# M.TECH - INFORMATION TECHNOLOGY

## CURRICULUM AND SYLLABUS I TO IV SEMESTERS

### SEMESTER I

<table>
<thead>
<tr>
<th>SL. NO.</th>
<th>COURSE CODE</th>
<th>COURSE TITLE</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>THEORY</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>IF8101</td>
<td>Advanced Databases</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>2.</td>
<td>IF8102</td>
<td>Network Engineering</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>3.</td>
<td>IF8151</td>
<td>Advanced Computer Architecture</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>4.</td>
<td>IF8152</td>
<td>Advanced Data Structures and Algorithm Analysis</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>5.</td>
<td>MA8160</td>
<td>Probability and Statistical Methods</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>6.</td>
<td>MM8163</td>
<td>Software Engineering Methodologies</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td><strong>PRACTICAL</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>IF8111</td>
<td>Data Structures Laboratory</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>8.</td>
<td>IF8112</td>
<td>Networking and DBMS Laboratory</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td></td>
<td>18</td>
<td>1</td>
<td>6</td>
<td>23</td>
</tr>
</tbody>
</table>

### SEMESTER II

<table>
<thead>
<tr>
<th>SL. NO.</th>
<th>COURSE CODE</th>
<th>COURSE TITLE</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>THEORY</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>IF8201</td>
<td>Data Analytics</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>2.</td>
<td>IF8202</td>
<td>Web Integrated Technologies</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>3.</td>
<td>IF8251</td>
<td>Advanced Operating System</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>4.</td>
<td>IF8252</td>
<td>Cloud Computing Technologies</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>5.</td>
<td>IF8254</td>
<td>Mobile and Pervasive Computing</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>6.</td>
<td></td>
<td>Elective I</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td><strong>PRACTICAL</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>IF8211</td>
<td>OS and Mobile Laboratory</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>8.</td>
<td>IF8212</td>
<td>Web Integrated Technologies Laboratory</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td></td>
<td>18</td>
<td>0</td>
<td>6</td>
<td>22</td>
</tr>
</tbody>
</table>
### SEMESTER III

<table>
<thead>
<tr>
<th>SL. NO.</th>
<th>COURSE CODE</th>
<th>COURSE TITLE</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td><strong>THEORY</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>IF8301</td>
<td>Cryptography and Information Security</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>Elective II</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>Elective III</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>PRACTICAL</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>IF8311</td>
<td>Project Work Phase I</td>
<td>0</td>
<td>0</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>5</td>
<td>IF8312</td>
<td>Technical Seminar and Report writing</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>TOTAL</strong></td>
<td>9</td>
<td>0</td>
<td>14</td>
<td>16</td>
</tr>
</tbody>
</table>

### SEMESTER IV

<table>
<thead>
<tr>
<th>SL. NO.</th>
<th>COURSE CODE</th>
<th>COURSE TITLE</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td><strong>PRACTICAL</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>IF8411</td>
<td>Project Work Phase II</td>
<td>0</td>
<td>0</td>
<td>24</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>TOTAL</strong></td>
<td>0</td>
<td>0</td>
<td>24</td>
<td>12</td>
</tr>
</tbody>
</table>

**TOTAL NO OF CREDITS: 73**
# UNIVERSITY DEPARTMENTS
UNIVERSITY DEPARTMENTS
ANNA UNIVERSITY, CHENNAI 600 025
REGULATIONS - 2013
M.TECH - INFORMATION TECHNOLOGY (PART TIME)
CURRICULUM AND SYLLABUS I TO VI SEMESTERS

## SEMESTER I

<table>
<thead>
<tr>
<th>SL. NO.</th>
<th>COURSE CODE</th>
<th>COURSE TITLE</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td><strong>THEORY</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>IF8151</td>
<td>Advanced Computer Architecture</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>2.</td>
<td>IF8152</td>
<td>Advanced Data Structures and Algorithm Analysis</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>3.</td>
<td>MA8160</td>
<td>Probability and Statistical Methods</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>PRACTICAL</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>IF8111</td>
<td>Data Structures Laboratory</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>TOTAL</strong></td>
<td>9</td>
<td>1</td>
<td>3</td>
<td>12</td>
</tr>
</tbody>
</table>

## SEMESTER II

<table>
<thead>
<tr>
<th>SL. NO.</th>
<th>COURSE CODE</th>
<th>COURSE TITLE</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td><strong>THEORY</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>IF8202</td>
<td>Web Integrated Technologies</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>2.</td>
<td>IF8251</td>
<td>Advanced Operating System</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>3.</td>
<td>IF8254</td>
<td>Mobile and Pervasive Computing</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>PRACTICAL</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>IF8211</td>
<td>OS and Mobile Laboratory</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>5.</td>
<td>IF8212</td>
<td>Web Integrated Technologies Laboratory</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>TOTAL</strong></td>
<td>9</td>
<td>0</td>
<td>6</td>
<td>13</td>
</tr>
</tbody>
</table>

## SEMESTER III

<table>
<thead>
<tr>
<th>SL. NO.</th>
<th>COURSE CODE</th>
<th>COURSE TITLE</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td><strong>THEORY</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>IF8101</td>
<td>Advanced Databases</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>2.</td>
<td>IF8102</td>
<td>Network Engineering</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>3.</td>
<td>MM8163</td>
<td>Software Engineering Methodologies</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>PRACTICAL</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>IF8112</td>
<td>Networking and DBMS Laboratory</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>TOTAL</strong></td>
<td>9</td>
<td>0</td>
<td>3</td>
<td>11</td>
</tr>
</tbody>
</table>
## SEMESTER IV

<table>
<thead>
<tr>
<th>SL. NO.</th>
<th>COURSE CODE</th>
<th>COURSE TITLE</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td><strong>THEORY</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>IF8201</td>
<td>Data Analytics</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>2.</td>
<td>IF8252</td>
<td>Cloud Computing Technologies</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td>Elective I</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>TOTAL</strong></td>
<td>9</td>
<td>0</td>
<td>0</td>
<td>9</td>
</tr>
</tbody>
</table>

## SEMESTER V

<table>
<thead>
<tr>
<th>SL. NO.</th>
<th>COURSE CODE</th>
<th>COURSE TITLE</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td><strong>THEORY</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>IF8301</td>
<td>Cryptography and Information Security</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td>Elective II</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>PRACTICAL</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>IF8311</td>
<td>Project Work Phase I</td>
<td>0</td>
<td>0</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>4.</td>
<td>IF8312</td>
<td>Technical Seminar and Report writing</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>TOTAL</strong></td>
<td>6</td>
<td>0</td>
<td>14</td>
<td>13</td>
</tr>
</tbody>
</table>

## SEMESTER VI

<table>
<thead>
<tr>
<th>SL. NO.</th>
<th>COURSE CODE</th>
<th>COURSE TITLE</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td>Elective III</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>PRACTICAL</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>IF8411</td>
<td>Project Work Phase II</td>
<td>0</td>
<td>0</td>
<td>24</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>TOTAL</strong></td>
<td>3</td>
<td>0</td>
<td>24</td>
<td>15</td>
</tr>
</tbody>
</table>

**TOTAL NO OF CREDITS: 73**
<table>
<thead>
<tr>
<th>SL. NO.</th>
<th>COURSE CODE</th>
<th>COURSE TITLE</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>IF8001</td>
<td>3G and 4G Wireless Networks</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>2.</td>
<td>IF8002</td>
<td>Building Internet of Things</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>3.</td>
<td>IF8003</td>
<td>Computer Graphics and Multimedia</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>4.</td>
<td>IF8004</td>
<td>Cyber Forensics</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>5.</td>
<td>IF8005</td>
<td>Design of Software Agents</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>6.</td>
<td>IF8006</td>
<td>E-Learning</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>7.</td>
<td>IF8007</td>
<td>Green Computing</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>8.</td>
<td>IF8008</td>
<td>Grid Computing</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>9.</td>
<td>IF8009</td>
<td>Knowledge Engineering</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>10.</td>
<td>IF8010</td>
<td>Semantic Web</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>11.</td>
<td>IF8011</td>
<td>Text Mining</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>12.</td>
<td>IF8012</td>
<td>X-Informatics</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>13.</td>
<td>IF8013</td>
<td>Machine Learning</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>14.</td>
<td>CP8075</td>
<td>Social Network Analysis</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>15.</td>
<td>IF8071</td>
<td>Artificial Intelligence</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>16.</td>
<td>IF8072</td>
<td>Compiler Design</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>17.</td>
<td>IF8073</td>
<td>Computer Vision</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>18.</td>
<td>IF8074</td>
<td>Data Warehousing and Data Mining</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>19.</td>
<td>IF8075</td>
<td>Digital Signal Processing</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>20.</td>
<td>IF8076</td>
<td>Embedded Computing System Design</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>21.</td>
<td>IF8077</td>
<td>Human Computer Interaction</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>22.</td>
<td>IF8078</td>
<td>Image Processing</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>23.</td>
<td>IF8079</td>
<td>Information Retrieval</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>24.</td>
<td>IF8080</td>
<td>Service Oriented Architecture</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>25.</td>
<td>IF8081</td>
<td>Soft Computing</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>26.</td>
<td>IF8082</td>
<td>Software Quality and Testing</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>27.</td>
<td>IF8083</td>
<td>Unix Internals</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>28.</td>
<td>IF8084</td>
<td>Adhoc and Sensor Networks</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>29.</td>
<td>IF8253</td>
<td>GPU Architecture and Programming</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>30.</td>
<td>IF8351</td>
<td>Virtualization</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>31.</td>
<td>MG8071</td>
<td>Operations Research</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>32.</td>
<td>MM8071</td>
<td>Digital Video Processing</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>33.</td>
<td>MM8252</td>
<td>Video Analytics</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>
OBJECTIVES:
- To learn the modeling and design of databases.
- To acquire knowledge on parallel and distributed databases and its applications.
- To study the usage and applications of Object Oriented and Intelligent databases.
- To understand the usage of advanced data models.
- To learn emerging databases such as XML, Cloud and Big Data.
- To acquire inquisitive attitude towards research topics in databases.

UNIT I  PARALLEL AND DISTRIBUTED DATABASES  9

UNIT II  OBJECT AND OBJECT RELATIONAL DATABASES  9

UNIT III  INTELLIGENT DATABASES  9

UNIT IV  ADVANCED DATA MODELS  9

UNIT V  EMERGING TECHNOLOGIES  9

TOTAL: 45 PERIODS

OUTCOMES:
Upon Completion of the course, the students will be able,
- To develop in-depth understanding of relational databases and skills to optimize database performance in practice.
- To understand and critique on each type of databases.
- To design faster algorithms in solving practical database problems.
- To implement intelligent databases and various data models.
REFERENCES:

IF8102 NETWORK ENGINEERING

OBJECTIVES:
- To provide an introduction to the principles and practices of Network Engineering.
- To understand the architecture of the network devices.
- To learn QoS related methodologies.
- To explore the emerging technologies in network engineering.

UNIT I FOUNDATIONS OF NETWORKING

UNIT II QUALITY OF SERVICE

UNIT III HIGH PERFORMANCE NETWORKS

UNIT IV NETWORK DEVICE ARCHITECTURE
UNIT V SOFTWARE DEFINED NETWORKING


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

- Gain an understanding of the principles of network engineering.
- Knowledge of advanced network engineering concepts and techniques.
- Capability development includes gaining an understanding of network engineering principles for network, system and service management.

REFERENCES:

IF8151 ADVANCED COMPUTER ARCHITECTURE

OBJECTIVES:
- To understand the evolution of computer architecture.
- To understand the state-of-the-art in computer architecture.
- To understand the design challenges in building a system.

UNIT I PIPELINING AND ILP

UNIT II THREAD-LEVEL PARALLELISM
Multi-threading – Multiprocessors - Centralized and Distributed Shared Memory Architectures – Cache Coherence Issues - Performance Issues – Synchronization Issues – Models of Memory Consistency - Interconnection Networks – Buses, Crossbar and Multi-Stage Switches – Multi-Core Processor Architectures - Case Study.

UNIT III SIMD AND GPU ARCHITECTURES
UNIT IV     MEMORY HIERARCHY DESIGN
Introduction - Optimizations of Cache Performance - Memory Technology and Optimizations – Name Mapping Implementations - Virtual Memory and Virtual Machines - Design of Memory Hierarchies - Case Studies.

UNIT V     WAREHOUSE-SCALE COMPUTERS
Programming Models and Workloads – Storage Architectures – Physical Infrastructure – Cloud Infrastructure – Case Study

TOTAL: 45 PERIODS

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

- Compare and evaluate the performance of various architectures.
- Design sub-systems to meet specific performance requirements.
- Analyze the requirements of large systems to select and build the right infrastructure.

REFERENCES:

IF8152     ADVANCED DATA STRUCTURES AND ALGORITHM ANALYSIS

OBJECTIVES:

- To understand the usage of algorithms in computing.
- To learn and use hierarchical data structures and its operations.
- To learn the usage of graphs and strings and its applications.
- To select and design data structures and algorithms that is appropriate for problems.
- To study about NP Completeness of problems.

UNIT I     ROLE OF ALGORITHMS IN COMPUTING

UNIT II    HIERARCHICAL DATA STRUCTURES

UNIT III   GRAPHS & STRINGS
UNIT IV   ALGORITHM DESIGN TECHNIQUES  9
Dynamic Programming: Matrix-Chain Multiplication – Elements of Dynamic Programming –
Longest Common Subsequence- Greedy Algorithms: An Activity-Selection Problem – Elements of
the Greedy Strategy – Huffman Codes

UNIT V   NP COMPLETE AND NP HARD  9
NP-Completeness: Polynomial Time – Polynomial-Time Verification – NP-Completeness and
Reducability – NP-Completeness Proofs – NP-Complete Problems

TOTAL: 45 PERIODS

OUTCOMES:
• Design data structures and algorithms to solve computing problems.
• Become familiar with the specification, usage, implementation and analysis of hierarchical data
  structures and algorithms.
• Design algorithms using graph structure and various string matching algorithms to solve real-
  life problems.
• Apply suitable design strategy for problem solving.

REFERENCES:
1. Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein, "Introduction to
   Education, Reprint 2006.

MA8160   PROBABILITY AND STATISTICAL METHODS  L T P C
                          3 1 0 4

OBJECTIVE:
• To introduce the basic concepts of one dimensional and two dimensional Random Variables.
• To provide information about Estimation theory, Correlation, Regression and Testing of
  hypothesis.
• To enable the students to use the concepts of multivariate normal distribution and principal
  components analysis.

UNIT I   ONE DIMENSIONAL RANDOM VARIABLES  9+3
Random Variables - Probability Function – Moments – Moment Generating Functions and
Their Properties – Binomial, Poisson, Geometric, Uniform, Exponential, Gamma and Normal
Distributions – Functions of a Random Variable.

UNIT II   TWO DIMENSIONAL RANDOM VARIABLES  9+3
Joint Distributions – Marginal and Conditional Distributions – Functions of Two Dimensional
Random Variables – Regression Curve – Correlation.

UNIT III   ESTIMATION THEORY  9+3
Unbiased Estimators – Method of Moments – Maximum Likelihood Estimation - Curve fitting by
UNIT IV TESTING OF HYPOTHESES 9+3
Sampling Distributions - Type I and Type II Errors - Tests based on Normal, t, 2 and F Distributions For Testing Of Mean, Variance And Proportions – Tests for Independence of Attributes and Goodness of Fit.

UNIT V MULTIVARIATE ANALYSIS 9+3

TOTAL: 45+15:60 PERIODS

OUTCOME:
- The course provides the basic concepts of Probability and Statistical techniques for solving mathematical problems which is useful in solving engineering problems.

REFERENCES:

MM8163 SOFTWARE ENGINEERING METHODOLOGIES L T P C 3 0 0 3

OBJECTIVES:
- To provide information about wider engineering issues that form the background in developing complex, evolving (software-intensive) systems.
- To plan a software engineering process that account for quality issues and non-functional requirements;
- To employ a selection of concepts and techniques to complete a small-scale analysis and design in mini projects.
- To impart knowledge and to translate requirement specifications into a design, and then realize that design practically, all using an appropriate software engineering methodology.
- To provide basic knowledge about software project management.

UNIT I SOFTWARE PRODUCT AND PROCESS 9

UNIT II SOFTWARE REQUIREMENTS 9
UNIT III  DESIGN CONCEPTS AND PRINCIPLES  9

UNIT IV  TESTING  9

UNIT V  SOFTWARE PROJECT MANAGEMENT  9

OUTCOMES:
Upon Completion of the course, the students should be able to,
- Implement mini projects incorporating the basic principles of software engineering.
- Familiar with the basic concepts of software design, implementation.
- Familiar with software testing of simple mini projects.
- Familiar with the Rational Rose and its equivalent open source tools for understanding basic software engineering concepts.
- Design and implement some basic cost estimation models.
- Critically analyze and apply software project management principles in simple projects.

REFERENCES:

IF8111  DATA STRUCTURES LABORATORY  L T P C
0 0 3 2

OBJECTIVES:
- To acquire the knowledge of using advanced tree structures.
- To learn the usage of heap structures.
- To understand the usage of graph structures and spanning trees.
- To learn the working of various string matching algorithms
EXPERIMENTS:
1. Implementation of a Binary Search Tree
2. Red-Black Tree Implementation
3. Heap Implementation
4. Binomial Heaps
5. Graph Traversals
6. Spanning Tree Implementation
7. Shortest Path Algorithms
8. String Matching Algorithms
9. Approximation Algorithms

TOTAL: 45 PERIODS

OUTCOMES:
Upon Completion of the course, the students will be able to:
- Design and implement basic and advanced data structures extensively.
- Design algorithms using graph structure and various string matching algorithms to solve real-life problems.
- Design and develop efficient algorithms with minimum complexity.

IF8112 NETWORKING AND DBMS LABORATORY

OBJECTIVES:
- To learn network programming and establish connection between network.
- To acquire knowledge about various networking tools.
- To study the design of databases for applications.
- To practice DBMS query language such as SQL and embedded programming.

EXERCISES:
1. Client-server programming
2. Socket programming (TCP/UDP)
3. Network analyzer
4. Traffic Analysis
5. Protocol Analysis
6. Study of Software Defined Networking tools
7. Data Definition, Manipulation of Tables and Views
8. Database Querying – Simple queries, Nested queries, Sub queries and Joins
9. Triggers
10. Transaction Control
11. Embedded SQL
12. Database Connectivity with Front End Tools
13. Front End Tools / Programming Languages
14. High level language extensions - PL/SQL Basics
15. Procedures and Functions
16. Database Design and Implementation (Case Study)

TOTAL: 45 PERIODS

OUTCOMES:
Upon Completion of the course, the students should be able to:
- To gain knowledge about network connectivity and network components.
- To design databases for various applications.
OBJECTIVES:

- To know the fundamental concepts of big data and analytics.
- To learn various techniques for mining data streams.
- To learn Event Modeling for different applications.

UNIT I  INTRODUCTION TO BIG DATA  8

UNIT II  DATA ANALYSIS  12

UNIT III  MINING DATA STREAMS  8

UNIT IV  FREQUENT ITEMSETS AND CLUSTERING  9
Mining Frequent Itemsets - Market Based Model – Apriori Algorithm – Handling Large Data Sets in Main Memory – Limited Pass Algorithm – Counting Frequent Itemsets 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  8

TOTAL: 45 PERIODS

OUTCOMES:

Upon Completion of the course, the students should be able to,
- Work with big data platform and its analysis techniques.
- Design efficient algorithms for mining the data from large volumes.
- Model a framework for Human Activity Recognition.

REFERENCES:
OBJECTIVES

- To understand the issues in the design of web application development.
- To learn the concepts of client side and server side technologies.
- To learn the concept of three tier application using MVC.
- To understand and learn the importance of Java based security solutions.
- To learn the concepts of software components using EJB.
- To learn the concept of other framework.

UNIT I  WEB DESIGN PRINCIPLES

UNIT II WEB APPLICATION DEVELOPMENT

UNIT III ENTERPRISE APPLICATION DEVELOPMENT

UNIT IV COMPONENTS AND FRAMEWORKS

UNIT V SOA BASICS

TOTAL: 45 PERIODS

OUTCOMES:
Upon Completion of the course, the students should be able to:

- Design and development of web applications using various models.
- Web application development using HTML and scripting technologies.
- Web application development using advanced features.
- Security features supported in java.
- Developing web services using J2EE and related technologies.
- Design and development of applications using other frameworks.
REFERENCES:

IF8251 ADVANCED OPERATING SYSTEM

OBJECTIVES:
- To learn the fundamentals of Operating system.
- To gain knowledge on Distributed operating system concepts that includes architecture, Mutual exclusion algorithms, Deadlock detection algorithms and agreement protocols.
- To gain insight on to the distributed resource management components viz. the algorithms for implementation of distributed shared memory, recovery and commit protocols.
- To know the components and management aspects of Real time, Mobile operating systems.

UNIT I OPERATING SYSTEM BASICS

UNIT II DISTRIBUTED OPERATING SYSTEM

UNIT III DISTRIBUTED RESOURCE MANAGEMENT

UNIT IV REAL TIME & MOBILE OPERATING SYSTEMS

UNIT V CASE STUDIES

TOTAL: 45 PERIODS
OUTCOMES:
Upon Completion of the course, the students should be able to:
- A complete overview of process management & memory management of Operating system.
- Ability to demonstrate the Mutual exclusion, Deadlock detection and agreement protocols of Distributed operating system.

REFERENCES:

IF8252 CLOUD COMPUTING TECHNOLOGIES

OBJECTIVES:
- To understand the concept of cloud and utility computing.
- To understand the various issues in cloud computing.
- To familiarize themselves with the state of the art in cloud
- To appreciate the emergence of cloud as the next generation computing paradigm.
- To be able to set up a private cloud.

UNIT I INTRODUCTION 8

UNIT II VIRTUALIZATION 9

UNIT III CLOUD INFRASTRUCTURE 9

UNIT IV PROGRAMMING MODEL 10
UNIT V  SECURITY IN THE CLOUD  9

TOTAL: 45 PERIODS

OUTCOMES:
Upon completion of this course, the students should be able to:

- Articulate the main concepts, key technologies, strengths and limitations of cloud computing
- Identify the architecture, infrastructure and delivery models of cloud computing
- Explain the core issues of cloud computing such as security, privacy and interoperability
- Choose the appropriate technologies, algorithms and approaches for the related issues

REFERENCES:

IF8254  MOBILE AND PERVERSIVE COMPUTING  L T P C
3 0 0 3

OBJECTIVES:
- To understand the basics of Mobile computing and Personal computing.
- To learn the role of wireless networks in Mobile Computing and Pervasive Computing.
- To study about the underlying wireless networks.
- To understand the architectures of mobile and pervasive applications.
- To become familiar with the pervasive devices and mobile computing platforms.

UNIT I  INTRODUCTION  9

UNIT II  3G AND 4G CELLULAR NETWORKS  9
UNIT III  SENSOR AND MESH NETWORKS  9

UNIT IV  CONTEXT AWARE COMPUTING  9

UNIT V  APPLICATION DEVELOPMENT  9

OUTCOMES:
At the end of the course the student should be able to,
- To deploy 3G networks.
- To develop suitable algorithms for 4G networks.
- To use sensor and mesh networks to develop mobile computing environment.
- To develop mobile computing applications based on the paradigm of context aware computing.

REFERENCES:

IF8211  OS AND MOBILE LABORATORY  L T P C
0 0 3 2

OBJECTIVES:
- To know about various platforms and tools available for developing mobile applications.
- To realize the differences between developing conventional applications and mobile applications.
- To learn programming skills in J2ME and Android SDK.
- To study about micro browser based applications to access the Internet using Sun Java Toolkit.

19
EXPERIMENTS:
1. Implementation of Process scheduling algorithms.
2. Simulation of Deadlock detection, prevention and recovery process.
4. Implementation of Distributed OS Agreement protocols.
5. Implementation of Distributed OS Resource Scheduling algorithms
6. Two-Phase Commit Protocol in Distributed OS.
7. IOS app development.
8. Survey of Mobile Application Development Tools
9. Form design for mobile applications
10. Applications using controls
11. Graphical and Multimedia applications
12. Data retrieval applications
13. Networking applications
14. Gaming applications
(Perform the experiments from 2 to 7 in J2ME and Android SDK framework)
15. Micro browser based applications using WAP, WML and WML scripts
(Perform experiments in 8 using Sun Java Wireless toolkit)

TOTAL: 45 PERIODS

OUTCOMES:
At the end of the course the student should be able to,

- Develop useful mobile applications for the current scenario in mobile computing and pervasive computing

IF8212 WEB INTEGRATED TECHNOLOGIES LABORATORY L T P C 0 0 3 2

OBJECTIVES:

- To learn how to create a simple web page using HTML along with the usage of style sheets, lists, creation or tables with borders, padding and colors.
- To get acquainted with JavaScript and how to embed JavaScript in HTML code.
- To construct dynamic server-side web pages and integrate the web application with many of the other Java2 Enterprise Edition application server methodologies.
- To develop Java Enterprise Applications using EJB3 and other Java EE technology and J2ME.

EXPERIMENT
1. Web programming with HTML tags, CSS for styling, Page layout
2. Develop webpage using JavaScript for client side programming and HTML forms
3. Using The DOM and the JavaScript object models
4. Website optimization: crunching HTML, using CSS to replace HTML and light-weight graphics to speed up websites
5. Creating XML file with XML DTD and XML schema, SAX, XSL
6. Web site creation with PHP for server side programming for storing current date-time using cookies and for storing page views using sessions
7. Web application development using Servlet/ PHP/ JSP/ ASP.NET
8. Working with PHP and MySQL.
9. Constructing dynamic server-side web pages using JSF and integrate the Web application with many of the other Java2 Enterprise Edition application server methodologies such as Enterprise Java Beans, JavaMail, and SOAP.
10. Developing Java Enterprise Applications Using EJB3 Session beans, entity beans and message-driven beans.
11. Working with JNDI, JDBC and JMS.
12. Application development using J2ME.

OUTCOMES:
Upon Completion of the course, the students should be able to,
- Web application development using HTML and scripting technologies.
- Hands on experience on Web application development using advanced features.
- Design and development of dynamic server-side web pages.
- Develop web services using J2EE and related technologies.
- Design and development of applications using other frameworks.

TOTAL : 45 PERIODS

IF8301 CRYPTOGRAPHY AND INFORMATION SECURITY

OBJECTIVES:
- To understand the mathematics behind Cryptography.
- To understand the standard algorithms used to provide confidentiality, integrity and authenticity.
- To get the knowledge of various security practices applied in the field of information technology.

UNIT I FUNDAMENTALS AND MATHEMATICS OF CRYPTOGRAPHY

UNIT II ENCRYPTION TECHNIQUES

UNIT III HASH FUNCTIONS AND SIGNATURES

UNIT IV SECURITY PRACTICES
UNIT V SECURE DEVELOPMENT

OUTCOMES:
Upon Completion of the course, the students should be able to,
• Apply the basic security algorithms required by any computing system.
• Predict the vulnerabilities across any computing system and hence be able to design a security solution for any computing system.

REFERENCES:

IF8001 3G AND 4G WIRELESS NETWORKS

OBJECTIVES:
• To learn various generations of wireless and cellular networks.
• To study about fundamentals of 3G Services, its protocols and applications.
• To study about evolution of 4G Networks, its architecture and applications.
• To study about WiMAX networks, protocol stack and standards.
• To understand about the emerging trends of smart phones and evolution of latest standards like DLNA and NFC.

UNIT I INTRODUCTION

UNIT II 3G NETWORKS

UNIT III 4G LTE NETWORKS

UNIT IV WIMAX NETWORKS
OUTCOMES:
Upon completion of the course, the students will be able to
- Conversant with the latest 3G/4G and WiMAX networks and its architecture.
- Design and implement wireless network environment for any application using latest wireless protocols and standards.
- Implement different type of applications for smart phones and mobile devices with latest network strategies.

REFERENCES:
OUTCOMES:
- Design a portable IoT using Arduino/ equivalent boards.
- Construct the basic IoT circuit.
- Establish the communication to the cloud through WIFI/ Bluetooth.
- Outline the applications of IoT in real time scenarios.

REFERENCES:
1. Charalampos Doukas, "Building Internet of Things with the Arduino", Create space, April 2002

IF8003 COMPUTER GRAPHICS AND MULTIMEDIA L T P C
3 0 0 3

OBJECTIVES:
- To understand the basic concepts of graphics designs.
- To familiarize the student with the transformation and projection techniques.
- To expose the student to various color models.
- To appreciate the use of multimedia authoring tools and multimedia compression techniques.

UNIT I INTRODUCTION TO GRAPHICS 9
Introduction - Design and Drawing - Pictures Storage and Display - Basic Graphics Pipeline, Bitmap and Vector- Based Graphics - Attributes of output primitives – Line, Circle and Ellipse drawing algorithms and Other Conics.

UNIT II TRANSFORMATION AND PROJECTION 9

UNIT III CURVE AND SURFACE DESIGN AND COLOUR MODELS 9

UNIT IV MULTIMEDIA AUTHORING AND DATA REPRSENTATIONS 9

UNIT V MULTIMEDIA DATA COMPRESSION 9
Lossless and Lossy Compression Algorithms – Image Compression Standards – Basic Audio and Video Compression Techniques – MPEG Audio and Video Coding – Computer and Multimedia Networks – Content Based Retrieval.

TOTAL: 45 PERIODS
OUTCOMES:
Upon Completion of the course, the students should be able to
- Implement basic graphics transformation and projection techniques.
- Design an application that incorporates different concepts of various color models.
- Apply and explore new techniques in the areas of compression techniques.

REFERENCES:
OUTCOMES:
Upon Completion of the course, the students should be able to
- To apply the concepts of computer forensics.
- To handle threats associated with security and information warfare.
- To design tools and tactics associated with cyber forensics.

REFERENCES:

IF8005 DESIGN OF SOFTWARE AGENTS L T P C 3 0 0 3
OBJECTIVES:
- To learn the principles and fundamentals of designing agents.
- To analyze architecture design of different agents.
- To understand user interaction with agents.

UNIT I INTRODUCTION

UNIT II ARCHITECTURAL DESIGN

UNIT III DETAILED DESIGN

UNIT IV AGENTS AND USER EXPERIENCE
UNIT V AGENTS FOR INTELLIGENT ASSISTANCE


TOTAL:45 PERIODS

OUTCOMES:
Upon Completion of the course, the students will be able to,
- Implement a architecture design for an agent.
- Implement communicative actions with agents.
- Use a tool to implement typical agents for different types of applications.

REFERENCES:

IF8006 E-LEARNING

OBJECTIVES:
- To gain knowledge about modern technology for learning.
- To acquaint with the E-Learning Tools.
- To learn technologies involved in E-learning application development.
- To become aware of the current business potential of E-learning based business.

UNIT I INTRODUCTION

UNIT II KNOWLEDGE MANAGEMENT
Computer Based Training – Pitfalls - classroom course to the web-case study knowledge Management – types – benefits - knowledge management pyramid - community and collaboration in knowledge management - knowledge management for professionals – services - building knowledge management solution

UNIT III E-LEARNING ARCHITECTURE
Integrating E-Learning and Classroom Learning - building Learning Architecture - Learning Architecture for - sales development - financial consultants - initial call center training, executives - E-Learning Applications

UNIT IV LEARNING MANAGEMENT SYSTEM

UNIT V CASE STUDY

TOTAL:45 PERIODS
OUTCOMES:
Upon completion of this course, students should be able to:
- Work with technologies involved in E-Learning Applications.
- Design and develop E-Learning application and work with E-Learning tools.

REFERENCES:

IF8007 GREEN COMPUTING

OBJECTIVE:
- To introduce the concept of green computing.
- To create awareness of energy efficient computing.
- To understand the power management in computing devices.
- To analyze the consumption of power in data centers.

UNIT I INTRODUCTION
Energy-efficient – power efficient and thermal aware computing and communication - Newton’s cooling model and basic thermodynamics and sustainability.

UNIT II POWER MANAGEMENT
Operating system Directed power management – Power management history and motivation – key power management concepts – power management scenarios – ACPI desktop motherboard design.

UNIT III DEVELOPMENT OF EFFICIENT POWER MANAGEMENT SYSTEM
Dual mode desktop power delivery – system BIOS – Designing mobile systems - Communication with peripheral devices – Drivers – Developing robust power managed applications.

UNIT IV ENERGY EFFICIENT DATA CENTER
Data center power consumption – Power metrics – Energy efficient data center tuning - energy efficient server management – Industry vision and recommendations.

UNIT V CASE STUDIES AND APPLICATION
Google green datacenter - IBM green technology - Microsoft – Case Studies – Applying Green IT Strategies and Applications to a Home – Hospital - Packaging Industry and Telecom Sector.

TOTAL: 45 PERIODS

OUTCOMES:
- Identify the benefits and challenges of energy efficient computing.
- Develop energy efficient computing applications.
- Apply the strategies of going Green.
REFERENCES:

IF8008 GRID COMPUTING L T P C
3 0 0 3

OBJECTIVES:
• To understand Grid Architecture.
• To understand different types of grids.
• To know Grid standards.
• To acquire the knowledge of Grid computing in various areas.

UNIT I INTRODUCTION 9

UNIT II FRAMEWORK 9

UNIT III DATA AND KNOWLEDGE GRID 9

UNIT IV GRID MIDDLEWARE 9

UNIT V APPLICATIONS 9

TOTAL:45 PERIODS

OUTCOMES:
Upon Completion of the course, the students should be able to,
• Create Grid Middleware architecture.
• Explain the services offered by grid.
• To utilize grid for various applications.
REFERENCES:

IF8009 KNOWLEDGE ENGINEERING

OBJECTIVES:
- To learn about proposition logic and predicate logics.
- To acquire knowledge about modal and non monotonic logics.
- To apply object oriented abstractions for various expert systems.
- To understand various planning strategies for problem solving.

UNIT I INTRODUCTION AND PROPOSITION LOGIC

UNIT II FIRST ORDER PREDICATE LOGIC AND DERIVATIVES

UNIT III MODAL AND NON MONOTONIC LOGICS

UNIT IV OBJECT ORIENTED REPRESENTATION

UNIT V ACTIONS AND PLANNING

TOTAL:45 PERIODS

OUTCOMES:
Upon completion of the course, the students will be able to
- To work with proposition logic and predicate logics.
- To develop intelligent systems using various AI techniques.
- To design successful plans to solve problems.
REFERENCES:

IF8010 SEMANTIC WEB L T P C
3 0 0 3

OBJECTIVES:
- To learn the importance of semantic web.
- To understand various semantic knowledge representation strategies.
- To learn the concepts of ontology.
- To learn the ontology related tools.

UNIT I INTRODUCTION

UNIT II SEMANTIC KNOWLEDGE REPRESENTATION

UNIT III RULE LANGUAGES

UNIT IV ONTOLOGY DEVELOPMENT
UNIT V SOFTWARE TOOLS

TOTAL:45 PERIODS

OUTCOMES:
Upon completion of the course, the students will be able to
• Compare conventional web with semantic web.
• Analyze and design semantic knowledge representation modes.
• Construct ontology using different tools.
• Use semantic web services with web applications.

REFERENCES:
5. John Davis, Dieter Fensal, Frank Van Harmelen,J. Wiley ”Towards the Semantic Web: Ontology Driven Knowledge Management”.

IF8011 TEXT MINING L T P C
3 0 0 3

OBJECTIVES:
• To understand the basic issues and types of text mining.
• To appreciate the different aspects of text categorization and clustering.
• To understand the role played by text mining in Information retrieval and extraction.
• To appreciate the use of probabilistic models for text mining.
• To appreciate the current trends in text mining.

UNIT I INTRODUCTION

UNIT II INFORMATION RETRIEVAL AND TEXT MINING
UNIT III  CLUSTERING AND CLASSIFICATION

UNIT IV  LEARNING AND TEXT MINING
Vector Space Models (VSM) for Search and Cluster Mining - Major and Minor Cluster Discovery - Discovering Hot Topics from Dirty Text - Thesaurus Assistant- Sentence Identifier- Sentence Extractor- Mining Case Excerpts for Hot Topics -Combining Families of Information Retrieval Algorithms using Metalearning.

UNIT V  TRENDS IN TEXT MINING

OUTCOMES:
Upon Completion of the course, the students will be able to
- Identify the different features that can be mined from text and web documents
- Use available open source classification and clustering tools on some standard text data sets
- Modify existing classification/clustering algorithms in terms of functionality or features used
- Design a system that uses text mining to improve the functions of an existing open source search engine
- Implement a text mining system that can be used for an application of your choice

REFERENCES:
1. Michael Berry, “Survey of Text Mining: Clustering- Classification- and Retrieval” - Springer, 2004

IF8012  X – INFORMATICS
OBJECTIVES:
- To gain knowledge about medical informatics and healthcare informatics.
- To understand the case study of computerized patient record.
- To study and use different tools for clinical information system.
- To apply the knowledge of Bio informatics for systems.
UNIT I  MEDICAL INFORMATICS  9

UNIT II  HEALTHCARE INFORMATICS  9
Strategic Planning - Selecting a Health Care Information System - Systems Integration and Maintenance - Systems Integration - Regulatory and Accreditation Issues - Contingency Planning and Disaster Recovery.

UNIT III  COMPUTERISED PATIENT RECORD  9

UNIT IV  MEDICAL IMAGING  9

UNIT V  BIO-INFORMATICS  9

TOTAL:45 PERIODS

OUTCOMES:
Upon completion of the course, the students will be able to
- To design and develop clinical and hospital management system on his own.
- To work with different medical imaging techniques.
- To apply the knowledge of bio informatics for biological databases.

REFERENCES:

IF8013  MACHINE LEARNING  L T P C
3 0 0 3

OBJECTIVES:
- To understand the concepts of machine learning.
- To appreciate supervised and unsupervised learning and their applications.
- To understand the theoretical and practical aspects of Probabilistic Graphical Models.
- To appreciate the concepts and algorithms of reinforcement learning.
- To learn aspects of computational learning theory.
UNIT I INTRODUCTION

UNIT II SUPERVISED LEARNING

UNIT III UNSUPERVISED LEARNING

UNIT IV PROBABILISTIC GRAPHICAL MODELS

UNIT V ADVANCED LEARNING

OUTCOMES:
Upon completion of the course, the students will be able to,
• To implement a neural network for an application of your choice using an available tool.
• To implement probabilistic discriminative and generative algorithms for an application of your choice and analyze the results.
• To use a tool to implement typical clustering algorithms for different types of applications.
• To design and implement an HMM for a sequence model type of application
• To identify applications suitable for different types of machine learning with suitable justification.

REFERENCES:

TOTAL: 45 PERIODS
OBJECTIVES:
- To gain knowledge about the current web development and emergence of Social Web.
- To study about the modeling, aggregating and knowledge representation of Semantic Web.
- To learn about the extraction and mining tools for Social networks.
- To gain knowledge on Web personalization and Web Visualization of Social networks.

UNIT I  INTRODUCTION TO SOCIAL NETWORK ANALYSIS  8

UNIT II  MODELLING, AGGREGATING AND KNOWLEDGE REPRESENTATION  8

UNIT III  EXTRACTION AND MINING COMMUNITIES IN WEB SOCIAL NETWORKS  10
Extracting evolution of Web Community from a Series of Web Archive - Detecting Communities in Social Networks - Definition of Community - Evaluating Communities - Methods for Community Detection & Mining - Applications of Community Mining Algorithms - Tools for Detecting Communities Social Network Infrastructures and Communities - Decentralized Online Social Networks- Multi-Relational Characterization of Dynamic Social Network Communities.

UNIT IV  PREDICTING HUMAN BEHAVIOR AND PRIVACY ISSUES  10

UNIT V  VISUALIZATION AND APPLICATIONS OF SOCIAL NETWORKS  8
Graph Theory- Centrality- Clustering - Node-Edge Diagrams, Matrix representation, Visualizing Online Social Networks - Visualizing Social Networks with Matrix-Based Representations- Matrix-Node-Link Diagrams - Hybrid Representations - Applications - Covert Networks - Community Welfare - Collaboration Networks - Co-Citation Networks.

TOTAL:45 PERIODS

OUTCOMES:
Upon completion of the course, the students will be able to
- To apply knowledge for current web development in the era of Social Web.
- To model, aggregate and represent knowledge for Semantic Web.
- To design extraction and mining tools for Social networks.
- To develop personalized web sites and visualization for Social networks.

REFERENCES:

---

IF8071  ARTIFICIAL INTELLIGENCE  L T P C
3 0 0 3

OBJECTIVES:
- To provide a strong foundation of fundamental concepts in Artificial Intelligence.
- To enable Problem-solving through various searching techniques.
- To enable the student to apply these techniques in applications which involve perception, reasoning and learning.
- To apply AI techniques primarily for machine learning, vision, and robotics.

UNIT I  INTRODUCTION  9

UNIT II  SEARCHING TECHNIQUES  9

UNIT III  KNOWLEDGE AND REASONING  9

UNIT IV  LEARNING  9
UNIT V \hspace{1cm} AI PLANNING AND APPLICATIONS


TOTAL: 45 PERIODS

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

- Provides a basic exposition to the goals and methods of Artificial Intelligence.
- Study of the design of intelligent computational agents.
- The knowledge acquired through learning can be used both for problem solving and for reasoning
- Improves problem solving, reasoning, planning, natural language understanding, computer vision, automatic programming and machine learning.

REFERENCES:

IF8072 \hspace{1cm} COMPILER DESIGN \hspace{1cm} L T P C
\hspace{1cm} 3 0 0 3

OBJECTIVES:
- To understand the optimization techniques used in compiler design.
- To be aware of the various computer architectures that support parallelism.
- To become familiar with the theoretical background needed for code optimization.
- To understand the techniques used for identifying parallelism in a sequential program.
- To learn the various optimization algorithms.

UNIT I \hspace{1cm} INTRODUCTION

UNIT II \hspace{1cm} INSTRUCTION-LEVEL PARALLELISM
UNIT III  OPTIMIZING FOR PARALLELISM AND LOCALITY – THEORY  9
Basic Concepts – Matrix-Multiply: An Example - Iteration Spaces - Affine Array Indexes – Data Reuse Array data dependence Analysis.

UNIT IV  OPTIMIZING FOR PARALLELISM AND LOCALITY- APPLICATION  9

UNIT V  INTERPROCEDURAL ANALYSIS  9

OUTCOMES:
Upon completion of the course, the students should be able to
• Design and implement techniques used for optimization by a compiler.
• Modify the existing data structures of an open source optimizing compiler.
• Design and implement new data structures and algorithms for code optimization.
• Critically analyze different data structures and algorithms used in the building of an optimizing compiler

REFERENCES:

IF8073  COMPUTER VISION  L T P C
3 0 0 3

OBJECTIVES:
• To understand the basic concepts of camera calibration, stereoscopic imaging and higher level image processing operations.
• To familiarize the student with the image processing facilities in Matlab and its equivalent open source tools like Open CV.
• To appreciate the use of compute vision in Industrial applications and to understand the role of computer vision.
• To understand and implement more advanced topics in current research literature.

UNIT I  FUNDAMENTALS OF VISION  9

UNIT II  GEOMETRIC VISION  9
UNIT III VISION ALGORITHMS 9
Segmentation - Edge detection - Optical flow and Tracking - Feature extraction (corners and blobs) - Grouping and fitting - Hough transform - RANSAC and Alignment

UNIT IV GEOMETRIC METHODS 9
Model based Vision - smooth surfaces and their outlines - Aspect graphs and Range data – Applications.

UNIT V HIGH LEVEL VISION 9
Classifiers – Finding templates - Geometric templates from spatial relations – Spatial Features – Classification - Applications.

OUTCOMES:
Upon Completion of the course, the students should be able to
– Implement basic computer vision algorithms.
– Familiar with the use of MATLAB and Open CV environment.
– Design and implement industrial applications that incorporate different concepts of medical Image Processing.
– Critically analyze different approaches to implement mini projects in industrial environment.

REFERENCES:
4. Richard Hartley and Andrew Zisserman, “Multiple View Geometry in Computer Vision”, Richard Hartley and Andrew Zisserman,

IF8074 DATA WAREHOUSING AND DATA MINING L T P C
3 0 0 3

OBJECTIVES:
• To understand Data mining principles and techniques and introduce Data Mining as a cutting edge business intelligence.
• To expose the students to the concepts of Data Warehousing Architecture and Implementation.
• To study the overview of developing areas – Web mining, Text mining and ethical aspects of Data mining.
• To identify Business applications and Trends of Data mining.

UNIT I DATA WAREHOUSE 8

UNIT II DATA MINING & DATA PREPROCESSING 9
Introduction to KDD process – Knowledge Discovery from Databases - Need for Data Preprocessing – Data Cleaning – Data Integration and Transformation – Data Reduction – Data Discretization and Concept Hierarchy Generation.
UNIT III    ASSOCIATION RULE MINING
Introduction - Data Mining Functionalities - Association Rule Mining - Mining Frequent Itemsets with and without Candidate Generation - Mining Various Kinds of Association Rules - Constraint-Based Association Mining.

UNIT IV    CLASSIFICATION & PREDICTION

UNIT V    CLUSTERING

OUTCOMES:
Upon Completion of the course, the students will be able to,
- Evolve Multidimensional Intelligent model from typical system.
- Discover the knowledge imbibed in the high dimensional system.
- Evaluate various mining techniques on complex data objects.

REFERENCES:

IF8075    DIGITAL SIGNAL PROCESSING

OBJECTIVES:
- To understand the basics of signals and systems.
- To analyze various frequency transforms and to determine their use to DSP.
- To design and analyze various digital filters.
- To give exposure on musical sound processing and image processing.

UNIT I    SIGNALS AND SYSTEMS

UNIT II    DISCRETE FOURIER TRANSFORMS
UNIT III  IIR FILTER DESIGN

UNIT IV  FIR FILTER DESIGN

UNIT V  SIGNAL PROCESSING

TOTAL : 45 PERIODS

OUTCOMES:
- Understand the basics of signals and systems.
- Analyze various frequency transforms and to determine their use to DSP.
- Design and analyze various digital filters.
- Exposure on signal processing like musical sound processing and image processing.

REFERENCES:
UNIT III        EMBEDDED NETWORK ENVIRONMENT  

UNIT IV        REAL-TIME CHARACTERISTICS  

UNIT V      SYSTEM DESIGN TECHNIQUES  

OUTCOMES: 
Upon completion of the course, the students will be able to
- Understand different architectures of embedded processor, microcontroller and peripheral devices.
- Interface memory and peripherals with embedded systems.
- Familiar with embedded network environment.
- Understand challenges in Real time operating systems.
- Design and analyze applications on embedded systems.

REFERENCES: 

TOTAL: 45 PERIODS

IF8077     HUMAN COMPUTER INTERACTION  

OBJECTIVES:
- To learn the principles and fundamentals of human computer interaction (HCI).
- To analyze HCI theories, as they relate to collaborative or social software.
- To establish target users, functional requirements, and interface requirements for a given computer application.
- To understand user interface design principles, and apply them to designing an interface.
- To learn user interface designs through usability inspection and user models.
- To know the applications of multimedia on HCI.

ATTENDED

CENTRE FOR ACADEMIC COURSES
Anna University, Chennai-600 025.
UNIT I  DESIGN PROCESS

UNIT II   DESIGN AND EVALUATION OF INTERACTIVE SYSTEMS

UNIT III MODELS

UNIT IV EXPERIMENTAL DESIGN AND STATISTICAL ANALYSIS OF HCI

UNIT V THEORIES

OUTCOMES:
Upon completion of the course, the students will be able to
- Interpret the contributions of human factors and technical constraints on human-computer interaction.
- Evaluate the role of current HCI theories in the design of software.
- Apply HCI techniques and methods to the design of software.
- Categorize and carefully differentiate various aspects of multimedia interfaces.
- Design and develop issues related to HCI for real application.

REFERENCES:
OBJECTIVES:
- To understand the basic concepts and algorithms of digital image processing.
- To familiarize the student with the image processing environments like Matlab and its equivalent open source Image processing environments.
- To expose the student to a broad range of image processing and issues and their applications, and to provide the student with practical experience using them.
- To appreciate the use of image processing in current technologies and to expose the students to real-world applications of image processing.

UNIT I FUNDAMENTALS OF IMAGE PROCESSING

UNIT II IMAGE ENHANCEMENT AND RESTORATION

UNIT III IMAGE SEGMENTATION AND IMAGE FEATURE ANALYSIS

UNIT IV MULTI RESOLUTION ANALYSIS AND MORPHOLOGICAL PROCESSING

UNIT V IMAGE PATTERN RECOGNITION AND CASE STUDIES

TOTAL : 45 PERIODS

OUTCOMES:
Upon Completion of the course, the students should be able to
- Implement basic image processing algorithms using MATLAB tools.
- Design an application that incorporates different concepts of Image Processing.
- Apply and explore new techniques in the areas of image enhancement- restoration-segmentation-compression-wavelet processing and image morphology.
- Critically analyze different approaches to implement mini projects
- Explore the possibility of applying Image processing concepts in various domains
REFERENCES:
   2011, India.

IF8079 INFORMATION RETRIEVAL

OBJECTIVES:
- To understand the basics of Information Retrieval with pertinence to modeling, query
  operations and indexing.
- To get an understanding of machine learning techniques for text classification and
  clustering.
- To understand the various applications of Information Retrieval giving emphasis to
  Multimedia IR, Web Search.
- To understand the concepts of digital libraries.

UNIT I INTRODUCTION
Introduction - Goals and History of IR - The Impact of the Web on IR - The Role of Artificial
Intelligence (AI) in IR - Basic IR Models - Boolean and Vector-Space Retrieval Models - Ranked
Retrieval - Text-Similarity Metrics - TF-IDF (Term Frequency/Inverse Document Frequency)
Weighting - Cosine Similarity.

UNIT II PREPROCESSING
Basic Tokenizing Indexing and Implementation of Vector-Space Retrieval - Simple Tokenizing -
Stop-Word Removal and Stemming - Inverted Indices - Efficient Processing with Sparse Vectors -
Query Operations and Languages - Relevance Feedback - Query Expansion - Query Languages.

UNIT III METRICS
Experimental Evaluation of IR - Performance Metrics – Recall - Precision and F Measure -
Evaluations on Benchmark Text Collections - Text Representation - Word Statistics - Zipf's Law -
Porter Stemmer – Morphology - Index Term Selection - Using Thesauri - Metadata and Markup
Languages - Web Search - Search Engines – Spidering – Metacrawlers - Directed Spidering - Link
Analysis Shopping Agents.

UNIT IV CATEGORIZATION AND CLUSTERING
Text Categorization and Clustering - Categorization Algorithms - Naive Bayes - Decision Trees
and Nearest Neighbor - Clustering Algorithms - Agglomerative Clustering - K-Means - Expectation
Maximization (EM) - Applications to Information Filtering – Organization and Relevance Feedback.

UNIT V EXTRACTION AND INTEGRATION
Recommender Systems - Collaborative Filtering and Content-Based Recommendation of
Documents and Products Information Extraction and Integration - Extracting Data from Text – XML
- Semantic Web - Collecting and Integrating Specialized Information on the Web.

TOTAL: 45 PERIODS
OUTCOMES:
Upon completion of the course, the students will be able to
- Build an Information Retrieval system using the available tools
- Identify and design the various components of an Information Retrieval system.
- Apply machine learning techniques to text classification and clustering which is used for efficient Information Retrieval.
- Analyze the Web content structure.
- Design an efficient search engine.

REFERENCES:

IF8080 SERVICE ORIENTED ARCHITECTURE

OBJECTIVES:
- To understand various architecture for application development.
- To learn the importance of SOA in application integration.
- To learn web service and SOA related tools.

UNIT I SOA BASICS

UNIT II SOA ANALYSIS AND DESIGN

UNIT III SOA GOVERNANCE

UNIT IV SOA IMPLEMENTATION

UNIT V APPLICATION INTEGRATION

TOTAL:45 PERIODS
OUTCOMES:
Upon Completion of the course, the students should be able to,
- Compare different IT architecture.
- Analyze and design SOA based applications.
- Implement web services and realization of SOA.
- Implement RESTful services.
- Design and implement SOA based application integration using BPEL.

REFERENCES:

OBJECTIVES:
- To learn the key aspects of Soft computing and Neural networks.
- To study the fuzzy logic components.
- To gain insight onto Neuro Fuzzy modeling and control.
- To know about the components and building block hypothesis of Genetic algorithm.
- To gain knowledge in machine learning through Support Vector Machines.

UNIT I INTRODUCTION TO SOFT COMPUTING
Evolution of Computing - Soft Computing Constituents – From Conventional AI to Computational Intelligence - Machine Learning Basics

UNIT II GENETIC ALGORITHMS

UNIT III NEURAL NETWORKS

UNIT IV FUZZY LOGIC

UNIT V NEURO-FUZZY MODELING

TOTAL: 45 PERIODS
OUTCOMES:
Upon Completion of the course, the students should be able to
- To discuss on machine learning through Neural networks.
- Apply knowledge in developing a Fuzzy expert system.
- Able to model Neuro Fuzzy system for clustering and classification.
- Discover knowledge to develop Genetic Algorithm and Support vector machine based machine learning system.

REFERENCES:

IF8082 SOFTWARE QUALITY AND TESTING L T P C
3 0 0 3

OBJECTIVES:
- To introduce the basics and necessity of software testing.
- To introduce various testing techniques along with software production.
- To introduce the concepts of Software quality and its assurance.

UNIT I INTRODUCTION

UNIT II SOFTWARE TESTING METHODOLOGY

UNIT III EMERGING SPECIALIZED AREAS IN TESTING

UNIT IV SOFTWARE QUALITY MODELS
UNIT V  QUALITY THROUGH CONTINUOUS IMPROVEMENT PROCESS

Role of Statistical Methods in Software Quality – Transforming Requirements into Test Cases – Deming’s Quality Principles – Continuous Improvement through Plan Do Check Act (PDCA).

TOTAL: 45 PERIODS

OUTCOMES:
Upon completion of the course, the students will be able to
- To work with various software testing strategies.
- To design and develop software quality models and implement software quality assurance.

REFERENCES:

IF8083  UNIX INTERNALS

OBJECTIVES:
- To understand the design of the UNIX operating system.
- To become familiar with the various data structures used.
- To learn the various low-level algorithms used in UNIX.

UNIT I  OVERVIEW

UNIT II  FILE SUBSYSTEM
Internal Representation of Files: Inodes – Structure of a Regular File – Directories – Conversion of a Path Name to an Inode – Super Block – Inode Assignment to a New File – Allocation of Disk Blocks.

UNIT III  SYSTEM CALLS FOR THE FILE SYSTEM

UNIT IV  PROCESSES
OUTCOMES:
Upon completion of the course, the students will be able to
- To understand the design of the UNIX operating system.
- To become familiar with the various data structures used.
- To learn the various low-level algorithms used in UNIX.

REFERENCES:
UNIT V  ADHOC AND SENSOR NETWORK SECURITY

TOTAL: 45 PERIODS

OUTCOMES:
Upon Completion of the course, the students should be able to

- To conversant with Ad-hoc and sensor networks, protocols and standards.
- To establish a Sensor network environment for different type of applications.

REFERENCES:

IF8253  GPU ARCHITECTURE AND PROGRAMMING  L T P C
3 0 0 3

OBJECTIVES:

- To understand the architecture of GPUs in order to program them effectively.
- To program using GPU programming frameworks.
- To optimize multimedia applications to run on GPUs.

UNIT I  GPU ARCHITECTURES

UNIT II  CUDA

UNIT III  OPENCL BASICS

UNIT IV  OPENCL CONCURRENCY & EXECUTION MODEL
OUTCOMES:
At the end of the course, the student will be able to
- Design multimedia applications using GPUs.
- Write Programs for GPUs using CUDA / OpenCL.
- Optimize programs to run on massive parallel architectures.

REFERENCES:

IF8351 VIRTUALIZATION L T P C
3 0 0 3

OBJECTIVES:
- To understand the concept of virtualization.
- To understand the various issues in virtualization.
- To familiarize themselves with the types of virtualization.
- To compare and analyze various virtual machines products.

UNIT I OVERVIEW OF VIRTUALIZATION 10

UNIT II SERVER CONSOLIDATION 8

UNIT III NETWORK VIRTUALIZATION 10
UNIT IV VIRTUALIZING STORAGE
8

UNIT V VIRTUAL MACHINES PRODUCTS
9

OUTCOMES:
Upon Completion of the course, the students should be able to
• Create a virtual machine and to extend it to a virtual network.
• Discuss on various virtual machine products.
• Compile all types of virtualization techniques and utilize them in design of virtual machines.

REFERENCES:

MG8071 OPERATIONS RESEARCH L T P C
3 1 0 4

OBJECTIVES:
This course aims at providing the necessary basic concepts of a few deterministic optimization techniques, queueing theory, simulation and apply them to various engineering problems.

UNIT I QUEUEING MODELS (9+3)

UNIT II LINEAR PROGRAMMING (9+3)
Formulation - Graphical Solution - Simplex Method - Two-Phase Method - Transportation and Assignment Models.

UNIT III NON-LINEAR PROGRAMMING (9+3)

UNIT IV DYNAMIC PROGRAMMING (9+3)

54
UNIT V  SIMULATION MODELLING  
Monte Carlo Simulation - Types of Simulation - Elements of Discrete Event Simulation - Generation of Random Numbers - Applications to Queuing systems.

L: 45  +T: 15  TOTAL: 60 PERIODS

OUTCOMES:
Upon completion of the course, the students will be able to
- Have a clear perception of the power of mathematical programming tools and acquire skills to analyze queueing models.
- Demonstrate the application of the operations research techniques to problems drawn from industry, management and other engineering fields.

REFERENCES:

MM8071  DIGITAL VIDEO PROCESSING

OBJECTIVES:
- To provide an introduction to the fundamental principles and techniques in multimedia signal processing.
- To provide an overview of the current multimedia standards and technologies.
- To provide details about representation and computing algorithms of multimedia.
- To review latest trends and future technologies.

UNIT I  FUNDAMENTALS OF VIDEO PROCESSING

UNIT II  DIGITAL VIDEO

UNIT III  VIDEO SEGMENTATION AND VIDEO FEATURE ANALYSIS
Video Modeling – Camera Models – Pinhole Model – Object Model – Shape Model, Motion Model – Scene Model - Two Dimensional Motion Models – Definition and Notation - Two Dimensional Motion Models Corresponding to Typical Camera Motions – Two Dimensional Motion Corresponding to Three Dimensional Rigid Motion and Approximation of Projective Mapping.
UNIT IV  MOTION ESTIMATION  
Two Dimensional Motion Estimation – Optical Flow – Two Dimensional Motion versus Optical Flow - Optical Flow Equation and Ambiguity in Motion Estimation - General Methodologies – Motion Representation - Motion Estimation Criteria – Optimization Methods - Pixel Based Motion Estimation - Regularization Using the Motion Smoothness Constraints – Block Matching Algorithm – Exhaustive Block Matching Algorithm – Phase Correlation Method and ultiresolution Motion Estimation – General Formulation and Hierarchical Block Matching Algorithm.

UNIT V  DIGITAL VIDEO ANALYSIS AND CASE STUDIES  

OUTCOMES:  
Upon Completion of the course, the students should be able to
- Implement basic algorithms related to digital video.
- Familiarize with the MATLAB and its equivalent open source tools for processing video.
- Design and implement some basic video related applications in domains like biometrics, object traction and in Industrial environment.
- Critically analyze the role of video in modern technologies.

REFERENCES:  

MM8252  VIDEO ANALYTICS  
OBJECTIVES:
- To know the fundamental concepts of big data and analytics.
- To learn various techniques for mining data streams.
- To acquire the knowledge of extracting information from surveillance videos.
- To learn Event Modeling for different applications.
- To understand the models used for recognition of objects in videos.

UNIT I  INTRODUCTION TO BIG DATA & DATA ANALYSIS  

UNIT II  MINING DATA STREAMS  

UNIT III  VIDEO ANALYTICS  
UNIT IV  BEHAVIOURAL ANALYSIS & ACTIVITY RECOGNITION
Event Modelling - Behavioural Analysis- Human Activity Recognition-Complex Activity Recognition- Activity Modelling using 3D shape, Video summarization, shape based activity models- Suspicious Activity Detection

UNIT V  HUMAN FACE RECOGNITION & GAIT ANALYSIS

OUTCOMES:
On successful completion of this course, students will be able to
1. Work with big data platform and its analysis techniques.
2. Design efficient algorithms for mining the data from large volumes.
3. Work with surveillance videos for analytics.
4. Design of optimization algorithms for better analysis and recognition of objects in a scene.
5. Model a framework for Human Activity Recognition

REFERENCES:

TOTAL: 45 PERIODS