B.TECH INFORMATION TECHNOLOGY

REGULATIONS 2014

CURRICULUM & SYLLABUS
(1st SEMESTER to 8th SEMESTER)

Approved in the Academic Council Meeting held on 16.07.2016

CHAIRMAN
ACADEMIC COUNCIL
SETHU INSTITUTE OF TECHNOLOGY
(An Autonomous Institution)

Estd. 1995

REGULATIONS 2014

CURRICULUM AND SYLLABI FOR
B.TECH INFORMATION TECHNOLOGY
(FOR THE STUDENTS ADMITTED FOR THE ACADEMIC YEAR 2014-2015 ONWARDS)
# SETHU INSTITUTE OF TECHNOLOGY
*(An Autonomous Institution)*

**REGULATIONS 2014**

Bachelor of Technology in Information Technology

## OVERALL COURSE STRUCTURE

<table>
<thead>
<tr>
<th>Category</th>
<th>Total No. of Courses</th>
<th>Credits</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Science &amp; Humanities</td>
<td>16</td>
<td>41</td>
<td>21.8</td>
</tr>
<tr>
<td>Basic Engineering</td>
<td>8</td>
<td>21</td>
<td>11.3</td>
</tr>
<tr>
<td>Professional Subjects–CORE</td>
<td>41</td>
<td>108</td>
<td>57.4</td>
</tr>
<tr>
<td>Professional Subjects–ELECTIVE</td>
<td>6</td>
<td>18</td>
<td>9.5</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>71</strong></td>
<td><strong>188</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

## COURSE CREDITS–SEMESTER WISE

<table>
<thead>
<tr>
<th>Branch</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
<th>VI</th>
<th>VII</th>
<th>VIII</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT</td>
<td>24</td>
<td>24</td>
<td>25</td>
<td>27</td>
<td>26</td>
<td>25</td>
<td>22</td>
<td>15</td>
<td>188</td>
</tr>
</tbody>
</table>
## Semester I

<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><strong>THEORY</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14UEN101</td>
<td>Technical English–I (Common to ALL Branches)</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>14UMA102</td>
<td>Engineering Mathematics- I (Common to ALL Branches)</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>14UPH103</td>
<td>Engineering Physics (Common to ALL Branches)</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>14UCY105</td>
<td>Applied Chemistry (Common to CSE,ICE,ECE,EEE,IT &amp; EIE)</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>14UCS106</td>
<td>Computer Programming (Common to ALL Branches)</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>14UME107</td>
<td>Engineering Graphics (Common to ALL Branches)</td>
<td>2</td>
<td>0</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td><strong>PRACTICAL</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14UCS108</td>
<td>Computer Programming Laboratory –I (Common to ALL Branches)</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>14UME109</td>
<td>Engineering Practices Laboratory (Common to ALL Branches)</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>14UGS110</td>
<td>Physics &amp; Chemistry Laboratory (Common to ALL Branches)</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td>17</td>
<td>2</td>
<td>09</td>
<td>24</td>
</tr>
</tbody>
</table>

Total No. of Credits - 24
### Semester II

<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><strong>THEORY</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14UEN201</td>
<td>Technical English– II (Common to ALL Branches)</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>14UMA202</td>
<td>Engineering Mathematics–II (Common to ALL Branches)</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>14UPH204</td>
<td>Applied Physics (Common to CSE,ICE,ECE,EEE,IT &amp; EIE)</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>14UCY204</td>
<td>Environmental Science (Common to ALL Branches)</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>14UME205</td>
<td>Basic Civil and Mechanical Engineering (Common to MECH,CSE,ICE,ECE,EEE,IT &amp; EIE Branches)</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>14UCS207</td>
<td>Digital Principles and System Design (Common to CSE &amp; IT)</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>
</tr>
<tr>
<td>14UCS208</td>
<td>Digital Laboratory (Common to CSE &amp; IT)</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>14UCS209</td>
<td>Computer Programming Laboratory–II (Common to ALL Branches)</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>14UGS210</td>
<td>Physics &amp; Environmental Science Laboratory (Common to ALL Branches)</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td>19</td>
<td>1</td>
<td>8</td>
<td>24</td>
</tr>
</tbody>
</table>

Total No. of Credits - 24
<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>14UMA321</td>
<td>Transforms and Partial Differential Equations</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>(Common to ALL Branches)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14UIT302</td>
<td>Programming with Data Structures</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>14UIT303</td>
<td>Computer Organization</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>14UIT304</td>
<td>Object Oriented Programming</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>(Common to CSE &amp; IT)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14UIT305</td>
<td>Database Systems</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>14UIT306</td>
<td>Analog and Digital Communication</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14UIT307</td>
<td>Programming with Data Structures Laboratory</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>14UIT308</td>
<td>Object Oriented Programming Laboratory</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>(Common to CSE &amp; IT)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14UIT309</td>
<td>Database Systems Laboratory</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14UGS331</td>
<td>Value Education and Human Rights</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>P/F</td>
</tr>
<tr>
<td></td>
<td>(Common to ALL Branches)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
<td>20</td>
<td>1</td>
<td>9</td>
<td>25</td>
</tr>
</tbody>
</table>

Total No. of Credits - 25
<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><strong>THEORY</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14UMA421</td>
<td>Applied Statistics and Queuing Networks (Common to CSE &amp; IT)</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>14UIT402</td>
<td>Analysis and Design of Algorithms</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>14UCS403</td>
<td>Java Programming (Common to CSE &amp; IT)</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>14UIT404</td>
<td>Principles of Operating Systems</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>14UIT405</td>
<td>Object Oriented Software Engineering Methodologies</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>14UEC423</td>
<td>Microprocessors and Microcontrollers (Common to CSE &amp; IT)</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>14UGS431</td>
<td>Qualitative and Quantitative Aptitude (Common to ALL Branches)</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td><strong>PRACTICAL</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14UCS407</td>
<td>Java Programming Laboratory (Common to CSE &amp; IT)</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>14UIT408</td>
<td>Operating Systems Practice Laboratory</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>14UEC427</td>
<td>Microcontrollers and Microprocessors Laboratory (Common to CSE &amp; IT)</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td>19</td>
<td>2</td>
<td>9</td>
<td>27</td>
</tr>
</tbody>
</table>

Total No. of Credits - 27
# Semester V

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>THEORY</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14UMA521</td>
<td>Discrete Mathematics (Common to CSE &amp; IT)</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>14UIT502</td>
<td>Computer Networks (Common to CSE &amp; IT)</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>14UCS503</td>
<td>Object Oriented Analysis and Design (Common to CSE &amp; IT)</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>14UIT504</td>
<td>Embedded Computing Systems</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>14UIT505</td>
<td>Graphics with OPENGL</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>14UIT506</td>
<td>Wireless Communication</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>
</tr>
<tr>
<td>14UIT507</td>
<td>Computer Networks Laboratory (Common to CSE &amp; IT)</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>14UCS508</td>
<td>Object Oriented Analysis and Design Laboratory (Common to CSE &amp; IT)</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>14UIT509</td>
<td>Graphics Programming Laboratory</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>14UGS531</td>
<td>Soft skills and Communication Laboratory (Common to CSE,ECE,EEE &amp; IT)</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td>18</td>
<td>1</td>
<td>11</td>
<td>26</td>
</tr>
</tbody>
</table>

**Total No. of Credits - 26**
# Semester VI

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>THEORY</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14UIT601</td>
<td>Service Oriented Architecture</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>14UIT602</td>
<td>Compiler Design</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>14UIT603</td>
<td>Web Technology</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>14UIT604</td>
<td>Cryptography and Network Security</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Elective–I</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Elective– II</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>
</tr>
<tr>
<td>14UIT607</td>
<td>Service Oriented Architecture Laboratory</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>14UIT608</td>
<td>Web Technology Laboratory</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>14UIT609</td>
<td>Network Security Laboratory</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>14UIT610</td>
<td>Mini Project / Technical Seminar</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td>18</td>
<td>0</td>
<td>11</td>
<td>25</td>
</tr>
</tbody>
</table>

Total No. of Credits - 25
## Semester VII

<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><strong>THEORY</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14UME701</td>
<td>Project Management and Finance</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>14UIT702</td>
<td>Advanced Database Systems</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>14UCS703</td>
<td>Insight Into Cloud Computing</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>14UIT704</td>
<td>Mobile Application Development</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Elective III</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Elective IV</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>
</tr>
<tr>
<td>14UIT707</td>
<td>Mobile Application Development Laboratory</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>14UIT708</td>
<td>Advanced Database Systems Laboratory</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td><strong>TOTAL</strong></td>
<td>18</td>
<td>0</td>
<td>6</td>
<td>22</td>
</tr>
</tbody>
</table>

**Total No. of Credits - 22**
Semester VIII

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>THEORY</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14UME801</td>
<td>Professional Ethics</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Elective V</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td></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>
</tr>
<tr>
<td>14UIT803</td>
<td>Project Work</td>
<td>0</td>
<td>0</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td><strong>TOTAL</strong></td>
<td>9</td>
<td>0</td>
<td>12</td>
<td>15</td>
</tr>
</tbody>
</table>

Total No. of Credits - 15
## LIST OF ELECTIVES

<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>14UIT901</td>
<td>Distributed Operating Systems</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>14UIT902</td>
<td>Modern Artificial Intelligence</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>14UIT903</td>
<td>Software Architecture</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>14UIT904</td>
<td>Agile Software Development</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>14UIT905</td>
<td>Intrusion Detection System</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>14UIT906</td>
<td>User Interface Framework Development</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>14UIT907</td>
<td>Management Information Systems</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>14UIT908</td>
<td>Grid and Cloud Computing</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>14UIT909</td>
<td>Data Analytics</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>14UIT910</td>
<td>Building Enterprise Applications</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>14UIT911</td>
<td>Adhoc and Sensor Networks</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>14UIT912</td>
<td>Principles of Software Testing</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>14UIT913</td>
<td>Internet of Everything</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>14UIT914</td>
<td>System Software Internals</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>14UIT915</td>
<td>Bio Informatics</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>14UIT916</td>
<td>Digital Asset Management</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>14UIT917</td>
<td>Communication Protocols</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>14UIT918</td>
<td>FOSS for Enterprise Applications</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>14UIT919</td>
<td>Social Network Analysis</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>14UIT920</td>
<td>Ethical Hacking and Information Forensics</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>14UIT921</td>
<td>Data Mining Concepts and Techniques</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>14UIT922</td>
<td>Satellite Communication and Broadcasting</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>14UCS902</td>
<td>Information Storage Management</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>14UEC953</td>
<td>Coding and Information Theory</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

**Note:** Student may choose any one of the electives offered by the other branch of study.
OBJECTIVES:

- To improve the language proficiency of students
- To enhance the vocabulary of students
- To strengthen the language competency through grammar

UNIT I

Listening-Conversation Practice; Speaking-Observing the diagram and speaking on the topic, Explaining daily routines; Reading- Reading Comprehension, Referring to the Dictionary and identifying the functions of words; Writing- Paragraph Writing (Writing for given situations); Grammar- Parts of Speech, Introduction of Present Tense and its four sub divisions; Vocabulary- Prefix and Suffix, Synonyms and Antonyms

UNIT II

Listening- Listening to Inspiring Speech, Instructions; Speaking- Narrating the Story, Self Introduction; Reading-Reading Short Stories, Newspaper Articles, Skimming; Writing- Summary Writing, Hints Developing, Letter Writing-Formal Letters-Writing a letter to Head of the Institution and Head of the Department; Grammar- Introduction of Past Tense and its four sub divisions, Voice-Active and Passive-Conversion of Assertive Sentence; Punctuation & Spelling, Vocabulary - Homonyms and Homophones, Idioms and Phrases

UNIT III

Listening- Completing the task of drawing a diagram based on instructions; Speaking- Review of the Movie, Seeking Permission, Reading- Note Making Skills, Writing- Letter Writing-Formal Letters-Letter to the Editor; Grammar- Introduction of Future Tense and its four sub divisions, Subject-Verb Agreement, Voice- Active and Passive-Conversion of Interrogative and Imperative Sentences; Vocabulary- British and American Words.

UNIT IV

Listening- Comprehension Passage, Tracing geographical locations through instructions; Speaking- Explaining Pictures of their choice, Making Requests; Reading- Reading Profiles of Leading Companies and Personalities; Writing- Report Writing, Writing Review of a Book/ Movie/ Journal; Grammar- Regular and Irregular Verbs, Instructions, Connectives-Discourse Markers; Vocabulary- Foreign Words

UNIT V

Listening- Listening to informal conversations and participating; Speaking- Expressing Opinions, Asking for Directions Using Polite Expressions, Giving Directions by Using Imperative sentences; Reading- Reading Job Advertisements, Scanning and Skipping; Writing- Process Description; Grammar- Numerical Adjectives, Sequencing Words, Spelling; Vocabulary- One Word Substitutions

TOTAL: 45 (L) + 15 (T) = 60 Periods
COURSE OUTCOMES:

After successful completion of this course the students will be able to:

- Comprehend and respond to various formal and informal situations
- Demonstrate improved oral fluency
- Exhibit improved reading comprehension, vocabulary and interpretation skills
- Effectively use standard grammar in writing meaningful sentences and paragraphs
- Employ social and professional skills efficiently

TEXT BOOKS:


REFERENCE BOOKS:

OBJECTIVES:

- To make the students capable of identifying algebraic eigen value problems from practical areas and obtain the eigen solutions in certain cases.
- To make the students knowledgeable in the area of infinite series and their convergence and to be familiar with the limitations of using infinite series approximations for solutions arising in mathematical modeling.
- To familiarize the students with the geometrical aspects of curvature, involutes and evolutes of plane curves, essential concepts for an engineer, as elegant applications of differential calculus.
- To make the student acquire sound knowledge in solving differential equations of certain types, including systems of differential equations that they might encounter in their studies of other subjects in the same or higher semesters.

UNIT I MATRICES 9 + 3


UNIT II SEQUENCES AND SERIES 9 + 3


UNIT III DIFFERENTIAL CALCULUS 8 + 3

Curvature in Cartesian coordinates – Centre and radius of curvature – Circle of curvature – Evolutes – Envelopes – Evolute as envelope of normals.

UNIT IV FUNCTIONS OF SEVERAL VARIABLES 8 + 3


UNIT V MULTIPLE INTEGRALS 8 + 3

Double integration – Cartesian and Polar coordinates – Change of order of integration – Change of variables between Cartesian and Polar coordinates – Triple integration in Cartesian coordinates – Area as double integral – Volume as triple integral.
COURSE OUTCOMES:

After the successful completion of this course, the student will be able to

- Find the derivative of the given function and its successive differentiation
- Predict the extreme values of functions with constraints and find the absolute maximum and minimum of a given function on different domains.
- Apply the various methods of integration for evaluating definite integrals.
- Demonstrate the use of double and triple integrals to compute area and volume.
- Find inverse and positive power of given matrix using Cayley Hamilton Theorem and reduce to canonical form by orthogonal transformation.

TEXT BOOKS:


REFERENCE BOOKS:

OBJECTIVES:

- To develop a clear knowledge of principles and applications of ultrasonics
- To make students understand the working method of different kinds of laser
- To introduce the types of fiber and communication applications
- To explain the basic principles of Quantum theory
- To develop the fundamental research interest in crystal physics

UNIT I  ULTRASONICS


UNIT II  LASERS


UNIT III  FIBER OPTICS AND APPLICATIONS

Introduction – Structure of optical fibre- Principle and propagation of light in optical fibres – Numerical aperture and Acceptance angle - Types of optical fibres (material, refractive index, modes)-Double crucible technique of fibre drawing - Splicing, Loss in optical fibre – attenuation, dispersion, bending Fibre optical communication system (Block diagram) – fibre optic sensors- Endoscope

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
COURSE OUTCOMES:

After the successful completion of this course, the student will be able to

- Explain the methods of ultrasonic production and its merits and demerits
- Discuss the basic principle of Laser, its types and their applications in industries.
- Summarize the Principle of Fibre optics, its types and losses associated with them.
- Demonstrate the operation of Scanning electron microscope.
- Explain the Physics of Crystals.

TEXT BOOKS:


REFERENCE BOOKS:

OBJECTIVES:

- To give outline the basics of electrochemistry and photochemistry.
- To introduce corrosion and its control methods.
- To explain surface chemistry and chemical analysis methods.

UNIT I  ELECTRO CHEMISTRY  9

Electrode – single electrode potential, Nernst equation (problem), reference electrodes - standard hydrogen electrode – calomel electrode, glass electrode, measurement of pH; cells – EMF – measurement of emf, reversible and irreversible cells, electrolyte concentration cells and applications, electrochemical series – significance, potentiometric titrations (redox - Fe²⁺vs dichromate and precipitation – Ag⁺vs Cl⁻ titrations) and Conductometric titrations (HCl vsNaOH).

UNIT II  PHOTO CHEMISTRY  9

Photochemical reaction: classification - thermal and photochemical reactions; laws of photochemistry - Grothus –Dropper Law, Stark Einstein Law (problems); Quantum yield and determination (problems); photochemical synthesis of HCl and HBr – Jablonski diagram; fluorescence and phosphorescence, chemiluminescence, photosensitisation, applications; photosynthesis, photoinhibitors; applications in chemical synthesis, photo lithography and thin film coating.

UNIT III  CORROSION AND CORROSION CONTROL  9

Corrosion: Types - Chemical and electrochemical – mechanisms; different forms – galvanic, pitting, stress corrosion cracking and differential aeration corrosion; factors influencing corrosion; corrosion control – sacrificial anode and impressed cathodic current methods, corrosion inhibitors; protective coatings: paints – constituents and functions; metallic coatings – electroplating of Au and electroless plating of Ni.

UNIT IV  SURFACE CHEMISTRY  9

Adsorption: types – physical and chemical adsorption, adsorption of gases on solids; adsorption isotherms – Freundlich and Langmuir isotherms; adsorption of solutes from solution; ion - exchange adsorption; adsorption in pollution abatement (Granular activated carbon and powdered activated carbon); removal of heavy metals from effluents-coagulation, sedimentation and filtration; catalysis-characteristics, autocatalysis, catalytic poisoning and promoters.

UNIT V  INSTRUMENTAL METHODS OF CHEMICAL ANALYSIS  9


TOTAL: 45 PERIODS
COURSE OUTCOMES

After successful completion of this course the students will be able to:

- Explain the basic operations of chemical electrodes and chemical cells
- Discuss the basics of photochemistry and surface chemistry
- Analyze various factors influencing corrosion and their control
- Choose appropriate instrument to analyze chemical properties of given material
- Discuss the types of photochemical reactions and their mechanisms

TEXT BOOKS:


REFERENCES:

OBJECTIVES:

- To introduce basic organization of computers and problem solving techniques.
- To impart the knowledge of programming constructs of C language.

UNIT I INTRODUCTION


UNIT II C PROGRAMMING BASICS


UNIT III ARRAYS AND STRINGS

Arrays – Initialization – Declaration – One dimensional and Two dimensional arrays. Bubble sort - Linear search - String - String handling using built-in functions and user defined functions.

UNIT IV FUNCTIONS AND POINTERS


UNIT V STRUCTURES, UNIONS AND FILE HANDLING


TOTAL : 45 PERIODS

COURSE OUTCOMES:

After the successful completion of this course, the student will be able to

- Discuss the basic organization of a computer.
- Explain basic primitives of C Language.
- Write simple programs in C.
- Design the Programs using functions.
- Differentiate structures and unions using simple programs.
TEXT BOOKS:


REFERENCE BOOKS:

OBJECTIVES:

- To develop in students graphic skill for communication of concepts, ideas and design of engineering products and expose them to existing national standards related to technical drawings
- To impart knowledge in development of surfaces, isometric and perspective projections

CONCEPTS AND CONVENTIONS (NOT FOR EXAMINATION)

Importance of Graphics in Engineering Applications – Use of Drafting Instruments – BIS Conventions and Specifications – Size, Layout and Folding of Drawing Sheets – Lettering and Dimensioning

UNIT I  PLANE CURVES, PROJECTION OF POINTS, LINES AND PLANE SURFACES  5+9

Plane Curves: (Not for Examination)

Conics – Construction of ellipse, Parabola and hyperbola by eccentricity method – Construction of cycloid – construction of involutes of squad and circle – Drawing of tangents and normal to the above curves.

Projections:

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 II  PROJECTION OF SOLIDS  6+9

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 III  SECTION OF SOLIDS AND DEVELOPMENT OF SURFACES  6+9

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

UNIT IV  ISOMETRIC AND PERSPECTIVE PROJECTIONS  6+9

Isometric Projections
Principles of isometric projection – isometric scale – isometric projections of simple solids, truncated prisms, pyramids, cylinders and cones.

Perspective Projections (Not for Examination)
Perspective projection of prisms, pyramids and cylinders by visual ray method.
UNIT V  ORTHOGRAPHIC PROJECTION  

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 of multiple views from pictorial views of objects.

TOTAL: 30 (L) + 45 (T) = 75 PERIODS

COURSE OUTCOMES:

After successful completion of this course the students will be able to:

- Discuss a simple engineering drawing in First angle projection
- Plot regular objects in different inclined position.
- Analyze information from drawings for making complex geometric models.
- Generate Isometric views of objects for orthographic projection.
- Estimate significance of a working drawing and proper dimensioning through orthographic projections.

TEXT BOOKS:


REFERENCE BOOKS:


Publication of Bureau of Indian Standards:


Special points applicable to End Semester Examinations on Engineering Graphics:

1. There will be five questions, each of either or type covering all units of the syllabus.
2. All questions will carry equal marks of 20 each making a total of 100.
3. The answer paper shall consist of drawing sheets of A3 size only. The students will be permitted to use appropriate scale to fit solution within A3 size.
4. Whenever the total number of candidates in a college exceeds 150, the End Semester Examination in that college will be conducted in two sessions (FN and AN on the same day) for 50 percent of student (approx) at a time.
OBJECTIVES:

- To demonstrate the implementation of programs in C.

LIST OF EXPERIMENTS

a) Unix Commands 2
b) Word Processing 4
   - Document creation, Formatting, Mail merge

c) Simple C Programming 24
   - Data types, Branching & Looping Constructs.
   - One dimensional Arrays, Matrix operations
   - Functions
   - Strings

TOTAL: 30 PERIODS

COURSE OUTCOMES:

After the successful completion of this course, the student will be able to

- Create the document in Word Processing software.
- Write programs using control constructs.
- Manipulate Matrix operations in C.
- Apply functions to reduce redundancy.
- Solve string operations without using inbuilt functions.

HARDWARE / SOFTWARE REQUIRED FOR A BATCH OF 30 STUDENTS

HARDWARE

LAN SYSTEM WITH 30 NODES (OR) STANDALONE PCS – 30 NOS.

SOFTWARE

OS – UNIX CLONE (License free Linux)
APPLICATION PACKAGE – OFFICE SUITE
COMPILER – C
OBJECTIVES:

- To demonstrate the plumbing and carpentry works.
- To train the students to perform welding and drilling operations.
- To demonstrate residential house wiring, fluorescent lamp wiring, measurement of earth resistance, colour coding of resistors, logic gates and soldering.

LIST OF EXPERIMENTS

**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.

b) Hands-on-exercise: Basic pipe connections–Mixed pipe material connection Pipe connections with different joining components.

d) Demonstration of plumbing requirements of high-rise buildings.

**Carpentry using power tools on:**

a) Study of the joints in roofs, doors, windows and furniture.

b) Hands-on-exercise: Wood work, joints by sawing, planning and cutting.

**II) MECHANICAL ENGINEERING PRACTICE**

**Welding:**

a) Preparation of arc welding of butt joints, lap joints and tee joints.

b) Study of Gas welding practice.

**Basic Machining:**

a) Drilling Practice

**Sheet Metal Work:**

a) Model making – Trays, funnels, etc.
b) Study of 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.  
(b) Foundry operations like mould preparation for gear and step cone pulley.

**GROUP B (ELECTRICAL & ELECTRONICS)**

**III) ELECTRICAL ENGINEERING PRACTICE**

(a) Residential house wiring using switches, fuse, indicator, lamp and energy meter and Stair case wiring  
(b) Fluorescent lamp wiring.  
(c) Measurement of resistance to earth of electrical equipment.

**IV) ELECTRONICS ENGINEERING PRACTICE**

(a) Study of Electronic components and equipments – Resistor, colour coding  
(b) Study of logic gates AND, OR, EX-OR and NOT Gate.  
(c) Soldering practice – Components, Devices and Circuits – Using general purpose PCB.

**COURSE OUTCOMES:**

After successful completion of this course the students will be able to:

- Organize the day to day work (basic work) that are carried out in industries, building constructions and also is in real life  
- Perform basic plumbing work and carpentry work  
- Execute the welding, basic machining, sheet metal work, basic wiring, soldering etc.  
- Demonstrate the basic engineering work to others  
- Solve the problems that are encountered in basic engineering work  

**TOTAL: 30 PERIODS**

**EQUIPMENT REQUIREMENT**

**CIVIL ENGINEERING**

<table>
<thead>
<tr>
<th>S.No</th>
<th>Name of the equipment/software</th>
<th>Quantity Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Assort components for plumbing consisting of pipes, plastic pipes, flexible pipes, couplings, unions, elbows, plugs and other fittings</td>
<td>5 Sets.</td>
</tr>
<tr>
<td>2</td>
<td>Carpentry vice (fitted to work bench)</td>
<td>15 Nos.</td>
</tr>
<tr>
<td>Sl. No.</td>
<td>Name of the equipment/software</td>
<td>Quantity Required</td>
</tr>
<tr>
<td>--------</td>
<td>---------------------------------------------------------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>1</td>
<td>Arc welding transformer with cables and holders</td>
<td>5 Nos.</td>
</tr>
<tr>
<td>2</td>
<td>Welding booth with exhaust facility</td>
<td>5 Nos.</td>
</tr>
<tr>
<td>3</td>
<td>Welding accessories like welding shield, chipping hammer, wire brush, etc.</td>
<td>5 Sets.</td>
</tr>
<tr>
<td>4</td>
<td>Oxygen and acetylene gas cylinders, blow pipe and other welding outfit</td>
<td>2 Nos.</td>
</tr>
<tr>
<td>5</td>
<td>Smithy tools</td>
<td>2 Sets.</td>
</tr>
<tr>
<td>6</td>
<td>Moulding table, foundry tools</td>
<td>2 Sets.</td>
</tr>
<tr>
<td>7</td>
<td>Study-purpose items: centrifugal pump, air-conditioner</td>
<td>One each.</td>
</tr>
</tbody>
</table>
### ELECTRICAL ENGINEERING

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of the equipment/software</th>
<th>Quantity Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Assorted electrical components for house wiring</td>
<td>15 sets</td>
</tr>
<tr>
<td>2</td>
<td>Electrical measuring instruments</td>
<td>10 sets</td>
</tr>
<tr>
<td>3</td>
<td>Megger (250V/500V)</td>
<td>1 No.</td>
</tr>
<tr>
<td>4</td>
<td>Study purpose items: Iron box, fan and regulator, emergency lamp</td>
<td>One each</td>
</tr>
<tr>
<td>5</td>
<td>Power Tools: (a) Range Finder (b) Digital Live-wire detector</td>
<td>2 No.</td>
</tr>
</tbody>
</table>

### ELECTRONICS ENGINEERING

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of the equipment/software</th>
<th>Quantity Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Logic trainer kit</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>CRO, AFO</td>
<td>2 each</td>
</tr>
<tr>
<td>3</td>
<td>Small multipurpose PCBs</td>
<td>10 No.</td>
</tr>
<tr>
<td>4</td>
<td>Soldering guns</td>
<td>10</td>
</tr>
<tr>
<td>5</td>
<td>Multimeters</td>
<td>5 No</td>
</tr>
<tr>
<td>6</td>
<td>Assorted electronic components for making circuits</td>
<td>Required quantity</td>
</tr>
</tbody>
</table>
Objectives:

- To make the students to understand the principle of Lasers and its applications.
- To give knowledge on Ultrasonic Interferometer and Young’s modulus of Elasticity
- To train the students to perform titration experiment to identify given salt

PHYSICS LABORATORY

LIST OF EXPERIMENTS

2. Determination of velocity of sound and compressibility of liquid – Ultrasonic Interferometer.
4. Determination of Young’s modulus of the material of the beam – Uniform bending
5. Torsional pendulum – Determination of Moment of inertia of a metallic disc rigidity modulus of a given wire.
6. Determination of Young’s modulus of the material of the beam – Non-uniform bending
   - A minimum of FIVE experiments shall be offered

CHEMISTRY LABORATORY

1. Estimation of Copper in brass by EDTA
2. Conductometric titration (simple acid base)
3. Conductometric titration (Mixture of weak and strong acids)
4. Conductometric titration (BaCl₂ vs Na₂SO₄)
5. Potentiometric titration (Fe²⁺ / KMnO₄ or K₂Cr₂O₇)
6. pH titration (acid and base)
7. Determination of molecular weight of a polyvinyl alcohol by viscometry method
   - A minimum of FIVE experiments shall be offered

TOTAL: 30 PERIODS

COURSE OUTCOMES:

After the successful completion of this course, the student will be able to

- Determine the velocity and compressibility of liquid
- Calculate the moment of Inertia and rigidity modulus.
- Determine the molecular weight of the polymer and composition of alloys
- Determine the accurate endpoint in volumetric analysis using analytical instruments
- Determine the acidic and basic nature of the solution using pH meter

Laboratory classes on alternate weeks for Physics and Chemistry
OBJECTIVES:

• To improve the language proficiency of students
• To enhance the vocabulary of students
• To strengthen the language competency through grammar

UNIT I


UNIT II

Listening- Performing Various Tasks Based on Audio Tracks; Speaking- Role Play Practice, Jargons - Expression Used to Define Technical Vocabulary; Reading- Fast Reading; Writing- Preparing Agenda and Minutes of the Meeting; Grammar- Direct and Indirect Speech, Conditional Clauses, Gerunds and Infinitives Vocabulary- Collocations.

UNIT III

Listening- Introduction to Phonetic Symbols ; Speaking- Speaking Sentences with Stress and Intonations; Reading- Reading Newspaper Articles, Journals, Magazines – Cloze test, Writing- Writing a Lab Report, Persuasive Paragraph writing; Grammar- Framing Questions, Types of Sentences; Vocabulary- Compound Nouns, Matching Words with Meanings

UNIT IV

Listening- Listening and Guided Note Taking; Speaking- Persuasive Strategies, Presentation of Problems and Solutions; Reading- Read to Understand the Given Context; Writing- Letter Writing; ( Inviting, Accepting and Declining), ; Grammar- Modal verbs, Articles; Sentence Completion; Vocabulary- Derivatives of Root Words.

UNIT V

Listening- Critical Analysis of Presentation and Group Discussion; Speaking- Interview Skills; Reading- Editing the E-Mail after Reading the Context; Writing- Writing Recommendations and Job Application with Resume Grammar- Simple, Compound and Complex sentences; Vocabulary- Words Often Confused and Misused

TOTAL: 45(L) = 45 Periods
COURSE OUTCOMES:

After successful completion of this course the students will be able to:

- Read, understand, analyse and discuss technical papers
- Participate confidently and effectively in group discussions
- Write clear and concise technical paper, resume, report and email
- Demonstrate comprehension of content and vocabulary
- Effectively employ critical analysis skills

TEXT BOOKS:


REFERENCE BOOKS:

OBJECTIVES:

- To develop an understanding of the basics of vector calculus comprising of gradient, divergence and curl, and line, surface and volume integrals and the classical theorems involving them.
- To acquaint the student with the concepts of analytic functions and their interesting properties which could be exploited in a few engineering areas, and be introduced to the host of conformal mappings with a few standard examples that have direct application.
- To make the student acquire sound knowledge of Laplace transform and its properties and sufficient exposure to the solution of certain linear differential equations using the Laplace transform technique.

UNIT I  ANALYTICAL SOLUTIONS OF ORDINARY DIFFERENTIAL EQUATIONS  8 + 3

Higher order linear differential equations with constant coefficients – Method of variation of parameters – Cauchy’s and Legendre’s linear equations – Applications of ODE (Bacterial growth, Population growth, Decayed problems).

UNIT II  VECTOR CALCULUS  8 + 3

Gradient Divergence and Curl – Directional derivative – Irrotational and Solenoidal vector fields – Vector integration – Green’s theorem in a plane, Gauss divergence theorem and Stokes’ theorem (excluding proofs) – Simple applications involving cubes and rectangular parallelepiped.

UNIT III  ANALYTIC FUNCTIONS  8 + 3

Functions of a complex variable – Analytic function – Necessary and Sufficient Conditions (excluding Proofs) – Harmonic function - Properties of an analytic function – Harmonic conjugate – Construction of analytic functions – Conformal mapping: w = z+c, cz, 1/z, and Bilinear transformation.

UNIT IV  COMPLEX INTEGRATION  9 + 3

Statement and applications of Cauchy’s integral theorem, Cauchy’s integral formula and Cauchy Residue Theorem – Taylor’s and Laurent’s expansions – Applications of residue theorem to evaluate real integrals – Unit circle and semi-circular contour (excluding Poles on the real axis).

UNIT V  LAPLACE TRANSFORM  9 + 3

Existence conditions – Transform of elementary functions – Basic properties – Transform of derivatives and integrals – Transform of unit step function, impulse function and periodic function - Inverse Laplace transform – Convolution theorem (excluding Proof) –Solution of linear ODE of second order with constant coefficients – Numerical solution of first order ODE by Taylor’s series
method and Euler”s method - First and second order ODE by fourth order Runge – Kutta method.

SUPPLEMENT TOPIC (for internal evaluation only) 3


TOTAL : 45 (L) + 15 (T) = 60 Periods

COURSE OUTCOMES:

After the successful completion of this course, the student will be able to

1. Solve first and higher order ordinary differential equations analytically and able to apply differential calculus to solve engineering problems.
2. Find the integral value using the suitable method like Greens Theorem, Gauss divergence Theorem, Stokes Theorem.
3. Construct an analytic function using various methods .Also able to convert a function from one domine to another domine using bilinear transformation.
4. Evaluate the values of a contour integral around a given contour in the complex plane.
5. Apply Laplace transform to solve Ordinary differential equations.

TEXT BOOKS:


REFERENCE BOOKS:

OBJECTIVES:

- To get a clear knowledge about the principles of conducting materials
- To impart the knowledge of magnetic, superconducting, optical and dielectric materials.
- To develop the fundamental research interest in new engineering materials

UNIT I  CONDUCTING MATERIALS


UNIT II  SEMICONDUCTING MATERIALS

Intrinsic semiconductor – carrier concentration derivation in n-type and p-type semiconductor – Fermi level – Variation of Fermi level with temperature – extrinsic semiconductors – carrier concentration derivation in n-type and p-type semiconductor – variation of Fermi level with temperature and impurity concentration – Hall effect – Determination of Hall coefficient – Applications.

UNIT III  MAGNETIC MATERIALS AND SUPERCONDUCTIVITY


UNIT IV  OPTICAL MATERIALS AND DIELECTRIC MATERIALS

Optical properties of metals, insulator and Semiconductor-Phosphorescence and fluorescence-Excitons, traps and colourcentres and their importance-different phosphors used in CRO screen- Liquid crystal as display material-Thermography and its applications. Dielectric Materials: Electrical susceptibility-Dielectric constant-Electronic,ionic,orientational and space charge polarization-Frequency and temperature dependence of polarization-Internal field-Claussius Mosotti relation(Derivation)
UNIT V NEW ENGINEERING MATERIALS

Metallic glasses, preparation, properties and applications - Shape memory alloys (SMA):
Characteristics, properties, application, advantages

.Nanomaterials: synthesis – plasma arcing – chemical vapour deposition – electro deposition-
solgels – ball milling - properties of nanoparticles and applications - Introduction to Carbon
nanotubes

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of this course, the student will be able to

- Discuss the principle of conducting materials and semiconductors
- Classify materials based on their electrical conducting properties.
- Summarize the applications of electrical materials.
- Explain the procedure of nanomaterial synthesis.
- Describe the properties of optical materials.

TEXT BOOKS:
   Revised Edition 2014
   Revised Edition 2013

REFERENCE BOOKS:
   New Delhi Revised Edition 2012
   Revised Edition 2014
OBJECTIVES

- To introduce the effect of technology on the environment and ecological balance.
- To discuss valuable information about the conditions of environment.
- To train the students to learn environmental studies and solve the problems.
- To create awareness about the environmental pollution and their problems

UNIT I  ENVIRONMENT, ECOSYSTEMS AND BIODIVERSITY  10


- Field study of common plants, insects, birds
- Field study of simple ecosystems – pond, river, hill slopes, etc.

UNIT II  ENVIRONMENTAL POLLUTION  9

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 – Solid 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 / Agricultura

UNIT III  NATURAL RESOURCES  9

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, food
adulteration, 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


UNIT V HUMAN POPULATION AND THE ENVIRONMENT


TOTAL: 45 PERIODS

COURSE OUTCOMES

After successful completion of this course the students will be able to:

- Realize the importance of environment
- Know about the precious resources in the environment
- Learn to conserve the resources
- Perform their role in maintaining a clean environment for future generation
- Maintain ecological balance and preserve bio-diversity

TEXT BOOKS

REFERENCE BOOKS:

OBJECTIVES:
- To understand the fundamentals of thermal systems
- To understand the basics of building construction and infrastructures

UNIT I
SURVEYING AND CIVIL ENGINEERING MATERIALS

Surveying:

Civil Engineering Materials:

UNIT II
BUILDING COMPONENTS AND STRUCTURES


UNIT III
B – MECHANICAL ENGINEERING
POWER PLANT ENGINEERING

Introduction, Classification of Power Plants – Working principle of steam, Gas, Diesel, Hydro-electric and Nuclear Power plants – Merits and Demerits – Pumps and turbines – working principle of Reciprocating pumps (single acting and double acting) – Centrifugal Pump

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

Terminology of Refrigeration and Air Conditioning. Principle of vapour compression and absorption system – Layout of typical domestic refrigerator – Window and Split type room Air conditioner

TOTAL: 60 PERIODS
COURSE OUTCOMES:

After the successful completion of this course, the student will be able to

- Receive knowledge in measurement of landscape and different building materials
- Comprehension the different building structure and its application in different places
- Synthesis the ideas of variety of energy sources into practical one
- Evaluation of IC engine about its performance and compared it with diesel engine power plant
- Knowledge about Refrigeration and Air conditioning techniques

TEXT BOOKS:


REFERENCE BOOKS:

OBJECTIVES:

- To introduce various number systems, Boolean algebra and various logic gates.
- To make the students to design various combinational and sequential circuits.
- To familiarize the students on programming with HDL for combinational and sequential circuits.

UNIT I  BOOLEAN ALGEBRA AND LOGIC GATES  8 + 3


UNIT II  COMBINATIONAL LOGIC  10 + 3


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  9 + 3

Types of Asynchronous Sequential Circuits - Analysis and Design of Fundamental Mode Asynchronous Sequential Circuits – Reduction of State and Flow Tables – Race-free State Assignment – Hazards – ASM chart

Total: 45(T) +15(L) = 60 Periods
COURSE OUTCOMES:

After the successful completion of this course, the student will be able to

- Apply arithmetic operations in any number system.
- Compare Boolean simplification techniques.
- Design a combinational circuit for arithmetic operations.
- Explain various types of memory and its working.
- Analyze and design a given sequential digital circuit.

TEXT BOOKS:


REFERENCE BOOKS:

OBJECTIVES:

- To demonstrate the knowledge in design and implementation of digital logic circuits.

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 Periods

COURSE OUTCOMES:

After the successful completion of this course, the student will be able to

- Use Boolean simplification techniques to design a combinational hardware circuit.
- Test the Boolean theorems.
- Design combinational and sequential circuits.
- Analyze a given digital circuit – combinational and sequential.
- Design the different functional units in a digital computer system.
<table>
<thead>
<tr>
<th>S.No.</th>
<th>Description of Equipment</th>
<th>Quantity required</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>IC trainer Kit (With Power supply, Bread Board, Assembled LED board/LEDs, Seven segment display)</td>
<td>15</td>
</tr>
<tr>
<td>2.</td>
<td>Digital Multimeter</td>
<td>5</td>
</tr>
<tr>
<td>3.</td>
<td>Chips IC – 7400</td>
<td>20</td>
</tr>
<tr>
<td>4.</td>
<td>Chips IC – 7402</td>
<td>20</td>
</tr>
<tr>
<td>5.</td>
<td>Chips IC – 7408</td>
<td>20</td>
</tr>
<tr>
<td>6.</td>
<td>Chips IC – 7406</td>
<td>20</td>
</tr>
<tr>
<td>7.</td>
<td>Chips IC – 7407</td>
<td>20</td>
</tr>
<tr>
<td>8.</td>
<td>Chips IC – 7408</td>
<td>20</td>
</tr>
<tr>
<td>9.</td>
<td>Chips IC – 7410</td>
<td>20</td>
</tr>
<tr>
<td>10.</td>
<td>Chips IC – 7411</td>
<td>20</td>
</tr>
<tr>
<td>11.</td>
<td>Chips IC – 74150</td>
<td>20</td>
</tr>
<tr>
<td>12.</td>
<td>Chips IC – 74180</td>
<td>20</td>
</tr>
<tr>
<td>13.</td>
<td>Chips IC – 74181</td>
<td>20</td>
</tr>
<tr>
<td>14.</td>
<td>Chips IC – 74147</td>
<td>20</td>
</tr>
<tr>
<td>15.</td>
<td>Chips IC – 74150</td>
<td>20</td>
</tr>
<tr>
<td>16.</td>
<td>Chips IC – 74170</td>
<td>20</td>
</tr>
<tr>
<td>17.</td>
<td>Chips IC – 7420</td>
<td>20</td>
</tr>
<tr>
<td>18.</td>
<td>Chips IC – 7426</td>
<td>20</td>
</tr>
<tr>
<td>19.</td>
<td>Chips IC – 7427</td>
<td>20</td>
</tr>
<tr>
<td>20.</td>
<td>Chips IC – 7428</td>
<td>20</td>
</tr>
<tr>
<td>21.</td>
<td>Chips IC – 7430</td>
<td>20</td>
</tr>
</tbody>
</table>

42
<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>22.</td>
<td>Chips IC – 7404</td>
<td>20</td>
</tr>
<tr>
<td>23.</td>
<td>Chips IC – 7494</td>
<td>20</td>
</tr>
<tr>
<td>24.</td>
<td>Work tables</td>
<td>10</td>
</tr>
<tr>
<td>25.</td>
<td>Computer with HDL software</td>
<td>15</td>
</tr>
<tr>
<td>26.</td>
<td>Wires (Single strand)</td>
<td></td>
</tr>
</tbody>
</table>
OBJECTIVES:

- To train the students with the advanced C Programming concepts.

LIST OF EXPERIMENTS

Advanced C Programming
  Functions and Strings
  Pointers and Arrays
  Structures and Unions
  Dynamic Storage Allocation
  File Handling

Total: 30 Periods

COURSE OUTCOMES:

After the successful completion of this course, the student will be able to

- Use string handling functions in C programs.
- Write programs using pointers.
- Differentiate structures and unions.
- Employ Memory allocation techniques in programs.
- Apply the file concepts to handle the data.

HARDWARE / SOFTWARE REQUIRED FOR A BATCH OF 30 STUDENTS

HARDWARE

LAN SYSTEM WITH 30 NODES (OR) STANDALONE PCS – 30 NOS.

SOFTWARE

OS – UNIX CLONE (License free Linux)
COMPILER – C
Objectives:

- To introduce experimental procedure to determine band gap of a semiconductor.
- To determine viscosity of liquid and thickness of a thin wire.
- To demonstrate the working of Spectrometer, Semiconductor Laser and Lee’s Di apparatus.
- To develop the students in practical skills for evaluate the quality parameters of water, soil and industrial effluents.

PHYSICS LABORATORY

1. Determination of band gap of a semiconductor.
3. Spectrometer – To find the dispersive power of a prism.
4. Determination of thickness of a thin wire – Air Wedge method.
6. Determination of thermal conductivity of a bad conductor – Lee’s Disc method

- A minimum of FIVE experiments shall be offered

CHEMISTRY LABORATORY

1. Determination of pH of water sample
2. Determination of electrical conductivity of water sample
3. Estimation to hardness of water by EDTA method
4. Estimation of alkalinity of water sample
5. Estimation of Chloride in water sample (Argentometric method)
6. Determination of DO in water (Winkler’s method)
7. Determination of acidity of industrial effluents.

- A minimum of FIVE experiments shall be offered

TOTAL: 30 Periods
COURSE OUTCOMES:

After the successful completion of this course, the student will be able to

- Explain the concepts of Lasers and its applications.
- Calculate the dispersive power using spectrometer
- Determine the thermal conductivity of a bad conductor.
- Determine the quality of water, soil and industrial effluents
- Determination of acidity of industrial effluents

Laboratory classes on alternate weeks for Physics and Chemistry
OBJECTIVES:

- To make the student knowledgeable in formulating certain practical problems in terms of partial differential equations, solve them and physically interpret the results.
- To familiarize the students to formulate and identify certain boundary value problems encountered in engineering practices, decide on applicability of the Fourier series method of solution, solve them numerically and interpret the results.
- To acquaint the student with the basics of Z-transform in its applicability to discretely varying functions, gained the skill to formulate certain problems in terms of difference equations and solve them using the Z-transform technique bringing out the elegance of the procedure involved.

UNIT I       FOURIER SERIES


UNIT II       FOURIER TRANSFORM


UNIT III      Z-TRANSFORM AND DIFFERENCE EQUATIONS


UNIT IV       APPLICATIONS OF PARTIAL DIFFERENTIAL EQUATIONS


UNIT V       NUMERICAL SOLUTIONS OF PARTIAL DIFFERENTIAL EQUATIONS

Finite difference solution of one dimensional heat equation by explicit and implicit methods – One dimensional wave equation and two dimensional Laplace and Poisson equations.

TOTAL: 45 (L) + 15 (T) = 60 PERIODS

COURSE OUTCOMES:

After the successful completion of this course, the student will be able to

- Find the Fourier series of the given function in the given range
- Find Fourier transform for a given function
- Solve the difference equation using Z transform
- Solve the Partial differential equation using various methods
- Apply partial differential equation to solve wave and heat equation
TEXT BOOKS:

REFERENCE BOOKS:
OBJECTIVES:
- To familiarize the design and applications of linear, tree, balanced tree, hashing, set and graph structures
- To demonstrate the systematic way of solving problems
- To explain implementation techniques using different data structures

UNIT I  LINEAR STRUCTURES  10
Abstract Data Types (ADT) – List ADT – Array-based implementation – Linked list implementation – Doubly-linked lists – Applications of lists – Stack ADT – Queue ADT – Circular queue implementation – Applications of stacks and queues.

UNIT II  TREE STRUCTURES  8
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 – Threaded Binary Trees.

UNIT III  BALANCED TREE  9

UNIT IV  HASHING AND SET  9

UNIT V  GRAPHS  9

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After the successful completion of this course, the student will be able to
- Apply the knowledge in types of data structures to solve the related problems in relevant applications.
- Apply the knowledge of tree data structures to find solutions to complex problems related to data search, storage and retrieval.
- Identify the issues in balanced trees and analyze them to solve the relevant problems.
- Analyze hashing and set techniques for achieving reliable data search and retrieval.
- Apply the concept of graph data structures to solve suitable applications.

TEXT BOOKS:
REFERENCE BOOKS:
OBJECTIVES:
- To introduce the basic structure and operation of a digital computer
- To demonstrate the operation of the arithmetic unit including the algorithms & implementation of fixed-point and floating-point addition, subtraction, multiplication & division
- To familiarize the concepts of pipe lining, memory systems, I/O devices and standard I/O interfaces

UNIT I BASIC STRUCTURE OF COMPUTERS 9

UNIT II COMPUTER ARITHMETIC 9
Addition and subtraction of signed numbers - Design of fast adders - Multiplication of positive numbers - Signed operand multiplication and fast multiplication - Integer division - Floating point numbers and operations.

UNIT III BASIC PROCESSING UNIT AND PIPELINING 9

UNIT IV MEMORY SYSTEM 9

UNIT V I/O ORGANIZATION 9
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 - CPU Processor Comparison – Intel Core i7 vs. i5 vs. i3.

COURSE OUTCOMES:
After the successful completion of this course, the student will be able to
- Understand the basic components of a computer, including CPU, memories, and input/output, and their organization
- Explain the arithmetic operations of binary number system
- Design a pipeline for consistent execution of instructions with minimum hazards
- Adapt a wide variety of memory technologies both internal and external
- Apply various I/O operations
TEXT BOOKS:

REFERENCE BOOKS:
OBJECTIVES:
- To explain the basic concepts of OOPs, benefits of OOPs and applications of OOPs
- To summarize various ways of handling exceptions, files and various OOPs features
- To demonstrate OOPs concepts with data structures

UNIT I  INTRODUCTION  9

UNIT II  CONSTRUCTORS AND DESTRUCTORS  9

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

UNIT IV  INHERITANCE AND POLYMORPHISM  9

UNIT V  INPUT/OUTPUT WITH FILES  9
Streams and formatted I/O – I/O manipulators - file handling – random access – object serialization – namespaces - std namespace – ANSI String Objects – standard template library - Applications of OOP to data structures

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After the successful completion of this course, the student will be able to
- Summarize basic oops concepts for an appropriate application
- Develop programs using constructors and destructors
- Identify exception handling mechanisms
- Describe Templates for time conventional programming
- Construct object oriented Programs using files
TEXT BOOKS:

REFERENCE BOOKS:
3. Lippman.S.B, JoseeLajoie, Barbara E. MooC++ Primer", Pearson Education,,fourth
OBJECTIVES:
- To introduce the basic concepts of database system design and architecture
- To familiarize the Normal forms
- To demonstrate the transaction, recovery controls and storage techniques

UNIT I  INTRODUCTION

UNIT II  RELATIONAL MODEL

UNIT III  DATABASE DESIGN
Functional Dependencies — Non-loss Decomposition — Functional Dependencies — First, Second, Third Normal Forms, Dependency Preservation — Boyce/Codd Normal Form-Multi-valued Dependencies and Fourth Normal Form — Join Dependencies and Fifth Normal Form

UNIT IV  TRANSACTIONS

UNIT V  IMPLEMENTATION TECHNIQUES

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After the successful completion of this course, the student will be able to
- Apply the knowledge of data base systems to construct an E-R model for any applications
- Design a DBMS for an application using Relational Models
- Select and apply appropriate techniques to develop a normalized database.
- Analyze the various storage techniques to improve the query processing.
- Identify the issues in emerging database technologies
TEXT BOOKS:

REFERENCE BOOKS:
OBJECTIVES:
- To familiarize the concepts, circuit analysis and techniques from basic communications systems to digital communications
- To explain the strengths and weaknesses of various communication systems
- To summarize the modeling and simulation characteristics of communication networks

UNIT I  FUNDAMENTALS OF ANALOG COMMUNICATION
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
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  MODELLING OF COMMUNICATION SYSTEM AND CHANNEL MODELS
Model of speech and picture signals, Pseudo noise sequences, Non-linear sequences, Analog channel model, Noise and fading, Digital channel model-Gilbert model of bustry channels, HF, Troposcatter and satellite channels, Switched telephone channels, Analog and Digital communication system models, Light wave system models.

UNIT IV  DIGITAL TRANSMISSION
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 – Inter symbol interference, eye patterns.

UNIT V  SPREAD SPECTRUM AND MULTIPLE ACCESS TECHNIQUES
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.

COURSE OUTCOMES:
After the successful completion of the course students will be able to
- Apply Analog and digital communication techniques in estimating channel characteristics
- Design simple analog communication systems
- Analyze the characteristics of communication channels
- Simulate the random variables
- Estimate the communications channels

TOTAL: 45 PERIODS
TEXT BOOKS:

REFERENCE BOOKS:
OBJECTIVES:
- To demonstrate the systematic way of solving problems using various data structures

LIST OF EXPERIMENTS
1. Implement singly linked lists.
2. Implement doubly linked lists.
3. Represent a polynomial as a linked list and write functions for polynomial addition.
4. Implement stack and use it to convert infix to postfix expression.
5. Implement a double-ended queue (dequeue) where insertion and deletion operations are possible at both the ends.
6. Implement an expression tree. Produce its pre-order, in-order, and post-order traversals.
7. Implement binary search tree.
8. Implement insertion in AVL trees.
9. Implement deletion in AVL trees.
10. Implement priority queue using binary heaps.
11. Implement hashing with open addressing.
12. Implement Prim's algorithm using priority queues to find MST of an undirected graph.

TOTAL: 45 PERIODS

COURSE OUTCOMES
After the successful completion of this course, the student will be able to
- Develop programs using dynamic memory allocation and linked list ADT
- Develop programs for implementing various tree structures
- Make use of tree ADT
- Solve the issues in arranging the data with hashing
- Solve real world problems by finding minimum spanning tree and Shortest path algorithm

HARDWARE AND SOFTWARE REQUIRMENTS
Computer Required: 30 No's
Minimum Requirement: Processor: Pentium IV, Ram: 1 GB, Hard Disk: 80 GB
Software Requirements:
- Operating System: Linux (Ubuntu/Fedora/Debian/Mint OS) / Windows
- TURBO C VERSION 3 Or GCC Version Unit III UNIT III4/ Built in linux /DEVC++
OBJECTIVES:
- To demonstrate the various features of Object Oriented Programming

LIST OF EXPERIMENTS
1. Write a C++ program using classes with primitive data members and objects.
2. Write a simple C++ program to create a class default arguments and necessary objects.
3. Write a C++ program to illustrate call by value, call by address, call by reference.
4. Write a C++ program to demonstrate the use of friend function.
5. Write a C++ program to implement virtual and inline functions.
6. Write a C++ program to create classes with constructor, destructor, copy constructor.
7. Write a C++ program to perform assignment operator overloading.
8. Write a C++ program to illustrate dynamic polymorphism.
9. Write a C++ program to create classes with hierarchical inheritance concepts.
10. Write a C++ program to perform sorting operation using templates.
11. Write a C++ program to implement a queue using exception handling.
12. Write a C++ program to perform operations on complex numbers using files as storage

TOTAL: 45 PERIODS

COURSE OUTCOMES
After the successful completion of this course, the student will be able to
- Make use of object oriented programming concepts
- Construct programs using the applications of object oriented programming.
- Apply inheritance and polymorphism concepts.
- Develop code for overloading operators
- Analyze access issues using files

HARDWARE AND SOFTWARE REQUIREMENTS
Computer Required: 30 No"s
Minimum Requirement:
Processor: Pentium IV, Ram: 1 GB, Hard Disk: 80 GB
Software Requirements:
Operating System: Linux (Ubuntu / Fedora / Debian / MintOS) / Windows
Turbo C Version 3 or GCC Version Unit III UNIT III4 / Built in Linux / DEVC++
OBJECTIVES:
- To demonstrate the database design concepts for various real time applications

LIST OF EXPERIMENTS
1. Implement Data Definition Language (DDL) commands in RDBMS.
2. Implement Data Manipulation Language (DML) and Data Control Language (DCL) commands in RDBMS.
3. Implement High-Level Language extension with Cursors.
4. Implement High Level Language extension with Triggers
5. Implement Procedures and Functions.
6. Implement embedded SQL.
8. Design and implementation of Payroll Processing System.
9. Design and implementation of Banking System.
10. Design and implementation of Library Information System.
11. Design and implementation of Air Ticket Reservation System.

TOTAL: 45 PERIODS

COURSE OUTCOMES
After the successful completion of this course, the student will be able to
- Apply the knowledge of DDL and DML in database design to solve the complex problems.
- Apply the knowledge of integrity constraints on a databases.
- Design a solution for PL/SQL queries using functions, cursors and Triggers
- Analyze the redundancy in database
- Function effectively as an individual and as a member for IT based products.

HARDWARE AND SOFTWARE REQUIREMENTS
Computer Required: 30 No’s
Minimum Requirement: Processor: Pentium IV, Ram: 1 GB, Hard Disk: 80 GB
Software Requirements: Operating System: Linux (Ubuntu / Fedora / Debian / Mint OS)/Windows
Front End: VB/VC++/Java or Equivalent
Back End: Oracle / SQL / MySQL / PostGress / DB2 or Equivalent
OBJECTIVES:

- To inculcate the values of humanism, spirituality and to have an awareness of human rights
- To acquire knowledge and develop a sensitivity to the diversity of Indian culture

UNIT I  VALUES AND SELF DEVELOPMENT  6

Concept of value- Social values and individual attitudes, Work ethics, Indian vision of humanism, Moral and non moral valuation, Standards and principles - - Need for inculcation of values in today’s society- Sense of duty, Devotion, Self reliance, Confidence, Concentration, Truthfulness, Cleanliness, Honesty, Humanity, Power of faith, National unity, Patriotism, Love for nature, Discipline.

UNIT II  PERSONALITY AND BEHAVIOR DEVELOPMENT  6

Soul and scientific attitude, God and scientific attitude, Positive thinking, Integrity and discipline, Punctuality, Love and kindness, Avoiding fault finding, Free from anger, Dignity of labor, Universal brotherhood and religious tolerance, True friendship, Happiness vs. suffering love for truth, Aware of self destructive habits, Association and cooperation, Doing best, Saving nature.

UNIT III  CHARACTER AND COMPETENCE  6

Science vs. God, Holy books vs. blind faith, Self management and good health, Science of reincarnation, Equality, Nonviolence, Humility, Role of women, All religions and same message, Mind your mind, Self control, Honesty, Studying effectively.

UNIT IV  STRATEGIES FOR VALUE INCULCATION AND EVALUATION  6

Co-curricular Activities- Story – Telling- Discussion / Symposium- Drama- Role – play- Slogans and Quotations - Slides, filmstrips, films- Games- Songs -The need for value evaluation-Tool and Techniques of value evaluation- Written tests technique Multiple choice, True and False, Fill in the blanks, Matching, Short answer-Tally of events Technique- Quiz technique- Photo language session- Checklist Technique- Art Computation Technique.

UNIT V  HUMAN RIGHTS  6

Jurisprudence of human rights nature and definition, Universal protection of human rights, Regional protection of human rights, National level protection of human rights, Human rights and vulnerable groups

TOTAL: 30 PERIODS

COURSE OUTCOMES:

After the successful completion of this course, the student will be able to:

- Explain the social and personal values of life
- Describe the importance of human rights
- Analyze key issues related to values of life and human rights and propose appropriate solutions to the situations
TEXT BOOKS:

REFERENCE BOOKS:
OBJECTIVES:
- To make the student acquire sound knowledge of standard distributions that can describe real life phenomena.
- To acquire skills in handling situations involving more than one random variable and functions of random variables.
- To provide the basic characteristic features of a queuing system and develop the skills in analyzing queuing models.

UNIT I  PROBABILITY & STATISTICAL DISTRIBUTIONS  9 + 3
Axioms of probability - Conditional probability - Total probability - Baye”s theorem – Discrete and continuous random variables - Moments - Moment generating functions and their properties. Binomial, Poisson, Normal, Geometric, Uniform, Exponential and Gamma distributions.

UNIT II  TWO DIMENSIONAL RANDOM VARIABLES  9 + 3
Joint distributions - Marginal and Conditional distributions – Covariance - Correlation and Regression - Transformation of random variables - Central limit theorem.

UNIT III  DESIGN OF EXPERIMENTS  9 + 3
Completely Randomized Design – Randomized Block Design – Latin Square Design.

UNIT IV  QUEUING THEORY  9 + 3
Markovian models – Birth and Death Queuing models - Steady state results: Single and multiple server queuing models - Little’s Formula - Queues with finite waiting rooms - Finite source models.

UNIT V  NON-MARKOVIAN QUEUES AND QUEUE NETWORKS  9 + 3
M/G/1 Queue - Pollaczek- Khintchine formula. Series Queues - Open and Closed networks.

TOTAL: 45 (L) + 15 (T) = 60 PERIODS

COURSE OUTCOMES:
After the successful completion of this course, the student will be able to
- Apply the acquired knowledge of standard distributions in real life phenomena.
- Find the relationship involving more than one random variables and able to analyze the problems.
- Design and analyze a process, to evaluate which process inputs have a significant impact on the process output using design of experiments.
- Study the basic characteristic features of a queuing system and acquire skills in analyzing queuing models.
- Apply basic probability techniques and models to analyze the performance of computer systems, and, in particular, of networks and queues.

TEXT BOOKS:

REFERENCE BOOKS:
OBJECTIVES:
- To introduce basic concepts of algorithms and classify various algorithmic techniques
- To review mathematical aspects and analysis of algorithms
- To summarize sorting, searching algorithms and report algorithm design methods

UNIT I BASIC CONCEPTS OF ALGORITHMS 9 + 3

UNIT II MATHEMATICAL ASPECTS AND ANALYSIS OF ALGORITHMS 9 + 3

UNIT III ANALYSIS OF SORTING AND SEARCHING ALGORITHMS 9 + 3

UNIT IV ALGORITHMIC TECHNIQUES 9 + 3

UNIT V ALGORITHM DESIGN METHODS 9 + 3

TOTAL: 45 (L) + 15 (T) = 60 PERIODS

COURSE OUTCOMES:
After the successful completion of this course, the student will be able to
- Explain the computational complexity of algorithm
- Apply the mathematical aspects to solve complex algorithms
- Analyze various searching and sorting techniques
- Apply algorithmic techniques in any simple real time applications
- Analyses various Algorithmic design methods

TEXT BOOKS:
REFERENCE BOOKS:

OBJECTIVES:
- To explain the concepts of object-oriented programming paradigms.
- To impart knowledge in I/O packages of Java.
- To summarize the basic concepts of GUI programming.
- To review concurrent programming paradigms.

UNIT I  
JAVA FUNDAMENTALS  
9

UNIT II  
INHERITANCE AND JAVA CLASSES  
9

UNIT III  
MULTI THREADING AND EXCEPTION HANDLING  
9

UNIT IV  
GUI  
9

UNIT V  
IO PACKAGES AND DATABASE CONNECTIVITY  
9
Input Streams - Output Streams - Object Serialization - Deserialization - Filter and Pipe Streams - JDBC Architecture - Establishing Connectivity and Working With Connection Interface.

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After the successful completion of this course, the student will be able to
- Describe object oriented programs in Java
- Compare various inheritance mechanisms in java.
- Explain multithreaded programming and exception handling in java.
- Design GUI based applications using Java 2D and Swing components.
- Discuss the connectivity with database using JDBC and work with I/O streams.

TEXT BOOKS:

REFERENCE BOOKS:

OBJECTIVES:

- To explain the tasks of Operating System such as Process Management, Memory Management and I/O management
- To familiarize CPU and disk scheduling algorithms
- To introduce the concept of file system

UNIT I  PROCESSSES 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 PERIODS
COURSE OUTCOMES:
After the successful completion of this course, the student will be able to
- Classify different types of operating systems
- Apply the suitable algorithms for various problems related to process management
- Illustrate deadlock and memory management problems
- Analyze virtual memory and file sharing concepts
- Make use of file management concepts

TEXT BOOKS:

REFERENCE BOOKS:
OBJECTIVES:
- To introduce the fundamental concepts of requirements engineering and Analysis modelling
- To explain the phases of a software project life Cycle, testing and maintenance measures
- To review the major considerations for enterprise integration and deployment

UNIT I SOFTWARE PROCESS AND PROJECT MANAGEMENT 9

UNIT II REQUIREMENTS ANALYSIS AND SPECIFICATION 9

UNIT III SOFTWARE DESIGN 9

UNIT IV TESTING AND IMPLEMENTATION 9

UNIT V PROJECT MANAGEMENT 9

TOTAL: 45 PERIODS

COURSE OUTCOMES:
At the end of the course, the student will be able to
- Demonstrate the current models, and techniques for the software lifecycle
- Identify the requirements needed for the solution to a software problem
- Apply appropriate software design and architecture for an application
- Identify suitable testing techniques for software projects.
- Choose suitable project planning and risk management for software projects
TEXT BOOKS:

REFERENCE BOOKS:
OBJECTIVES:
- To introduce the different types of microprocessor architecture
- To present the multiprocessor configuration and architecture
- To provide the knowledge about microcontroller and the concepts of interfacing

UNIT I THE 8085 AND 8086 MICROPROCESSORS

8085 Microprocessor architecture-Addressing modes- Instruction set-Programming the 8085.

UNIT II 8086 SOFTWARE ASPECTS


UNIT III MULTIPROCESSOR CONFIGURATIONS

Coprocessor Configuration – Closely Coupled Configuration – Loosely Coupled Configuration –8087 Numeric Data Processor – Data Types – Architecture –8089 I/O Processor –Architecture – Communication between CPU and IOP.

UNIT IV I/O INTERFACING


UNIT V MICROCONTROLLERS


TOTAL: 45 PERIODS

COURSE OUTCOMES:
After successful completion of this course, the Students will be able to:
- Compare the 8085 and 8086 architecture and its programming
- Explain I/O interfacing
- Differentiate between closely coupled configuration and loosely coupled configuration
- Explain the 8087,8089 architecture and its application
- Describe the architecture of microcontroller and its interfacing concept for real time applications

TEXT BOOKS:
REFERENCE BOOKS:

OBJECTIVES:

- To make the student acquire sound knowledge of the characteristic of quantitative and qualitative aptitude.
- To familiarize the student with various principles involved in solving mathematical problems.
- To develop an understanding of the basic concepts of reasoning skills.

UNIT I  QUANTITATIVE APTITUDE  8


UNIT II  NON VERBAL AND LOGICAL REASONING  7


TOTAL = 15 Periods

COURSE OUTCOMES:

After the successful completion of this course, the student will be able to

- Solve the problems on commercial mathematics and correlation
- Interpret the graphical and numerical data
WEBSITES:


TEXT BOOKS:


REFERENCE BOOKS:

OBJECTIVES:
  • To demonstrate various features of JAVA

LIST OF EXPERIMENTS
  1. Simple Java Programs.
  2. Programs Using Arrays and Strings.
  3. Programs to Demonstrate Static Data Members and Member Functions.
  4. Programs on Interfaces.
  5. Programs on Packages.
  6. Programs Using Function Overloading.
  7. Programs Using Inheritance, Function Overriding, and Constructors.
  8. Programs Using I/O Streams.
  9. Programs Using Files.
  10. Programs Using Exception Handling.
  11. Programs Using AWT.
  12. Programs Using Swing.
  13. Programs Using JDBC.

TOTAL: 45 PERIODS

COURSE OUTCOMES
After the successful completion of this course, the student will be able to
  • Create GUI applications Using Java Swing
  • Design Database application with JDBC connectivity
  • Apply exception handling mechanism in java
  • Compare the method overloading and method overriding in java
  • Write programs with file handling concepts in java

HARDWARE AND SOFTWARE REQUIREMENTS
Hardware: Computers Required: 30 No’s.
Software:
  1. Operating System: Ms-Windows 2000 / XP / NT or Linux
  2. Java SE or Equivalent Edition.
  4. MySql or Equivalent Database Product.
OBJECTIVES:

- To demonstrate operating system function calls, system calls and scheduling algorithm using UNIX operating system

LIST OF EXPERIMENTS

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. Develop an Application using Inter Process communication (using shared memory, pipes or message queues).
8. Implement deadlock detection and prevention algorithms.
9. Implement various memory management schemes (First, Best, Worst fit and Buddy schemes).
10. Implement various Page Replacement algorithms(FIFO, LRU)
11. Implement the file allocation techniques such as Linked, Indexed or Contiguous.
12. Implement various Disk Scheduling algorithms(FCFS, SSTF, SCAN, C-SCAN)

TOTAL: 45 PERIODS

COURSE OUTCOMES

After the successful completion of this course, the student will be able to

- Demonstrate process management and control
- Demonstrate various CPU scheduling algorithms
- Solve problems involving semaphores
- Develop various applications involving memory management, File Management
- Make use of various disk scheduling algorithms

HARDWARE AND SOFTWARE REQUIREMENTS

Hardware: Computers Required: 30 No"s.
Software:
1. Operating System: Ms-Windows 2000 / XP / NT or Linux server
2. Java SE or Equivalent Edition.
OBJECTIVES:
- To introduce the basics of microprocessor and microcontroller Programming, interfacing and their applications.

LIST OF EXPERIMENTS
1. Programs for 8/16 bit Arithmetic operations (Using 8085)
2. Programs for Sorting and Searching (Using 8085)
3. Interfacing ADC and DAC
4. Parallel Communication between two MP Kits using Mode 1 and Mode 2 of 8255
5. Serial Communication between two MP Kits using 8251
6. Interfacing and Programming 8279, 8259, and 8253
7. Programs for 16 bit Arithmetic operations (Using 8086)
8. Programs for Sorting and Searching (Using 8086)
9. Programs for String manipulation operations (Using 8086)
10. Interfacing and Programming of Stepper Motor and DC Motor Speed control
11. Programs for Arithmetic, Logical and Bit manipulation (Using 8051)
12. Programming and verifying Timer, Interrupts and UART operations (Using 8051)
13. Communication between 8051 microcontroller kit and PC
14. Traffic Light Control

TOTAL: 45 PERIODS

COURSE OUTCOMES
After the successful completion of this course, the student will be able to
- Apply the knowledge of arithmetic and logical operation programs using 8085, 8086 and 8051 assembly language programs
- Analyze the communication between two microprocessor kits using parallel communication and serial communication
- Evaluate the communication protocols using 8255 and 8251 for 8085 and 8051
- Apply and Compile programs using 8086 simulator
- Interface the peripheral devices such as 8279, 8253 and 8259 with microprocessor

HARDWARE AND SOFTWARE REQUIREMENTS
1. 8085 Trainer Kit -15
2. 8086 Trainer Kit -15
3. 8051 Trainer Kit -15
4. 8255 Interfacing Card - 3
5. 8279 Interfacing Card - 3
6. 8251 Interfacing Card - 3
7. ADC Interfacing Card - 3
8. DAC Interfacing Card - 3
9. Stepper Motor Interfacing Card - 3
OBJECTIVES:
- To make the student acquire sound knowledge to test the logic of program
- To familiarize the student to be aware of generating functions
- To develop an understanding of the concepts of graphs and Trees
- To acquaint the student with the concepts and properties of Lattices

UNIT I LOGIC AND PROOFS 9 + 3

UNIT II COMBINATORICS 9 + 3
Mathematical inductions - Strong induction and well ordering - The basics of counting – The pigeonhole Principle – Permutations and Combinations - Recurrence relations – Solving Linear recurrence relations - Generating functions - Inclusion and exclusion and applications.

UNIT III GRAPHS 9 + 3
Graphs and graph models - Graph terminology and special types of graphs – Representing graphs and graph isomorphism – Connectivity - Euler and Hamilton paths - Trees, Spanning Trees (Definitions and properties only).

UNIT IV ALGEBRAIC STRUCTURES 9 + 3
Algebraic systems - Semi groups and Monoids – Groups - Subgroups and Homomorphisms - Cosets and Lagrange’s theorem - Ring & Fields (Definitions and examples).

UNIT V LATTICES AND BOOLEAN ALGEBRA 9 + 3

TOTAL: 45 (L) + 15 (T) = 60 PERIODS

COURSE OUTCOMES:
After the successful completion of this course, the student will be able to
- Apply the acquired knowledge of the concepts needed to test the logic of the program
- Synthesize induction hypotheses and simple induction proofs which is a very important tool in computer science engineering
- Identify the basic properties of graphs, trees and use these concepts to model simple applications
- Analyze the structures on many levels
- Apply the acquired knowledge of partial order, Lattices and Boolean algebra which play an important role in many disciplines of computer science
TEXT BOOKS:

REFERENCE BOOKS:
OBJECTIVES:
- To introduce the functions of different layers
- To familiarize the network topologies and protocols
- To explain IEEE standard employed in computer networking

UNIT I       PHYSICAL LAYER
Network architecture – layers – Physical links – Channel access on links – Hybrid multiple access techniques - Issues in the data link layer - Framing – Error correction and detection – Link-level Flow Control

UNIT II      DATALINK LAYER
Medium access – CSMA – Ethernet – Token ring – FDDI - Wireless LAN – Bridges and Switches

UNIT III     NETWORK LAYER

UNIT IV      TRANSPORT LAYER

UNIT V       APPLICATION LAYER

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After the successful completion of this course, the student will be able to
- Apply the knowledge of various Physical Layers components
- Identify, formulate and analyze various link layer and physical layer protocols
- Identify the networks and analyze the flow of information between the nodes
- Apply the Knowledge of Transport layer to improve QoS in networks
- Apply the knowledge of various Application Layer protocols

TEXT BOOKS:
REFERENCE BOOKS:
Objective Oriented Analysis and Design (Common to CSE & IT)

**Objectives:**
- To impart the knowledge of OOAD and system design using UML diagrams.
- To explain the fundamental design patterns for object-oriented analysis.
- To discuss how to apply state modeling to business entity classes and graphical notation for UML diagrams.
- To demonstrate about Mapping design to code and Testing.

**Unit I: UML Diagrams**


**Unit II: Design Patterns**


**Unit III: Case Study**

- Case study – the Next Gen POS system, Inception -Use case Modeling - Relating Use cases – include, extend and generalization - Elaboration - Domain Models - Finding conceptual classes and description classes – Associations – Attributes – Domain model refinement – Finding conceptual class Hierarchies - Aggregation and Composition.

**Unit IV: Applying Design Patterns**

- 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 - Applying GoF design patterns.

**Unit V: Coding and Testing**


**COURSE OUTCOMES:**

After the successful completion of this course, the student will be able to:

- Explain fundamental concepts of object-oriented analysis and design.
- Apply system development design patterns and UML graphical notations.
- Describe different Use cases and conceptual class hierarchies.
- Prepare different UML diagrams based on use case narrative.
- Compare and contrast various testing techniques.

**TOTAL: 45 PERIODS**
TEXT BOOKS:


REFERENCE BOOKS:

OBJECTIVES:
- To explain the basic structure of embedded system
- To familiarize with modern hardware/software tools for building prototypes of embedded systems
- To summarize the current statistics of embedded systems

UNIT I  INTRODUCTION TO EMBEDDED COMPUTING AND ARM PROCESSORS
Complex systems and microprocessors – Embedded system design process – Design example: Model train controller - Instruction sets preliminaries - ARM Processor – CPU: programming input and output supervisor mode, exceptions and traps – Co-processors - Memory system mechanisms – CPU

UNIT II  EMBEDDED COMPUTING PLATFORM DESIGN
The CPU Bus-Memory devices and systems – Designing with computing platforms – Consumer electronics architecture – platform-level performance analysis - Components for embedded programs- Models of programs - Assembly, linking and loading – compilation techniques - Program level performance analysis – Software performance optimization – Program level energy and power analysis and optimization – Analysis and optimization of program size- Program validation and testing.

UNIT III  PROCESSES AND OPERATING SYSTEMS
Introduction – Multiple tasks and multiple processes – Multirate systems- Preemptive real-time operating systems- Priority based scheduling- Interprocess communication mechanisms – Evaluating Operating system performance- power optimization strategies for processes – Example Real time operating systems-POSIX-Windows CE.

UNIT IV  SYSTEM DESIGN TECHNIQUES AND NETWORKS
Design methodologies- Design flows - Requirement Analysis – Specifications-System analysis and architecture design – Quality Assurance techniques- Distributed embedded systems – MPSoCs and shared memory multiprocessors.

UNIT V  CASE STUDY
Data compressor - Alarm Clock - Audio player - Software modem-Digital still camera – Telephone answering machine-Engine control unit – Video accelerator.

COURSE OUTCOMES:
Upon completion of the course, students will be able to:
- Explain architecture and programming of the ARM processor
- Analyze the performance characteristics of embedded systems
- Explain the basic concepts of real time Operating system design
- Apply the system design techniques to develop software for embedded systems
- Apply embedded systems to solve real world problems
TEXT BOOKS:

REFERENCE BOOKS:
OBJECTIVES:
- To introduce the concepts and techniques used in two-dimensional and three-dimensional computer graphics
- To familiarize with the algorithms and models for geometric projections, transformations, texture mapping, shading and lighting
- To review graphics programming with OpenGL

UNIT I 2D PRIMITIVES
Output primitives – Line, Circle and Ellipse drawing algorithms - Attributes of output primitives– Two dimensional Geometric transformation - Two dimensional viewing – Line, Polygon, Curve and Text clipping algorithms

UNIT II 3D CONCEPTS
Parallel and Perspective projections - Three dimensional object representation – Polygons, Curved lines, Splines, Quadric Surfaces,- Visualization of data sets - 3D transformations – Viewing -Visible surface identification.

UNIT III GRAPHICS PROGRAMMING

UNIT IV RENDERING

UNIT V FRACTALS

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After the successful completion of this course, the student will be able to
- Apply various algorithms for 2D primitives, geometric transformations and clipping
- Explain the 3D Object representation , transformations and viewing concepts
- Construct 2D & 3D graphic primitives using OpenGL
- Make use of rendering techniques to naturalize the scene
- Develop graphics application using animations

TEXT BOOKS:

REFERENCE BOOKS:
COURSE OBJECTIVE:

- Know the characteristic of wireless channel
- Learn the various cellular architectures concepts
- Understand the concepts behind various digital signaling schemes for fading channels
- Be familiar the various multipath mitigation techniques
- Understand the various multiple antenna systems

UNIT I  WIRELESS CHANNELS

Large scale path loss – Path loss models: Free Space and Two-Ray models -Link Budget design –
Small scale fading- Parameters of mobile multipath channels – Time dispersion parameters -
Coherence bandwidth – Doppler spread & Coherence time, Fading due to Multipath time
delayspread – flat fading – frequency selective fading – Fading due to Doppler spread – fast fading –
slow fading.

UNIT II  CELLULAR ARCHITECTURE

Multiple Access techniques - FDMA, TDMA, CDMA – Capacity calculations–Cellular concept-
Frequency reuse - channel assignment- hand off- interference & system capacity- trunking& grade of
service – Coverage and capacity improvement.

UNIT III  DIGITAL SIGNALING FOR FADING CHANNELS

Structure of a wireless communication link, Principles of Offset-QPSK, p/4-DQPSK, Minimum
ShiftKeying, Gaussian Minimum Shift Keying, Error performance in fading channels, OFDM principle
–Cyclic prefix, Windowing, PAPR.

UNIT IV  MULTIPATH MITIGATION TECHNIQUES

Equalisation – Adaptive equalization, Linear and Non-Linear equalization, Zero forcing and
LMSAlgorithms. Diversity – Micro and Macrodiversity, Diversity combining techniques, Error
probability in fading channels with diversity reception, Rake receiver

UNIT V  MULTIPLE ANTENNA TECHNIQUES

MIMO systems – spatial multiplexing -System model -Pre-coding - Beam forming –
transmitterdiversity, receiver diversity- Channel state information-capacity in fading and non-fading
channels.

TOTAL: 45 PERIODS
COURSE OUTCOMES:

After the successful completion of this course, the student will be able to
- Classify the different fading techniques
- Choose the appropriate multiple access techniques for any scenario
- Analyze various signaling schemes for fading channels
- Compare multipath mitigation techniques and analyze their performance
- Design MIMO systems with transmit/receive diversity

TEXT BOOKS:

REFERENCE BOOKS:
OBJECTIVES:
- To demonstrate the various Networking Protocols

LIST OF EXPERIMENTS
1. Implementation of Data Encryption and Decryption
2. Implementation of CRC
3. Implementation of Domain Name System
4. Implementation of sliding window protocol
5. Implementation of Stop and Wait protocol
6. Implementation of Distance Vector Routing protocol
7. Configure Network using Link State Vector Routing protocol
8. Write a program for Hamming Code generation for error detection and correction.
9. Implementation of ARP/RARP
10. Programs using TCP Sockets (like date and time server & client, echo server & client, etc.)
11. Programs using UDP Sockets (like simple DNS)
12. Study of Glomosim / OPNET

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After the successful completion of the course students will be able to
- Apply the knowledge of data Encryption and Decryption
- Identify Formulate Analyze the functionality of protocols
- Apply the Knowledge of basic functionality of protocols
- Identify and analyze the Error correction and detection to improve the QoS
- Identify the issues and analyze the outcome of the issues by Applying the knowledge of OPNET

HARDWARE AND SOFTWARE REQUIREMENTS
- PCs, C++ Compiler, J2SDK (Freeware), Network simulators, NS2/Glomosim/OPNET (Freeware)
OBJECTIVES:
- To introduce the basics of OO analysis and design skills and familiarize with UML design diagrams.

LIST OF EXPERIMENTS
To develop a mini-project for the following exercises listed below.
1. To develop a problem statement.
2. Identify Use Cases and develop the Use Case model.
3. Identify the conceptual classes and develop a domain model with UML Class diagram.
4. Using the identified scenarios, find the interaction between objects and represent them using UML Sequence diagrams.
5. Draw relevant state charts and activity diagrams.
6. Identify the User Interface, Domain objects, and Technical services. Draw the partial layered, logical architecture diagram with UML package diagram notation.
7. Develop and test the Technical services layer.
8. Develop and test the Domain objects layer.
9. Develop and test the User interface layer.

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
14. Library Management System
15. Student Information System

COURSE OUTCOMES:
After the successful completion of this course, the student will be able to
- Design the projects using OO concepts
- Use the UML analysis and design models.
- Use the UML graphical notations for the appropriate diagrams
- Apply appropriate design patterns
- Convert design into code

TOTAL: 45 PERIODS
SOFTWARE AND HARDWARE REQUIREMENT

SOFTWARE:
Rational Suite, Open Source Alternatives: ArgoUML, Visual Paradigm, Eclipse IDE and JUnit

HARDWARE:
Standalone desktops 30 Nos
OBJECTIVES:
- To demonstrate the 2D,3D and geometric transformation using OpenGL

LIST OF EXPERIMENTS
1. Implementation of Bresenhams Algorithm – Line, Circle, Ellipse.
2. Implementation of Line, Circle and ellipse attributes.
3. Two Dimensional transformations - Translation, Rotation, Scaling, Reflection, Shear.
5. Cohen Sutherland 2D line clipping and Windowing.
7. Three dimensional transformations - Translation, Rotation, Scaling.
8. Composite 3D transformations.
9. Implementation of color models using OpenGL.
10. Projection of the 3D image using OpenGL.
11. Draw three dimensional object & scenes using OpenGL.
12. Draw at least four basic graphics primitives using OpenGL.
13. Generating Fractal images using OpenGL.

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After the successful completion of the course students will be able to
- Develop applications for geometric transformation.
- Construct graphical functions using graphics primitives
- Compare 2D & 3D transformations
- Apply different aspects of color in computer graphics
- Develop an animation application using OpenGL

HARDWARE AND SOFTWARE REQUIREMENTS
Minimum Hardware Requirements: (for a batch of 30 students)
Intel Pentium III 800 MHz Processor or higher version, Intel chipset 810 mother board or higher version, 14” color monitor or greater than that Mouse, Keyboard, 2GB HDD or greater, 256 MB RAM or greater
Software Requirements: Turbo C / C++ compiler that supports graphics.h package.
   Special DOSBOXed installer for Turbo C++ compiler
OBJECTIVES:

- To develop a requisite knowledge in soft skills and communication skills.
- To understand long texts and be able to orally summarize complex reports, commentaries and correspondence with the occasional use of a dictionary, and extract ideas and opinions.

UNIT I COMMUNICATION SKILL 10

Listening to the Conversation - Introducing oneself before audience - Group Discussion - Formal Letter writing – E-Mail Etiquettes - Power Point Presentation

UNIT II PREPARATION FOR INTERVIEWS 10

Preparation of Resume - Difference between Bio-data and CV- Visiting Company Web site - Gathering Information about Company - Mode of Selection - Different types of Selection Methods – Pre-placement Talk - Attitude before Interview

UNIT III INTERVIEW SKILL 10

Body Language - Types of Interview - Attending Telephonic Interview – Do’s and Don’ts during and after the Interview - Expectation of the Interviewer - Mock Interview.

TOTAL: 30 PERIODS

COURSE OUTCOMES:

After the successful completion of this course, the student will be able to:

- Explain the social and personal values of life
- Describe the importance of human rights
- Analyze key issues related to values of life and human rights and propose appropriate solutions to the situations

REFERENCE BOOKS:

1. Dr. K.Alex, Soft Skills, know yourself and know the world, Second Revised Edition2011, S Chand Publication New Delhi-110055

HARDWARE AND SOFTWARE REQUIREMENTS

Software: Globarena and CDs Generated by the Department of English
Hardware: 60 Systems & LCD Projector with Speakers
OBJECTIVES:
- To introduce the service oriented analysis techniques
- To import the technology underlying the service design
- To demonstrate the SOA platforms and WS specification standards

UNIT I  INTRODUCTION

UNIT II  WEB SERVICES
Web services – Service descriptions – Messaging with SOAP –Message exchange Patterns – Coordination –Atomic Transactions – Business activities – Orchestration –Choreography - Service layer abstraction – Application Service Layer – Business Service Layer – Orchestration Service Layer

UNIT III  COMMUNICATION AND SOA

UNIT IV  SOA PLATFORMS
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 STANDARDS

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After the successful completion of the course students will be able to
- Explain the client server and distributed architecture
- Analyze the significance of service orientation architecture and web services
- Make use of Communication techniques for an appropriate service
- Select the suitable SOA platform for an application
- Create WS specification standards for an applications
TEXT BOOKS:

REFERENCE BOOKS:
OBJECTIVES:
• To introduce the phases of operation of a compiler
• To familiarize the design and implementation of a lexical analyzer and parser
• To demonstrate the code generation and optimization

UNIT I LEXICAL ANALYSIS
Introduction to Compiling- Compilers-Analysis of the source program-The phases- Cousins- The grouping of phases-Compiler construction tools. The role of the lexical analyzer- Input buffering-Specification of tokens-Recognition of tokens-A language for specifying lexical analyzer.

UNIT II SYNTAX ANALYSIS and RUN-TIME ENVIRONMENTS
Syntax Analysis- The role of the parser-Context-free grammars-Writing a grammar - Topdown parsing-Bottom-up Parsing-LR parsers-Constructing an SLR(1) parsing table. Type Checking- Type Systems-Specification of a simple type checker. Run-Time Environments-Source language issues-Storage organization-Storage-allocation strategies.

UNIT III INTERMEDIATE CODE GENERATION
Intermediate languages-Declarations-Assignment statements - Boolean expressions- Case statements- Backpatching-Procedure calls

UNIT IV CODE GENERATION
Issues in the design of a code generator- The target machine-Run-time storage management- Basic blocks and flow graphs- Next-use information-A simple code generator-Register allocation and assignment-The DAG representation of basic blocks - Generating code from DAG.

UNIT V CODE OPTIMIZATION

COURSE OUTCOMES:
After the successful completion of the course students will be able to
• Apply the knowledge of lexical analysis phase to solve the problem of tokenization of a sequence of characters
• Apply the knowledge of parsers to solve syntax analysis phase of programming statements
• Analyze intermediate code generation and formulate intermediate codes for the output of syntax analyzer
• Identify and analyze the issues of code generation using the principles of register allocation and assignment
• Apply various techniques on generated intermediate codes to solve the problem of code optimization

TOTAL: 45 PERIODS
TEXT BOOKS:

REFERENCE BOOKS:
OBJECTIVES:
- To introduce the essentials of web and markup languages
- To import the HTML & XHTML elements and the basics of client server programming
- To summarize the Document Object Model, XML and C# & .NET framework

UNIT I  INTRODUCTION  

UNIT II  CSS AND CLIENT SIDE PROGRAMMING  
**Style Sheets:** CSS-Introduction to Cascading Style Sheets-Features-Core Syntax-Style Sheets and HTML Style Rule Cascading and Inheritance-Text Properties-Box Model Normal Flow Box Layout-Beyond the Normal Flow-Other Properties-Case Study. **Client-Side Programming:** The JavaScript Language-History and Versions Introduction JavaScript in Perspective-Syntax-Variables and Data Types-Statements-Operators-Literals-Functions-Objects-Arrays-Built-in Objects-JavaScript Debuggers.

UNIT III  CLIENT SIDE PROGRAMMING & DOM  

UNIT IV  XML AND JSP  

UNIT V  .NET FRAMEWORK  

TOTAL: 45 PERIODS
COURSE OUTCOMES:
After the successful completion of the course students will be able to
- Design and develop web pages using HTML and DHTML
- Interpret the role of Cascading Style Sheets and Scripting for a web service
- Compare and contrast server side technologies
- Infer the knowledge of MVC architecture supported by different frameworks
- Build web based applications for the enterprises

TEXT BOOKS:

REFERENCE BOOKS:
OBJECTIVES:
- To familiarize the symmetric and asymmetric encryption algorithms
- To explain the authentication and Hash functions for improved security
- To review the network security applications such as firewalls, IDS and trusted systems

UNIT I INTRODUCTION TO CRYPTOGRAPHY

UNIT II SYMMETRIC CIPHERS

UNIT III HASH FUNCTIONS AND PUBLIC KEY CRYPTOGRAPHY

UNIT IV AUTHENTICATION APPLICATIONS

UNIT V SYSTEM SECURITY

COURSE OUTCOMES:
After the successful completion of the course students will be able to
- Apply the knowledge of mathematical concepts to cryptography
- Analyze the Strength of symmetric cipher algorithm
- Apply Public Key Cryptography and Make use of Hash Functions in cryptography techniques
- Select an appropriate techniques for Authentication applications
- Analyze the Network security design using available secure solutions

TEXT BOOKS:
REFERENCE BOOKS:

OBJECTIVES:
- To demonstrate SOA applications Using .NET Framework

LIST OF EXPERIMENTS
1. Develop a program to implement invoice Order Processing using .NET component
2. Develop a program to implement Payment processing using .NET component
3. Develop a program to implement invoice Order Processing using EJB component
4. Develop a program to implement Payment processing using EJB component
5. Develop a program for implement calculator and to calculate simple and complex interest using .NET
6. Develop a program for calculate Library management processing using EJB component
7. Develop a program for calculate Library management processing using .NET component
8. Invoke .NET components as web services.
9. Invoke EJB components as web services.
10. Develop a Service Orchestration Engine (workflow) using WS-BPEL and implement service composition. For example, a business process for planning business travels will invoke several services. This process will invoke several airline companies (such as Air India, Indian Railways etc.) to check the airfare price and buy at the lowest price.
11. Develop a J2EE client to access a .NET web service.
12. Develop a .NET client to access a J2EE web service.

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After the successful completion of the course students will be able to
- Develop programs using service oriented analysis and Design
- Apply component based model in service oriented architecture
- Develop a service orchestration Engine using WS-BPEL
- Design an application using .NET and J2EE web service
- Apply WS-BPEL services in service orchestration Engine

HARDWARE AND SOFTWARE REQUIREMENTS
Hardware: CPU: (As Server) Processor (Core 2 Quad or equivalent) with good speed, 2GBRAM, 300GBHDD.
OBJECTIVES:
- To demonstrate web services and Web pages Using DHTML and Scripting Languages

LIST OF EXPERIMENTS
1. To create a simple HTML file to demonstrate the use of different tags (frames, links, tables etc)
2. To 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
3. To create a web page with all types of Cascading style sheets
4. To create a scientific calculator using JavaScript
5. To create a Client Side Scripts for Validating Web Form Controls using DHTML
6. Write programs in Java to create applets incorporating the following features:
   i. Create a color palette with matrix of buttons
   ii. Set background and foreground of the control text area by selecting a color from color palette.
   iii. In order to select Foreground or background use check box control as radio buttons
   iv. To set background images
7. Write programs in Java using Servlets:
   i. To invoke servlets from HTML forms
   ii. To invoke servlets from Applets
8. Write programs in Java to create three-tier applications using JSP and Databases
9. Write Programs using XML – Schema – XSLT/XSL
10. Programs using AJAX
11. Write Programs using C# and .NET
12. Consider a case where we have two web Services- an airline service and a travel agent and the travel agent is searching for an airline. Implement this scenario using Web Services and Data base

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After the successful completion of the course students will be able to
- Design and develop web pages using HTML, DHTML and Cascading Style Sheets
- Demonstrate the creation of interactive web pages
- Adapt client side and server side scripting
- Write XML schema for an application
- Build web based systems for the enterprises using technology like JSP, Servlet, C# and ASP.NET

HARDWARE AND SOFTWARE REQUIREMENTS
Hardware: Standalone Desktops – 30 Nos
Software: Java, Dream Weaver or Equivalent, MySQL or Equivalent, Apache Server
OBJECTIVES

- To demonstrate the Network Security Concepts with different Algorithms and Techniques

LIST OF EXPERIMENTS

1. Study of TCP and UDP Sockets
2. Study of TCP/UDP performance
3. Implement the following SUBSTITUTION & TRANSPOSITION TECHNIQUES concepts:
   a) Caesar Cipher
   b) Playfair Cipher
   c) Hill Cipher
   d) Vigenere Cipher
   e) Rail fence—row & Column Transformation
4. Implement the following algorithms
   a) DES
   b) RSA Algorithm
   c) Diffie-Hellman
   d) MD5
   e) SHA-1
5. Implement the SIGNATURE SCHEME—Digital Signature Standard
6. Demonstrate how to provide secure data storage, secure data transmission and for creating
digital signatures (GnuPG).
7. Set up a honeypot and monitor the honeypot on network (KF Sensor)
8. Installation of rootkits and study about the variety of options
9. Perform wireless audit on an access point or a router and decrypt WEP and WPA (NetStumbler)
10. Demonstrate intrusion detection system (IDS) using any tool (snort or any other s/w)
11. Performance comparison of MAC protocols
12. Performance comparison of routing protocols

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of the course students will be able to
- Apply the classical cipher techniques for Network Security
- Develop the various symmetric and asymmetric Security Algorithms
- Identify the different open source tools for network security analysis
- Analyze the network security designs using available secure solutions
- Analyze the Performance of Network Security Protocols

HARDWARE AND SOFTWARE REQUIREMENTS

Hardware: Standalone desktops -30 Nos. OR Server supporting 30 terminals or more.
Software: C / C++ / Java or equivalent compiler, GnuPG, KF Sensor or Equivalent, Snort, Net
Stumbler or Equivalent, Opnet.
OBJECTIVES

- To engage the student in integrated activities of reading, research, discussion and
presentation around a designated subject

This course is introduced to enrich the communication skills of the student and to create awareness
on recent development in Electronic and Instrumentation through Technical presentation. In this
course, a student has to present at least two Technical papers or recent advances in
engineering/technology that will be evaluated by a committee constituted by the Head of the
Department.

COURSE OUTCOMES

After successful completion of this course the students will be able to:

- Identify and formulate a technical problem to reach substantiated conclusion using basic
technical knowledge
- Design or Develop prototype model for societal needs applying the basic engineering
knowledge
- Evaluate the performance of the developed solution using appropriate techniques and
tools
- Apply management principles to function as a team
- Communicate the technical information effectively
PROJECT MANAGEMENT AND FINANCE

14UME701
(Common to MECH, ICE, CSE, ECE, EEE, IT & EIE)

L T P C
3 0 0 3

OBJECTIVES:

- To impart knowledge to find solutions and approaches for various projects.
- To familiarize the utilization of project within time, resource and financial constraints.

UNIT I  PROJECT MANAGEMENT CONCEPTS 9

Concept and characteristics of a project, importance of project management, types of project, project organizational structure, project life cycle, Statement of Work, Work Breakdown Structure.

UNIT II  PROJECT PLANNING 9

Project Planning and Scheduling techniques - developing the project network using CPM/PERT, Limitations of CPM/PERT, Precedence Diagramming Method, constructing diagram and computations using precedence diagramming method, PERT/CPM simulation, reducing project duration.

UNIT III  RESOURCE SCHEDULING & CRITICAL CHAIN SCHEDULING 9

Resource Scheduling - Resource allocation method, splitting and multitasking, Multi project resources scheduling - Critical Chain Scheduling - Concept of critical chain scheduling - critical chain scheduling method, application of Critical chain scheduling and limitations.

UNIT IV  PROJECT QUALITY MANAGEMENT 9

Concept of project quality, responsibility for quality in projects, quality management at different stages of project, tools and techniques, Quality Management Systems, Project Performance Measurement and Control - Monitor and assess project performance, schedule, and cost. Project Closure/ Termination - Meaning of closure/ termination, project audit process, termination steps, final closure.

UNIT V  FINANCIAL ACCOUNTING 9


TOTAL: 45 Periods

COURSE OUTCOMES:

After the successful completion of this course, the student will be able to

- Discuss various characteristics and importance of project management.
- Use CPM/PERT network for finding minimum project duration.
- Compare various scheduling methods.
- Justify various tools and techniques at different stages of quality management.
- Discuss financial ratios, cash flow and fund flow analysis.
TEXT BOOKS:


REFERENCE BOOKS:

OBJECTIVES:
- To import the needs of different databases
- To introduce the transaction management of the database
- To be familiarize in web ,intelligent and real time database

UNIT I  PARALLEL DATABASES

UNIT II  OBJECT ORIENTED DATABASES

UNIT III  WEB DATABASES

UNIT IV  INTELLIGENT DATABASES

UNIT V  CURRENT TRENDS

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After the successful completion of the course students will be able to
- Choose the appropriate database system architecture
- Develop an application using OODBMS
- Make use of web technology to construct a web database
- Explain the enhanced Data Models for Intelligent database
- Analyze the current trend in databases
TEXT BOOKS:

REFERENCE BOOKS:
OBJECTIVES:
- To introduce the essentials of building fully featured applications on various cloud models.
- To familiarize the concepts of designing and developing various service models (IaaS, PaaS and SaaS) and deployment models (Public, Private and Hybrid clouds).
- To impart the knowledge of Multi-cloud management systems and business clouds.

UNIT I OVERVIEW OF CLOUD COMPUTING

UNIT II PRIVATE CLOUDS

UNIT III PUBLIC CLOUDS

UNIT IV CLOUD SECURITY

UNIT V MULTI-CLOUD MANAGEMENT SYSTEMS AND BUSINESS CLOUDS
Concept of multi-cloud management, Challenges in managing heterogeneous clouds, benefits and advantages of multi-cloud management systems.
Cloud Computing in Business, Various Biz Clouds focused on industry domains (Retail, Banking and Financial sector, Life Sciences, Social networking, Telecom, Education).

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After the successful completion of the course students will be able to
- Explain the concepts of Cloud Computing and the various deployment and service models of Cloud Computing
- Apply the virtualization techniques to provide IaaS
- Apply Aneka tools and other techniques to provide PaaS and SaaS
- Identify issues of security concerns in Cloud Computing
- Describe Multi-Cloud management System for various applications

**TEXT BOOKS:**

**REFERENCE BOOKS:**
- Michael Miller, Cloud Computing, Pearson Education, New Delhi, 2009
COURSE OBJECTIVES:
- Understand the essentials of mobile apps development
- Understand the fundamental concepts of designing and developing
- Learn the major considerations of graphics and multimedia.
- Learn the various testing process.

UNIT I GETTING STARTED WITH MOBILE APPS 9
An introduction to mobile development history- Overview of Architecture of Android – A walk through to Android Studio - Working with emulator.

UNIT II ELEMENTS OF DESIGNING 9
User Interface Designing – Mobile Layouts – Mobile User Interface Elements-Draw-able-widgets-menu

UNIT III PROGRAMMING WITH MOBILE APPS 9
An introduction to programming- Configuring an app- Threads, Async task, Services – states and life cycle-Notifications-Broadcast receivers-Telephony and SMS APIs-Native data handling – on-device file I/O, shared preferences,

UNIT IV ANIMATION AND SENSORS 9
Graphics and animation – custom views-canvas-animation APIs- multimedia – audio/video playback and record- location awareness and native hardware access (sensors)

UNIT V CONNECTING TO THE DATA BASES AND TESTING 9
Mobile databases -SQLite, and enterprise data access (via Internet/Intranet)-Connecting Apps with database- Testing - White box testing-Black box testing and test automation of mobile apps-Robotium-Versioning and Staging(Deployment).

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After the successful completion of the course students will be able to
- Apply appropriate key techniques and tools for developing and maintaining mobile applications
- Identify the user interface requirements for mobile platforms and analyze the appropriate strategies for Development and deployment
- Apply the Knowledge of advanced Java competency in mobile application development
- Identify, review and analyze the appropriate UI layout for the mobile application development
- Develop mobile apps using Android as development platform with key focus on user experience

TEXT BOOKS:
REFERENCEBOOKS:
OBJECTIVES:
- To demonstrate and develop the Mobile Application using various Tools and Techniques

LIST OF EXPERIMENTS
1. Write a program to build an Android Application Display Hello World
2. Write a program to display the views of different attributes.
   a) Relative Layout Views
   b) Linear Layout Views
3. Write a program to implement a menu which uses check-able items in Menu.
4. Write a program to implement a Custom Button and handle the displayed message on button press.
5. Write a program to implement the Table layout in View Group that displays child View elements in rows and columns.
6. Write a program to implement tween animation and rotate the text in your android application.
7. Write a program to show how to use Date picker control of SDK in your android applications.
8. Write a program which enables you to draw an image using bitmap class object.
9. Write a program which allows you to get image from web and displayed them using the Image view.
10. Write a program which shows you how to create a scroll view when text is not visible on one page.
11. Write a program which will shows you how to run any video file.
12. Create an Android application for the following.
    a) Body Mass Index (BMI)

TOTAL: 30 PERIODS

COURSE OUTCOMES:
After the successful completion of the course students will be able to
- Write simple programs to display various layouts
- Implement the different menu, button controls
- Construct an animation application
- Build the robust & scalable android applications

HARDWARE AND SOFTWARE REQUIREMENTS
Standalone desktops with Windows or Android or iOS or Equivalent Mobile Application Development Tools with appropriate emulators and debuggers - 30 Nos.
OBJECTIVES:
- To demonstrate and design an efficient database for various applications

LIST OF EXPERIMENTS:

DISTRIBUTED DATABASE
Consider a distributed database for a bookstore with 4 sites called S1, S2, S3 and S4. Consider the following relations:
Books (ISBN, primary Author, topic, total Stock, price)
Book Store (store No, city, state, zip, inventory Value)
Stock (store No, ISBN, Qty)
Total Stock is the total number of books in stock and inventory Value is the total inventory value for the store in dollars.
1. Consider that Books are fragmented by price amounts into:
   F1: Books: price up to $20
   F2: Books: price from $20.01 to $50
   F3: Books: price from $50.01 to $100
   F4: Books: price $100.01 and above
   Write SQL query for the following
   i. Insert and Display details in each table.
   ii. Find the total number of books in stock where price is between $15 and $55.

2. Consider that Book Stores are divided by ZIP codes into:
   S1: Bookstore: Zip up to 25000
   S2: Bookstore: Zip 25001 to 50000
   S3: Bookstore: Zip 50001 to 75000
   S4: Bookstore: Zip 75001 to 99999
   Write SQL query for the following
   i. Update the book price of book No=1234 from $45 to $55 at site S3.
   ii. Find total number of book at site S2.

OBJECT ORIENTED DATABASE
A University wants to track persons associated with them. A person can be an Employee or Student. Employees are Faculty, Technicians and Project associates. Students are Full time students, Part time students and Teaching Assistants.

3. Design an Enhanced Entity Relationship (EER) Model for university database. Write OQL for the following
   i. Insert details in each object.
   ii. Display the Employee details.

4. Design an Enhanced Entity Relationship (EER) Model for university database. Write OQL for the following
i. Display Student Details.
ii. Modify person details.
iii. Delete person details.

PARALLEL DATABASE
5. Consider the application for University Counseling for Engineering Colleges. The college, department and vacancy details are maintained in 3 sites. Students are allocated colleges in these 3 sites simultaneously. Implement this application using parallel database [State any assumptions you have made].

6. There are 5 processors working in a parallel environment and producing output. The output record contains college details and students mark information. Implement parallel join and parallel sort algorithms to get the marks from different colleges of the university and publish 10 ranks for each discipline.

XML
Design XML Schema for the given company database
Department (deptName, deptNo, deptManagerSSN, deptManagerStartDate, deptLocation )
Employee (empName, empSSN, empSex, empSalary, empBirthDate, empDeptNo, empSupervisorSSN, empAddress, empWorksOn)
Project ( projName, projNo, projLocation, projDeptNo, projWorker )

7. Implement the following queries using XQuery and XPath
   i. Retrieve the department name, manager name, and manager salary for every department.
   ii. Retrieve the employee name, supervisor name and employee salary for each employee who works in the Research Department.
   iii. Retrieve the project name, controlling department name, number of employees and total hours worked per week on the project for each project.
   iv. Retrieve the project name, controlling department name, number of employees and total hours worked per week on the project for each project with more than one employee working on it.

8. Implement a storage structure for storing XML database and test with the above schema.
9. Create applications using Triggers.
11. Develop an application using mobile database.

WEKA TOOL
12. Work with Weka tool classification and clustering algorithms using the given training data and test with the unknown sample. Also experiment with different scenarios and large data set.

<table>
<thead>
<tr>
<th>RID</th>
<th>Age</th>
<th>Income</th>
<th>Student</th>
<th>Credit_rating</th>
<th>Class: buys_computer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>youth</td>
<td>high</td>
<td>no</td>
<td>fair</td>
<td>no</td>
</tr>
<tr>
<td>2</td>
<td>youth</td>
<td>high</td>
<td>no</td>
<td>excellent</td>
<td>no</td>
</tr>
<tr>
<td>3</td>
<td>middle_aged</td>
<td>high</td>
<td>no</td>
<td>fair</td>
<td>yes</td>
</tr>
<tr>
<td>4</td>
<td>senior</td>
<td>medium</td>
<td>no</td>
<td>fair</td>
<td>yes</td>
</tr>
<tr>
<td>5</td>
<td>senior</td>
<td>low</td>
<td>yes</td>
<td>fair</td>
<td>yes</td>
</tr>
<tr>
<td>6</td>
<td>senior</td>
<td>low</td>
<td>yes</td>
<td>excellent</td>
<td>no</td>
</tr>
<tr>
<td>7</td>
<td>middle_aged</td>
<td>low</td>
<td>yes</td>
<td>excellent</td>
<td>yes</td>
</tr>
<tr>
<td>No</td>
<td>Group</td>
<td>Age</td>
<td>Gender</td>
<td>Assessment</td>
<td>Improvement</td>
</tr>
<tr>
<td>----</td>
<td>-----------</td>
<td>---------</td>
<td>--------</td>
<td>------------</td>
<td>-------------</td>
</tr>
<tr>
<td>8</td>
<td>youth</td>
<td>medium</td>
<td>no</td>
<td>fair</td>
<td>no</td>
</tr>
<tr>
<td>9</td>
<td>youth</td>
<td>low</td>
<td>yes</td>
<td>fair</td>
<td>yes</td>
</tr>
<tr>
<td>10</td>
<td>senior</td>
<td>medium</td>
<td>yes</td>
<td>fair</td>
<td>yes</td>
</tr>
<tr>
<td>11</td>
<td>youth</td>
<td>medium</td>
<td>yes</td>
<td>excellent</td>
<td>yes</td>
</tr>
<tr>
<td>12</td>
<td>middle aged</td>
<td>medium</td>
<td>no</td>
<td>excellent</td>
<td>yes</td>
</tr>
<tr>
<td>13</td>
<td>middle aged</td>
<td>high</td>
<td>yes</td>
<td>fair</td>
<td>yes</td>
</tr>
<tr>
<td>14</td>
<td>senior</td>
<td>medium</td>
<td>no</td>
<td>excellent</td>
<td>no</td>
</tr>
</tbody>
</table>

**TOTAL: 45 PERIODS**

**COURSE OUTCOMES:**
After the successful completion of the course students will be able to
- Apply the concepts of distributed and object oriented databases
- Make use of the features of parallel database
- Apply the clustering and classification using weka tool
- Develop application using XML and work on it
- Apply query evaluation and optimization techniques

**HARDWARE AND SOFTWARE REQUIREMENTS**
Computer Required: 30 No's
Minimum Requirement: Processor: Pentium IV, Ram: 1 GB, Hard Disk: 80 GB
Software Requirements:
- Operating System: Linux (Ubuntu/Fedora / Debian / Mint OS) / Windows
- Turbo C Version 3 or GCC Version Unit III UNIT III4/ Built in Linux /DEVC++
- Front End: NetBeans Back End: Oracle 9i/ PL SQL / Hadoop / Weka
OBJECTIVES:

- To impart knowledge on a values-based approach and provide a method of thinking about and dealing with ethical issues in the workplace.
- To explain what a profession is and what it means to act.

UNIT I  ENGINEERING ETHICS


UNIT II  ENGINEERING AS SOCIAL EXPERIMENTATION


UNIT III  ENGINEER’S RESPONSIBILITY FOR SAFETY


UNIT IV  RESPONSIBILITIES AND RIGHTS


UNIT V  GLOBAL ISSUES


TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of this course, the student will be able to:

- Identify and apply the content of at least one example of a law (state, national, or international) dealing with engineering ethics.
- Apply the code of ethics/conduct of at least one professional society.
- Describe their own personal definition of what makes for an ethical engineer.
- Explain historical, legal, professional, and personal reasons why legal and professional.
- Judge the ethical issues and professional importance in the society.
TEXT BOOKS:

REFERENCE BOOKS:
OBJECTIVE

- To deepen comprehension of principles by applying them to a new problem which may be the design and manufacture of a device, a research investigation, a computer based project or management project.

PROJECT DESCRIPTION:
Six periods per week shall be allotted in the time table and this time shall be utilized by the students to receive the directions from the guide, on library reading, laboratory work, computer analysis or field work as assigned by the guide and also to present in periodical seminars on the progress made in the project. The progress of the project is evaluated based on a minimum of three reviews.

COURSE OUTCOMES

- Design/Develop sustainable solutions for societal issues with environmental considerations applying the basic engineering knowledge
- Analyze and review research literature to synthesize research methods including design of experiments to provide valid conclusion
- Utilize the new tools, algorithms, techniques to provide valid conclusion following the norms of engineering practice
- Test and Evaluate the performance of the developed solution using appropriate techniques and tools
- Apply management principles to function effectively in the project team for project execution
- Engage in learning for effective project implementation in the broadest context of technological change with consideration for public health, safety, cultural and societal needs
- Write effective reports and make clear presentation to the engineering community and society
OBJECTIVES:
- To explain the hardware and software features that support distributed OS
- To import a broader sense of knowledge in multi-threading operating system and memory concepts
- To demonstrate some insight into the design of ATM networks and client server model

UNIT I  INTRODUCTION TO DISTRIBUTED SYSTEMS  9
Distributed system goals, Hardware Concepts, Software concepts, design issues, Case study: Unix

UNIT II  COMMUNICATION IN DISTRIBUTED SYSTEMS  9
Layered Protocol, ATM Networks, client server model - remote procedure call – group communication, Case study: SUN RPC, DCE, RPC.

UNIT III  SYNCHRONIZATION  9
Clock synchronization - mutual exclusion - election atomic transactions - deadlocks, Case study: CHORUS

UNIT IV  PROCESS AND PROCESSORS DISTRIBUTED FILE SYSTEMS  9
Threads - System models processor allocation - scheduling fault tolerance - real time distributed systems. File system design and implementation - trends in distributed file systems

UNIT V  SHARED MEMORY  9
Introduction - bus based multi processors, ring based multiprocessors , switched multiprocessors - NUMA comparison of shared memory systems - consistency models - page based distributed shared memory - shared variable distributed shared memory - object based distributed shared memory

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After the successful completion of the course students will be able to
- Explain the issues in designing distributed operating systems.
- Discuss various networking and communication technologies
- List the synchronization problems in distributed systems
- Adapt trends in distributed file systems.
- Implement the real time shared memory systems.

TEXT BOOKS:
REFERENCE BOOKS:

OBJECTIVES:
- To Introduce the basic concepts of artificial intelligence
- To explain various knowledge representation techniques.
- To import the various knowledge inference, machine learning approaches and problem solving techniques

UNIT I INTRODUCTION TO AI AND PRODUCTION SYSTEMS 9
Introduction to AI-Problem formulation, Problem Definition -Production systems, Control strategies, Search strategies. Problem characteristics, Production system characteristics -Specialized production system- Problem solving methods - Problem graphs, Matching, Indexing and Heuristic functions -Hill Climbing-Depth first and Breath first, Constraints satisfaction - Related algorithms, Measure of performance and analysis of search algorithms.

UNIT II REPRESENTATION OF KNOWLEDGE 9
Game playing - Knowledge representation, Knowledge representation using Predicate logic, Introduction to predicate calculus, Resolution, Use of predicate calculus, Knowledge representation using other logic-Structured representation of knowledge.

UNIT III KNOWLEDGE INFERENCE 9
Knowledge representation -Production based system, Frame based system. Inference - Backward chaining, Forward chaining, Rule value approach, Fuzzy reasoning - Certainty factors, Bayesian Theory-Bayesian Network-Dempster - Shafer theory.

UNIT IV PLANNING AND MACHINE LEARNING 9

UNIT V COMMUNICATION, PERCEPTION AND ACTION 9

COURSE OUTCOMES:
After the successful completion of the course students will be able to
- Identify problems that are amenable to solution by AI methods
- Apply predicate logic for knowledge representation
- Choose appropriate AI methods to solve a given problem
- Design and carry out an empirical evaluation of different AI algorithms
- Differentiate the types of grammars
TEXT BOOKS:

REFERENCE BOOKS:
OBJECTIVES:
- To explain the requirements of software architectures
- To describe various architectural styles and views
- To introduce the quality attributes of software architectures

UNIT I  INTRODUCTION AND ARCHITECTURAL DRIVERS  9

UNIT II  QUALITY ATTRIBUTE WORKSHOP  9
Quality Attribute Workshop–Documenting Quality Attributes –Six part scenarios–Case studies

UNIT III  ARCHITECTURAL VIEWS  9

UNIT IV  ARCHITECTURAL STYLES  9
Introduction–Data flow styles–Call-return styles–Shared Information styles-Event styles–Case studies for each style.

UNIT V  DOCUMENTING THE ARCHITECTURE  9
Good practices–Documenting the Views using UML–Merits and Demerits of using visual languages – Need for formal languages - Architectural Description Languages – ACME – Case studies. Special topics: SOA and Web services–Cloud Computing–Adaptive structures

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After the successful completion of the course students will be able to
- Understand the significance of software architecture in large scale software systems
- Recognize major software architectural styles, design patterns, and frameworks
- Generate architectural alternatives for a problem based on quality attributes
- Develop software architectures using various documentation approaches
- Build the systems using paradigms.

TEXT BOOKS:
REFERENCE BOOKS:

OBJECTIVES:

- To learn how to immediately start producing software incrementally regardless of existing engineering practices or methodologies
- To learn how to simplify the implementation of Agile processes
- To learn how to simplify XP implementation through a Scrum wrapper
- To learn why Agile processes work and how to manage them
- To understand the theoretical underpinnings of Agile processes

UNIT I  FUNDAMENTALS OF AGILE

UNIT II  AGILE SCRUM FRAMEWORK
Introduction to Scrum, Project phases, Agile Estimation, Planning game, Product backlog, Sprint backlog, Iteration planning, User story definition, Characteristics and content of user stories, Acceptance tests and Verifying stories, Project velocity, Burn down chart, Sprint planning and retrospective, Daily scrum, Scrum roles – Product Owner, Scrum Master, Scrum Team, Scrum case study, Tools for Agile project management

UNIT III  AGILE TESTING
The Agile lifecycle and its impact on testing, Test-Driven Development (TDD), xUnit framework and tools for TDD, Testing user stories - acceptance tests and scenarios, Planning and managing testing cycle, Exploratory testing, Risk based testing, Regression tests, Test Automation, Tools to support the Agile tester

UNIT IV  AGILE SOFTWARE DESIGN AND DEVELOPMENT

UNIT V  INDUSTRY TRENDS
Market scenario and adoption of Agile, Agile ALM, Roles in an Agile project, Agile applicability, Agile in Distributed teams, Business benefits, Challenges in Agile, Risks and Mitigation, Agile projects on Cloud, Balancing Agility with Discipline, Agile rapid development technologies

TOTAL: 45 PERIODS
COURSE OUTCOMES:
After the successful completion of the course students will be able to
• Apply the knowledge of design principles and refactoring techniques to achieve Agility
• Function effectively as an individual and as a member or leader in agile framework
• Apply appropriate techniques for Test Driven Development
• Design solution for complex information and communication engineering problems using agile principles
• Formulate testing activities within an Agile project to meet the industry trends

TEXT BOOKS:

REFERENCE BOOKS:
3. Mike Cohn, ” User Stories Applied: For Agile Software”, Addison Wesley , 1stEdition
5. www.it-ebooks.info/tag/agile
OBJECTIVES:
- To introduce the fundamentals of Intrusion Detection in order to avoid common pitfalls.
- To explain intrusion detection alerts and logs to distinguish attack types from false alarms.
- To import Intrusion Detection tools and techniques in order to improve the security posture of an enterprise.

UNIT I  INTRODUCTION

UNIT II  THEORETICAL FOUNDATIONS OF DETECTION
Taxonomy of anomaly detection system – fuzzy logic – Bayes theory – Artificial Neural networks – Support vector machine – Evolutionary computation – Association rules – Clustering

UNIT III  ARCHITECTURE AND IMPLEMENTATION
Centralized – Distributed – Cooperative Intrusion Detection - Tiered architecture

UNIT IV  JUSTIFYING INTRUSION DETECTION AND ORGANIZATIONS STANDARDS

UNIT V  APPLICATIONS AND TOOLS

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After the successful completion of the course students will be able to
- Explain basics of intrusion detection system techniques.
- Compare various types of intrusion detections and techniques.
- Adapt different architectures and implementation.
- Originate security policies and organization standards.
- Discuss various intrusion detection tools.

TEXT BOOKS:
REFERENCE BOOKS:

OBJECTIVES:
- To explain the characteristics and components of windows
- To familiarize various controls for the windows
- To summarize the various problem in windows design with color, text, graphics and testing methods

UNIT I  INTRODUCTION  8

UNIT II  HUMAN COMPUTER INTERACTION  10

UNIT III  WINDOWS  9

UNIT IV  MULTIMEDIA  9

UNIT V  WINDOWS LAYOUT – TEST  9

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After the successful completion of the course students will be able to
- Apply the knowledge of user interfaces and design principles to design any web application
- Design the interfaces using system components, HCI concepts and principles that meet with realistic constraints
- Apply the knowledge of window characteristics to develop any applications
- Conduct investigations on different applications with modern IT tools to assess the user interface design
- Apply the knowledge of different testing techniques to identify the problem in web designs

TEXT BOOKS:
REFERENCE BOOKS:
OBJECTIVES:
- To review the fundamentals of Information Systems
- To demonstrate the knowledge through system structure
- To import the knowledge involved in Decision Making Process

UNIT I  INFORMATION SYSTEM AND ORGANIZATION
9

UNIT II  REPRESENTATION AND ANALYSIS OF SYSTEM STRUCTURE
9

UNIT III  SYSTEMS, INFORMATION AND DECISION THEORY
9

UNIT IV  INFORMATION SYSTEM APPLICATION
9

UNIT V  DEVELOPMENT AND MAINTENANCE OF INFORMATION SYSTEMS
9

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After the successful completion of the course students will be able to
- Understand the concept of information systems for various organization
- Apply the appropriate problem solving techniques for business frameworks
- Understand the decision theory related to information systems
- Recognize the need for information Technology tools
- select and apply appropriate techniques, resources and modern IT tools to complex engineering activities
TEXT BOOKS:

REFERENCE BOOKS:
OBJECTIVES:
- To emphasize the need for Grid computing in solving large scale problems
- To explain grid computing infrastructures and cloud services
- To introduce programming models and security issues in the grid and cloud environment

UNIT I  INTRODUCTION
Evolution of Distributed computing: Scalable computing over the Internet—Technologies for network based systems—clusters of cooperative computers—Grid computing Infrastructures—cloud computing—service oriented architecture—Introduction to Grid Architecture and standards—Elements of Grid—Overview of Grid Architecture

UNIT II  GRID SERVICES
Introduction to Open Grid Services Architecture (OGSA)—Motivation—Functionality Requirements—Practical & Detailed view of OGSA/OGSI—Data intensive grid service models—OGSA services.

UNIT III  VIRTUALIZATION
Cloud deployment models: public, Private, Hybrid, community—Categories of cloud computing: Everything as a service: Infrastructure, platform, software—Pros and Cons of cloud computing—Implementation levels of virtualization—virtualization structure—virtualization of CPU, Memory and I/O devices—virtual clusters and Resource Management—Virtualization for data center automation.

UNIT IV  PROGRAMMING MODEL

UNIT V  SECURITY
Trust models for Grid security environment—Authentication and Authorization methods—Grid security infrastructure—Cloud Infrastructure security: network, host and application level—aspects of data security, provider data and its security, Identity and access management architecture, IAM practices in the cloud, SaaS, PaaS, IaaS availability in the cloud, Key privacy issues in the cloud.

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After the successful completion of the course students will be able to
- Understand the role of grid computing techniques to solve large scale problems
- Apply the virtualization concepts
- Demonstrate various grid and cloud tool kits
- Exhibit knowledge on security models in the grid and cloud environment
- Use grid and cloud tool kits
TEXT BOOKS:

REFERENCE BOOKS:
OBJECTIVES:
- To introduce the fundamental concepts of big data analytics
- To explain big data analysis using intelligent techniques
- To familiarize the various search methods, clustering techniques and frameworks and visualization approaches

UNIT I INTRODUCTION TO BIGDATA

UNIT II DATA ANALYSIS

UNIT III MINING DATA STREAMS

UNIT IV FREQUENT ITEM SETS AND CLUSTERING
Mining Frequent item sets—Market based model—Apriori Algorithm—Handling large data sets in Main memory—Limited Pass algorithm—Counting frequent item sets in a stream—Clustering Techniques—Hierarchical—K-Means—Clustering high dimensional data—CLIQUE and PROCLUS—Frequent pattern based clustering methods—Clustering in non-euclidean space—Clustering for streams and Parallelism.

UNIT V FRAMEWORKS AND VISUALIZATION
Map Reduce—Hadoop, Hive, MapR—Sharding—No SQL Databases—S3—Hadoop Distributed file systems—Visualizations—Visual data analysis techniques, Interaction techniques; Systems and applications

COURSE OUTCOMES:
After the successful completion of the course students will be able to
- Explain big data and use cases from selected business domains
- Explain NoSQL big data management
- Analyze, Install, configure, and run Hadoop and HDFS.
- Perform map-reduce analytics using Hadoop.
- Apply hadoop related tools such as Hbase, cassandra, pig, and hive for big data analytics.
TEXT BOOKS:

REFERENCE BOOKS:
OBJECTIVES:
- To familiarize functional / nonfunctional requirements, business scenario and document the use case diagrams in the given template
- To demonstrate logical architecture for the given business scenario documented in use case diagrams
- To import data architecture for the given logical architecture

UNIT I INTRODUCTION 8
Introduction to enterprise applications and their types, software engineering methodologies, life cycle of raising an enterprise application, introduction to skills required to build an enterprise application, key determinants of successful enterprise applications, and measuring the success of enterprise applications

UNIT II DESIGN PHASE 9
Inception of enterprise applications, enterprise analysis, business modeling, requirements elicitation, use case modeling, prototyping, nonfunctional requirements, requirements validation, planning and estimation

UNIT III ARCHITECTURE DESIGN 10
Concept of architecture, views and viewpoints, enterprise architecture, logical architecture, technical architecture - design, different technical layers, best practices, data architecture and design – relational, XML, and other structured data representations, Infrastructure architecture and design elements - Networking, Internetworking, and Communication Protocols, IT Hardware and Software, Middleware, Policies for Infrastructure Management, Deployment Strategy, Documentation of application architecture and design

UNIT IV IMPLEMENTATION METHODOLOGIES 9
Construction readiness of enterprise applications - defining a construction plan, defining a package structure, setting up a configuration management plan, setting up a development environment, introduction to the concept of Software Construction Maps, construction of technical solutions layers, methodologies of code review, static code analysis, build and testing, dynamic code analysis – code profiling and code coverage

UNIT V VALIDATION 9
Types and methods of testing an enterprise application, testing levels and approaches, testing environments, integration testing, performance testing, penetration testing, usability testing, globalization testing and interface testing, user acceptance testing, rolling out an enterprise application.

TOTAL: 45 PERIODS
COURSE OUTCOMES:
After the successful completion of the course students will be able to
- List the skills required to build the enterprise application.
- Estimate the requirement for business model
- Design architecture and networking model for an application
- Construct and develop different solution layers
- Build a suitable test case for an application

TEXT BOOKS:

REFERENCE BOOKS:
OBJECTIVES:
- To explain mobile adhoc networks, design, implementation issues, routing and clustering mechanism
- To import the 802.11 Wireless Lan (WiFi) and Bluetooth standards
- To demonstrate designing and implementing adhoc network functionality using network simulation tools and Pocket PCs

UNIT I ROUTING
Cellular and Ad hoc wireless networks – Issues of MAC layer and Routing – Proactive, Reactive and Hybrid Routing protocols – Multicast Routing – Tree based and Mesh based protocols – Multicast with Quality of Service Provision

UNIT II QUALITY OF SERVICE

UNIT III ENERGY MANAGEMENT ADHOC NETWORKS

UNIT IV MESH NETWORKS
Necessity for Mesh Networks – MAC enhancements – IEEE 802.11s Architecture– Opportunistic Routing – Self Configuration and Auto Configuration - Capacity Models Fairness – Heterogeneous Mesh Networks – Vehicular Mesh Networks

UNIT V SENSOR NETWORKS

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After the successful completion of the course students will be able to
- Discuss the routing mechanism and solutions for quality of service.
- Compare the schemes for energy management of ad hoc networks
- Explain different types Mesh Networks for various applications
- Choose information and dissemination protocols for real time sensor networks
- Identify recent trends in sensor networks
TEXT BOOKS:

REFERENCE BOOKS:
OBJECTIVES:
- To introduce software testing principles
- To import knowledge on various software testing and test case design strategies
- To summarize test planning, monitoring and controlling approaches using testing tools

UNIT I INTRODUCTION

UNIT II TEST CASE DESIGN

UNIT III LEVELS OF TESTING

UNIT IV TEST MANAGEMENT

UNIT V TEST AUTOMATION

TOTAL: 45 PERIODS
COURSE OUTCOMES:
After the successful completion of the course students will be able to
- Apply the software testing principles and its defects
- Develop test cases to exercise a software
- Design and conduct various types and levels of software testing for a software project
- Apply various testing techniques, including domain, code, fault, usage and model based for real time applications
- Make use of Automated testing tools for software project

TEXT BOOKS:

REFERENCE BOOKS:
OBJECTIVES:

- To introduce the Vision of IoT.
- To familiarize IoT Market perspective.
- To Use Devices in IoT Technology.
- To Understand State of the Art – IoT Architecture.
- To impart the knowledge of Real World IoT Design Constraints and Applications

UNIT I INTRODUCTION
From M2M to IoT - M2M communication - M2M towards IoT - the global context - Game changers - General technology and scientific trends - Trends in information and communications technologies - Implications for IoT - Barriers and concerns - A use case example - Differing characteristics

UNIT II A MARKET PERSPECTIVE
Introduction - M2M Value Chains, IoT Value Chains - An emerging industrial structure for IoT - The international driven global value chain and global information monopolies. - An Architectural Overview : Building an architecture - Main design principles and needed capabilities - An IoT architecture outline - standards considerations.

UNIT III IOT TECHNOLOGY FUNDAMENTALS
Devices and gateways - Local and wide area networking - Data management - Business processes in IoT - Everything as a Service(XaaS) - M2M and IoT Analytics - Knowledge Management

UNIT IV IOT ARCHITECTURE

UNIT V REAL-WORLD DESIGN CONSTRAINTS AND APPLICATIONS
Introduction - Technical Design constraints - hardware is popular again - Data representation and visualization - Interaction and remote control - The Smart Grid : Smart metering - Smart house - Smart energy city - Commercial Building Automation : Introduction - Case study: phase one-commercial building automation today, Case study: phase two- commercial building automation in the future

COURSE OUTCOMES:
After the successful completion of the course students will be able to

- Understand the vision of IoT from a global context
- Determine the Market perspective of IoT
- Use Devices, Gateways and Data Management in IoT
- Build state of the art architecture in IoT.
- Design the solutions for Real world Applications of IoT.

TOTAL: 45 PERIODS
TEXT BOOKS:

REFERENCE BOOKS:
OBJECTIVES:
- To explain the relationship between system software and machine architecture
- To demonstrate the design and implementation of assemblers, linkers and loaders
- To familiarize the macro processors and system software tools

UNIT I INTRODUCTION
System software and machine architecture – The Simplified Instructional Computer (SIC) - Machine architecture - Data and instruction formats - addressing modes - instruction sets - I/O and programming.

UNIT II ASSEMBLERS

UNIT III LOADERS AND LINKERS

UNIT IV MACRO PROCESSORS

UNIT V SYSTEM SOFTWARE TOOLS
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.

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After the successful completion of the course students will be able to
- Understand the Architecture of SIC Machine
- Discuss Assembler, Loader and their design aspects
- Explain Macro Processors Functions and Design Options
- Develop Application using System Software Tools
- Design a computer based system to meet desired needs
TEXT BOOKS:

REFERENCE BOOKS:
OBJECTIVES:

- To demonstrate the computational aspects and soft computing approaches in biotechnology
- To explain the evolution of life
- To familiarize the advancements in biotechnology

UNIT I INTRODUCTION


UNIT II DATABASES

Data management – data life cycle – database technology – interfaces and implementation – biological databases and their uses

UNIT III PATTERN MATCHING & MACHINE LEARNING


UNIT IV PHYLOGENY

Introduction; mutations; irrelevant mutations; controls; mutations as a measure of time; distances; reconstruction; distances between species; estimating time intervals from distances

UNIT V ADVANCED TOPICS IN BIOINFORMATICS


TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of the course students will be able to

- Demonstrate programming skills to provide computational solutions
- Express modern biology and its relationship with informatics
- Discuss various DB technologies with respect to bioinformatics
- Deploy Bioinformatics Algorithms utilizing tools
- Develop Biomolecular and cellular computing applications

TEXT BOOKS:

REFERENCE BOOKS:

OBJECTIVES:

- To explain the ways and means of creating and storing digital content
- To demonstrate the basics of content management and design issues
- To familiarize the key technologies to build content management systems.

UNIT I  CREATING DIGITAL CONTENT  8


UNIT II  COMPRESSING AND INDEXING  9


UNIT III  CONTENT MANAGEMENT  10


UNIT IV  DESIGN OF CMS  8

The Wheel of CMS—Working with Metadata–Cataloging Audiences Designing Publications–Designing content Components–Accounting for Authors-Accounting for Acquisition sources.

UNIT V  BUILDING CMS  10

Content Markup Languages - XML and Content Management - Processing Content.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of the course students will be able to

- Discuss the purpose and value of Digital Asset Management.
- Evaluate the various compression and indexing techniques
- Explain various metadata standards.
- Develop applications based on Content of Management system.
- Choose the appropriate technique for the efficient utilization of digital resources.

TEXT BOOKS:

REFERENCE BOOKS:

OBJECTIVES:
- To explain the internals of the TCP/IP protocols
- To demonstrate how TCP/IP is actually implemented
- To familiarize the interaction among the protocols in a protocol stack

UNIT I INTRODUCTION
Internetworking concepts and architectural model - classful Internet address - CIDR-Subnetting and Supernetting - ARP - RARP - IP - IP Routing - ICMP - IPv6

UNIT II TCP
Services - header - connection establishment and termination - interactive data flow - bulk data flow - timeout and retransmission - persist timer – keep alive timer - futures and performance

UNIT III IP IMPLEMENTATION
IP global software organization - routing table - routing algorithms - fragmentation and reassembly - error processing (ICMP) - Multicast Processing (IGMP)

UNIT IV TCP IMPLEMENTATION I
Data structure and input processing - transmission control blocks - segment format - comparison - finite state machine implementation - output processing - mutual exclusion - computing the TCP data length

UNIT V TCP IMPLEMENTATION II
Timers - events and messages - timer process - deleting and inserting timer event - flow control and adaptive retransmission - congestion avoidance and control - urgent data processing and push function.

COURSE OUTCOMES:
After the successful completion of the course students will be able to
- Outline various communication protocols
- Explain the purpose of various TCP timers.
- Describe the IP routing concepts.
- Compare various implementations of TCP.
- Formulate simple data communication problems

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCE BOOKS:
OBJECTIVES:
- To demonstrate GNU/Linux Architecture and Linux Distributions
- To explain the File Handling and Graphics Tools
- To import the Linux Web Server Using LAMP

UNIT I GNU/LINUX ARCHITECTURE AND DEVELOPMENT TOOLS 9
GNU/Linux Architecture, Architectural Breakdown of Major Kernel Components, Linux distributions, GNU Compiler Tool Chain, Building Software with GNU Make, Makefile Constructs. Static-Shared-Dynamic Libraries, Building packages with Automake / Autoconf

UNIT II DEPLOYMENT TOOLS 9
Components of a LAMP Server, Manage Multiple Websites with Virtual Hosts, Encrypt Sensitive Pages with SSL, Enable Server-side Includes and CGI Scripts

UNIT III FILE HANDLING TOOLS AND GRAPHICS TOOLS 9
File Handling-API-Character access mechanisms, String access mechanisms, Sequential and Random access methods, Graphics File Formats, Diagramming with Dia, Open Office Draw, GIMP

UNIT IV TEXT PROCESSING TOOLS 9
Bash beginnings, Pathnames and Permissions, Useful elements, cron Job, Script Versions Text Processing with awk and sed scripts

UNIT V VERSIONING CONTROL, COPYRIGHT ISSUES AND LICENSES 9
Standards for free software projects, Version Control, Bug Tracker, Wikis, Website Licenses, Patents, Copyright assignment and Ownership, Dual Licensing Schemes.

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After the successful completion of the course students will be able to
- Apply the knowledge of architecture and development tools for FOSS
- Apply reasoning informed by the various deployment tools to assess FOSS
- Select and apply appropriate tools for File handling mechanisms and Graphic file formats
- Design solutions for complex information and communication engineering problems using appropriate text processing tools
- Apply Ethical principles and commit to ethical responsibilities through versioning control, copyright issues and licenses

TEXT BOOKS:

REFERENCE BOOKS:
OBJECTIVES:
- To introduce the concept of semantic web and related applications
- To explain the knowledge representation using ontology
- To review human behavior in social web and visualization of social networks

UNIT I  INTRODUCTION  9

UNIT II  MODELLING, AGGREGATING AND KNOWLEDGE REPRESENTATION  9

UNIT III  EXTRACTION AND MINING COMMUNITIES IN WEB SOCIAL NETWORKS  9

UNIT IV  PREDICTING HUMAN BEHAVIOUR AND PRIVACY ISSUES  9

UNIT V  VISUALIZATION AND APPLICATIONS OF SOCIAL NETWORKS  9

TOTAL: 45 PERIODS
COURSE OUTCOMES:
After the successful completion of the course students will be able to
- Summarize the concept of semantic web and related applications.
- Classify modelling, aggregating and knowledge representation.
- Categorize web communities in social networks.
- Analyze human behavior and privacy issues.
- Determine the applications of social networks and visualization

TEXT BOOKS:

REFERENCE BOOKS:
OBJECTIVES:
- To introduce the fundamentals of hacking
- To summarize different types of attacks and threats
- To review the fraud prevention approaches and forensic tools

UNIT I INTRODUCTION TO HACKING

UNIT II ATTACK TYPES

UNIT III THREAT MANAGEMENT

UNIT IV FRAUD PREVENTION

UNIT V FORENSICS AND TOOLS

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After the successful completion of the course students will be able to
- Compare various hacking and attacks
- Analyze various vulnerability in network protocols
- Analyze various threat management techniques
- Compare various intrusion detection techniques
- Infer the knowledge of forensic tools

TEXT BOOKS:
REFERENCE BOOKS:
OBJECTIVES:
- To introduce the fundamentals of data mining and its functionalities
- To familiarize knowledge in different data mining techniques and algorithms
- To review various application domains of data mining

UNIT I DATA WAREHOUSING

UNIT II DATA MINING

UNIT III ASSOCIATION RULE MINING AND CLASSIFICATION
Mining Frequent Patterns, Associations and Correlations–Mining Methods–Mining Various Kinds of Association Rules–Correlation Analysis–Constraint Based Association Mining–Classification and Prediction–Basic Concepts–Decision Tree Induction–Bayesian Classification–Rule Based Classification–Classification by Back propagation–Support Vector Machines–Associative Classification–Lazy Learners–Other Classification Methods–Prediction

UNIT IV CLUSTERING AND APPLICATIONS

UNIT V ADVANCED MINING
Web mining, Web content mining, Introduction to Spatial mining & its primitives, spatial classification algorithm (ID3extension), Spatial clustering algorithm (SD), Introduction to temporal mining, Time series, Temporal association rule

COURSE OUTCOMES:
After the successful completion of the course students will be able to
- Identify and analyze appropriate data warehousing techniques for an engineering problem
- Apply the basic knowledge of pre processing techniques for real time applications supports data mining concepts
- Apply appropriate techniques to implement association mining and classification algorithms
- Apply the knowledge of clustering method for an application
- Analyze an appropriate mining method for an application to improve the mining process

TOTAL: 45 PERIODS
TEXT BOOKS:

REFERENCE BOOKS:
OBJECTIVES:

- To understand the fundamentals of satellite communications
- To explain the design issues of the satellite subsystem and link
- To familiarize the satellite broadcasting techniques and applications of GPS

UNIT I  INTRODUCTION

Origin of Satellite Communications, Historical Background, Basic Concepts of Satellite Communications, Frequency allocations for Satellite Services, Applications, Future Trends of Satellite Communications

UNIT II  ORBITAL MECHANICS AND LAUNCHERS

Orbital Mechanics, Look Angle determination, Orbital perturbations, Orbit determination, launches and launch vehicles, Orbital effects in communication systems performance.

UNIT III  SATELLITE SUBSYSTEMS AND SATELLITE LINK DESIGN

Attitude and orbit control system, telemetry, tracking, Command and monitoring, power systems, communication subsystems, Satellite antenna Equipment reliability and Space qualification - Basic transmission theory, system noise temperature and G/T ratio, Design of down links, up link design, Design of satellite links for specified C/N, System design example.

UNIT IV  MULTIPLE ACCESS

Frequency division multiple access (FDMA) Intermodulation, Calculation of C/N. Time division Multiple Access (TDMA) Frame structure, Examples. Satellite Switched TDMA Onboard processing, DAMA, Code Division Multiple access (CDMA), Spread spectrum transmission and reception.

UNIT V  SATELLITE NAVIGATION AND GPS

Radio and Satellite Navigation, GPS Position Location principles, GPS Receivers and codes, Satellite signal acquisition, GPS Navigation Message, GPS signal levels, GPS receiver operation, GPS C/A code accuracy, Differential GPS.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of the course students will be able to

- Understand the basics of satellite communication & orbital mechanism.
- Discuss broadcast subsystems and system link models
- Identify Satellite Multiple Access Protocol for an application.
- Construct satellite navigation receiver
- Select a metric to measure the performance of satellite communication systems

TEXT BOOKS:

REFERENCE BOOKS:

OBJECTIVES:

- To introduce storage architectures and key data center elements in classic, virtualized, and cloud environments
- To explain storage networking technologies such as FC SAN, IP SAN, FCoE, NAS, and object-based and unified storage
- To impart the knowledge of Backup and Archive in virtualized and non-virtualized environment

UNIT I STORAGE SYSTEMS

Introduction to information storage - evolution of storage architecture, key data center elements, virtualization, and cloud computing - Data center environment - Details key data center elements – host (or compute), connectivity, storage, and application in both classic and virtual environments- RAID - RAID implementations, techniques, and levels along with the impact of RAID on application performance - Intelligent storage system - Details components of intelligent storage systems. It also covers virtual storage provisioning and intelligent storage system implementations.

UNIT II STORAGE NETWORKING TECHNOLOGIES

Fibre Channel Storage Area Network (FC SAN) - FC SAN components, connectivity options, and topologies including access protection mechanism „zoning“. IP SAN and Fibre Channel over Ethernet (FCoE) - iSCSI and FCIP protocols for storage access over an IP network. Converged protocol FCoE and its components. Network Attached Storage (NAS) - File sharing technology using NAS and covers its benefits, components, and implementations. File level storage virtualization. Object based and Unified Storage - Emerging areas of object-based storage and unified storage solutions. Content addressed storage (CAS) as an implementation of an object-based solution.

UNIT III BACKUP, ARCHIVE, AND REPLICATION

Introduction to Business Continuity - information availability and business continuity solutions in both virtualized and non-virtualized environments. Backup and Archive - Backup and recovery in both virtualized and non-virtualized environments - Deduplication technology to optimize data backups along with archival solutions to address fixed content storage requirements. Local Replication - Local replications of data along with data restore and restart considerations. Remote Replication - Remote replication technologies in virtualized and non-virtualized environments. Three-site replication and continuous data replication.

UNIT IV CLOUD COMPUTING

Cloud Computing - Cloud computing, its benefits, characteristics, deployment models and services. Cloud challenges and migration considerations.
UNIT V SECURING AND MANAGING STORAGE INFRASTRUCTURE

Securing the Information Infrastructure - Framework and domains of storage security along with covering security implementation at storage networking. Security in virtualized and cloud environments. Managing the Information Infrastructure - storage infrastructure monitoring and management - storage tiering, information lifecycle management (ILM), and cloud service management activities

TOTAL: 45 Periods

COURSE OUTCOMES:

After successful completion of the course, the students will be able to

- Discuss the various storage system principles
- Describe storage networking technology requirements and solutions
- Explain about the data replication techniques
- Demonstrate cloud deployment models and services
- Identify parameters for managing and monitoring storage infrastructure

TEXT BOOKS:


REFERENCE BOOKS:

1. G. Somas Sundaram, Alok Shrivastava, " Information Storage and Management”, Wiley, India,
2. Ulf Troppens, Wolfgang Mueller-Friedt, Rainer Erkens, " Storage Network explained : Basic and application of fiber channels, SAN, NAS, iSESI, INFINIBAND and FCOE ", Wiley, India,
OBJECTIVES:
- To introduce the basic concepts of information theory and source coding
- To familiarize the students with the concept of Text, Audio, Video, Image and speech compression Techniques and error control codes

UNIT I INFORMATION THEORY 9

UNIT II SOURCE CODING: TEXT, AUDIO AND SPEECH 9
Text: Adaptive Huffman Coding, Arithmetic Coding, Dictionary techniques LZW algorithm – Audio: Perceptual coding, Masking techniques, Psychoacoustic model, MPEG Audio layers I,II,III, Dolby AC3 - Speech: Channel Vocoder, Linear Predictive Coding

UNIT III SOURCE CODING: IMAGE AND VIDEO 9

UNIT IV ERROR CONTROL CODING: BLOCK CODES 9
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 9
Convolutional codes – code tree, trellis, state diagram - Encoding – Decoding: Sequential search and Viterbi algorithm – Principle of Turbo coding

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After successful completion of this course, the Students will be able to
- Explain about the basic concepts of information theory
- Apply source coding techniques to Text, Audio, speech, image and Video
- Compare Source coding and Channel coding
- Summarize the efficient data compression scheme for a given information source
- Analyze the different types of error control codes to the given information source for error correction and error detection
TEXT BOOKS:

REFERENCE BOOKS: