601  NETWORK PROGRAMMING AND NETWORK MANAGEMENT     L T P C
                                                 3 0 0 3

OBJECTIVES

• To learn the basics of socket programming using TCP Sockets.
• To learn basics of UDP sockets.
• To develop knowledge of threads for developing high performance scalable applications.
• To learn about raw sockets.
• To understand simple network management protocols & practical issues.

UNIT I   NETWORKING & TCP/IP
Communication protocols, Network architecture, UUCP, XNS, IPX/SPX for LANs, TCP & IP headers, IPv4 & v6 address structures, Programming Applications: Time & date routines, Internet protocols: Application layer, Transport layer, Network layer, Datalink layer protocols, Chat, Email, Web server working method & programming.

UNIT II   SOCKET PROGRAMMING
Creating sockets, POSIX data type, Socket addresses, Assigning address to a socket, Java socket programming, Thread programming, Berkeley Sockets: Overview, socket address structures, byte manipulation & address conversion functions, elementary socket system calls, socket, connect, bind, listen, accept, fork, exec, close, TCP ports (ephemeral, reserved), Berkeley Sockets: I/O asynchronous & multiplexing models, select & poll functions, signal & fcntl functions, socket implementation (client & server programs), UNIX domain protocols.

UNIT III   SOCKET OPTIONS, ELEMENTARY UDP SOCKETS

UNIT IV   ADVANCED SOCKETS

UNIT V   NETWORK MANAGEMENT

TOTAL : 45

TEXT BOOKS:

REFERENCES:
BIT602  DIGITAL SIGNAL PROCESSING  L T P C
3 1 0 4

OBJECTIVES
• Understand the basic concepts of discrete-time signal processing and systems necessary for
the design and analysis of advanced signal processing technologies.
• Understand the concept of frequency in continuous-time and discrete-time signals.
• Understand the basic operations that are involved in analog-to-digital and digital-to analog
converters.
• Understand the basic principles of the sampling theorem, how the aliasing errors can be
avoided, and the effects of quantization noise.
• Understand the basic operations that can be performed on digital signals and systems, and the
fundamental concepts of linear time-invariance (LTI), stability, causality, and difference
equation.

UNIT I  SIGNALS AND SYSTEMS  9
Basic Elements of Digital Signal Processing – Concept of Frequency in Continuous Time and

UNIT II  FREQUENCY TRANSFORMATIONS  9
Introduction to DFT – Efficient Computation of DFT – Properties of DFT – Filtering Methods Based
Frequency – Use of FFT Algorithms in Linear Filtering and Correlation.

UNIT III  IIR FILTER DESIGN  9
Structures of IIR – Analog filter design – Discrete time IIR filter from analog filter – IIR filter design
by Impulse Invariance, Bilinear transformation, Approximation of derivatives– filter design using
frequency translation

UNIT IV  FIR FILTER DESIGN  9
Symmetric and Antisymmetric FIR Filters – Linear Phase Filter – Windowing Technique –

UNIT V  APPLICATIONS  9
Multirate signal processing – Speech compression – Adaptive filter – Musical sound processing –
Image Processing

TUTORIAL: 15
TOTAL: 60

TEXT BOOKS

REFERENCES
   Pearson Education,1998
BIT603  PRINCIPLES OF COMPILER DESIGN  L  T  P  C  
3  0  0  3

OBJECTIVES:

- To understand, design and implement a lexical analyzer
- To understand, design and implement a parser
- To understand, design code generation schemes
- To understand optimization of codes and runtime environment

UNIT I  OVERVIEW OF COMPUTER HARDWARE, SYSTEM SOFTWARE AND COMPILER  
9
Introduction - Computer Hardware and types of System Software - Man-machine communication spectrum - Introduction to Compilers - Theory of computer languages - Design of language - Evolution of compilers - Stages of compilation

UNIT II  LEXICAL ANALYSIS  
9
Introduction - Alphabets and tokens in computer languages - Representation of tokens and regular expression - Token reorganization and finite state automata – Implementation - Error recovery

UNIT III  SYNTAX ANALYSIS  
9
Introduction - Context-free grammar and structure of language - Parser and its types - Top-down parser - Bottom-up parser – Implementation - Parser generator tool (Yacc) - Error handling

UNIT IV  RUN-TIME STORAGE ORGANIZATION AND INTERMEDIATE CODE GENERATION  
9
Run-time storage organization: Introduction - Scope and lifetime of variables - Symbol table - Storage allocation - Access to non-local names from stack - Heap allocation - Garbage collection
Intermediate code generation: Introduction - Need for Intermediate code - Types of Intermediate code - Representation of all language constructs by three-address code - Grammar symbols and attributes - Semantic analysis - Semantic routines for intermediate code generation

UNIT V  OPTIMIZATION AND CODE GENERATION  
9
Optimization: Introduction - Hints on writing optimized code at user level - Construction of basic blocks and processing - Data-flow analysis using flow graph - Data-flow equations for blocks with backward flow control - Principal sources of optimization and transformations –Alias - procedural optimization - Loops in flow graph - Loop optimization

TOTAL : 45

TEXT BOOK:

REFERENCE BOOKS:
**BIT604  EMBEDDED SYSTEMS**  
L T P C  
3 0 0 3

**OBJECTIVES**
- To introduce students to the embedded systems, its hardware and software.
- To introduce ARM processor and Instruction set.
- To explain memory system mechanisms.
- To explain programming concepts and embedded programming in C and C++.
- To motivate the students with complete design of embedded system.

**UNIT I  EMBEDDED COMPUTING**  
9  
Challenges of Embedded Systems – Embedded system design process, Embedded processors – 8051 Microcontroller, ARM processor – Architecture, Instruction sets and programming.

**UNIT II  MEMORY AND INPUT / OUTPUT MANAGEMENT**  
9  
Programming Input and Output – Memory system mechanisms – Memory and I/O devices and interfacing – Interrupts handling.

**UNIT III  PROCESSES AND OPERATING SYSTEMS**  
9  
Multiple tasks and processes – Context switching – Scheduling policies – Inter process Communication mechanisms – Performance issues.

**UNIT IV  EMBEDDED SOFTWARE**  
9  
Programming embedded systems in assembly and C – Meeting real time constraints – Multi-state systems and function sequences, Embedded software development tools – Emulators and debuggers.

**UNIT V  EMBEDDED SYSTEM DEVELOPMENT**  
9  
Design issues and techniques – Case studies – Complete design of example embedded systems.

**TOTAL : 45**

**TEXT BOOKS:**

**REFERENCES:**
BIT605  OBJECT ORIENTED PROGRAMMING USING JAVA  L T P C
3 1 0 4

OBJECTIVE:
• To understand the concepts of object-oriented, event driven, and concurrent programming paradigms and develop skills in using these paradigms using Java.

UNIT I  FUNDAMENTALS         9

UNIT II  FEATURES         10

UNIT III  STREAMS AND GRAPHICS PROGRAMMING    10

UNIT IV  EVENT HANDLING AND EXCEPTIONS        8

UNIT V  GENERIC AND MULTITHREADED PROGRAMMING        8

TUTORIAL : 15
TOTAL: 60

TEXT BOOK

REFERENCES
<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BIT631</strong></td>
<td><strong>NETWORK PROGRAMMING LABORATORY</strong></td>
<td><strong>L T P C</strong></td>
<td><strong>0 0 3 2</strong></td>
</tr>
<tr>
<td>(Using C &amp; Java)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Program for creation of TCP &amp; UDP Sockets.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Programs using TCP Sockets (like date and time server &amp; client, echo server &amp; client, etc..)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Programs using UDP Sockets (like echo Server &amp; client, simple DNS)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Implementation of Chat server program with multiple clients.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Simulation of Sliding Window Protocols</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Design a RPC application to add and subtract a given pair of integers.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Write a program to implement alarm clock using,</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a) APPLET     B) Application</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Configure a Network using Distance vector Routing protocol with packet tracer software.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>Connect the Computers in Local Area Networks.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
BIT632                                   JAVA LABORATORY                                   L T P C
                        0 0 3 2

1. Develop a Java package with simple Stack and Queue classes. Use JavaDoc comments for documentation.
2. Design a class for Complex numbers in Java. In addition to methods for basic operations on complex numbers, provide a method to return the number of active objects created.
3. Design a Date class similar to the one provided in the java.util package.
4. Develop with suitable hierarchy, classes for Point, Shape, Rectangle, Square, Circle, Ellipse, Triangle, Polygon, etc. Design a simple test application to demonstrate dynamic polymorphism.
5. Design a Java interface for ADT Stack. Develop two different classes that implement this interface, one using array and the other using linked-list. Provide necessary exception handling in both the implementations.
6. Develop a simple paint-like program that can draw basic graphical primitives in different dimensions and colors. Use appropriate menu and buttons.
7. Develop a scientific calculator using even-driven programming paradigm of Java.
8. Develop a template for linked-list class along with its methods in Java.
9. Design a thread-safe implementation of Queue class. Write a multi-threaded producer consumer application that uses this Queue class.
10. Write a multi-threaded Java program to print all numbers below 100,000 that are both prime and fibonacci number (some examples are 2, 3, 5, 13, etc.). Design a thread that generates prime numbers below 100,000 and writes them into a pipe. Design another thread that generates fibonacci numbers and writes them to another pipe. The main thread should read both the pipes to identify numbers common to both.
11. Develop a multi-threaded GUI application of your choice.
BIT633   COMPREHENSION       L T P C  
0 3 0 1

OBJECTIVE

- Comprehension is aimed to assess the students understanding in various subjects he / she studied up to VII semester in the B.Tech. course of study.

Guidelines for Comprehension

I. Comprehension will be conducted in the following 15 subjects
   1. Data Structures and Algorithms using C
   2. Digital Principles and System Design
   3. Object Oriented Programming
   5. Operating Systems
   6. Database Management Systems
   7. Java Programming
   8. Computer Networks
   9. Theory of Computation
   10. Network Programming and Management
   11. Web Technology
   12. C# and .NET Technologies
   13. Information Theory and Coding
   14. Open Source Systems
   15. Cryptography and Network Security

II. The 15 Subjects will be divided into three groups having five subjects each.

III. A panel of three examiners including one external will be evaluating the Students.

V. Comprehension is valued for 100 marks (70 External + 30 Internal)
   - Three written tests for 30 marks.
   - Viva-voce exam for 70 marks by the panel.

VI. Each written test will have 50 multiple choice questions from five subjects. (Two Questions from each unit of each subject)

VII. Only one student is evaluated at a time for a minimum of 10 minutes.

VIII. Same team evaluates all the students.
BIT001 INFORMATION STORAGE AND MANAGEMENT 3 0 0 3

OBJECTIVES
- To study about the storage technologies and its architecture
- To study the network storage and availability of information
- To enhance the security with storage
- To know about the virtualization technologies

UNIT I STORAGE SYSTEM 9
Introduction to information storage, virtualization and cloud computing - Key data center elements - Compute, application, and storage virtualization - Disk drive & flash drive components and performance – RAID - Intelligent storage system and storage provisioning (including virtual provisioning)

UNIT II STORAGE NETWORKING TECHNOLOGIES AND VIRTUALIZATION 9
Fibre Channel SAN components, FC protocol and operations - Block level storage virtualization - iSCSI and FCIP as an IP-SAN solutions - Converged networking option – FCoE - Network Attached Storage (NAS) - components, protocol and operations - File level storage virtualization - Object based storage and unified storage platform

UNIT III BACKUP, ARCHIVE, AND REPLICATION 9
Business continuity terminologies, planning and solutions - Clustering and multi-pathing architecture to avoid single points of failure - Backup and recovery - methods, targets and topologies - Data deduplication and backup in virtualized environment - Fixed content and data archive - Local replication in classic and virtual environments - Remote replication in classic and virtual environments - Three-site remote replication and continuous data protection

UNIT IV CLOUD COMPUTING CHARACTERISTICS AND BENEFITS 9
Cloud Enabling technologies – Characteristics and benefits of cloud computing - Services and deployment models - Cloud computing infrastructure – Cloud challenges - Cloud migration considerations

UNIT V SECURING AND MANAGING STORAGE INFRASTRUCTURE 9
Security threats, and counter measures in various domains - Security solutions for FC-SAN, IP-SAN and NAS environments - Security in virtualized and cloud environments - Monitoring and managing various information infrastructure components in classic and virtual environments - Information lifecycle management (ILM) and storage tiering

TOTAL: 45

TEXT BOOK

REFERENCES
BIT002 DISTRIBUTED SYSTEMS L T P C
3 0 0 3

OBJECTIVES
• To carry out the basic research needed to develop new geographic information technologies that are distributed, ubiquitous, and mobile, allowing geographic information to be accessed, analyzed, and used in decision-making anywhere, at any time
• Students are expected to develop distributed applications using latest technologies

UNIT I INTRODUCTION

UNIT II PROCESSES AND DISTRIBUTED OBJECTS
Interprocess Communication - The API for the Internet Protocols - External Data Representation and Marshalling - Client-Server Communication - Remote Procedure Call - Events and Notifications - Java RMI - Case Study, Group Communication - Distributed Objects and Remote Invocation - Communication between Distributed Objects - Case Study

UNIT III OPERATING SYSTEM ISSUES – I

UNIT IV SYNCHRONIZATION

UNIT V DISTRIBUTED TRANSACTION PROCESSING

TOTAL : 45

TEXT BOOKS:

REFERENCES:
BIT003       MOBILITY ENGINEERING     L T P C
3 0 0 3

OBJECTIVES

• The proposed course would help the students to acquire knowledge on various mobile technologies available and their future trends, learn how the existing technology can transform to mobile technology, learn about the devices, platform, various layers involved and how the data flows end-to-end.

• The course also will help the students to understand mobile testing and applications of mobile technology in various industries like Healthcare, Banking and Finance etc.

UNIT I     INTRODUCTION TO MOBILITY
Evolution of Mobility – Classification of Mobile technologies-Portable, Personal, Static and Shared-
Current trends in mobility- Genres of mobility- Future of Mobility.

UNITII     NEED FOR MOBILITY
Transformation to Mobility - Why this transformation - ASIS information - Business decisions on the fly - Work force management - Remote Access - Migration Roadmap – Accessibility


Platforms - Native– Android, iOS, Symbian, Windows Mobile, Black Berry HTML 5 and Java Script

Data & Storage - Data Source, Data Manipulation, Data mining – Representation - Dashboard, Graphs- Temporary storage of data depends on device

Connectivity - SSL, Digital Certificate, Security tokens, WIFI, Internet, Client Server Configuration

Content - Formats support - File format/Video/Audio/PDF Files.

Mobile App - End to End data flow from UI to / from DB based on remote access using device, platform, Data /Storage/connectivity and content

UNITIII     ENTERPRISE MOBILITY SOLUTION LAYERS AND ARCHITECTURE
Enterprise mobility Solution layers – Device layer, Access layer, Adaptation layer, Management Layer and Services Layer and Application layer, Mobile Architecture layer – (UI/ Web services/DAO) – 3tier – Mobile Layer – to co-exist with traditional web pages – Mobile API to interact with backend-web services

UNITIV     MOBILE APPLICATION DEVELOPMENT ENVIRONMENT AND MOBILE TESTING
UNIT V APPLICATIONS OF MOBILITY
Mobility in Healthcare - Mobility in Education - Mobility in Banking & Finance – M-Commerce - Mobile Social Networking - Location Based Services - Bring your own device (BYOD)

TOTAL : 45

TEXT BOOK:

REFERENCES:
4. Developing Modern Mobile Web Apps patterns & practices – Microsoft
BCS003 UNIX INTERNALS (Common to CSE & IT) 3 0 0 3

OBJECTIVES
- To explore the design concepts of UNIX OS
- To understand the functional components of UNIX

UNIT I OVERVIEW OF UNIX OS 7

UNIT II KERNEL DATA STRUCTURES 9
The Buffer Cache - Headers - Buffer Pool - Buffer Retrieval - Reading and Writing Disk Blocks - Advantages and Disadvantages, Internal Representation of Files - Inodes - Structure - Directories - Path Name to Inode - Super Block - Inode Assignment - Allocation of Disk Blocks - Other File Types.

UNIT III FILE SYSTEM 10

UNIT IV PROCESS MANAGEMENT AND CONTROL 10

UNIT V MEMORY AND I/O SUBSYSTEM 9
Memory Management Policies - Swapping - Demand Paging - a Hybrid System - I/O Subsystem - Driver Interfaces - Disk Drivers - Terminal Drivers.

TOTAL: 45

TEXT BOOK

REFERENCES
BCS007 DATA WAREHOUSING AND DATA MINING (Common to CSE & IT) L T P C 3 0 0 3

OBJECTIVES
- To identify data warehouse architecture and necessity for data mining.
- To learn the importance and methods of data preprocessing.
- To understand the concepts of data warehousing and OLAP.
- To understand the data mining techniques and their applications.
- To provide insight on Big data issues.

UNIT I DATA WAREHOUSE AND OLAP TECHNOLOGY 9
Introduction to Data Warehousing - Data warehousing Components - Building a Data warehouse - Mapping the Data Warehouse to a Multiprocessor Architecture - DBMS Schemas for Decision Support - Data Extraction, Cleanup, and Transformation Tools - Metadata – Business analysis reporting, Query tools and Applications - Online Analytical Processing (OLAP) - OLAP and Multidimensional Data model.

UNIT II DATA PREPROCESSING 9
Data Mining - Data Mining Functionalities - Data Preprocessing - Data Cleaning - Data Integration and Transformation - Data Reduction - Data Discretization and Concept Hierarchy Generation.

UNIT III ASSOCIATION RULES 9

UNIT IV CLASSIFICATION AND CLUSTERING 9
Classification and Prediction, Issues - Decision Tree Induction - Bayesian Classification - Rule based classification - Other Classification Methods - Prediction - Accuracy and Error Measures - Cluster Analysis - Types of data - Categorization of Clustering methods - Partitioning methods - Hierarchical Methods - Outlier Analysis.

UNIT V MINING MULTIMODAL DATA 9

TOTAL: 45

TEXT BOOKS

REFERENCES
BIT701 INFORMATION THEORY AND CODING L T P C
3 1 0 4

OBJECTIVES
• Expose students to the principles and practice of information theory, covering both theoretical and
applied issues.
• It comprises the source coding methods as text, audio, speech, image & video methods and error
control coding methods as block codes & convolutional codes.
• It covers the basic principles of information theory, including the basic theory and algorithms behind
source and channel coding for single-user and multi-user systems.

UNIT I INFORMATION THEORY 12
Information – Entropy, Information rate, classification of codes, Kraft McMillan inequality, Source coding
theorem, Shannon-Fano coding, Huffman coding, Extended Huffman coding - Joint and conditional
entropies, Mutual information - Discrete memory less channels – BSC, BEC – Channel capacity, Shannon
limit.

UNIT II SOURCE CODING: TEXT, AUDIO AND SPEECH 12
Text: Adaptive Huffman Coding, Arithmetic Coding, LZW algorithm – Audio: Perceptual coding, Masking
techniques, Psychoacoustic model, MEG Audio layers I,II,III, Dolby AC3 - Speech: Channel Vocoder,
Linear Predictive Coding.

UNIT III SOURCE CODING: IMAGE AND VIDEO 12
Image and Video Formats – GIF, TIFF, SIF, CIF, QCIF – Image compression: READ, JPEG – Video
Compression: Principles-I, B, P frames, Motion estimation, Motion compensation, H.261, MPEG standard.

UNIT IV ERROR CONTROL CODING: BLOCK CODES 12
Definitions and Principles: Hamming weight, Hamming distance, Minimum distance decoding - Single parity
codes, Hamming codes, Repetition codes - Linear block codes, Cyclic codes - Syndrome calculation, Encoder
and decoder – CRC.

UNIT V ERROR CONTROL CODING: CONVOLUTIONAL CODES 12
Convolutional codes – code tree, trellis, state diagram - Encoding – Decoding: Sequential search and Viterbi
algorithm – Principle of Turbo coding.

L:45 T:15 TOTAL: 60 PERIODS

TEXT BOOKS
Education Private Limited, 2008
2. Fred Halsall, “Multimedia Communications: Applications, Networks, Protocols and Standards”,
Pearson Education Asia, 2009

REFERENCES
2006.
BIT702 COMPUTER GRAPHICS AND MULTIMEDIA L T P C
3 1 0 4

OBJECTIVES
- To learn the basics of computer graphics concepts which include both 2D and 3D and about graphics programming.
- To have a detailed knowledge of shaping the objects and shadows.
- To introduce the concepts of fractals and Boolean operations in shaping the objects.

UNIT I 2D PRIMITIVES  12

UNIT II 3D CONCEPTS  12

UNIT III GRAPHICS PROGRAMMING  12

UNIT IV OVERVIEW OF MULTIMEDIA  12

UNIT V MULTIMEDIA SYSTEMS AND APPLICATIONS  12

L:45 T:15 TOTAL: 60 PERIODS

TEXT BOOKS

REFERENCES
BIT703 WEB TECHNOLOGY  L  T  P  C
3  1  0  4

OBJECTIVE
- The subject provides knowledge to learn and implement the various web programming technologies of current trend today.

UNIT I INTRODUCTION TO INTERNET WEB PROGRAMMING  12

UNIT II CLIENT SIDE PROGRAMMING  12

UNIT III SERVER-SIDE PROGRAMMING  12

UNIT IV ADVANCED WEB SERVER SIDE PROGRAMMING  12
EJB – Fundamentals -Writing Session beans – Entity bean – Web application frameworks-MVC (model view controller) frame work- struts- JSF.

UNIT V WEB SERVICE  12

L:45 T:15 TOTAL: 60 PERIODS

TEXT BOOK

REFERENCES
UNIT I  INTRODUCTION  9
Overview - Classical Encryption techniques - Block Ciphers - Data Encryption Standard - Block Cipher Design Principles and Modes of Operation - Evaluation criteria for AES - AES Cipher – Triple DES.

UNIT II  PUBLIC KEY CRYPTOGRAPHY  9

UNIT III  AUTHENTICATION AND HASH FUNCTION  9

UNIT IV  NETWORK SECURITY  9

UNIT V  SYSTEM LEVEL SECURITY  9
Intrusion detection - password management - Viruses and related Threats - Virus Counter measures - Firewall Design Principles - Trusted Systems.

TOTAL: 45 PERIODS

TEXT BOOKS

REFERENCES
<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>BIT731</td>
<td>COMPUTER GRAPHICS AND MULTIMEDIA</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>LABORATORY</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**LIST OF EXPERIMENTS**

1. To implement Bresenham’s algorithms for line, circle and ellipse drawing algorithms.
2. To perform 2D Transformations such as translation, rotation, scaling, reflection and shearing of objects.
3. To implement Cohen-Sutherland 2D clipping and window view port mapping.
4. To perform 3D Transformations such as translation, rotation and scaling.
5. To Implement Composite 3D transformations.
6. To Draw 3D objects and scenes using OPENGL.
7. To convert between color models (RGB, YIQ, CMY & HSV)
8. Implementation of text compression algorithm using RLE and Static Huffman.
9. To implement image compression algorithm using Huffman.
10. To perform animation using any Animation software (Macromedia Flash, Swish..etc)
11. To perform basic operations on image using Photoshop /GIMP /any equivalent Image manipulation software

**TOTAL : 45 PERIODS**
BIT732 WEB TECHNOLOGY LABORATORY

LIST OF EXPERIMENTS

1. Create a web page with the following using HTML
   i) To embed an image map in a web page
   ii) To fix the hot spots
   iii) Show all the related information when the hot spots are clicked.
2. Create a web page with all types of Cascading style sheets.
3. Client Side Scripts for Validating Web Form Controls using DHTML
4. Write programs in Java using Servlets:
   - To invoke servlets from HTML forms
   - Session
   - Cookie
5. Write programs in Java to create three-tier applications using JSP and Databases
   - for conducting on-line examination.
   - for displaying student mark list. Assume that student information is available in a database which has been stored in a database server.
6. Programs using AJAX
7. Program using EJB
   - Stateless session bean
   - Stateful session bean
8. Creation of web service in J2EE and Invoke it in DOTNET.

TOTAL : 45 PERIODS
BIT733  MOBILITY WITH ANDROID  L T P C  0 0 3 2

OBJECTIVES
• The proposed integrated course would help the students to learn the concepts of developing a mobility application over the popular Android platform of Google. The course is designed to have some theoretical orientation of mobility and Android through class room teaching along with the hands-on understanding and would culminate in development of an individual Android application by each of the student.

UNIT I MOBILITY AND ANDROID OVERVIEW  9
Evolution of Mobility - Classification of Mobile technologies - Portable, Personal, Static and Shared - Current trends in mobility - Future of Mobility - Foundation to mobile application development in Android - Mobile Ecosystems - Mobile Architecture layer - (UI / Web services/DAO) - 3 tier - (Mobile Layer – to co-exist with traditional Web pages - Mobile API to interact with backend- Web Services - Introduction to XML, JSON formats. Overview - What is Android?-History of Android - Application development - App marketing place - Advantages of android over other OS - Anatomy of an Android Application

UNIT II ANDROID APP BASICS AND USER INTERFACE LAYOUT  9
Basic Tools like ADB, DDMS – Emulator - Debugging and Running the App - Activities and Intents - Intent receivers - Content providers - Cursor and queries - Broadcast receiver and Permission Linear Layout - Absolute Layout - Table Layout - Relative Layout - Frame Layout - Scroll View Views: Gallery and Image View - Image Switcher View – Photo View – Profile View - Grid View - Web View - Analog clock View and Digital clock view.

UNIT III UI EVENT MANAGEMENT  9

UNIT IV DATA STORAGE MANAGEMENT  9
Preference Files Management- Create PDF, CSV - Using SQLite Databases - Connecting to External Database – HTTP Client - Request from Client - Parsing responses.

UNIT V NETWORKING AND LOCATION BASED SERVICES  9

TOTAL: 45 PERIODS

TEXT BOOK

REFERENCES
BIT801 MOBILE COMMUNICATION (Common to IT & EEE) 3 0 0 3

OBJECTIVES
- To learn the basics of Wireless voice and data communications technologies.
- To study the working principles of wireless LAN and its standards.
- To build working knowledge on various telephone and satellite networks.
- To build knowledge on various Mobile Computing algorithms.
- To build skills in working with Wireless application Protocols to develop mobile content applications.

UNIT I WIRELESS COMMUNICATION FUNDAMENTALS 9

UNIT II TELECOMMUNICATION SYSTEMS 9

UNIT III WIRELESS LAN 9

UNIT IV NETWORK AND TRANSPORT LAYER 9
Mobile Network Layer: Mobile IP, Dynamic Host Configuration Protocol, ad hoc networks
Mobile Transport Layer: Tradition TCP, Indirect TCP, Snooping TCP, Mobile TCP, Fast retransmit/ Fast recovery Transmission / timeout freezing, selective retransmission, Transaction oriented TCP.

UNIT V WIRELESS ATM 9
Motivation for ATM, wireless ATM, Working group, WATM services, reference model, functions, radio access layer, handover, location management, Addressing, mobile quality of service, access point control protocol.

TOTAL: 45 PERIODS

TEXT BOOKS

REFERENCES
BMG601 PRINCIPLES OF MANAGEMENT

OBJECTIVES:
- To get the skills needed to successfully manage an organization.
- To understand concepts of strategic and tactical organizational planning.
- Implement employee motivational approaches and conflict management skills.
- To describe common performance appraisal processes.
- To understand group and team management, management development, and employee training.
- Describe concepts of controlling and control systems.

UNIT I FOUNDATIONS 9

UNIT II MANAGERS AND ENVIRONMENT 9

UNIT III FUNCTIONAL AREA OF ORGANISATION 9

UNIT IV MOTIVATION AND DIRECTIONS 9

UNIT V CONTROLLING STRATEGIES 9

TOTAL: 45 PERIODS

TEXT BOOKS

REFERENCES
BIT007 SOFTWARE PROJECT MANAGEMENT

OBJECTIVES
- To provide basic software project management skills with a strong emphasis on issues and problems associated with delivering successful IT projects.
- The module is designed to provide an understanding of the particular issues encountered in handling IT projects.
- To provide knowledge on management activities as Evaluation, Planning, Monitoring & Control and Managing Teams.
- To undertake and be aware of aspects of planning management.

UNIT I INTRODUCTION TO SOFTWARE PROJECT MANAGEMENT

UNIT II PROJECT EVALUATION

UNIT III ACTIVITY PLANNING

UNIT IV MONITORING AND CONTROL

UNIT V MANAGING PEOPLE AND ORGANIZING TEAMS

TOTAL: 45 PERIODS

TEXT BOOK

REFERENCES
OBJECTIVES

- To understand the basics of Sensor Networks.
- To learn various fundamental and emerging protocols of all layers.
- To study about the issues pertaining to major obstacles in establishment and efficient management of sensor networks.
- To demonstrate the nature and applications sensor networks.

UNIT I INTRODUCTION
Challenges for wireless sensor networks, Comparison of sensor network with ad hoc network, Single node architecture – Hardware components, energy consumption of sensor nodes, Network architecture – Sensor network scenarios, types of sources and sinks, single hop versus multi-hop networks, multiple sinks and sources, design principles, Development of wireless sensor networks.

UNIT II PHYSICAL LAYER
Introduction, wireless channel and communication fundamentals – frequency allocation, modulation and demodulation, wave propagation effects and noise, channels models, spread spectrum communication, packet transmission and synchronization, quality of wireless channels and measures for improvement, physical layer and transceiver design consideration in wireless sensor networks, Energy usage profile, choice of modulation, Power Management.

UNIT III DATALINK LAYER
MAC protocols – fundamentals of wireless MAC protocols, low duty cycle protocols and wakeup concepts, contention-based protocols, Schedule-based protocols - SMAC, BMAC, Traffic-adaptive medium access protocol (TRAMA), Link Layer protocols – fundamentals task and requirements, error control, framing, link management.

UNIT IV NETWORK LAYER

UNIT V CASE STUDY
Target detection tracking, Habitat monitoring, Environmental disaster monitoring, Practical implementation issues, IEEE 802.15.4 low rate WPAN, Operating System Design Issues, Introduction to TinyOS – NesC, Interfaces, modules, configuration, Programming in TinyOS using NesC, Emulator TOSSIM.

TOTAL: 45 PERIODS

TEXT BOOKS
REFERENCES
BIT009  USER INTERFACE DESIGN  L  T  P  C
3  0  0  3

OBJECTIVES
• To study the concept of menus, windows, interfaces.
• To study about the human machine interaction.
• To study the characteristics and components of windows.
• To study various problems in windows design.
• To study the various testing methods

UNIT I  INTRODUCTION
Introduction-Importance-Human-Computer interface-characteristics of graphics interface-Direct manipulation graphical system - web user interface-popularity-characteristic & principles.

UNIT II  HUMAN INTERACTION STYLE
Direct manipulation and virtual environment – Menu Selection – Form Fill in and dialog boxes – Command and Natural Language – Interaction devices – Collaboration and social media participation.

UNIT III  WINDOWS

UNIT IV  MULTIMEDIA

UNIT V  WINDOWS LAYOUT - TEST

TOTAL: 45 PERIODS

TEXT BOOKS

REFERENCE
**BCS010 ADVANCED JAVA PROGRAMMING**

**OBJECTIVES**
- To learn advanced Java programming concepts like reflection, native code interface, threads, etc.
- To develop network programs in Java.
- To understand concepts needed for distributed and multi-tier applications.
- To understand issues in enterprise applications development.

**UNIT I JAVA BASICS REVIEW**

**UNIT II NETWORK PROGRAMMING IN JAVA**

**UNIT III APPLICATIONS IN DISTRIBUTED ENVIRONMENT**

**UNIT IV MULTI-TIER APPLICATION DEVELOPMENT**

**UNIT V ENTERPRISE APPLICATIONS**

**TOTAL: 45 PERIODS**

**TEXT BOOKS**

**REFERENCES**
BGE003 INTELLECTUAL PROPERTY RIGHTS (IPR)  L T P C
3 0 0 3

OBJECTIVES
• To create an awareness on Intellectual Property Rights (IPR)
• To understand patents and copyrights
• To know about application procedures of IPR

UNIT I TYPES OF PROPERTY

UNIT II PATENTS AND APPLICATION PROCEDURES
IP – Patents – Copyrights and related rights – Trade Marks and rights arising from Trademark
Registration – Definitions – Industrial Designs and Integrated circuits – Protection of Geographical
Indications at national and International levels – Application Procedures.

UNIT III INTERNATIONAL PARTICIES
International convention relating to Intellectual Property – Establishment of WIPO – Mission and
Activities – History – General Agreement on Trade and Tariff (GATT).

UNIT IV LEGISLATIONS AND POLICY
Indian Position Vs WTO and Strategies – Indian IPR legislations – commitments to WTO-Patent
Ordinance and the Bill – Draft of a national Intellectual Property Policy – Present against unfair
competition.

UNIT V CASE STUDIES
Case Studies on – Patents (Basumati rice, turmeric, Neem, etc.) – Copyright and relatedrights – Trade
Marks – Industrial design and Integrated circuits – Geographic indications –Protection against unfair
competition.

TOTAL: 45 PERIODS

TEXT BOOK
1. Subbaram N.R. “Handbook of Indian Patent Law and Practice”, S. Viswanathan Printers and

REFERENCES
   www.ipmatters.net/features/000707_gibbs.html.
BIT010 PARALLEL COMPUTING L T P C 3 0 0 3

OBJECTIVES
• To understand the basic concepts of parallel computation and become familiar with state-of-the-art parallel architectures.
• To compare alternative approaches to designing and implementing parallel algorithms and architectures.
• To solve large scale problems and implement system software to support parallel computing on the most common parallel computing platforms.
• To measure and evaluate the performance of parallel applications.

UNIT I SCALABILITY AND CLUSTERING 9

UNIT II ENABLING TECHNOLOGIES 9

UNIT III SYSTEM INTERCONNECTS 9
Basics of Interconnection Networks – Network Topologies and Properties – Buses, Crossbar and Multistage Switches, Software Multithreading – Synchronization Mechanisms.

UNIT IV PARALLEL PROGRAMMING 9
Paradigms And Programmability – Parallel Programming Models – Shared Memory Programming.

UNIT V MESSAGE PASSING PROGRAMMING 9

TOTAL: 45 PERIODS

TEXT BOOKS

REFERENCES
OBJECTIVES

- To understand the fundamentals of cloud computing
- To study about the web based applications in cloud
- To know about the use of cloud computing

UNIT I UNDERSTANDING CLOUD COMPUTING


UNIT II DEVELOPING CLOUD SERVICES


UNIT III CLOUD COMPUTING FOR EVERYONE

Centralizing Email Communications – Collaborating on Schedules – Collaborating on To-Do Lists – Collaborating Contact Lists – Cloud Computing for the Community – Collaborating on Group Projects and Events – Cloud Computing for the Corporation.

UNIT IV USING CLOUD SERVICES


UNIT V OTHER WAYS TO COLLABORATE ONLINE


TOTAL: 45 PERIODS

TEXT BOOKS

BCS025  GREEN COMPUTING  L T P C  3 0 0 3
(Common to CSE & IT)

OBJECTIVES
- To learn about the importance of the green computing.
- To have a knowledge of the green computing approaches.
- To learn about the architecture of the Green Computing.
- Understanding the applications of green Computing in various domains.

UNIT I  OVERVIEW AND INITIATIVES  9
Overview – Issues: Toxin – Power consumption – Disposals – Power saving – Hardware saving -
Current initiatives – Global initiatives – Asia Standards – Consumption issues.

UNIT II  CONSUMPTION ISSUES  9
Minimizing power usage: Power problems – Monitoring power usage – Reducing power usage –
Low power computers and components – Cooling costs: Reducing cooling costs – Optimizing
airflow – Data center design.

UNIT III  GREEN COMPUTING PLATFORMS  9
Greening process – Datacenter design and redesign – Virtualization.

UNIT IV  GREEN COMPUTING ARCHITECTURE  9
Rethinking of behavior – paperless communication – Recycling.

UNIT V  GREEN COMPUTING MODELS  9
Hardware considerations – Case studies: Energy utilities – Universities – Technological Businesses
– Other Organizations.

TOTAL: 45 PERIODS

TEXT BOOKS
1. Toby J.Velte, Anthony T.Velte and Robert Elsenpeter, “Green IT Reduce your Information
2. John Lamb, “The Greening of IT: How Companies can make a Difference for the

REFERENCE
1. Jason Harris, “Green Computing and Green IT Best Practices on Regulations and Industry
   Initiatives, Virtualization, Power Management, Materials Recycling and Telecommuting”,
BCS009  HIGH SPEED NETWORKS  L T P C
(0) (0) (3) (3)
OBJECTIVES
- To provide an understanding of the networking standards that can be adopted with the current day requirements of complex and voluminous content transfer over heterogeneous platforms.
- To have a primitive level performance analysis for of traffic with different networking standards and to study the standards adopted for handling high traffic.
- To get a feel of designing a High speed network setup with specialized hardware and optimization approaches like parallelism and pipelining.

UNIT I  HIGH SPEED NETWORKS  9

UNIT II  CONGESTION AND TRAFFIC MANAGEMENT  9

UNIT III  TCP AND ATM CONGESTION CONTROL  9

UNIT IV  INTEGRATED AND DIFFERENTIATED SERVICES  9

UNIT V  PROTOCOLS FOR QOS SUPPORT  9

TOTAL: 45 PERIODS

TEXT BOOKS

REFERENCES
**BCS018 SERVICE ORIENTED ARCHITECTURE**
(Common to CSE & IT)

**OBJECTIVE**
- To gain understanding of the basic principles of service orientation.
- To learn service oriented analysis techniques.
- To learn technology underlying the service design.
- To know about various WS-* specification standards.

**UNIT I SOA FUNDAMENTALS**

**UNIT II SOA AND WEB SERVICES**

**UNIT III SOA ANALYSIS**
Service oriented analysis - Business-centric SOA - Deriving business services - service modeling - Service Oriented Design - WSDL basics - SOAP basics - SOA composition guidelines - Entity centric business service design - Application service design - Task-centric business service design.

**UNIT IV SOA PLATFORM BASICS**
SOA platform basics - SOA support in J2EE - Java API for XML based web services (JAX-WS) - Java architecture for XML binding (JAXB) - Java API for XML Registries (JAXR) - Java API for XML based RPC (JAX-RPC) - Web Services Interoperability Technologies (WSIT) - SOA support in .NET - Common Language Runtime - ASP.NET web forms - ASP.NET web services - Web Services Enhancements (WSE).

**UNIT V WS SPECIFICATION**

**TOTAL: 45 PERIODS**

**TEXT BOOKS**

**REFERENCES**
BIT012 KNOWLEDGE MANAGEMENT

OBJECTIVES
- To understand the basics of Knowledge Management
- To know the Knowledge Architecture and Models
- To know the Knowledge Capturing Techniques & technologies
- To become aware of Testing and Training in Knowledge management
- To understand the Knowledge Management Protocols & data mining tools

UNIT I KNOWLEDGE MANAGEMENT

UNIT II KNOWLEDGE MANAGEMENT SYSTEM LIFECYCLE

UNIT III CAPTURING KNOWLEDGE

UNIT IV KNOWLEDGE CODIFICATION

UNIT V KNOWLEDGE TRANSFER AND SHARING

TOTAL: 45 PERIODS

TEXT BOOK

REFERENCES
<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>BIT013</td>
<td>INFORMATION SECURITY</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

**OBJECTIVES**
- To understand the fundamentals of information security
- To know the Legal, Ethical and Professional issues in Information Security

**UNIT I  FUNDAMENTALS**

**UNIT II  SECURITY INVESTIGATION**

**UNIT III  SECURITY ANALYSIS**

**UNIT IV  LOGICAL DESIGN**

**UNIT V  PHYSICAL DESIGN**

**TOTAL: 45 PERIODS**

**TEXT BOOK**

**REFERENCES**
BCS013 M-COMMERCE (Common to CSE & IT) 3 0 0 3

OBJECTIVES

- Recognize the business principles of M-Commerce
- Understand the various technical Support for M-Commerce
- Able to build business models using M-Commerce approaches

UNIT I INTRODUCTION 9

UNIT II NETWORK INFRASTRUCTURE 9

UNIT III MOBILE COMMERCE TECHNOLOGY 9
NTT Docomos’s I-Mode - Towards a Classification Framework for Mobile Location Based Services - Wireless Personal and Local Area Networks - The Impact of Technology Advances on Strategy Formulation in Mobile Communications Networks.

UNIT IV MOBILE COMMERCE: THEORY AND APPLICATIONS 9

UNIT V BUSINESS-TO-BUSINESS MOBILE E-COMMERCE 9
A perspective on M-Commerce – Location based services: criteria for adoption and solution deployment - MCommerce in the automotive industry making a case for strategic partnerships- Case study:The Role of Mobile advertising in building a brand.

TOTAL: 45 PERIODS

TEXT BOOKS

REFERENCES
BCS015  ADHOC NETWORKS  L T P C
(Common to CSE & IT)  3 0 0 3

OBJECTIVES

- To impart the trends in emerging field of wireless networking.
- To focus on layered communication modeling, such as the media access control and network layer.
- To address quality of service issues and network reliability for transmission of real-time information.

UNIT I  FUNDAMENTALS


UNIT II  ADHOC ROUTING PROTOCOLS


UNIT III  MULTICAST ROUTING IN ADHOC NETWORKS


UNIT IV  TRANSPORT LAYER-SECURITY PROTOCOLS


UNIT V  QoS AND ENERGY MANAGEMENT


TOTAL: 45 PERIODS

TEXT BOOK


REFERENCES

BCS027  NATURE AND BIO INSPIRED COMPUTING  L T P C
(Common to CSE & IT)  3 0 0 3

OBJECTIVES

• To acquire in-depth knowledge about the Nature and Bio inspired Computing.
• To introduce the students to biologically inspired computing.
• To uncover the state-of-the-art of present technology.
• To survey relevant theoretical models, reconfigurable architectures and computational intelligence techniques.

UNIT I  INTRODUCTION

UNIT II  ANT COLONY OPTIMIZATION

UNIT III  APPLICATIONS

UNIT IV  SWARM INTELLIGENCE
Biological foundations of Swarm Intelligence – Swarm Intelligence in Optimization – Particle Swarms for dynamic optimization problems.

UNIT V  COMPUTING PARADIGMS
Biological Inspired computing to Natural Computing – Integration of Evolutionary Computation Components in Ant Colony Optimization – Particle Swarm Optimization based on Socio-cognition.

TOTAL: 45 PERIODS

TEXT BOOKS

REFERENCES