

**Department of**

**Computer Science & Engineering**

Syllabus

For

B.Tech CSE

Edition-2014



|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  | **GYAN VIHAR SCHOOL OF ENGINEERING AND TECHNOLOGY** | | | | | | | | |  |  |  |
|  |  |  | **DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING** | | | | | | |  |  |  |  |  |
|  |  |  | **Teaching and Examination Scheme for B.Tech (CSE) program** | | | | | | |  |  |  |  |  |
|  |  |  |  | **Edition - 2014** | |  |  |  |  |  |  |  |  |  |
|  | **Year: II** | |  |  |  |  |  |  |  | **Semester: III** | |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  | |  |
|  | **S.** | **Course Code** | **Course Name** | **Credits** |  | **Contact Hrs/Wk.** | | |  | **Exam** |  | **Weightage (in%)** | | |
|  | **No.** |  |  |  | **L** | **L** | **T/S** | **P** |  | **Hrs.** |  | **CE** |  | **ESE** |
|  |  |  | **A. Theory** |  |  |  |  |  |  |  |  |  |  |  |
|  | 1 | MA 203 | Advance Mathematics | 4 | 3 | 3 | 1 | - |  | 3 |  | 30 |  | 70 |
|  | 2 | CP 201 | Data Structure & Algorithms | 4 | 3 | 3 | 1 | - |  | 3 |  | 30 |  | 70 |
|  | 3 | EC 223 | Digital Electronics | 3 | 3 | 3 | - | - |  | 3 |  | 30 |  | 70 |
|  | 4 | CP 203 | Principles of Programming Language | 3 | 3 | 3 | - | - |  | 3 |  | 30 |  | 70 |
|  | 5 | HS 203 | Humanities & Social Sciences | 3 | 3 | 3 | - | - |  | 3 |  | 30 |  | 70 |
|  | 6 |  | **Elective (Any One)** | 3 | 3 | 3 | - | - |  | 3 |  | 30 |  | 70 |
|  |  | EC 221 | Electronic Devices & Circuits |  |  |  |  |  |  |  |  |  |  |  |
|  |  | CP 212 | PATTERN RECOGNITION & |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  | LEARNING |  |  |  |  |  |  |  |  |  |  |  |
|  |  | EC 213 | Medical Electronics |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  | **B. Practicals / Sessionals** |  |  |  |  |  |  |  |  |  |  |  |
|  | 8 | EC 253 | Electronic Devices & Circuits Lab | 1 | - | - | - | 2 |  | 3 |  | 60 |  | 40 |
|  | 7 | EC 255 | Electronic Lab-I | 2 | - | - | - | 2+2 |  | 3 |  | 60 |  | 40 |
|  | 9 | CP 251 | Data Structure & Algorithms Lab | 2 | - | - | - | 2+2 |  | 3 |  | 60 |  | 40 |
|  | 10 | CP 253 | Internet Programming Lab | 1 | - | - | - | 2 |  | 3 |  | 60 |  | 40 |
|  |  |  | **C. Discipline and Co- Curricular Activities** |  |  |  |  |  |  |  |  |  |  |  |
|  | 11 | DC 201 | Discipline and Co- Curricular Activities – | 2 | - |  |  |  |  |  |  | 100 |  |  |
|  |  |  | III |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  | **Total** | **28** | 18 | **18** | **2** | **12** |  |  |  |  |  |  |
|  |  |  | **Total Teaching Load** |  | **32** | **33** |  |  |  |  |  |  |  |  |
|  | **Year: II** | |  |  |  |  |  |  |  |  |  |  | **Semester: IV** | |
|  |  |  |  |  | |  |  |  |  |  |  |  | |  |
|  | **S.** | **Course Code** | **Course Name** | **Credits** |  | **Contact Hrs/Wk.** | | |  | **Exam** |  | **Weightage (in%)** | | |
|  | **No.** |  |  |  | **L** | **L** | **T/S** | **P** |  | **Hrs.** |  | **CE** |  | **ESE** |
|  |  |  | A. Theory |  |  |  |  |  |  |  |  |  |  |  |
|  | 1 | CP 202 | Software Engineering | 3 | 3 | 3 | - | - |  | 3 |  | 30 |  | 70 |
|  | 2 | MA 204 | Introduction To Probability Theory And Stochastic Processes | 4 | 3 | 3 | 1 | - |  | 3 |  | 30 |  | 70 |
|  | 3 | EC 212 | Microprocessor & Interface | 4 | 3 | 3 | 1 | - |  | 3 |  | 30 |  | 70 |
|  | 4 | CP 206 | JAVA | 3 | 3 | 3 | - | - |  | 3 |  | 30 |  | 70 |
|  | 5 |  | **Elective 1 (Any one)** | 3 | 3 | 3 | - | - |  | 3 |  | 30 |  | 70 |
|  |  | CP 208 | Open Source Technology |  |  |  |  |  |  |  |  |  |  |  |
|  |  | CP 217 | E-Commerce |  |  |  |  |  |  |  |  |  |  |  |
|  | 6 |  | **Elective 2 (Any one)** | 3 | 3 | 3 | - | - |  | 3 |  | 30 |  | 70 |
|  |  | EC 210 | Telecom Engg. Fundamentals |  |  |  |  |  |  |  |  |  |  |  |
|  |  | HS 202 | Cognitive Skill |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  | **B. Practicals / Sessionals** |  |  |  |  |  |  |  |  |  |  |  |
|  | 7 | EC 252 | Microprocessor Lab | 2 | - | - | - | 2+2 |  | 3 |  | 60 |  | 40 |
|  | 8 | CP 254 | Programming Language Lab | 2 | - | - | - | 2+2 |  | 3 |  | 60 |  | 40 |
|  | 9 | CP 256 | Open Source Technology | 1 | - | - | - | 2 |  | 3 |  | 60 |  | 40 |
|  | 10 | CP 258 | Design Practices In CS Lab | 1 | - | - | - | 2 |  | 3 |  | 60 |  | 40 |
|  |  |  | C. Discipline and Co- Curricular Activities |  |  |  |  |  |  |  |  |  |  |  |
|  | 11 | DC 202 | Discipline and Co- Curricular Activities – | 2 | - |  |  |  |  |  |  | 100 |  |  |
|  |  |  | IV |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  | **Total** | **28** | 18 | **18** | **2** | **12** |  |  |  |  |  |  |
|  |  |  | **Total Teaching Load** |  | **32** | **32** |  |  |  |  |  |  |  |  |

**L = Lecture T = Tutorial CE = Continuous Evaluation**

**S = Seminar P = Practical ESE = End Semester Examination**



**GYAN VIHAR SCHOOL OF ENGINEERING AND TECHNOLOGY**

**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING**

**Teaching and Examination Scheme for B.Tech (CSE) program**

**Edition - 2014**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Year: III** | | |  |  |  |  |  |  |  |  |  |  |  |  | **Semester: V** | | |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **S.** | | **Course Code** | | **Course Name** | | **Credits** |  | **Contact Hrs/Wk.** | | | | |  | **Exam** |  | **Weightage (in%)** | | |  |
|  | **No.** | |  |  |  |  |  |  | **L** |  | **T/S** |  | **P** |  | **Hrs.** |  | **CE** |  | **ESE** |  |
|  |  |  |  |  | **A. Theory** | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 1 |  | CP 301 | | Database Management System | | 4 | 3 | | 1 | | - | | 3 | | 30 | | 70 | |  |
|  | 2 |  | CP 303 | | Discrete mathematical Structure | | 3 | 3 | | - | | - | | 3 | | 30 | | 70 | |  |
|  | 3 |  | CP 305 | | Web Technology | | 4 | 3 | | 1 | | - | | 3 | | 30 | | 70 | |  |
|  | 4 |  | CP 307 | | Computer Graphics | | 3 | 3 | | - | | - | | 3 | | 30 | | 70 | |  |
|  | 5 |  |  |  | Departmental Elective (Any one) | | 3 | 3 | | - | | - | | 3 | | 30 | | 70 | |  |
|  |  |  | CP 309 | | Logical & Functional Programming | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  | CP 311 | | Advance Data Structure | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 6 |  |  |  | **Open Elective(Any one)** | | 3 | 3 | | - | | - | | 3 | | 30 | | 70 | |  |
|  |  |  | EC 312 | | Introduction to wireless Network | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  | HS 301 | | Verbal and non-Verbal Reasoning | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  | **B. Practicals / Sessionals** | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 7 |  | CP 351 | | Computer Graphics lab | | 1 | - | | - | | 2 | | 3 | | 60 | | 40 | |  |
|  | 8 |  | CP 355 | | Web Programming Lab | | 2 | - | | - | | 2+2 | | 3 | | 60 | | 40 | |  |
|  | 9 |  | CP 353 | | Data Base Management System Lab | | 2 | - | | - | | 2+2 | | 3 | | 60 | | 40 | |  |
|  | 10 |  | PE 301 | | Minor Project | | 1 | - | | - | | 2 | | 3 | | 60 | | 40 | |  |
|  |  |  |  |  | C. Discipline and Co- Curricular Activities | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 11 |  | DC 301 | | Discipline and Co- Curricular Activities – | | 2 |  |  |  |  |  |  |  |  | 100 | |  |  |  |
|  |  |  |  |  | V | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  | **Total** | | **28** | **18** | | **2** | | **12** | |  |  |  |  |  |  |  |
|  |  |  |  |  | **Total Teaching Load** | |  | **32** | |  |  |  |  |  |  |  |  |  |  |  |
| **Year: III** | | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **Semester: VI** |  |
|  |  |  |  |  |  |  |  |  |  | |  | |  |  |  |  |  | |  |  |
|  | **S.** |  | **Course Code** |  | **Course Name** |  | **Credits** |  | **Contact Hrs/Wk.** | | | | |  | **Exam** |  | **Weightage (in%)** | | |  |
|  | **No.** |  |  |  |  |  |  |  | **L** |  | **T/S** |  | **P** |  | **Hrs.** |  | **CE** |  | **ESE** |  |
|  |  |  |  |  | A. Theory |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 1 |  | CP 302 |  | Computer Architecture |  | 3 |  | 3 |  | - |  | - |  | 3 |  | 30 |  | 70 |  |
|  | 2 |  | CP 304 |  | Theory of Computation |  | 4 |  | 3 |  | 1 |  | - |  | 3 |  | 30 |  | 70 |  |
|  | 3 |  | CP 306 |  | Computer Networks |  | 4 |  | 3 |  | 1 |  | - |  | 3 |  | 30 |  | 70 |  |
|  | 4 |  | CP 308 |  | Design Analysis & Algorithm |  | 4 |  | 3 |  | 1 |  | - |  | 3 |  | 30 |  | 70 |  |
|  |  |  |  |  | **Departmental Elective IV(Any one)** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 5 |  | Cp 310 |  | System soft ware Engineering |  | 3 |  | 3 |  | - |  | - |  | 3 |  | 30 |  | 70 |  |
|  |  |  | CP 314 |  | Simulation Modeling |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 6 |  |  |  | **Open Elective IV(Any one)** |  | 3 |  | 3 |  | - |  | - |  | 3 |  | 30 |  | 70 |  |
|  |  |  | Cp 312 |  | Data Mining & Data warehousing |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  | HS 302 |  | Technical writing |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  | CP 316 |  | Bio Informatics |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  | **B. Practicals / Sessionals** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 7 |  | CP 352 |  | Computer Architecture lab |  | 2 |  | - |  | - |  | 2+2 |  | 3 |  | 60 |  | 40 |  |
|  | 8 |  | CP 354 |  | COMPUTER NETWORK Lab |  | 1 |  | - |  | - |  | 2 |  | 3 |  | 60 |  | 40 |  |
|  | 9 |  | CP 356 |  | System software Lab |  | 2 |  | - |  | - |  | 2+2 |  | 3 |  | 60 |  | 40 |  |
|  | 10 |  | PE 302 |  | Major Project (Stage -I ) |  | 1 |  | - |  | - |  | 2 |  | 3 |  | 60 |  | 40 |  |
|  |  |  |  |  | C. Discipline and Co- Curricular Activities |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 11 |  | DC 302 |  | Discipline and Co- Curricular Activities – |  | 2 |  |  |  |  |  |  |  |  |  | 100 |  |  |  |
|  |  |  |  |  | VI |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  | **Total** |  | **29** |  | **18** |  | **3** |  | **12** |  |  |  |  |  |  |  |
|  |  |  |  |  | **Total Teaching Load** |  |  |  | **33** |  |  |  |  |  |  |  |  |  |  |  |

**L = Lecture T = Tutorial CE = Continuous Evaluation**

**S = Seminar P = Practical ESE = End Semester Examination**



**GYAN VIHAR SCHOOL OF ENGINEERING AND TECHNOLOGY**

**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING**

**Teaching and Examination Scheme for B.Tech (CSE) Program**

**Edition - 2014**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Year: IV** | | |  |  |  |  |  |  |  |  |  |  |  |  |  | **Semester: VII** | | |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |  |
|  | **S.** | | **Course** |  | **Course Name** |  | **Credits** |  | **Contact Hrs/Wk.** | | | | | **Exam** |  | **Weightage (in%)** | | | |  |
|  | **No.** | | **Code** |  |  |  |  |  | **L** |  | **T/S** |  | **P** | **Hrs.** |  | **CE** |  |  | **ESE** |  |
|  |  |  |  |  | **A. Theory** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 1 |  | CP 403 |  | Asynchronous Transfer Mode Networks | 3 | | 3 | | - | | - | | 3 | 30 | |  | 70 | |  |
|  | 2 |  | CP 405 |  | Operating Systems | 3 | | 3 | | - | | - | | 3 | 30 | |  | 70 | |  |
|  | 3 |  | CP 407 |  | Artificial Intelligence | 4 | | 3 | | 1 | | - | | 3 | 30 | |  | 70 | |  |
|  | 4 |  | CP 409 |  | Real Time Systems | 4 | | 3 | | 1 | | - | | 3 | 30 | |  | 70 | |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 5 |  |  |  | **Departmental Elective(Any one)** | 3 | | 3 | | - | | - | | 3 | 30 | |  | 70 | |  |
|  |  |  | CP 411 |  | Multimedia Systems |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  | CP 415 |  | Neural Network |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 6 |  |  |  | **Open Electives(Any one)** | 3 | | 3 | | - | | - | | 3 | 30 | |  | 70 | |  |
|  |  |  | EC 417 |  | Signal & System |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  | EC 419 |  | Logic Synthesis |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  | HS 401 |  | Technical aptitude |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  | BM 504 |  | Operation and Production Management |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  | **B. Practical / Sectionals** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 7 |  | CP 451 |  | .NET Lab | 1 | | - | | - | | 2 | | 3 | 60 | |  | 40 | |  |
|  | 8 |  | CP 453 |  | X-Windows Lab | 2 | | - | | - | | 2+2 | | 3 | 60 | |  | 40 | |  |
|  | 9 |  | PE 401 |  | Major Project (Stage -II ) | 2 | | - | | - | | 2+2 | | 3 | 60 | |  | 40 | |  |
|  | 10 |  | PT 401 |  | Practical Training Seminar | 1 | | - | | - | | 2 | | 3 | 60 | |  | 40 | |  |
|  |  |  |  |  | **C. Discipline and Co- Curricular** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  | **Activities** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 11 |  | DC 401 |  | Discipline and Co- Curricular Activities – | 2 | |  |  |  |  |  |  |  | 100 | |  |  |  |  |
|  |  |  |  |  | VII |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  | **Total** | **28** | | **18** | | **2** | | **12** | |  |  |  |  |  |  |  |
|  |  |  |  |  | **Total Teaching Load** |  |  | **32** | |  |  |  |  |  |  |  |  |  |  |  |
|  | **Year: IV** | | |  |  |  |  |  |  |  |  |  |  |  |  |  | **Semester: VIII** | | |  |
|  |  |  |  |  |  |  |  |  |  | |  | |  |  |  |  | | |  |  |
|  | **S.** |  | **Course Code** |  | **Course Name** |  | **Credits** |  | **Contact Hrs/Wk.** | | | | | **Exam** |  | **Weightage (in%)** | | | |  |
|  | **No.** |  |  |  |  |  |  |  | **L** |  | **T/S** |  | **P** | **Hrs.** |  | **CE** |  |  | **ESE** |  |
|  |  |  |  |  | **A. Theory** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 1 |  | CP 402 |  | Network Security System |  | 4 |  | 3 |  | 1 |  | - | 3 |  | 30 |  | | 70 |  |
|  | 2 |  | CP 404 |  | Advance Computer Architectures |  | 4 |  | 3 |  | 1 |  | - | 3 |  | 30 |  | | 70 |  |
|  | 3 |  |  |  | Compiler Construction |  | 4 |  | 3 |  | 1 |  | - | 3 |  | 30 |  | | 70 |  |
|  | 4 |  |  |  | **Departmental Elective (Any one)** |  | 3 |  | 3 |  | - |  | - | 3 |  | 30 |  |  | 70 |  |
|  |  |  | CP 408 |  | Distributed Systems |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  | CP 410 |  | Fault Tolerant System |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  | CP 414 |  | Embedded Systems |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  | CP 420 |  | Parallel Computing |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 5 |  |  |  | **Open Electives(Any one)** |  | 3 |  | 3 |  | - |  | - | 3 |  | 30 |  |  | 70 |  |
|  |  |  | EC 418 |  | CAD for VLSI DESIGN |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  | HS 402 |  | ENGLISH COMPREHENSION |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  | MODULE |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  | **B. Practicals / Sessionals** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 6 |  | CP 452 |  | Compiler Lab |  | 2 |  | - |  | - |  | 2+2 | 3 |  | 60 |  |  | 40 |  |
|  | 7 |  | CP 454 |  | Advance Computer Architecture Lab |  | 2 |  | - |  | - |  | 2+2 | 3 |  | 60 |  |  | 40 |  |
|  | 8 |  | CP 456 |  | NETWORK SYSTEM SECURITY LAB |  | 1 |  | - |  | - |  | 2 | 3 |  | 60 |  |  | 40 |  |
|  | 9 |  | EC 458 |  | VLSI Design Lab |  | 1 |  | - |  | - |  | 2 | 3 |  | 60 |  |  | 40 |  |
|  | 10 |  | SM 402 |  | B. Tech. Seminar |  | 1 |  |  |  |  |  | 2 | 3 |  | 60 |  |  | 40 |  |
|  |  |  |  |  | **Total** |  | **25** |  | **15** |  | **3** |  | **14** |  |  |  |  |  |  |  |
|  |  |  |  |  | **Total Teaching Load** |  |  |  | **32** |  |  |  |  |  |  |  |  |  |  |  |

**L = Lecture T = Tutorial CE = Continuous Evaluation**

**S = Seminar P = Practical ESE = End Semester Examination**

Department Of Computer Science and Engineering

List Of Courses

**Edition – 2014**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Sr.** |  |  | **Credits** | **Contact Hrs** | | |  | **Exam Hrs.** | **Weightage**  **(in%)** | |  |
| **No.** | **Sub. Code** | **Course Name** |  |  | **/Wk.** | |  |  |  |
|  |  |  |  | **L** |  | **T/S** | **P** |  | **CE** | **ESE** |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
| 1 | CP 201 | Data Structure & Algorithms | 4 | 3 |  | 1 | - | 3 | 30 | 70 |  |
|  |  |  |  |  |  |  |  |  |  |  |
| 2 | CP 202 | Software Engineering | 3 | 3 |  | - | - | 3 | 30 | 70 |  |
|  |  |  |  |  |  |  |  |  |  |  |
| 3 | CP 203 | Principles of Programming Language | 3 | 3 |  | - | - | 3 | 30 | 70 |  |
|  |  |  |  |  |  |  |  |  |  |  |
| 4 | CP 205 | Internet Programming | 3 | 3 |  | - | - | 3 | 30 | 70 |  |
|  |  |  |  |  |  |  |  |  |  |  |
| 5 | CP 206 | JAVA | 3 | 3 |  | - | - | 3 | 30 | 70 |  |
|  |  |  |  |  |  |  |  |  |  |  |
| 6 | CP 208 | Open Source Technology | 3 | 3 |  | - | - | 3 | 30 | 70 |  |
|  |  |  |  |  |  |  |  |  |  |  |
| 7 | CP 210 | Management Information System | 3 | 3 |  | - | - | 3 | 30 | 70 |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  | CP 212 | PATTERN RECOGNITION & | 4 | 3 |  | 1 | - | 3 | 30 | 70 |  |
| 8 |  | LEARNING |  |  |  |  |  |  |  |  |  |
| 9 | CP 217 | E-Commerce | 3 | 3 |  | 0 | - | 3 | 30 | 70 |  |
|  |  |  |  |  |  |  |  |  |  |  |
| 10 | CP 251 | Data Structure & Algorithms Lab | 2 | - |  | - | 2+2 | 3 | 60 | 40 |  |
|  |  |  |  |  |  |  |  |  |  |  |
| 11 | CP 253 | Internet Programming Lab | 1 | - |  | - | 2 | 3 | 60 | 40 |  |
|  |  |  |  |  |  |  |  |  |  |  |
| 12 | CP 254 | Programming Language Lab | 2 | - |  | - | 2+2 | 3 | 60 | 40 |  |
|  |  |  |  |  |  |  |  |  |  |  |
| 13 | CP 256 | Open Source Technology | 1 | - |  | - | 2 | 3 | 60 | 40 |  |
|  |  |  |  |  |  |  |  |  |  |  |
| 14 | CP 258 | Design Practice in CS Lab | 1 | - |  | - | 2 | 3 | 60 | 40 |  |
|  |  |  |  |  |  |  |  |  |  |  |
| 15 | CP 301 | Database Management System | 4 | 3 |  | 1 | - | 3 | 30 | 70 |  |
|  |  |  |  |  |  |  |  |  |  |  |
| 16 | CP 302 | Computer Architecture | 3 | 3 |  | - | - | 3 | 30 | 70 |  |
|  |  |  |  |  |  |  |  |  |  |  |
| 17 | CP 303 | Discrete mathematical Structure | 3 | 3 |  | - | - | 3 | 30 | 70 |  |
|  |  |  |  |  |  |  |  |  |  |  |
| 18 | CP 304 | Theory of Computation | 4 | 3 |  | 1 | - | 3 | 30 | 70 |  |
|  |  |  |  |  |  |  |  |  |  |  |
| 19 | CP 305 | Web Technology | 4 | 3 |  | 1 | - | 3 | 30 | 70 |  |
|  |  |  |  |  |  |  |  |  |  |  |
| 20 | CP 306 | Computer Networks | 4 | 3 |  | 1 | - | 3 | 30 | 70 |  |
|  |  |  |  |  |  |  |  |  |  |  |
| 21 | CP 307 | Computer Graphics | 3 | 3 |  | - | - | 3 | 30 | 70 |  |
|  |  |  |  |  |  |  |  |  |  |  |
| 22 | CP 308 | Design Analysis & Algorithm | 4 | 3 |  | 1 | - | 3 | 30 | 70 |  |
|  |  |  |  |  |  |  |  |  |  |  |
| 23 | CP 309 | Logical & Functional Programming | 3 | 3 |  | - | - | 3 | 30 | 70 |  |
|  |  |  |  |  |  |  |  |  |  |  |
| 24 | CP 310 | System soft ware Engineering | 3 | 3 |  | - | - | 3 | 30 | 70 |  |
|  |  |  |  |  |  |  |  |  |  |  |
| 25 | CP 311 | Advance Data Structure | 3 | 3 |  | - | - | 3 | 30 | 70 |  |
|  |  |  |  |  |  |  |  |  |  |  |
| 26 | CP 312 | Data Mining & data warehousing | 3 | 3 |  | - | - | 3 | 30 | 70 |  |
|  |  |  |  |  |  |  |  |  |  |  |
| 27 | CP 314 | Simulation Modeling | 3 | 3 |  | - | - | 3 | 30 | 70 |  |
|  |  |  |  |  |  |  |  |  |  |  |
| 28 | CP 316 | Bio Informatics | 3 | 3 |  | - | - | 3 | 30 | 70 |  |
|  |  |  |  |  |  |  |  |  |  |  |
| 29 | CP 351 | Computer Graphics lab | 1 | - |  | - | 2 | 3 | 60 | 40 |  |
|  |  |  |  |  |  |  |  |  |  |  |
| 30 | CP 352 | Computer Architecture lab | 2 | - |  | - | 2+2 | 3 | 60 | 40 |  |
|  |  |  |  |  |  |  |  |  |  |  |
| 31 | CP 353 | Data Base Management System Lab | 2 | - |  | - | 2+2 | 3 | 60 | 40 |  |
|  |  |  |  |  |  |  |  |  |  |  |
| 32 | CP 354 | COMPUTER NETWORK Lab | 1 | - |  | - | 2 | 3 | 60 | 40 |  |
|  |  |  |  |  |  |  |  |  |  |  |
| 33 | CP 355 | Web Programming Lab | 2 | - |  | - | 2+2 | 3 | 60 | 40 |  |
|  |  |  |  |  |  |  |  |  |  |  |
| 34 | CP 356 | System software Lab | 2 | - |  | - | 2+2 | 3 | 60 | 40 |  |
|  |  |  |  |  |  |  |  |  |  |  |
| 35 | CP 402 | Network Security System | 4 | 3 |  | 1 | - | 3 | 30 | 70 |  |
|  |  |  |  |  |  |  |  |  |  |  |
| 36 | CP 403 | Asynchronous Transfer Mode Networks | 3 | 3 |  | - | - | 3 | 30 | 70 |  |
|  |  |  |  |  |  |  |  |  |  |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 37 | CP 404 | Advance Computer Architectures | 4 | 3 | 1 | - | 3 | 30 | 70 |  |
|  |  |  |  |  |  |  |  |  |  |
| 38 | CP 405 | Operating Systems | 3 | 3 | - | - | 3 | 30 | 70 |  |
|  |  |  |  |  |  |  |  |  |  |
| 39 | CP 406 | Compiler Construction | 4 | 3 | 1 | - | 3 | 30 | 70 |  |
|  |  |  |  |  |  |  |  |  |  |
| 40 | CP 407 | Artificial Intelligence | 4 | 3 | 1 | - | 3 | 30 | 70 |  |
|  |  |  |  |  |  |  |  |  |  |
| 41 | CP 408 | Distributed Systems | 3 | 3 | - | - | 3 | 30 | 70 |  |
|  |  |  |  |  |  |  |  |  |  |
| 42 | CP 409 | Real Time Systems | 4 | 3 | 1 | - | 3 | 30 | 70 |  |
|  |  |  |  |  |  |  |  |  |  |
| 43 | CP 410 | Fault Tolerant System | 3 | 3 | - | - | 3 | 30 | 70 |  |
|  |  |  |  |  |  |  |  |  |  |
| 44 | CP 411 | Multimedia Systems | 3 | 3 | - | - | 3 | 30 | 70 |  |
|  |  |  |  |  |  |  |  |  |  |
| 45 | CP 414 | Embedded Systems | 3 | 3 | - | - | 3 | 30 | 70 |  |
|  |  |  |  |  |  |  |  |  |  |
| 46 | CP 415 | Neural Network | 3 | 3 | - | - | 3 | 30 | 70 |  |
|  |  |  |  |  |  |  |  |  |  |
| 47 | CP 420 | Parallel Computing | 4 | 3 | 1 | - | 3 | 30 | 70 |  |
|  |  |  |  |  |  |  |  |  |  |
| 48 | CP 451 | .NET Lab | 1 | - | - | 2 | 3 | 60 | 40 |  |
|  |  |  |  |  |  |  |  |  |  |
| 49 | CP 452 | Compiler Lab | 2 | - | - | 2+2 | 3 | 60 | 40 |  |
|  |  |  |  |  |  |  |  |  |  |
| 50 | CP 453 | X-Windows Lab | 2 | - | - | 2+2 | 3 | 60 | 40 |  |
|  |  |  |  |  |  |  |  |  |  |
| 51 | CP 454 | Advance Computer Architecture Lab | 2 | - | - | 2+2 | 3 | 60 | 40 |  |
|  |  |  |  |  |  |  |  |  |  |
| 52 | CP 456 | NETWORK SYSTEM SECURITY LAB | 1 | - | - | 2 | 3 | 60 | 40 |  |
|  |  |  |  |  |  |  |  |  |  |
| 53 | CP 501 | Advanced Multimedia Technology | 3 | 3 | - | - | 3 | 30 | 70 |  |
|  |  |  |  |  |  |  |  |  |  |
|  | CP 502 | Software Quality Assurance And | 4 | 3 | 1 | - | 3 | 30 | 70 |  |
| 54 | Certification |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| 55 | IT 501 | Mobile and Satellite Communication | 3 | 3 | 0 | - | 3 | 30 | 70 |  |
|  |  |  |  |  |  |  |  |  |
| 56 | EC 210 | Telecom Engg. Fundamentals | 4 | 3 | 1 | - | 3 | 30 | 70 |  |
|  |  |  |  |  |  |  |  |  |  |
| 57 | EC 212 | Microprocessor & Interface | 4 | 3 | 1 | - | 3 | 30 | 70 |  |
|  |  |  |  |  |  |  |  |  |  |
| 58 | EC 213 | Medical Electronics | 3 | 3 | - | - | 3 | 30 | 70 |  |
|  |  |  |  |  |  |  |  |  |  |
| 59 | EC 221 | Electronic Devices & Circuits | 3 | 3 | - | - | 3 | 30 | 70 |  |
|  |  |  |  |  |  |  |  |  |  |
| 60 | EC 223 | Digital Electronics | 3 | 3 | - | - | 3 | 30 | 70 |  |
|  |  |  |  |  |  |  |  |  |  |
| 61 | EC 252 | Microprocessor Lab | 2 | - | - | 2+2 | 3 | 60 | 40 |  |
|  |  |  |  |  |  |  |  |  |  |
| 62 | EC 253 | Electronic Devices & Circuits Lab | 1 | - | - | 2 | 3 | 60 | 40 |  |
|  |  |  |  |  |  |  |  |  |  |
| 63 | EC 255 | Electronics Lab –I | 2 | - | - | 2+2 | 3 | 60 | 40 |  |
|  |  |  |  |  |  |  |  |  |  |
| 64 | EC 312 | Introduction to wireless Network | 3 | 3 | - | - | 3 | 30 | 70 |  |
|  |  |  |  |  |  |  |  |  |  |
| 65 | EC 417 | Signal & System | 4 | 3 | 1 | - | 3 | 30 | 70 |  |
|  |  |  |  |  |  |  |  |  |  |
| 66 | EC 418 | CAD for VLSI DESIGN | 3 | 3 | - | - | 3 | 30 | 70 |  |
|  |  |  |  |  |  |  |  |  |  |
| 67 | EC 419 | Logic Synthesis | 4 | 3 | 1 | - | 3 | 30 | 70 |  |
|  |  |  |  |  |  |  |  |  |  |
| 68 | EC 458 | VLSI Design Lab | 1 | - | - | 2 | 3 | 60 | 40 |  |
|  |  |  |  |  |  |  |  |  |  |
| 69 | MA 203 | Advance Mathematics | 4 | 3 | 1 | - | 3 | 30 | 70 |  |
|  |  |  |  |  |  |  |  |  |  |
| 70 | MA 204 | Introduction To Probability Theory And Stochastic Processes | 4 | 3 | 1 | - | 3 | 30 | 70 |  |
|  |  |  |  |  |  |  |  |  |  |
| 71 | HS-201 | Communication Skill | 3 | 3 | - | - | 3 | 30 | 70 |  |
|  |  |  |  |  |  |  |  |  |  |
| 72 | HS 202 | Cognitive Skill | 3 | 3 | 0 | - | 3 | 30 | 70 |  |
|  |  |  |  |  |  |  |  |  |  |
| 73 | HS 203 | Humanities & Social Science |  |  |  |  |  |  |  |  |
| 74 | HS 301 | Verbal and non-Verbal Reasoning | 3 | 3 | - | - | 3 | 30 | 70 |  |
| 75 | HS 302 | Technical writing | 3 | 3 | - | - | 3 | 30 | 70 |  |
|  |  |  |  |  |  |  |  |  |  |
| 76 | HS 401 | Technical aptitude | 3 | 3 | 0 | - | 3 | 30 | 70 |  |
|  |  |  |  |  |  |  |  |  |  |
| 77 | HS 402 | English Comprehension Module | 3 | 3 | - | - | 3 | 30 | 70 |  |
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| **CP 201 : DATA STRUCTURES AND ALGORITHMS** | | **C(L,T,P) = 4 (3,1,0)** |  |  |
|  |  |  |  |  |
| **Unit** | **Contents of the Course** |  | **Total Contact** |  |
|  |  |  | **Hrs.** |  |
|  | Data Structure: Definition, Implementation, Operation, Application, Algorithm writing and convention. Analysis of | |  |  |
|  | algorithm, Complexity Measures and Notations |  |  |  |
| **I** | Arrays: Representation of arrays (multidimensional), Address calculation using column and row major ordering. | | 8 |  |
|  | Linked Lists : Implementation, Doubly linked list, Circular linked list, unrolled linked list, skip-lists, Splices, Sentinel | |  |  |
|  | nodes, Application (Sparse Matrix, Associative Array, Functional Programming) |  |  |  |
|  | Stacks : Definition, Implementation, Application (Tower of Hanoi, Function Call and return, Parentheses Matching, | |  |  |
| **II** | Back-tracking, Expression Evaluation) |  | 7 |  |
|  | Queues : Definition, deque, enque, priority queue, bounded queue, Implementation, Application | |  |  |
|  | Tree: Definition of elements, Binary trees: Types (Full, Complete, Almost complete), Binary Search Tree, Traversal | |  |  |
| **III** | (Pre, In, Post & Level order) |  | 7 |  |
| Pruning, Grafting. Application: Arithmetic Expressions Evaluation Variations: Indexed Binary Tree | |  |
|  |  |  |
|  | Threaded Binary Tree, AVL tree, Multi-way trees, B tree, B+ tree, Forest, Trie and Dictionary | |  |  |
|  |  |  |  |  |
|  | Graphs: Elementary definition, Representation (Adjacency Matrix, Adjacency Lists) |  |  |  |
| **IV** | Traversal (BFS, DFS)Application: Spanning Tree (Prim and Kruskal Algorithm) |  | 6 |  |
|  | Dijkstra's algorithm, shortest path algorithms. |  |  |  |
| **V** | Sorting: Bubble, Selection, Insertion, Quick, Radix |  | 6 |  |
| Merge, Bucket, Heap, Searching: Hashing, Symbol Table, Binary Search, Simple String Searching | |  |
|  |  |  |
|  |  | **Total** | 34 |  |

**Reference Books:**

1. Aho A.V., J.E.Hopcroft. J.D.Ulman: Data Structures and Algorithms, Addison Wesley.
2. Brastrad: Algorithms, PHI.
3. Horowitz and Sawhni: Algorithms Design and Analysis, CS Press.
4. Kruse R.L.: Data structure and Program Design.PHI.
5. Tanenbaum : Data structures in C,PHI
6. Trembley & Sorenson :An Introduction to Data Structures, Mc-Graw Hill International

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| **CP 202** | | **SOFTWARE ENGINEERING** | **C(L,T,P) = 3 (3,0,0)** |  |  |
|  |  |  |  |  |  |
| **Unit** |  | **Contents of the Course** |  | **Total Contact** |  |
|  |  |  |  | **Hrs.** |  |
|  |  | System Analysis: Characteristics, Problems in system Development |  |  |  |
| **I** |  | System Level project Planning, System Development Life cycle (SDLC), |  | 7 |  |
|  |  | Computer system engineering system analysis, modeling the architecture, system specification. | |  |  |
|  |  | Software Project Management: Objectives, Resources and their estimation, LOC and FP estimation, effort estimation | |  |  |
| **II** |  | COCOMO estimation model, risk analysis |  | 7 |  |
|  | Software project scheduling. Software Development : Life Cycle (SWDLC), SWDLC models software engineering | |  |
|  |  |  |  |
|  |  | approaches |  |  |  |
|  |  | Requirement Analysis: Requirement analysis tasks, Analysis principles. Software prototyping and specification data | |  |  |
| **III** |  | dictionary |  | 6 |  |
|  | Finite state machine (FSM) models. Structured Analysis: Data and control flow diagrams, control and process | |  |
|  |  |  |  |
|  |  | specification behavioral modeling, extension for data intensive applications |  |  |  |
| **IV** |  | Software Design: Design fundamentals, Effective modular design |  | 7 |  |
|  | Data architectural and procedural design, design documentation |  |  |
|  |  |  |  |  |
|  |  | Object Oriented Analysis: Object oriented Analysis Modeling, Data modeling. |  |  |  |
| **V** |  | Object Oriented Design: OOD concepts and methods class and object definitions, refining operations. | | 8 |  |
|  |  | Class and object relationships, object modularization. Introduction to Unified Modeling Language | |  |  |
|  |  |  | Total | 35 |  |
| **Reference Books:** | | |  |  |  |

1. Pressman; Software Engineering-A practitioner's Approach, McGraw Hill International
2. Behforooz and F.J. Hudson: Software Engineering Fundamentals Oxford University Press

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| **CP 203** | | **PRINCIPLES OF PROGRAMMING LANGUAGE** | **C(L,T,P) = 3 (3,0,0)** |  |  |
|  |  |  |  |  |  |
| **Unit** |  | **Contents of the Course** |  | **Total Contact** |  |
|  |  |  |  | **Hrs.** |  |
|  |  | Programming Language: Definition, History, Features. Issue in Language Design: Structure and Operation of | |  |  |
| **I** |  | computer |  | 8 |  |
|  | Language Paradigms. Efficiency, Regularity. Issues in Language Translation: Syntax, Semantics, Stages analysis | |  |
|  |  |  |  |
|  |  | and synthesis, Parse Tree, CFG and BNF grammar. |  |  |  |
| **II** |  | Specification and Implementation of Elementary and Structured Data Types |  | 7 |  |
|  | Type equivalence, checking and conversion. Array, List, Structure, Union. |  |  |
|  |  |  |  |  |
|  |  | Sequence control with Expressions, Conditional Statements, Loops, Exception handling |  |  |  |
| **III** |  | Subprogram definition and activation, simple and recursive subprogram |  | 7 |  |
|  |  | Subprogram environment. Parameter passing mechanism. |  |  |  |
|  |  | Abstract Data type, information hiding, encapsulation, type definition. |  |  |  |
| **IV** |  | Static and Stack-Based Storage management |  | 6 |  |
|  |  | Fixed and Variable size heap storage management. Garbage Collection |  |  |  |
| **V** |  | Parallel Programming: Introduction, parallel processing and programming language |  | 6 |  |
|  | Threads, semaphore, monitor, message passing. |  |  |
|  |  |  |  |  |
|  |  |  | **Total** | 34 |  |
| **Reference Books:** | | |  |  |  |

1. V. Rajaraman :Fundamentals of Computers
2. Ghezzi: Programming Language Concepts, Addison Wesley.
3. Kernighan, Ritchie :Programming in C
4. Structure :Programming in C++
5. Pratt :Programming Languages
6. Ravi Shetty: Programming Language

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| **CP 205: INTERNET PROGRAMING** | | **C(L,T,P) = 3 (3,0,0)** |  |
|  |  |  |  |
| **Units** | **Course Contents** |  | **Hours** |
| I | **Internet Connection Concepts** –Server, Client and Parts, DNS, Telephone, Cable and Satellite connections- Dialup, ISDN, | | **6** |
|  | ADSL and Leased live based connection, Cable and DSS a/c, Web TV and Internet, ISP features. TCP and UDP protocols, URL’s | |  |
|  | , CGI, MIME and introduction to SGML |  |  |
| II | **Introduction of intranet -** Intranet v/s LAN, Components of Internet-Workstations and Client software, Server and Network | | **6** |
|  | operating system. Network cards, cabling and hubs, steps for creating an intranet. Maintenance and connecting to internet. | |  |
| III | **E-mail technology** - features and concepts–massage headers, address book, attachment, filtering and forwarding mails. | | **7** |
| IV | **Web technology -** Elements of web–clients and servers languages and protocols, web page and web sites, special kinds of web | | **8** |
|  | sites, web resources – search engines, massage boards, clubs, news groups and chat, web page creation concepts – planning, | |  |
|  | navigation, themes and publishing. Analyzing web traffic – log file data, analyzing log file and product for analyzing web traffic. | |  |
| V | **Scripting languages HTML** –forms–frames–table–webpage design–java script introduction–control structures–functions | | **8** |
|  | – arrays – objects – simple web applications. |  |  |
|  | **Dynamic HTML** –introduction–cascading style sheets–objects model and collections–events model–filter and transition– | |  |
|  | data binding – data control – ActiveX Control – handling of multimedia data. |  |  |
|  |  | **Total** | 35 |

**Reference Books:**

1. Young, “The Complete Reference Of Internet”, Tata McGraw Hill.
2. Deitel, Deitel and Nieto, “Internet and World Wide Web – How To Program”, Pearson Education Publisher, 2000.
3. Thom no A. Powell, “The Complete Reference HTML and XHTML”, fourth edition Tata McGraw Hill, 2003.

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| **CP 206** | **JAVA** | **C(L,T,P) = 4 (3,1,0)** |  |  |
|  |  |  |  |  |
| **Units** | **Contents of the Course** |  | **Total Contact** |  |
|  | **Hrs.** |  |
|  |  |  |  |
|  | **An overview of Java:** Object oriented programming, Two paradigms, abstraction, the, OOP principles, Java class | |  |  |
|  | Libraries **Date types, variables and arrays:** Integers, floating-point types, characters, Boolean, Iterates, Variable, Data | |  |  |
| I | types and casting, automatic type promotion in expressions arrays. |  | **7** |  |
|  | **Operators:** Arithmetic operators, bit wise operators, relational operators, Boolean logical assignment operators, the? | |  |  |
|  | Operator, operator precedence |  |  |  |
|  | **Control statements: -**Java's selection statements, iteration statements, jump statements |  |  |  |
| II | **Introduction to classes: Class** fundamentals, declaring object reference variable, Introducing methods, constructors, | | **6** |  |
|  | the key word, garbage collection, the finalize () method. |  |  |
|  |  |  |  |
|  | **Methods and Classes:-**Overloading methods, using objects as parameters, recursion |  |  |  |
|  | **Inheritance:** Inheritance basics, using super, method overriding, dynamic method dispatch, using abstract Classes, | |  |  |
| II | Using final with inheritance, Package and Interfaces, Package asses protection, importing packages | |  |  |
|  | **Exception handling:** Exception handling fundamentals. Exception types, Uncaught Exceptions Using try and catch, | |  |  |
|  | multiple catch clauses, nested try statements throw, Finally Java built in exception creating your own exception sub | |  |  |
|  | classes, using exceptions. | |  |  |
|  | **Multithreaded Programming:** The Java thread model, the main thread, creating thread, creating multiple thread, using | | **8** |  |
|  | is alive () and join (). Thread priorities, synchronization, Inter thread Communications, suspending resuming and | |  |  |
|  | stopping thread using multithreading | |  |  |
| IV | **String handling:** The string constructor, string length, special string operator character extraction, string comparison, | |  |  |
| searching string, modifying string, data conversion, changing the case of characters, string buffer. | | **7** |  |
|  |  |
|  | **Networking:** Networking basics, Java and the Internet Address, TCP/IP client Sockets URL,URL connection, TCP/IP | |  |  |
| V | server Sockets The Applet Class | |  |  |
| **The Applet Class:** its architecture displays methods. The HTML APPLET. Passing parameters to Applet. The get | |  |  |
|  |  |  |
|  | Documentation Base () and get Code Base () methods Applet Context and Show Document | | **7** |  |
|  | **Total** | | 35 |  |

**Reference Books:**

1. Java 2 Computer Reference (Tata McGraw Hill)
2. Core Java-I (Addison Wesley) - horstmann
3. Core Java - II (Addison Wesley)

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| **CP 208** | | **OPEN SOURCE TECHNOLOGY** | **C(L,T,P) = 3 (3,0,0)** |  |  |
|  |  |  |  |  |  |
| **Unit** |  | **Contents of the Course** |  | **Total Contact Hrs.** |  |
|  | OST overview: Evolution & development of OST and contemporary technologies, Factors leading to its growth. | | |  |  |
|  | Open Source Initiative (OSI), Free Software Foundation and the GNU Project, principle and methodologies. Contexts | | |  |  |
| **I** | of OST (India & international). |  |  | 7 |  |
|  | Applications of open source (open source teaching and open source media) Risk Factors. Myths regarding open | | |  |  |
|  | source. |  |  |  |  |
|  | Philosophy of Software Freedom, Free Software, OSS, Closed software, Public Domain Software, Shared software, | | |  |  |
| **II** | Shared source. |  |  | 7 |  |
| Detail of few OSS like Open Audio, Video, 2d & 3d graphics software, system tools, office tools, | | |  |
|  |  |  |
|  | Networking & internet, Security, Educational tools and Games | |  |  |  |
|  | Open Source Development Model, Starting and Maintaining an Open Source Project | |  |  |  |
| **III** | Open Source Hardware, Open Source Design, Ongoing OS Projects (i.e. examples of few good upcoming software | | | 7 |  |
|  | projects.) Case Study: - Linux, Wikipedia. | |  |  |  |
| **IV** | Licenses and Patents: What Is A License, How to create your own Licenses? | |  | 6 |  |
| Important FOSS Licenses (Apache,BSD, GPL, LGPL), copyrights and copy lefts, Patents | |  |  |
|  |  |  |  |
|  | Social and Financial impacts of open source technology, Economics of FOSS: Zero Marginal Cost, Income generation | | |  |  |
| **V** | Opportunities |  |  | 8 |  |
|  | Problems with traditional commercial software, Internationalization, Open Source as a Business Strategy. | | |  |  |
|  |  |  | **Total** | 35 |  |

**Reference Books:**

1. Vikas thada, Review to OST
2. Balaguruswamy concepts of open source concepts

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CP 210** | | **MANAGEMENT INFORMATION SYSTEM** | **C(L,T,P) = 3 (3,0,0)** |  |  |
|  |  |  |  |  |  |
| **Unit** |  | **Contents of the Course** |  | **Total Contact** |  |
|  |  |  |  | **Hrs.** |  |
| **I** | Introduction: MIS concept, Definition, role & Impact of MIS | |  | 6 |  |
| Process of management, organization structure & behavior | |  |  |
|  |  |  |  |
| **II** | Basic of Management Information System: Decision Making, Information concepts | |  | 7 |  |
| System concepts & control Types of system handling system complexity System development model | | |  |
|  |  |  |
| **III** | Development of Management Information System: Requirement and implementation of MIS | | | 6 |  |
| Choice of information Technology for Management Information System | |  |  |
|  |  |  |  |
|  | Application of Management Information system: Application in manufacturing sector using for personal | | |  |  |
| **IV** | management |  |  | 7 |  |
| Financial management, Production Management, Material Management, Marketing Management Application in | | |  |
|  |  |  |
|  | Service Sector |  |  |  |  |
| **V** | Enterprise Resource Planning (ERP): EMS, ERP, Benefits implementation, EMS & MIS. | |  | 7 |  |
| Case Studies: Application of SAP technologies in manufacturing sector. | |  |  |
|  |  |  |  |
|  |  |  | **Total** | 33 |  |

**Reference Books:**

1. S.Jawadekar: Management Information System, (Tata McGraw Hill)
2. Loudon & Loudon-Management Information Systems, Pearson Education Asia.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CP 212** | | **PATTERN RECOGNITION & LEARNING** | **C(L,T,P) = 3 (3,0,0)** |  |  |
|  |  |  |  |  |  |
| **Unit** |  | **Contents of the Course** |  | **Total Contact Hrs.** |  |
| **I** |  | Introduction to Learning, different approaches to machine Learning. |  | 7 |  |
|  | Learning Algorithms, Complexity of inductive inference. |  |  |
|  |  |  |  |  |
| **II** |  | Review of formal languages, finite automata and regular languages, context-free languages and parsing. | | 6 |  |
|  | Language identification in the limit. Gold's basic results. |  |  |
|  |  |  |  |  |
| **III** |  | Polynomial learning, PAC learnability, Valiant's results. |  | 6 |  |
|  | VC-dimension. Examples from language identification. |  |  |
|  |  |  |  |  |
| **IV** |  | Sample Complexity for finite hypothesis spaces, |  | 6 |  |
|  | Learnability of COMPUTER NETWORK F formulas. |  |  |
|  |  |  |  |  |
| **V** |  | Sample Complexity for infinite hypothesis spaces, VC dimension for neural networks. |  | 7 |  |
|  | Mistake Bound Model of Learning. |  |  |
|  |  |  |  |  |
|  |  |  | **Total** | 32 |  |

**Reference Books:**

1. Mitchell T.M., Machine Learning, Mc-Graw Hill International, 1984.
2. Anthony M. and Biggs N., Computational Learning Theory: An Introduction, Cambridge University Press, England, 1992.
3. Natarajan B.K., Machine Learning: A Theoretical Approach, Morgan Kaufman, 1991.
4. Kearns M.J. and Vazirani U.V., an Introduction to Computational Learning Theory, Cambridge, Ma., MIT Press, 1994.

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| **CP 217** | | **E-COMMERCE** | **C(L,T,P) = 3 (3,0,0)** |  |  |  |
|  |  |  |  |  |  |  |
| **Unit** |  | **Contents of the Course** |  |  | **Total Contact** |  |
|  |  |  |  |  | **Hrs.** |  |
|  |  | Business Strategy in an Electronic Age: Value Chain-supply chains, Proter's value chain, model and Inter- | | |  |  |
|  |  | Organizational value chains. Competitive Advantage-Competitive strategy |  |  |  |  |
| **I** |  | Proter's Model, First Mover advantage and competitive advantage using e-commerce Business strategy | |  | 7 |  |
|  |  | Introduction to Business Strategy, Strategic Implications of IT technology e-commerce Implementation and | | |  |  |
|  |  | evaluation |  |  |  |  |
|  |  | Business to Business Electronic Commerce: Inter-organizational Transactions, |  |  |  |  |
| **II** |  | The credit Transaction Trade cycle. |  |  | 7 |  |
|  | A variety of transactions, Electronic markets-markets and electronic markets, usage of electronic markets, | | |  |
|  |  |  |  |
|  |  | Advantages and disadvantages of electronic markets |  |  |  |  |
|  |  | Electronic Data Interchange (EDI): Definition and benefits of EDI. |  |  |  |  |
| **III** |  | EDI technology, standards, communications, implementation, agreements and securities. |  |  | 6 |  |
|  |  | EDI trading patterns and transactions. |  |  |  |  |
|  |  | Building an E-Commerce Site: Introduction to object behavior, components, active scripting. | |  |  |  |
|  |  | Object models, Infrastructure objects, service object and data objects, choosing the objects. |  |  |  |  |
| **IV** |  | Building a scalable application, Addition the configure method, connecting to the | database, Accessing | and | 6 |  |
|  | versioning the database. |  |  |  |
|  |  |  |  |  |  |
|  |  | Building the catalog object with example. Creating shopping basket-Holding state, creating the tables for a shopping | | |  |  |
|  |  | basket, modifying the object model and making the basket accessible |  |  |  |  |
|  |  | J2EE Architecture Overview: Enterprise components, Information technology in the enterprises, | |  |  |  |
| **V** |  | Introduction to enterprise objects and enterprise component model. |  |  | 6 |  |
|  |  | The J2EE model features, J2EE components-container architecture. Enterprises Java and J2EE architecture. | |  |  |  |
|  |  |  | **Total** | | 32 |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |  |

**Reference Books:**

1. David Whiteley - E-Commerce Strategy, Technology and Application, Tata McGraw Hill.
2. Mathew Reynolds - Beginning E-commerce with Visual Basic ASP, SQL Server 7.0 and MTS, Shroff Publishers & Distributors Pvt. Ltd.
3. Perrone & Chaganti - Building Java Enterprises System with J2EE, Techmedia.
4. Kalakota - Frontiers of Electronic Commerce, Pearson Education.

**CP 251 DATA STRUCTURE AND ALGORITHM LAB C(L,T,P) = 2(0,0,2+2)**

1. Program on array searching, sorting (Bubble sort, Quick sort, Marge sort etc.)
2. Program to insert element at desire position, replacing element, deletion in array.
3. Various matrices operations.
4. Various strings programs.
5. Implementation of stack and queue using array
6. Implementation of stack and queue using link lists
7. Implementation of circular queue using link lists.
8. Two-way link lists programs.
9. Infix to postfix/prefix conversion.
10. BST implementation (addition, deletion, searching).
11. Graph traversal (BFS, DFS).

**CP 253 INTERNET PROGRAMMING LAB** **C(L,T,P) = 1(0,0,2)**

1. Create a bio-data of self using HTML with a photograph on the page and containing marks in a table.
2. Develop your web page with the following properties.
3. 2 Photographs display at the same place, which can flip on mouse over.
4. Link to separate HTML file for academics, sports and other interests.
5. Enhance your Web page using style sheets, frames and setup a hyper link to your friend’s page.
6. Make a form for submission of Querying about the interest rates of bank (use Text fields of HTML) and submit buttons of HTML.
7. Make a local query form, which takes in the input the range of marks through Text fields and display the list of students having marks in that range in another window.
8. Enhance the above query through password protection.
9. Build a shopping Cart page in which items of 10 types are picked and quantity and a bill is generated by the web page.
10. Enhance the above page for making a payment through electronic billing system.
11. Associate guest book in your web page.
12. Setup a Counter to count the number of visitors on your web page.

**CP 254** **PROGRAMMING LANGUAGE LAB** **C(L,T,P) = 2 (0,0,2+2)**

1. Write Programs in java to demonstrate concept of inheritance property.

2. Write a simple java application program using JFrane that extends MouseAdapter and MouseMotionAdapter simultaniously

3. Create a simple java applet that shows the use of FlowLayout with default parameter to arrange the component at the center of the window

Write a Program for implementing exception handling

4. Write a Program for implementing multithreading.

5. Demonstrates basics of string concatenation and automatic conversion of numbers for printing to console.

* 1. Applet version prints to browser console from the applet's init() method.
  2. Application prints from main() method.

6. Write a Program in java to implement a stack and its operation.

7. To implement spell checker using dictionary.

8. To implement color selector from a given set of colors.

9. To implement shape selector from a given set of shapes.

10.To implement a calculator with its functionality.

11.To show movement of a car.

**CP 256 Open Source Technology Lab C(L,T,P) = 1 (0,0,2)**

**1. Introduction To Linux**: An Introduction to UNIX, Linux, and GNU What Is UNIX, What Is

Linux, The GNU Project and the Free Software Foundation

**2. Installation of Linux** : Basic Installation, network based installation

**3. Linux System Administration** Process Management with Linux, Memory Management, File

System management, User Administration, Linux Startup and Shutdown, Software package

Management

**4. Shell Programming** Shells, Scripting Rationale Creating a bash Script, bash Startup Files, A

Script’s Environment, Exporting Variables, Exit Status, Programming the Shell, Parameter Passing,

Operators, looping, Input and Output ,Interrupts

**5. Software Tools** C Language and Linux, MySQL Database, Network Simulator, SciLAB

configuration, Multimedia, etc.

**6. Kernel Configuration** Overview of the Linux Kernel, Configuring the Linux Kernel,

Configuration Options, Building and Installing the Kernel, Building the Kernel, Installing a New

Kernel, Configuring your Boot Manager

**7. Network Administration** LAN Card configuration, DHCP, DNS, FTP, Telnet, SSH, NFS, Web

Server, SQUID Proxy configuration

**CP 258** **DESIGN PRACTICES IN CS LAB** **C(L,T,P) = 1 (0,0,2)**

In this lab first 8 experiments are to practice software engineering techniques. Use any open source CASE tool. Many of them are available at www.sourceforge.net. You can choose any other CASE tool, as per choice. Language: C++ / JAVA

Design Approach: Object Oriented these designing can be done on any automation system e.g. library management system, billing s ystem, payroll system, bus reservation system, gas agency management system, book-shop management system, students management system.

1. Do feasibility study
2. Document all the requirements as specified by customer in Software Requirement Specification
3. Design sequence diagrams for project
4. Design Collaboration diagram
5. Design Data Flow Diagram for the project
6. Design Entity Relation Diagram for the project
7. Design Class diagram
8. Design at least 10 test cases for each module.
9. -10: Code and test the project, which you have designed in last 8 labs.

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| **CP 301** | | **DATABASE MANAGEMENT SYSTEMS** | **C(L,T,P) = 4 (3,1,0)** |  |  |
|  |  |  | |  |  |
| **Unit** |  | **Contents of the Course** | | **Total Contact** |  |
|  |  |  |  | **Hrs.** |  |
|  |  | INTRODUCTION TO DATABASE SYSTEMS: Overview and History of DBMS. File System vs DBMS | |  |  |
| **I** |  | .Advantage of DBMS Describing and Storing Data in a DBMS. | | 6 |  |
|  |  | Queries in DBMS. Transaction management and Structure of a DBMS | |  |  |
|  |  | ENTITY RELATIONSHIP MODEL: Overview of Data Design Entities, Attributes and Entity Sets, Relationship | |  |  |
| **II** |  | and Relationship Sets. Features of the ER Model-Key Constraints, Participation Constraints, Weak Entities, Class | | 7 |  |
|  | Hierarchies, Aggregation Conceptual Data Base, Design with ER Model-Entity vs Attribute, Entity vs Relationship | |  |
|  |  |  |  |
|  |  | Binary vs Ternary Relationship and Aggregation vs ternary Relationship Conceptual Design for a Large Enterprise | |  |  |
| **III** |  | RELATIONSHIP ALGEBRA AND CALCULUS**:** Relationship Algebra Selection and Projection, Set Operations, | | 7 |  |
|  | Renaming, Joints, Division Relation Calculus, Expressive Power of Algebra and Calculus | |  |
|  |  |  |  |
|  |  | SQL QUERIES PROGRAMMING AND TRIGGERS: The Forms of a Basic SQL Query, Union, Intersection and | |  |  |
| **IV** |  | Except, Nested Queries ,Correlated Nested Queries, | Set-Comparison Operations, Aggregate Operators, Null Values | 6 |  |
|  |  | Embedded SQL, Dynamic SQL, ODBC and JDBC, Triggers and Active Databases. | |  |  |
|  |  | SCHEMA REFINEMENT AND NORMAL FORMS: Introductions to Schema Refinement, Functional | |  |  |
| **V** |  | Dependencies, Boyce-Codd Normal Forms, Third Normal Form | | 8 |  |
|  |  | Normalization-Decomposition into BCOMPUTER NETWORK F Decomposition into 3-NF manufacturing sector. | |  |  |
|  |  |  | **Total** | 34 |  |

**Reference Books:**

Raghu Rama Krishnan : Database Managment Systems ,2nd ed: Tata Mc-Graw Hill

1. Elmasri -Fundamentals of Data Base Systems, Pearson Educations.
2. Silverschatz Korth and Sudarshan -Database Systems Concepts, 4th ed. Tata Mc-Graw Hill.
3. Gordon C- Everest -Database Management Objectives Systems Functions and Administration. Tata Mc-Graw Hill.

|  |  |  |  |  |  |
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| **CP 302** | | **COMPUTER ARCHITECTURE** | **C(L,T,P) = 3 (3,0,0)** |  |  |
|  |  |  |  |  |  |
| **Unit** |  | **Contents of the Course** |  | **Total Contact** |  |
|  |  |  |  | **Hrs.** |  |
|  |  | REGISTER TRANSFER LANGUAGE: Data movement around registers. Data movement from/to memory, arithmetic | |  |  |
| **I** |  | and logic micro operations. |  | 6 |  |
|  |  | Concept of bus and timing in register transfer |  |  |  |
| **II** |  | CPU ORGANISATION: Addressing Modes, Instruction Format. |  | 7 |  |
|  | CPU organization with large registers, stacks and handling of interrupts & subroutines Instruction pipelining | |  |
|  |  |  |  |
| **III** |  | ARITHMETIC ALGORITHM: Array multiplier, Booth's algorithm. |  | 7 |  |
|  | Addition subtraction for signed unsigned numbers and 2's complement numbers |  |  |
|  |  |  |  |  |
| **IV** |  | MICROPROGRAMMED CONTROL **Unit** : Basic organization of micro-programmed controller | | 7 |  |
|  | Horizontal & Vertical formats, Address sequencer |  |  |
|  |  |  |  |  |
|  |  | MEMORY ORGANISATION: Concept of RAM/ROM, basic cell of RAM |  |  |  |
| **V** |  | Associative memory, Cache memory organization, Vertical memory organization. |  | 8 |  |
|  | I/O ORGANISATION: Introduction to Peripherals & their interfacing. Strobe based and handshake-based | |  |
|  |  |  |  |
|  |  | communication, DMA based data transfer, I/O processor |  |  |  |
|  |  |  | **Total** | 34 |  |
| **Reference Books:** | | |  |  |  |

1. J.P.Hayes -'Computer Architecture & organization', Mc-Graw Hill.
2. Heuring-Computer System Design and Architecture, Pearson Education.
3. M.MORRISMANNO-'Computer System Architecture', Prentice Hall of India.
4. Bartee-Computer Architecture, Tata Mc-Graw Hill.
5. Stallings-Computer Organization and Architecture, Pearson Education.

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| **CP 303 DISCRETE MATHEMATICAL STRUCTURES** | | **C(L,T,P) = 4 (3,1,0)** |  |  |
|  |  |  |  |  |
| **Unit** | **Contents of the Course** |  | **Total** |  |
|  |  |  | **Contact Hrs.** |  |
| **I** | Formal Logic: Statement, Symbolic Representation and Tautologies, Quantifiers, Predicator and validity | | 7 |  |
| Normal form. Propositional Logic, Predicate Logic, Logic Programming and Proof of correctness. | |  |
|  |  |  |
|  | Sets and Functions: Sets, relations, functions, operations, equivalence relations Relation of partial order, partitions, | |  |  |
| **II** | binary relations. Transforms: Discrete Fourier and Inverse Fourier Transforms in one and two dimensions, discrete | | 6 |  |
|  | Cosine transform |  |  |  |
|  | Graph Theory: Graphs - Directed and Undirected, Eulerian chains and cycles Hamiltonian chains and cycles, BFS | |  |  |
| **III** | DFS Trees, chromatic number, connectivity and other graphical parameters Applications. |  | 7 |  |
|  | Polya's Theory of enumeration and its applications |  |  |  |
|  | Proof, Relation and Analysis of Algorithm Techniques for theorem proving: Direct Proof, Proof by Contra position, | |  |  |
| **IV** | Proof by exhausting cares and proof by contradiction, Principle of mathematical induction, principle of complete | | 7 |  |
|  | induction. Solution methods for linear, first-order recurrence relations with constant coefficients. | |  |  |
|  | Monoids and Groups: Groups, Semigroups and Monoids cyclic semi graphs and sub monoids, | |  |  |
| **V** | Subgroups and cosets. Congruence relations on semi groups. Morphism, Normal sub groups. | | 8 |  |
|  | Structure off cyclic groups, permutation groups and dihedral groups elementary applications in coding theory | |  |  |
|  |  | **Total** | 35 |  |
| **Reference Books:** | |  |  |  |

1. Kolman b, Busby R.: Discrete Mathematical Structure for Computer Science, PHI.
2. Knuth, D.E. :The Art of Computer Programming, Volume I, Narosa
3. Liu :Introduction to Discrete Mathematics, McGraw Hill
4. Deo : Graph Theory, PHI

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| **CP 304** | | **THEORY OF COMPUTATION** | **C(L,T,P) = 4 (3,1,0)** |  |
|  |  |  |  |  |
| **Unit** |  |  | **Contents of the Course** | **Total** |
|  |  |  |  | **Contact** |
|  |  |  |  | **Hrs.** |
|  |  | Finite Automata & Regular Expression: Basic Concepts of finite state system, Deterministic and non-deterministic finite | |  |
| **I** |  | automation and designing regular expressions | relationship between regular expression & Finite automata minimization of | 6 |
|  |  | finite automation mealy & Moore Machines |  |  |
|  |  | Regular Sets of Regular Grammars**:** Basic Definition of Formal Language and Grammars. Regular Sets and Regular Grammars | |  |
| **II** |  | closure proportion of regular sets, Pumping lemma for regular sets, decision Algorithms for regular sets, Myhell\_Nerod Theory | | 7 |
|  |  | & Organization of Finite Automata |  |  |
|  | Context Free Languages& Pushdown Automata: Context Free Grammars – Derivations and Languages –Relationship between | | |  |  |
|  | derivation and derivation trees – ambiguity – simplification of CEG – Greiback Normal form –Chomsky normal forms – | | |  |  |
| **III** | Problems related to COMPUTER NETWORK F and GNF Pushdown Automata: Definitions – Moves –Instantaneous | | | 7 |  |
|  | descriptions – Deterministic pushdown automata – Pushdown automata and CFL - pumping lemma for CFL - Applications of | | |  |  |
|  | pumping Lemma. | | |  |  |
|  | Turing Machines: Turing machines – Computable Languages and functions – Turing Machine constructions –Storage in finite | | |  |  |
| **IV** | control – multiple tracks – checking of symbols – subroutines – two way infinite tape. | | | 6 |  |
| Undecidability:Properties of recursive and Recursively enumerable languages – Universal Turing Machines as an undecidable | | |  |
|  |  |  |
|  | problem – Universal Languages – Rice’s Theorems | | |  |  |
| **V** | Linear bounded Automata Context Sensitive Language: Chomsky Hierarchy of Languages and automata Basic Definition& | | | 7 |  |
| descriptions of Theory & Organization of Linear bounded Automata Properties of context-sensitive languages. | | |  |
|  |  |  |
|  | **Total** | | | 33 |  |

**Reference Book:**

1. John E.Hopcroft, Rajeev Motwani and J.D. Ulman, Introduction to Automata theory Languages and Computation, Pearson Education
2. John C. Martin, Introduction to Languages and the Theory of Computation, TMH.
3. Cohen, Introduction to Computer Theory, Pearson Education Asia.

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| --- | --- | --- | --- | --- |
| **CP 305** | | **WEB TECHNOLOGY** | **C(L,T,P) = 3 (3,0,0)** |  |
|  |  |  |  |  |
| **Unit** |  | **Contents of the Course** |  | **Total Contact Hrs.** |
|  | Introduction and Web Development Strategies History of Web | |  |  |
| **I** | Protocols governing Web, Creating Websites for individual and Corporate World, Cyber Laws Web Applications | | | 6 |
|  |  | Writing Web Projects, Identification of Objects, Target Users, Web Team, Planning and Process Development. | |  |
|  | HTML, XML and Scripting List, Tables, Images, Forms, Frames, CSS Document type definition, | | |  |
| **II** | XML schemes, Object Models, Presenting XML, Using XML Processors: DOM and SAX | |  | 7 |
|  | Introduction to Java Script, Object in Java Script, Dynamic HTML with Java Script | |  |  |
|  | Java Beans and Web Servers Introduction to Java Beans, Advantage, Properties, BDK | |  |  |
| **III** | Introduction to EJB, Java Beans API Introduction to Servelets, Lifecycle, JSDK, Servlet API | | | 7 |
|  | Servlet Packages: HTTP package, working with Http request and response, Security Issues. | |  |  |
|  | Introduction to JSP, JSP processing, JSP Application Design, Tomcat Server, Implicit | |  |  |
| **IV** | JSPobjects, Conditional Processing, Declaring variables and methods | |  | 7 |
|  | Error Handling and Debugging, Sharing data between JSP pages- Sharing Session and Application Data. | | |  |
|  | Database Connectivity Database Programming using JDBC | |  |  |
| **V** |  | Studying Javax.sql.\*package, accessing a database from a JSP page |  | 8 |
|  |  | Application-specific Database Action, Developing Java Beans in a JSP page, introduction to Struts framework. | |  |
|  |  |  | **Total:** | 35 |

**Reference Books:**

1 Ajit singh poonia, web technology and fundamentals

2 J.E. Frend internet and history.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CP 306** | | **COMPUTER NETWORKS** | **C(L,T,P) = 3 (3,0,0)** |  |  |
|  |  |  |  |  |  |
| **Unit** |  |  | **Contents of the Course** | **Total Contact** |  |
|  |  |  |  | **Hrs.** |  |
| **I** |  | Network, Network Protocols, Edge, Access Networks and Physical Media Protocol Layers and their services models, | | 6 |  |
|  | Internet Backbones, NAP's and ISPs |  |  |
|  |  |  |  |  |
|  |  | Application Layer: Protocol and Service provided by application layer, transport protocols. The World Wide Web. | |  |  |
| **II** |  | HTTP, Message formats, User Server Interaction and Web caches. FTP commands and replies. Electronic Mail, SMTP, | | 7 |  |
|  | Mail Message Formats and MIME and Mail Access Protocols DNS The internet's directory service DNS records and | |  |
|  |  |  |  |
|  |  | Message. |  |  |  |
|  |  | Transport Layer: Transport Layer Service and Principles, Multiplexing and Demultiplexing applications, | |  |  |
| **III** |  | Connectionless Transport. UDP Segment structure and UDP Checksum. Principles of Reliable Data Transfer-Go back to | | 7 |  |
|  | N and Selective Repeat. Connection Oriented Transport TCP Connection and Segment Structure, Sequence Numbers | |  |
|  |  |  |  |
|  |  | and acknowledgement numbers, Telnet, Round trip time and timeout. TCP connection management | |  |  |
| **IV** |  | Network Layer and Routing: Network service model, Routing principles. Link State routing Algorithm, A distant Vector | | 7 |  |
|  | routing & OSPF algorithm. Router Components; Input Prot, Switching fabric and output port. IPV6 Packet format. | |  |
|  |  |  |  |
|  |  | Sonet/SDH: Synchronous Transport Signals. Physical configuration-SONET Devices, Sections, Lines and Paths. | |  |  |
|  |  | SONET Layers-Photonic Layer, section layer, line layer, path layer and device layer relationship. | |  |  |
| **V** |  | Sonet Frame format. Section overhead, Line overhead and path overhead. Virtual Tributaries and types of VTs. Point | | 8 |  |
|  |  | To Point Protocol (PPP), transition States, PPP Layers-Physical Layer and Data Link Layer, Link Control Protocols. | |  |  |
|  |  | LCP Packets and options. Authentication PAP and CHAP, Network Control Protocol (NCP). | |  |  |
|  |  |  | **Total** | 35 |  |

**Reference Books:**

1. J.F.Kurose and K.W.Ross-Computer Networking, Pearson Education Asia.
2. B.A.Forouzan-Data Communications and Networking, Tata Mc-Graw Hill.
3. Garcia and Widjaja-Communication Networks, Tata Mc-Graw Hill.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CP 307** | | **COMPUTER GRAPHICS** | **C(L,T,P) = 3 (3,0,0)** |  |  |
|  |  |  |  |  |  |
| **Unit** |  | **Contents of the Course** |  | **Total Contact** |  |
|  |  |  |  | **Hrs.** |  |
|  |  | Introduction to Raster scan displays, Storage tube displays, refreshing, flicking, interlacing, color monitors, | |  |  |
| **I** |  | display processors resolution, working principle of dot matrix, inkjet laser printers, working principles of keyboard, | | 6 |  |
|  | mouse scanner, digitizing camera, track ball , tablets and joysticks |  |  |
|  |  |  |  |  |
|  |  | graphical input techniques, positioning techniques, rubber band techniques, dragging etc |  |  |  |
|  |  | Scan conversion techniques, image representation, line drawing |  |  |  |
| **II** |  | simple DDA, Bresenham’s Algorithm, Circle drawing, general method, symmetric DDA |  | 7 |  |
|  |  | Bresenham’s Algorithm, curves, parametric function, Beizier Method, Bsp- line Method |  |  |  |
|  |  | 2D & 3D Co-ordinate system, Translation, Rotation, Scaling, Reflection Inverse transformation, Composite | |  |  |
| **III** |  | Transformation |  | 7 |  |
|  | world coordinate system, screen coordinate system, parallel and perspective projection, Representation of 3D object | |  |
|  |  |  |  |
|  |  | on 2D screen |  |  |  |
|  |  | Point Clipping. Line Clipping Algorithms, Polygon Clipping algorithms |  |  |  |
| **IV** |  | Introduction to Hidden Surface elimination, Basic illumination model, diffuse reflection, specular reflection, phong | | 6 |  |
|  | shading, Gourand shading ray tracing |  |  |
|  |  |  |  |  |
|  |  | color models like RGB, YIQ, CMY, HSV etc |  |  |  |
|  |  | Multimedia components, Multimedia Hardware, SCSI, IDE, MCI |  |  |  |
| **V** |  | Multimedia data and file formats, RTF, TIFF, MIDI, JPEG, DIB, MPEG, Multimedia Tools, Presentation tools, | | 7 |  |
|  |  | Authoring tools, presentation |  |  |  |
|  |  |  | **Total** | 33 |  |

**Reference Books:**

1. J.Foley, A. Van dam, S.Feiner, J.Hughes: Computer Graphics Principles and Practice. Addison Wesley.
2. D.Rogers and Adams: Mathematical Elements of computer Graphics McGraw Hill.
3. D.Hearn and Baker: Computer Graphics PHI.

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| --- | --- | --- | --- | --- | --- |
| **CP 308** | | **DESIGN & ANALYSIS OF ALGORITHMS** | **C(L,T,P) = 4 (3,1,0)** |  |  |
|  |  |  |  |  |  |
| **Unit** |  | **Contents of the Course** |  | **Total Contact** |  |
|  |  |  |  | **Hrs.** |  |
|  |  | BACKGROUND: Review of Algorithm Complexity and Order Notations and Sorting Methods. | |  |  |
| **I** |  | DIVIDE AND CONQUER METHOD: Binary Search, Merge Sort, Quick sort and strassen's matrix multiplication | | 6 |  |
|  | algorithms. |  |  |
|  |  |  |  |  |
|  |  | GREEDY METHOD: Knapsack Problem, Job Sequencing, Optimal Merge Patterns and Minimal Spanning Trees | |  |  |
|  |  | DYNAMIC PROGRAMMING: Matrix Chain Multiplication. Longest Common Subsequence and 0/1 Knapsack | |  |  |
| **II** |  | Problem. |  | 7 |  |
|  | BRANCH AND BOUND: Traveling Salesman Problem and Lower Bound Theory. |  |  |
|  |  |  |  |  |
|  |  | Backtracking Algorithms and queens problem. |  |  |  |
|  |  | PATTERN MATCHING ALGORITHMS: Naïve and Rabin Karp string matching algorithms, KMP Matcher and | |  |  |
| **III** |  | Boyer Moore Algorithms. |  | 7 |  |
|  |  | ASSIGNMENT PROBLEMS: Formulation of Assignment and Quadratic Assignment Problem | |  |  |
|  |  | RANDOMIZED ALGORITHMS. Las Vegas algorithms, Monte Carlo algorithms, randomized algorithm for Min- | |  |  |
| **IV** |  | Cut, randomized algorithm for 2-SAT. |  | 7 |  |
|  |  | Problem definition of Multicommodity flow, Flow shop scheduling and Network capacity assignment problems | |  |  |
|  |  | PROBLEM CLASSES NP, NP-HARD AND NP-COMPLETE: Definitions of P, NP-Hard and NP-Complete | |  |  |
| **V** |  | Problems. |  | 8 |  |
|  | Decision Problems. Cook's Theorem. Proving NP-Complete Problems - Satisfiability problem and Vertex Cover | |  |
|  |  |  |  |
|  |  | Problem. Approximation Algorithms for Vertex Cover and Set Cover Problem. |  |  |  |
|  |  |  | **Total** | 35 |  |
| **Reference Books:** | | |  |  |  |

1. Aho A.V. J.E. Hopcroft, J.D. Ullman: Design and Analysis of Algorithms, Pearson Education.
2. Rivest and Cormen, Introduction to Algorithms, Prentice Hall of India.
3. Baase, Computer Algorithms, Pearson Education.
4. Brassard, Algorithmics, Prentice Hall.
5. Bazaraa, Linear Programming & Network Flows,John Wiley & Sons.

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| **CP 309** | | **LOGICAL AND FUNCTIONAL PROGRAMMING** | **C(L,T,P) = 3 (3,0,0)** |  |  |
|  |  |  | |  |  |
| **Unit** |  | **Contents of the Course** | | **Total Contact** |  |
|  |  |  |  | **Hrs.** |  |
|  |  | PROPOSITIONS: Fully parenthesized propositions, Evaluation of constant propositions, Evaluation of proposition n a | |  |  |
|  |  | state. |  |  |  |
| **I** |  | Precedence rules for operators, Tautologies, Propositions a sets of states and Transforming English to prepositional form, | | 6 |  |
|  |  | REASONING USING EQUIVALENCE TRANSFORMATIONS: The laws of equivalence, rules of substitution and | |  |  |
|  |  | transitivity |  |  |  |
|  |  | **Inference rules. Formal system of axioms and interference** | **Rules** |  |  |
| **II** |  | NATURAL DEDUCTION SYSTEM: Introduction to deductive proofs, Inference rules, proofs and sub-proofs, adding | | 7 |  |
|  |  | flexibility to the natural deduction system and developing natural deduction system proofs | |  |  |
| **III** |  | PREDICATES: Extending the range of a state, Quantification, Free and Bound Identifiers, Textual substitution | | 7 |  |
|  | Quantification over other ranges and some theorems about textual substitution and states | |  |
|  |  |  |  |
|  |  | LOGIC PROGRAMMING: Introduction to prepositional and predicate calculus, First-order predicate calculus | |  |  |
| **IV** |  | Format logical systems, PROLOG programming-Facts, Rules and queries, Implementations, Applications, Strengths and | | 7 |  |
|  |  | Weaknesses |  |  |  |
|  |  | FUNCTIONAL PROGRAMMING: Introduction to lambda calculus-Syntax and semantics, Computability and | |  |  |
|  |  | correctness. |  |  |  |
| **V** |  | Features of Functional Languages-Composition of functions, Functions as first-class Objects, no side effects and clean | | 8 |  |
|  | semantics |  |  |
|  |  |  |  |  |
|  |  | LISP Programming-Data types and structures, Scheme dialect, primitive functions, functions for constructing functions | |  |  |
|  |  | and functional forms. Applications of functional languages and comparison of functional and imperative languages | |  |  |
|  |  |  | Total | 35 |  |
| **Reference Books:** | | |  |  |  |

1. Appleby-Programming Languages, Tata Mc-Graw Hill.
2. Sebesta-Concepts of Programming Languages, Pearson Education
3. David Gries-The Science of programming, Narosa Publication House.

|  |  |  |  |  |  |
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| **CP 310** | | **SYSTEM SOFTWARE ENGINEERING** | **C(L,T,P) = 4 (3,1,0)** |  |  |
|  |  |  |  |  |  |
| **Unit** |  | **Contents of the Course** |  | **Total Contact** |  |
|  |  |  |  | **Hrs.** |  |
|  |  | Overview: Comparison of machine language, assembly language and high level languages | |  |  |
|  |  | External and internal representation of instructions and data. Data allocation structures, search structures and | |  |  |
| **I** |  | addressing modes. |  | 6 |  |
|  |  | Activities and system software for program generation, translation and execution. Editors for source code and | |  |  |
|  |  | object code/executable code files |  |  |  |
| **II** |  | Assemblers: Assembly language specification. Machine dependent and independent features of assembler. | | 7 |  |
|  | Classification of assemblers. Pass structure of assemblers (problem and associated for IBM-PC. | |  |
|  |  |  |  |
|  |  | Loader and Linkers: Functions and classification. |  |  |  |
| **III** |  | Machine dependent and independent features of loaders |  | 6 |  |
|  |  | Design of bootstrap, absolute and relocatable loaders, Design of linker. Case study of MS-DOS linker | |  |  |
|  |  | Macro processors: Macro definition, call and expansion. Macro processor algorithm and data structure. | |  |  |
| **IV** |  | Machine independent features (parameters, unique labels, conditional expansion, nesting and recursion). | | 7 |  |
|  |  | Pass structure and design of microprocessor and macro assembler, Case study of MASM macro processor | |  |  |
|  |  | High level language processor: HLL specification: Grammars and parse trees, expression and precedence. | |  |  |
|  |  | Lexical analysis: Classification of tokens, scanning methods, character recognition, lexical ambiguity. | |  |  |
| **V** |  | Syntactic analysis: Operator precedence parsing, recursive descent parsing. |  | 7 |  |
|  |  | Symbol Table Management: Data structure for symbol table, basing functions for symbols, overflow technique, | |  |  |
|  |  | block structure in symbol table |  |  |  |
|  |  | Total |  | 33 |  |

**Reference Books:**

1. D.M. Dhamdhere-System programming & operating system. Tata McGraw Hill.
2. L.L. Beck-System Software, Pearson Education
3. J.J. Donovan-System programming Tata McGraw Hill.

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| **CP 311** | | **ADVANCED DATA STRUCTURES** | **C(L,T,P) = 3 (3,0,0)** |  |  |
|  |  |  |  |  |  |
| **Unit** |  | **Contents of the Course** |  | **Total Contact** |  |
|  |  |  |  | **Hrs.** |  |
|  |  | ADVANCED TREES: Definition**s** Operations on Weight Balanced Trees (Huffman Trees), 2-3 Trees and Red- | |  |  |
|  |  | Black Trees. |  |  |  |
| **I** |  | Augmenting Red-Black Trees to Dynamic Order Statistics and Interval Tree Applications. |  | 6 |  |
|  |  | Operations on Disjoint sets and its union-find problem Implementing Sets. Dictionaries, Priority Queues and | |  |  |
|  |  | Concatenable Queues using 2-3 Trees |  |  |  |
|  |  | MERGEABLE HEAPS: Merge able Heap Operations, Binomial Trees Implementing Binomial Heaps and its | |  |  |
| **II** |  | Operations, 2-3-4. Trees and 2-3-4 Heaps. |  | 7 |  |
|  | Amortization analysis and Potential Function of Fibonacci Heap Implementing Fibonacci Heap. | |  |
|  |  |  |  |
|  |  | SORTING NETWORK**:** Comparison network, zero-one principle, bitonic sorting and merging network sorter. | |  |  |
|  |  | GRAPH THEORY DEFINITIONS: Definitions of Isomorphic Components. |  |  |  |
| **III** |  | Circuits, Fundamental Circuits, Cut-sets. Cut-Vertices Planer and Dual graphs, Spanning Trees, Kuratovski's two | | 7 |  |
|  |  | Graphs |  |  |  |
|  |  | GRAPH THEORY ALGORITHMS**:** Algorithms for Connectedness, Finding all Spanning Trees in a Weighted | |  |  |
|  |  | Graph and Planarity Testing |  |  |  |
| **IV** |  | Breadth First and Depth First Search, Topological Sort, Strongly Connected Components and Articulation Point. | | 7 |  |
|  |  | Single Min-Cut Max-Flow theorem of Network Flows. Ford-Fulkerson Max Flow Algorithms | |  |  |
|  |  |  |  |  |  |
|  |  | NUMBER THEORITIC ALGORITHM: Number theoretic notation, Division theorem |  |  |  |
| **V** |  | GCD recursion, Modular arithmetic, Solving Linear equation, Chinese remainder theorem, power of an element | | 8 |  |
|  |  | RSA public key Cryptosystem, primality Testing and Integer Factorization |  |  |  |
|  |  | Total |  | 35 |  |

**Reference Books:**

1. Narsingh Deo-Graph Theory with Application to Engineering and Computer Science, Prentice Hall of India.
2. Baase-Computer Algorithms, Pearson Education.
3. Cormen-Introduction to Algorithms, Prentice Hall of India.
4. Aho A.V., Hopcrptt J.E. and Ullman J.D.-The Design and Analysis of Computer Algorithms, Pearson Education.
5. Horowitz and Sawhni-Fundamentals of Data Structures Galgotia Book Source.

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| **CP 312** | | **DATA MININIG AND DATA WAREHOUSING** | **C(L,T,P) = 3 (3,0,0)** |  |  |
|  |  |  |  |  |  |
| **Unit** |  | **Contents of the Course** |  | **Total** |  |
|  |  |  |  | **Contact** |  |
|  |  |  |  | **Hrs.** |  |
|  |  | Overview, Motivation(for Data Mining),Data Mining-Definition & Functionalities |  |  |  |
|  |  | Data Processing, Form of Data Preprocessing |  |  |  |
| **I** |  | Data Cleaning: Missing Values, Noisy Data, (Binning, Clustering, Regression, Computer and Human inspection) | | 6 |  |
|  | Inconsistent Data, Data Integration and Transformation. Data Reduction:-Data Cube Aggregation, Dimensionality | |  |
|  |  |  |  |
|  |  | reduction |  |  |  |
|  |  | Data Compression, Luminosity Reduction, Clustering, Discrimination and Concept hierarchy generation | |  |  |
|  |  | Concept Description:- Definition, Data Generalization, Analytical Characterization, Analysis of attribute relevance, | |  |  |
|  |  | Mining Class comparisons |  |  |  |
|  |  | Statistical measures in large Databases. Measuring Central Tendency, Measuring Dispersion of Data, Graph Displays | |  |  |
| **II** |  | of Basic Statistical class Description |  | 7 |  |
|  | Mining Association Rules in Large Databases, Association rule mining, mining Single-Dimensional Boolean | |  |
|  |  |  |  |
|  |  | Association rules from Transactional |  |  |  |
|  |  | Databases– Apriority Algorithm, Mining Multilevel Association rules from Transaction Databases and Mining Multi- | |  |  |
|  |  | Dimensional Association rules from Relational Databases. |  |  |  |
|  |  | What is Classification & Prediction, Issues regarding Classification and prediction, Decision tree, Bayesian | |  |  |
|  |  | Classification, Classification by Back propagation |  |  |  |
|  |  | Multilayer feed-forward Neural Network, Back propagation Algorithm, Classification methods K-nearest neighbor | |  |  |
| **III** |  | classifiers, Genetic Algorithm. |  | 7 |  |
|  | Cluster Analysis: Data types in cluster analysis, Categories of clustering methods |  |  |
|  |  |  |  |  |
|  |  | Partitioning methods. Hierarchical Clustering- CURE and Chameleon. Density Based Methods-DBSCAN, OPTICS. | |  |  |
|  |  | Grid Based Methods- STING, CLIQUE. Model Based Method –Statistical Approach, Neural Network approach, | |  |  |
|  |  | Outlier Analysis |  |  |  |
|  |  | Data Warehousing: Overview, Definition, Delivery Process, Difference between Database System and Data Warehouse | |  |  |
| **IV** |  | Multi Dimensional Data Model, Data Cubes, Stars, Snow Flakes, Fact Constellations, Concept hierarchy, Process | | 7 |  |
|  |  | Architecture, 3 Tier Architecture, Data Mining |  |  |  |
|  |  | Aggregation, Historical information, Query Facility, OLAP function and Tools. |  |  |  |
| **V** |  | OLAP Servers, ROLAP, MOLAP, HOLAP, Data Mining interface, Security, Backup and Recovery, Tuning Data | | 8 |  |
|  |  | Warehouse, Testing Data Warehouse. |  |  |  |
|  |  | Total |  | 35 |  |

**Reference Books:**

1. Rob Mattson-Web Warehousing and Knowledge Management, Tata Mc-Graw Hill.
2. Shelley Powers-Dynamic Web Publishing, Techmedia.

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| **CP 314** | | **SIMULATION AND MODELING** | **C(L,T,P) = 3 (3,0,0)** |  |
|  |  |  |  |  |
| **Unit** |  | **Contents of the Course** |  | **Total Contact** |
|  |  |  |  | **Hrs.** |
|  |  | System definition and components, Stochastic activities, continuous and discrete systems |  |  |
| **I** |  | System modeling, types of models, static and dynamic physical models, static and dynamic mathematical models, full | | 6 |
|  |  | corporate model, types of system study |  |  |
|  |  | System simulation, why to simulate and when to simulate, basic nature of simulation |  |  |
|  |  | technique of simulation, comparison of simulation and analytical methods, types of system simulation, real time | |  |
| **II** |  | simulation, hybrid simulation |  | 7 |
|  |  | Simulation of pure-pursuit problem single-server queuing system and an inventory problem, Monte-Carlo simulation, | |  |
|  |  | Distributed Lag models, Cobweb model. |  |  |
|  |  | Simulation of continuous systems, analog vs. digital simulation, simulation of water reservoir system, simulation of | |  |
|  |  | servo system, simulation of an autopilot. |  |  |
| **III** |  | Discrete system simulation, fixed time-step vs. event-to-event model, generation of random numbers, test of | | 7 |
|  |  | randomness, generalization of non-uniformly distributed random numbers |  |  |
|  |  | Monte-Carlo computation vs. stochastic simulation |  |  |
|  |  | System Dynamics, exponential growth models, exponential decay models, modified exponential growth models | |  |
| **IV** |  | logistic curves, generalization of growth models, system dynamics diagrams, feedback in socio-economic systems and | | 6 |
|  |  | world models |  |  |
|  |  | Simulation of PERT networks, critical path simulation, uncertainties in activity duration, resource allocation and | |  |
|  |  | consideration. |  |  |
| **V** |  | Simulation software, simulation languages, continuous and discrete simulation languages, expression based languages, | | 7 |
|  |  | object-oriented simulation, general-purpose vs. application-oriented simulation packages |  |  |
|  |  | CSMP-III and MODSIM-III. |  |  |
|  |  | Total |  | 33 |

**Reference Books:**

1. Kelton W.D. and Law A.M. -Simulation Modeling and Analysis, II Edition, Mc-Graw Hill.
2. G.A.Korn-Interactive Dynamic System Simulation, Mc Graw Hill.

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|  | **CP 316** | **BIO-INFORMATICS** | **C(L,T,P) = 3 (3,0,0)** |  |
|  |  |  |  |  |
| **Units** | **Course Contents** |  |  | **Hours** |
|  | **Introductory Concepts:** The Central Dogma–The Killer application–Parallel Universes– Watson’sDefinition–Top Down | | |  |
| I | Versus Bottom up – Information Flow – Convergence – Databases – Data Management – Data Life Cycle – Database | | |  |
|  | Technology – Interfaces Implementation – Networks – Geographical Scope – Communication Models – Transmissions | | | 7 |
|  | Technology – Protocols – Bandwidth – Topology – Hardware – Contents – Security – Ownership – Implementation – | | |  |
|  | Management. |  |  |  |
|  | **Search Engines and Data Visualization:** The search process–Search Engine Technology–Searching and Information Theory | | |  |
| II | – Computational methods – Search Engines and Knowledge | |  | 7 |
|  | Management – Data Visualization – sequence visualization – structure visualization – user Interface – Animation Versus | | |  |
|  | simulation – General Purpose Technologies. | |  |  |
|  | **Statistics and Data Mining:** Statistical concepts–Microarrays–Imperfect Data–Randomness–Variability–Approximation | | |  |
| III | – Interface Noise – Assumptions – Sampling and Distributions – Hypothesis Testing – Quantifying Randomness – Data | | | 7 |
|  | Analysis – Tool selection statistics of Alignment – Clustering and Classification – Data Mining – Methods – Selection and | | |  |
|  | Sampling – Preprocessing and Cleaning – Transformation and Reduction – Data Mining Methods – Evaluation – Visualization | | |  |
|  | – Designing new queries – Pattern Recognition and Discovery – Machine Learning – Text Mining – Tools.\ | | |  |
|  | **Pattern Matching:** Pairwise sequence alignment–Local versus global alignment–Multiple sequence alignment– | | | 8 |
| IV | Computational methods – Dot Matrix analysis – Substitution matrices – Dynamic Programming – Word methods – Bayesian | | |  |
|  | methods – Multiple sequence alignment | |  |  |
|  | **Modeling and Simulation:** Drug Discovery–Components–Process–Perspectives–Numeric considerations–Algorithms– | | | 6 |
| V | Hardware – Issues – Protein structure – AbInitio Methods – Heuristic methods – Systems Biology – Tools | | |  |
|  | **Total** |  |  | 35 |
|  | **REFERENCE BOOKS:** | |  |  |

1. Ranjan Bose, “Information Theory, Coding and Cryptography”, Tata McGraw- Hill, 2002.
2. Viterbi, “Information Theory and Coding”, McGraw-Hill, 1982.
3. John G. Proakis, “Digital Communications”, McGraw-Hill, New edition, 2000.

**CP 351 COMPUTER GRAPHICS LAB** **C(L,T,P) = 1 (0,0,2)**

1. Implementation of line generation using slope’s method, DDA and Bresenham’s algorithms.
2. Implementation of circle generation using Mid-point method and Bresenham’s algorithm.
3. Implementation of ellipse generation using Mid-point method.
4. Implementation of polygon filling using Flood-fill, Boundary-fill and Scan-line algorithms.
5. Implementation of 2D transformation: Translation, Scaling, Rotation, Mirror Reflection and Shearing (write a menu driven program).
6. Implementation of Line Clipping using Cohen-Sutherland algorithm and Bisection Method.
7. Implementation of Polygon Clipping using Sutherland-Hodgman algorithm.
8. Implementation of 3D geometric transformations: Translation, Scalind and rotation.
9. Implementation of Curve generation using Interpolation methods.
10. Implementation of Curve generation using B-spline and Bezier curves.
11. Implementation of any one of Back face removal algorithms such as Depth-Buffer algorithm, Painter’s algorithm, Warnock’s algorithm, Scan-line algorithm)

**CP-352** **COMPUTER ARCHITECTURE LAB** **C(L,T,P) = 2 (0,0,2+2)]**

This lab will be based on assembly programming on of RISC processor simulator SPIM. SPIM simulator is available at site SPIM exercises

1. Read an integer from the keyboard and print it out if (n => n\_min AND n <= n\_max).
2. Read an integer from the keyboard and print out the following as per switch-case statement Switch (n)

{n <= 10 print "not a lot" n == 12 print "a dozen"

n == 13 print "a baker's dozen" n == 20 print "a score"

n >= 100 print "lots and lots" n! = 42 print "integer"

otherwise print "you have the answer!”}

1. Read a string from the keyboard and count the number of letters. Use the equivalent of following for loop to count number of chars. for (s1=0; str [s1] != '\n'; ++s1)
2. Print out a line of characters using simple procedure call.
3. Print out a triangle of characters using recursive procedure call.
4. Print factorial of a number using recursion.
5. Print reverse string after reading from keyboard.
6. Print a string after swapping case of each letter.
7. Print an integer in binary and hex.
8. Implement bubble sort algorithm.
9. Print Pascal Triangle of base size 12.
10. Evaluate and print Ackerman function.

**CP 353** **DATABASE MANAGEMENT LAB** **C(L,T,P) = 2 (0,0,2+2)**

Student can use MySql (preferred open source DBMS) or any other Commercial DBMS tool (MS-Access / ORACLE) at backend and C++ (preferred) VB/JAVA at front end.

1. (a) Write a C++ program to store students records (roll no, name, father name) of a class using file handling. (Using C++ and File handling).

(b) Re-write program 1, using any DBMS and any compatible language. (C++/MySQL) (VB and MS-Access)

1. Database creation/ deletion, table creation/ deletion.
2. Write a program to take a string as input from user. Create a database of same name. Now ask user to input two more string, create two tables of these names in above database.
3. Write a program, which ask user to enter database name and table name to delete. If database exist and table exist then delete that table.
4. Write a program, which ask user to enter a valid SQL query and display the result of that query.
5. Write a program in C++ to parse the user entered query and check the validity of query. (Only SELECT query with WHERE clause)
6. - 6. Create a database db1, having two tables t1 (id, name, age) and t2 (id, subject, marks).

(a) Write a query to display name and age of given id (id should be asked as input).

(b) Write a query to display average age of all students.

(c) Write a query to display mark-sheet of any student (whose id is given as input).

(d) Display list of all students sorted by the total marks in all subjects.

1. - 8. Design a Loan Approval and Repayment System to handle Customer's Application for Loan and handle loan repayments by deposi ting installments and reducing balances.

9 -10. Design a Video Library Management System for managing issue and return of Video tapes/CD and manage customer's queries

**CP 354 COMPUTER NETWORK LAB C(L,T,P) = 1(0,0,2)**

1. The lab is to be conducted in Perl programming language, Perl works on all platforms (including windows)
2. Write few basic programs of Perl.
3. A Hello World Program
4. Write a program to add to 10 numbers.
5. Write a program of reading input from the keyboard and displaying them on monitor.
6. Write a program to take two strings as input and compare them 3. To understand advance constructs of Perl
7. Write a program to create a list of your course (all theory courses in current semester) using array and print them.
8. Write a program to accept ten number, store it into a hash table (Perl have itself) and when asked by user tell him that number exists or not. (do not store duplicate numbers)
9. Write a program to compute the number of lines in a file.
10. Find the IP address of a host or turn an IP address into a name.
11. Connect to an FTP server and get or put files. Automate the one-time transfer of many files to download the file everyday, which have changed since yesterday. (use Net: FTP)
12. Write a program to send mail. The programs should monitor system resources like disk space and notify admin by mail when disk space becomes dangerously low. (use Net: mail)
13. Fetch mail from a POP3 server (use Net: pop 3)
14. Find out who owns a domain (use Net: whois, Whois is a service provided by domain name registration authorities to identify owners of domain names)
15. Test whether a machine is alive. machine can be specified using IP address or domain name of machine.
16. You have a URL that fetch its content from a Perl script, convert it to ASCII text (by stripping html tags) and display it.
17. Writing a TCP Client, Writing a TCP Server and communicate some data over TCP

**CP 355 WEB PROGRAMING LAB** **C(L,T,P) = 2 (0,0,2+2)**

1. Develop a static html page using style sheet to show your own profile.

Add a page to show 5 photos and add a page to show your academics in a table

Add a page containing 5 links to your favorite website Add navigational links to all above pages (add menu).

1. Update your homepage, by creating few html file (e.g. header, footer, left-sidebar, right), in these file you will put all html code to be shown on every page.
2. Use Cascading Style Sheets to format your all pages in a common format.
3. Basic Php programs: Write a simple "hello word" program using php.
4. Write a program to accept two strings (name and age) from user. Print welcome statement e.g. “Hi Ram, your age is 24."
5. Write a program to create a calculator, which can support add, subtraction and multiply and division operation.
6. Write a program to take input parameters for a table (no. of rows and no. of columns), and create the desired table.
7. Create a "Contact Me" page -Ask user to enter his name, email ID, Use Java-Script to verify entered email address.
8. Store submitted value in a MySql database. Display latest 5 submitted records in contact me page. Display above record with navigation support. e.g. (next, previous, first, last).

**CP 356** **SYSTEM SOFTWARE LAB** **C(L,T,P) = 2 (0,0,2+2)**

In this lab we will practice how source code is processed by compiler/ assembler/ pre-processor.

All programs have to be written in C++

1. Write a class for file handling, having functions to open/ read/ write/ close/ reset. (2-5) Develop a program which take input a file of C language

1. Print Lines of Codes and print signature of all function (including main)
2. Print number of variables in every function (with type)
3. Generate a new file without the comments. (/\* \*/ and //)
4. Process all #define (i.e. #define MAX 100, than replace every occurrence of MAX with 100). (Macro value 100 can be an expression also.)

6. Write a program to create a symbol table.

7. Write a program which can parse a given C file and store all variables and functions in symbol table. (8-10). Write a program to convert given C program into RTL code.

Assumption

1. input C file will have only main function,
2. only two type of statements, either variable declaration statements (int sub1=23;) OR mathematical expression (sub1=sub2-sub3 ;).
3. system have 16 registers (R1 to R16)
4. RTL opcode available are: ADD, LOAD, MOVE, SUB, MULTIPLY, DIVIDE
5. No control-flow (i.e. if-else, loop, jump etc.) expression is there in input code e.g.

int main()

{

int sub1=72, sub2=85, sub3=63; float per;

per=(sub1+sub2+sub3)/(100+100+100);

}

|  |  |  |  |  |  |
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| **CP 402** | | **NETWORK SECURITY SYSTEM** | **C(L,T,P) = 4 (3,1,0)** |  |  |
|  |  |  |  |  |  |
| **Unit** |  | **Contents of the Course** |  | **Total** |  |
|  |  |  |  | **Contact Hrs.** |  |
|  |  | Introduction to security attacks, services and mechanism, introduction to cryptography. |  |  |  |
|  |  | Conventional Encryption: Conventional encryption model, classical encryption techniques- substitution ciphers and | |  |  |
|  |  | transposition ciphers, cryptanalysis, stereography, stream and block ciphers. |  |  |  |
| **I** |  | Modern Block Ciphers: Block ciphers principals, Shannon’s theory of confusion and diffusion, festal structure, data | | 6 |  |
|  |  | encryption standard(DES), strength of DES, differential and linear crypt analysis of DES, block cipher modes of | |  |  |
|  |  | operations, triple DES, IDEA encryption and decryption, strength of IDEA, confidentiality using conventional encryption, | |  |  |
|  |  | traffic confidentiality, key distribution, random number generation |  |  |  |
|  |  | Introduction to graph, ring and field, prime and relative prime numbers, modular arithmetic | |  |  |
| **II** |  | Fermat’s and Euler’s theorem, primality testing, Euclid’s Algorithm, Chinese Remainder theorem, discrete logarithms. | | 7 |  |
|  | Principals of public key crypto systems, RSA algorithm, security of RSA, key management, Diffle-Hellman key exchange | |  |
|  |  |  |  |
|  |  | algorithm, introductory idea of Elliptic curve cryptography, Elganel encryption. |  |  |  |
|  |  | Message Authentication and Hash Function: Authentication requirements, authentication functions, message authentication | |  |  |
|  |  | code |  |  |  |
| **III** |  | Hash functions, birthday attacks, security of hash functions and MACS, MD5 message digest algorithm, | | 7 |  |
|  |  | Secure hash algorithm (SHA). Digital Signatures: Digital Signatures, authentication protocols, digital signature standards | |  |  |
|  |  | (DSS), proof of digital signature algorithm |  |  |  |
| **IV** |  | Authentication Applications: Kerberos and X.509, directory authentication service, electronic mail security-pretty good | | 7 |  |
|  | privacy (PGP), S/MIME |  |  |
|  |  |  |  |  |
|  |  | IP Security: Architecture, Authentication header, Encapsulating security payloads, combining security associations, key | |  |  |
| **V** |  | management. |  | 8 |  |
|  | Web Security: Secure socket layer and transport layer security, secure electronic transaction (SET). System | |  |
|  |  |  |  |
|  |  | Security: Intruders, Viruses and related threads, firewall design principals, trusted systems |  |  |  |
|  |  | Total |  | 35 |  |

**Reference Books:**

Hawang & Briggs-Network security, Mc Graw Hill.

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| **CP 403** | | **ASYNCHRONOUS TRANSFER MODE NETWORKS** | **C(L,T,P) = 3 (3,0,0)** |  |  |
|  |  |  |  |  |  |
| **Unit** |  | **Contents of the Course** |  | **Total Contact** |  |
|  |  |  |  | **Hrs.** |  |
|  |  | INTRODUCTION: An overview of communication networks protocol layering, multiplexing and switching principles | |  |  |
| **I** |  | of Asynchronous Transfer Mode Precursor Technologies-X 25, Frame Relay and ISDN. |  | 6 |  |
|  |  | Broad Band-ISDN (B-ISDN)-Configuration, Interfaces, reference model and services |  |  |  |
|  |  | ATM PROTOCOL STACK :ATM reference model, |  |  |  |
| **II** |  | Physical layer transmission convergence sub layer functions, physical medium dependent sub layer and physical layer | | 7 |  |
|  |  | standards for ATM |  |  |  |
| **III** |  | ATM layer-ATM cell header structure. |  | 7 |  |
|  | ATM layer functions. ATM adaptation layer-AAL1 to AAL5 layers |  |  |
|  |  |  |  |  |
|  |  | TRAFFIC MANAGEMENT: Concept of Traffic and service. Traffic and service characteristics of voice and video data. | |  |  |
| **IV** |  | ATM Traffic descriptors and QOS parameters. Factors affecting QOS parameters and service categories. | | 8 |  |
|  |  | QOS classes. Elements of ATM Traffic management-Traffic contracting, policing and shaping | |  |  |
| **V** |  | SWITCHING IN ATM: Performance measures and Architectural issues in switch design. ATM switching Architecture | | 7 |  |
|  |  | Total |  | 35 |  |

**Reference Books:**

1. Sunil Kasera-ATM Networks Concepts and Protocols, Tata McGraw Hills.
2. Rainer Handel-ATM Networks 2nd Edition, Pearson Education Asia.
3. Stallings B-ISDN & ATM with Frame Relay-Pearson

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| **CP 404** | | **ADVANCED COMPUTER ARCHITECTURES** | **C(L,T,P) = 4 (3,1,0)** |  |  |
|  |  |  |  |  |  |
| **Unit** |  | **Contents of the Course** |  | **Total** |  |
|  |  |  |  | **Contact Hrs.** |  |
|  |  | INTRODUCTION**:** Parallel Computing, Parallel Computer Model, Program and Network Properties, | |  |  |
|  |  | Parallel Architectural Classification Schemes, Flynn’s & Fang’s Classification, Performance Metrics and Measures, | |  |  |
| **I** |  | Speedup Performance Laws: Multiprocessor System and Interconnection Networks; |  | 6 |  |
|  |  | IEEE POSIX Threads: Creating and Exiting Threads, Simultaneous Execution of Threads, Thread Synchronization | |  |  |
|  |  | using Semaphore and Mutex, Canceling the Threads. |  |  |  |
|  |  | PIPELINING AND MEMORY HIERARCHY: Basic and Intermediate Concepts, Instruction Set Principle; | |  |  |
| **II** |  | ILP: Basics, Exploiting ILP, Limits on ILP; Linear and Nonlinear Pipeline Processors; Super Scalar and Super | | 7 |  |
|  | Pipeline Design; Memory Hierarchy Design: Advanced Optimization of Cache Performance, Memory Technology | |  |
|  |  |  |  |
|  |  | and Optimization, Cache Coherence and Synchronization Mechanisms. |  |  |  |
|  |  | THREAD AND PROCESS LEVEL PARALLEL ARCHITECTURE: Introduction to MIMD Architecture, | |  |  |
|  |  | Multithreaded Architectures, Distributed Memory MIMD Architectures |  |  |  |
| **III** |  | Shared Memory MIMD Architecture, Clustering, Instruction Level Data Parallel Architecture, SIMD Architecture, | | 7 |  |
|  |  | Fine Grained and Coarse Grained SIMD Architecture, Associative and Neural Architecture | |  |  |
|  |  | Data Parallel Pipelined and Systolic Architectures, Vector Architectures |  |  |  |
|  |  | Parallel Algorithms: PRAM Algorithms: Parallel Reduction, Prefix Sums, Preorder Tree Traversal, Merging two | |  |  |
|  |  | Sorted lists; |  |  |  |
| **IV** |  | Matrix Multiplication: Row Column Oriented Algorithms, Block Oriented Algorithms; Parallel Quick sort, Hyper | | 7 |  |
|  |  | Quick sort; |  |  |  |
|  |  | Solving Linear Systems: Gaussian Elimination, Jacobi Algorithm; Parallel Algorithm Design Strategies | |  |  |
|  |  | Developing Parallel Computing Applications: OpenMP Implementation in ‘C’: Execution Model, Memory Model; | |  |  |
| **V** |  | Directives: Conditional Compilation, Internal Control Variables, Parallel Construct, Work Sharing Constructs, | | 8 |  |
|  | Combined Parallel Work-Sharing Constructs, Master and Synchronization Constructs; Run-Time Library | |  |
|  |  |  |  |
|  |  | Routines: Execution Environment Routines, Lock Routines, Timing Routines; Simple Examples in ‘C’. Basics of MPI | |  |  |
|  |  | Total |  | 35 |  |

**Reference Books:**

1. Hawang & Briggs-Computer Architecture & Parallel Processing, Mc Graw Hill.
2. Subrata Das-Advanced Computer Architecture, Vol I & II.

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| **CP 405** | | **OPERATING SYSTEMS** | **C(L,T,P) = 3 (3,0,0)** |  |  |
|  |  |  |  |  |  |
| **Unit** |  | **Contents of the Course** |  | **Total Contact** |  |
|  |  |  |  | **Hrs.** |  |
|  |  | Introduction to Operating Systems, Operating system services, multiprogramming, time-sharing system, storage | |  |  |
|  |  | structures |  |  |  |
| **I** |  | System calls, multiprocessor system. |  | 6 |  |
|  | Basic concepts of CPU scheduling, Scheduling criteria, Scheduling algorithms, algorithm evaluation, multiple | |  |
|  |  |  |  |
|  |  | processor scheduling, real time scheduling |  |  |  |
|  |  | I/0 devices organization, I/0 devices organization, I/0 devices organization, I/0 buffering |  |  |  |
|  |  | Process concept, process scheduling, operations on processes |  |  |  |
|  |  | Threads, inter-process communication, precedence graphs |  |  |  |
| **II** |  | Critical section problem, semaphores, and classical problems of synchronization. |  | 6 |  |
|  |  | Deadlock problem, deadlock characterization, deadlock prevention, deadlock avoidance, deadlock detection, recovery | |  |  |
|  |  | from deadlock, Methods for deadlock handling. |  |  |  |
|  |  | Concepts of memory management, logical and physical address space |  |  |  |
| **III** |  | swapping, contiguous and non-contiguous allocation |  | 7 |  |
|  |  | paging, segmentation, and paging combined with segmentation |  |  |  |
| **IV** |  | Concepts of virtual memory, demand paging, page replacement algorithms |  | 7 |  |
|  | Allocation of frames, thrashing, demand segmentation. Security threads protection intruders-Viruses-trusted system | |  |
|  |  |  |  |
| **V** |  | Disk scheduling, file concepts, file access methods, allocation methods, directory systems, file protection, | | 8 |  |
|  | Introduction to distributed systems and parallel processing case study. |  |  |
|  |  |  |  |  |
|  |  | Total |  | 34 |  |
| **Reference Books:** | | |  |  |  |

1. A.S.Tanenbaum-Modern Operating Systems, Pearson Education Asia.
2. D.M.Dhamdhere-Operating Systems-A Concept based approach, Tata Mc-Graw Hills.
3. Achyut godble -Operating Systems, Tata Mc-Graw Hills.
4. Stallings-Operating System, Pearson.

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| **CP 406** | | **COMPILER CONSTRUCTION** | **C(L,T,P) = 4 (3,1,0)** |  |
|  |  |  |  |  |
| **Unit** |  | **Contents of the Course** |  | **Total** |
|  |  |  |  | **Contact Hrs.** |
|  |  | Compiler, Translator, Interpreter definition, Phase of compiler introduction to one pass & Multipass compilers, | |  |
| **I** |  | Bootstrapping, Review of Finite automata lexical analyzer, Input, buffering, Recognition of tokens | | 6 |
|  |  | Idea about LEX: A lexical analyzer generator, Error handling |  |  |
|  |  | Review of CFG Ambiguity of grammars, Introduction to parsing. Bottom up parsing Top down parsing techniques, | |  |
|  |  | Shift reduce parsing, Operator precedence parsing, Recursive descent parsing predictive parsers. | |  |
| **II** |  | LL grammars & passers error handling of LL parser. LR parsers, Construction of SLR, Conical LR & LALR parsing | | 7 |
|  |  | tables, parsing with ambiguous grammar. |  |  |
|  |  | Introduction of automatic parser generator: YACC error handling in LR parsers. |  |  |
|  |  | Syntax directed definitions; Construction of syntax trees, |  |  |
|  |  | L-attributed definitions, Top down translation. |  |  |
| **III** |  | Specification of a type checker, Intermediate code forms using postfix notation and three address code, | | 7 |
|  |  | Representing TAC using triples and quadruples, Translation of assignment statement. Boolean expression and control | |  |
|  |  | structures |  |  |
|  |  | Storage organization, Storage allocation, Strategies, Activation records, Accessing local and non local names in a | |  |
| **IV** |  | block structured language |  | 7 |
|  |  | Parameters passing, Symbol table organization, Data structures used in symbol tables |  |  |
|  |  | Definition of basic block control flow graphs, DAG representation of basic block, Advantages of DAG, | |  |
| **V** |  | Sources of optimization, Loop optimization, Idea about global data flow analysis, Loop invariant computation, | | 8 |
|  |  | Peephole optimization, Issues in design of code generator, A simple code generator, Code generation from DAG | |  |
|  |  | Total |  | 35 |

**Reference Books:**

1. A.V. Aho-Compilers principles, techniques and tools, Pearson Education Asia.
2. N.Wirth-Compiler Construction, Pearson Education Asia.
3. Charles N.Fischer-Crafting a Computer in C, Pearson Education Asia.

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| **CP 407** | | **ARTIFICIAL INTELLIGENCE** | **C(L,T,P) = 4 (3,1,0)** |  |  |
|  |  |  |  |  |  |
| **Unit** |  | **Contents of the Course** |  | **Total Contact** |  |
|  |  |  |  | **Hrs.** |  |
|  |  | Meaning and definition of artificial intelligence, Various types of production systems, Characteristics of production | |  |  |
|  |  | systems |  |  |  |
|  |  | Study and comparison of breadth first search and depth first search. Techniques, other Search Techniques like hill | | 6 |  |
|  |  | Climbing, Best first Search. |  |  |  |
|  |  | A\* algorithm, AO\* algorithms etc, and various types of control strategies |  |  |  |
|  |  | Knowledge Representation, Problems in representing knowledge, knowledge representation using propositional and | |  |  |
| **II** |  | predicate logic, comparison of propositional and predicate logic |  | 7 |  |
|  |  | Resolution, refutation, deduction, theorem proving, inferencing, monotonic and non-monotonic reasoning. | |  |  |
| **III** |  | Probabilistic reasoning, Baye's theorem, semantic networks scripts schemas, frames, conceptual dependency and | | 7 |  |
|  | fuzzy logic, forward and backward reasoning |  |  |
|  |  |  |  |  |
|  |  | Game playing techniques like minimax procedure, |  |  |  |
| **IV** |  | alpha-beta cut-offs etc, planning, Study of the block world problem in robotics, |  | 7 |  |
|  |  | Introduction to understanding and natural languages processing |  |  |  |
| **V** |  | Introduction to learning, Various techniques used in learning, introduction to neural networks, applications of neural | | 7 |  |
|  | networks, common sense, reasoning, some example of expert systems. |  |  |
|  |  |  |  |  |
|  |  | Total |  | 34 |  |

**Reference Books:**

1. E.Rich, K Knight-Artificial Intelligence, Tata McGraw Hills.
2. S.Russell, P.Norving-Artificial Intelligence-A Modern Approach, Pearson Education, Asia.
3. Thomas Dean-Artificial Intelligence-Theory & Practice, Pearson Education, Asia.
4. Alison Caursey - The Essence of Artificial Intelligence, Pearson Education, Asia.

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| **CP 408** | | **DISTRIBUTED SYSTEMS** | **C(L,T,P) = 3 (3,0,0)** |  |  |
|  |  |  |  |  |  |
| **Unit** |  | **Contents of the Course** |  | **Total Contact** |  |
|  |  |  |  | **Hrs.** |  |
|  |  | CHARACTERIZATION OF DISTRIBUTED SYSTEMS: Introduction, Examples of distributed Systems, Resource | |  |  |
|  |  | sharing and the Web Challenges. System |  |  |  |
|  |  | Models: Architectural models, Fundamental Models Theoretical Foundation for Distributed System: Limitation of | |  |  |
| **I** |  | Distributed system, absence of global clock, shared memory, Logical clocks, |  | 6 |  |
|  |  | Lamport’s & vectors logical clocks, Causal ordering of messages, global state, and termination. Distributed Mutual | |  |  |
|  |  | Exclusion: Classification of distributed mutual exclusion, requirement of mutual exclusion theorem, | |  |  |
|  |  | Token based and non token based algorithms, performance metric for distributed mutual exclusion algorithms | |  |  |
|  |  | DISTRIBUTED DEADLOCK DETECTION: system model, resource Vs communication deadlocks, deadlock | |  |  |
|  |  | prevention, avoidance, detection & resolution, centralized dead lock detection, distributed dead lock detection | |  |  |
|  |  | Path pushing algorithms, edge chasing algorithms. Agreement Protocols: Introduction System models, classification of | |  |  |
| **II** |  | Agreement Problem |  | 7 |  |
|  |  | Byzantine agreement problem, Consensus problem, Interactive consistency Problem, Solution to Byzantine Agreement | |  |  |
|  |  | problem |  |  |  |
|  |  | Application of Agreement problem, Atomic Commit in Distributed Database system |  |  |  |
|  |  | DISTRIBUTED OBJECTS AND REMOTE INVOCATION: Communication between distributed objects, Remote | |  |  |
|  |  | procedure call, Events and notifications, Java RMI case study. |  |  |  |
| **III** |  | SECURITY: Overview of security techniques, Cryptographic algorithms, Digital signatures Cryptography pragmatics, | | 7 |  |
|  | Case studies: Needham Schroeder, Kerberos, SSL & Millicent. |  |  |
|  |  |  |  |  |
|  |  | DISTRIBUTED FILE SYSTEMS: File service architecture, Sun Network File System, The Andrew File System, Recent | |  |  |
|  |  | advances |  |  |  |
|  |  | TRANSACTIONS AND CONCURRENCY CONTROL: Transactions, Nested transactions, Locks, Optimistic | |  |  |
|  |  | Concurrency control, Timestamp ordering, Comparison of methods for concurrency control. | |  |  |
| **IV** |  | DISTRIBUTED TRANSACTIONS: Flat and nested distributed transactions, Atomic Commit protocols, Concurrency | | 7 |  |
|  | control in distributed transactions, |  |  |
|  |  |  |  |  |
|  |  | Distributed deadlocks, Transaction recovery. Replication: System model and group communication, Fault - tolerant | |  |  |
|  |  | services, highly available services, Transactions with replicated data |  |  |  |
|  |  | DISTRIBUTED ALGORITHMS: Introduction to communication protocols, Balanced sliding window protocol, Routing | |  |  |
| **V** |  | algorithms, Destination based routing, |  | 8 |  |
|  | APP problem, Deadlock free Packet switching, Introduction to Wave & traversal algorithms, Election algorithm. | |  |
|  |  |  |  |
|  |  | CORBA CASE STUDY: CORBA RMI, CORBA services |  |  |  |
|  |  | Total |  | 34 |  |

**Reference Books:**

1. George Coulouris-Distributed Systems Concepts and Design, 3rd ed., Pearson Education Asia.
2. A.S. Tanenbaum-Distributed Systems Principles and Paradigms, Prentice Hall of India.
3. Darrel Ince-Developing Distributed and E-Commerce Applications, Addition Wesley.

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| **CP 409** | | **REAL TIME SYSTEMS** | **C(L,T,P) = 3 (3,0,0)** |  |  |
|  |  |  |  |  |  |
| **Unit** |  | **Contents of the Course** |  | **Total** |  |
|  |  |  |  | **Contact** |  |
|  |  |  |  | **Hrs.** |  |
|  |  | Introduction: Definition, Typical Real Time Applications: Digital Control, High Level Controls, Signal Processing etc., | |  |  |
|  |  | Release Times, Deadlines, and Timing Constraints, |  |  |  |
| **I** |  | Hard Real Time Systems and Soft Real Time Systems, Reference Models for Real Time Systems: Processors and | | 6 |  |
|  |  | Resources, Temporal Parameters of Real Time Workload |  |  |  |
|  |  | Periodic Task Model, Precedence Constraints and Data Dependency. |  |  |  |
|  |  | Real Time Scheduling: Common Approaches to Real Time Scheduling: Clock Driven Approach, Weighted Round | |  |  |
|  |  | Robin Approach, Priority Driven Approach, |  |  |  |
| **II** |  | Dynamic Versus Static Systems, Optimality of Effective-Deadline-First (EDF) and Least-Slack-Time-First (LST) | | 7 |  |
|  |  | Algorithms, Offline Versus Online Scheduling, |  |  |  |
|  |  | Scheduling Aperiodic and Sporadic jobs in Priority Driven and Clock Driven Systems |  |  |  |
|  |  | Resources Access Control: Effect of Resource Contention and Resource Access Control (RAC), Non-preemptive | |  |  |
| **III** |  | Critical Sections, Basic Priority-Inheritance and Priority-Ceiling Protocols |  | 7 |  |
|  | Stack Based Priority-Ceiling Protocol, Use of Priority-Ceiling Protocol in Dynamic Priority Systems, Preemption | |  |
|  |  |  |  |
|  |  | Ceiling Protocol, Access Control in Multiple-Unit Resources, Controlling Concurrent Accesses to Data Objects | |  |  |
|  |  | Multiprocessor System Environment: Multiprocessor and Distributed System Model, Multiprocessor Priority-Ceiling | |  |  |
|  |  | Protocol, |  |  |  |
| **IV** |  | Schedulability of Fixed-Priority End-to-End Periodic Tasks, Scheduling Algorithms for End-to-End Periodic Tasks, | | 7 |  |
|  |  | End-to-End Tasks in Heterogeneous Systems, Predictability and Validation of Dynamic Multiprocessor Systems, | |  |  |
|  |  | Scheduling of Tasks with Temporal Distance Constraints |  |  |  |
|  |  | Real Time Communication: Model of Real Time Communication |  |  |  |
| **V** |  | Priority-Based Service and Weighted Round- Robin Service Disciplines for Switched Networks | | 8 |  |
|  | Medium Access Control Protocols for Broadcast Networks, Internet and Resource Reservation Protocols, Real Time | |  |
|  |  |  |  |
|  |  | Protocols, Communication in Multicomputer System, An Overview of Real Time Operating Systems | |  |  |
|  |  | Total |  | 35 |  |

**Reference Books:**

1. W.S.Liu-Real-Time Systems, Pearson Education Asia.
2. Raymond A.Buhr-Introduction to Real-Time Systems, Pearson education Asia.
3. Alan Burns-Real-Time Systems and Programming Languages, Pearson Education.

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| **CP 410** | | **FAULT TOLERANT SYSTEM** | **C(L,T,P) = 3 (3,0,0)** |  |  |
|  |  |  |  |  |  |
| **Unit** |  | **Contents of the Course** |  | **Total** |  |
|  |  |  |  | **Contact Hrs.** |  |
|  |  | Basic Concepts: Failure and Faults, reliability and failurerate, relation between eligibility and Mean-time– Between | |  |  |
| **I** |  | failures, maintainability and availability, reliability of series and parallel systems, |  | 7 |  |
|  | Test Generation: Fault diagnosis of digital systems, Test generation for combinational logic circuits –conventional | |  |
|  |  |  |  |
|  |  | methods, Random testing, transition count testing and signature analysis.sd |  |  |  |
|  |  | Fault Tolerant Design: Basic concepts – static, dynamic, Hybrid, and self-purging redundancy, shift-over Modular | |  |  |
| **II** |  | Redundancy (SMR). Triple Modular redundancy, SMR. Reconfiguration, use of error correcting codes. | | 6 |  |
|  | Time redundancy, software redundancy, fail soft-operation, examples of practical fault tolerant systems, Introduction | |  |
|  |  |  |  |
|  |  | to fault Tolerant Design of VLSI Chips. |  |  |  |
|  |  | Self Checking Circuits: Design of Totally self-checking checkers, checkers using m-out of –n codes, Berger codes and | |  |  |
| **III** |  | low cost residue code. Self-checking sequential Machines, partially self checking circuits. |  | 8 |  |
|  | Fail Safe Design: Strongly fault secure circuits, failsafe Design of sequential circuits using partition theory and Berger | |  |
|  |  |  |  |
|  |  | codes, totally self-checking PLA design. |  |  |  |
|  |  | Design for Testable Combination Logic circuits: Basic concepts of test ability, controllability and observability. | |  |  |
| **IV** |  | The read-muller expansion technique, three level OR-AND-OR design, use of control logic and syndrome-testable | | 8 |  |
|  |  | design. |  |  |  |
|  |  | Design of Testable Sequential circuits The scan-path technique – level sensitive scan design (LSSD) | |  |  |
| **V** |  | Random Access scan technique, built-in-test, built-in-test of VLSI chips, design for autonomous self-Test, Designing | | 7 |  |
|  |  | Testability into logic Boards. |  |  |  |
|  |  | Total |  | 36 |  |

**Reference Books:**

1. LALA: Digital systems design using PLD’s PHI 1990.
2. N. N. Biswas: Logic Design theory, PHI 1990.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CP 411** | | **MULTIMEDIA SYSTEMS** | **C(L,T,P) = 3 (3,0,0)** |  |  |
|  |  |  |  |  |  |
| **Unit** |  | **Contents of the Course** |  | **Total Contact** |  |
|  |  |  |  | **Hrs.** |  |
|  |  | Introduction to Multimedia, Multimedia Information, Multimedia Objects, Multimedia in business and work. | |  |  |
|  |  | Convergence of Computer |  |  |  |
| **I** |  | Communication and Entertainment products and Stages of Multimedia Projects, Multimedia hardware, Memory & | | 6 |  |
|  | storage devices, Communication devices, |  |  |
|  |  |  |  |  |
|  |  | Multimedia software's, presentation tools, tools for object generations, video, sound, image capturing, authoring tools, | |  |  |
|  |  | card and page based authoring tools |  |  |  |
| **II** |  | Multimedia Building Blocks Text |  | 7 |  |
|  | Sound MIDI, Digital Audio, audio file formats, MIDI under windows environment Audio & Video Capture. | |  |
|  |  |  |  |
|  |  | Data Compression Huffman Coding, Shannon Fano Algorithm, Huffman Algorithms |  |  |  |
| **III** |  | Adaptive Coding, Arithmetic Coding Higher Order Modeling. Finite Context Modeling, Dictionary based Compression, | | 7 |  |
|  |  | Sliding Window Compression, LZ77, LZW compression, Compression, Compression ratio loss less & lossy compression | |  |  |
| **IV** |  | Speech Compression & Synthesis Digital Audio concepts |  | 6 |  |
|  | Sampling Variables, Loss less compression of sound, loss compression & silence compression. | |  |
|  |  |  |  |
|  |  | Images: Multiple monitors, bitmaps, Vector drawing, lossy graphic compression, image file formatic animations Images | |  |  |
|  |  | standards |  |  |  |
| **V** |  | JPEG Compression, Zig Zag Coding, Multimedia Database. Content based retrieval for text and images, | | 8 |  |
|  | Video: Video representation, Colors, Video Compression, MPEG standards, MHEG Standard Video Streaming on net, | |  |
|  |  |  |  |
|  |  | Video Conferencing, Multimedia Broadcast Services, Indexing and retrieval of Video Database, recent development in | |  |  |
|  |  | Multimedia |  |  |  |
|  |  | Total |  | 34 |  |

**Reference Books:**

1. Ralf Steinmetz & Klara Nahrstedt - Multimedia: computing, Communication & Applications, Pearson Education Asia.
2. Prabhat K.Andleigh-Multimedia System Design, Prentice Hall, Iran Thaukrar.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **CP 414** | | **EMBEDDED SYSTEMS** | **C(L,T,P) = 3 (3,0,0)** |  |
|  |  |  |  |  |
| **Unit** |  | **Contents of the Course** |  | **Total** |
|  |  |  |  | **Contact** |
|  |  |  |  | **Hrs.** |
|  |  | Overview of Embedded System: Embedded System, Categories and Requirements of Embedded Systems | |  |
| **I** |  | Challenges and Issues in Embedded Software Development, Applications of Embedded Systems in Consumer | | 6 |
|  |  | Electronics, Control System, Biomedical Systems, Handheld computers, Communication devices | |  |
|  |  | Embedded Hardware & Software Development Environment: Hardware Architecture |  |  |
| **II** |  | Micro- Controller Architecture, Communication Interface Standards, Embedded System Development Process, | | 7 |
|  |  | Embedded Operating systems Types of Embedded Operating systems |  |  |
|  |  | Design quality and Microcontroller: Quality matrix, software and hardware, Estimation |  |  |
| **III** |  | 8 Bit microcontrollers Architecture, on chip peripherals, instruction set/programming of Intel MCS51 family (8 bit ) | | 7 |
|  |  | Inter facing of 8051 with LCD, ADC, sensors, stepper motor, key board, DAC, memory |  |  |
|  |  | Real Time & Database Applications: Real- Time Embedded Software Development, Sending a Message over a Serial | |  |
| **IV** |  | Link, Simulation of a Process Control System Controlling an Appliance from the RTLinux System, Embedded Database | | 7 |
|  |  | Applications using examples like Salary Survey, Energy Meter Readings |  |  |
|  |  | Programming Languages for Embedded Systems: Tools for building embedded systems - with case studies. Microchip | |  |
| **V** |  | PIC16 family PIC16F873 processor features architecture memory organization register file map I/O ports PORTA - | | 8 |
|  |  | PORTB PORTC Data EEPROM and flash program memory Asynchronous serial port SPI mode I2C mode | |  |
|  |  | Total |  | 35 |

**Reference Books:**

1. William Stallings: Embedded System (PHI, 5th Ed.)
2. James Martin: semiconductor in computer (PHI, 3rd Ed.)

|  |  |  |  |  |  |
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| **CP 415** | | **NEURAL NETWORK** | **C(L,T,P) = 3 (3,0,0)** |  |  |
|  |  |  |  |  |  |
| **Unit** |  | **Contents of the Course** |  | **Total Contact** |  |
|  |  |  |  | **Hrs.** |  |
| **I** |  | Neural Networks and Fuzzy Systems: Neural and Fuzzy Machine Intelligence, Fuzziness as Multivalence, the Dynamical - | | 6 |  |
|  | Systems Approach to Machine Intelligence, and Intelligent Behavior as Adaptive Model- Free Estimation. (11) | |  |
|  |  |  |  |
| **II** |  | Neural Dynamics I: Activations and Signals, Neurons as Functions, Signal Monotonicity, Biological Activations and | | 7 |  |
|  | Signals, Neuron Fields, Neuronal Dynamical Systems, Common Signal Functions, Pulse-Coded Signal Functions | |  |
|  |  |  |  |
|  |  | Neuronal Dynamics II: Activation Models, Neuronal Dynamical Systems, Additive Neuronal Dynamics, Additive | |  |  |
| **III** |  | Neuronal Feedback, Additive Bivalent Models, BAM Connection Matrices, Additive Dynamic and the Noise-Saturation | | 8 |  |
|  |  | Dilemma, General Neuronal Activations: Cohen-Grossberg and Multiplicative Models |  |  |  |
|  |  | Synaptic Dynamics I: Unsupervised Learning, Learning as Encoding, Change, and Quantization, Four Unsupervised | |  |  |
| **IV** |  | Learning Laws, Probability Spaces and Random Processes, Stochastic Unsupervised Learning and Stochastic Equilibrium, | | 7 |  |
|  |  | Signal Hebbian Learning, Competitive Learning, Differential Hebbian Learning, Differential Competitive Learning. | |  |  |
|  |  | Synaptic Dynamics II: Supervised Learning, Supervised Function Estimation, Supervised Learning as Operant | |  |  |
| **V** |  | Conditioning, Supervised Learning as Stochastic Pattern Learning with known Class Memberships, Supervised Learning | | 7 |  |
|  |  | as stochastic Approximation, The Back propagation Algorithm. |  |  |  |
|  |  | Total |  | 35 |  |

**Reference Books:**

1. An Introduction to Neural Networks, K Gurney, Routledge, 1997, Non-mathematical introduction
2. Neural Networks: A Comprehensive Foundation, S Haykin , Prentice Hall, 1999, Very comprehensive and up-to-date, but heavy in maths
3. Neural Networks for Pattern Recognition, C M Bishop, Oxford University Press, 1995

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CP 420** | | **PARALLEL COMPUTING** | **C(L,T,P) = 3 (3,0,0)** |  |  |
|  |  |  |  |  |  |
| **Unit** |  |  | **Contents of the Course** | **Total** |  |
|  |  |  |  | **Contact Hrs.** |  |
|  |  | SCALABILITY AND CLUSTERING: Evolution of Computer Architecture – Dimensions of Scalability – Parallel | |  |  |
| **I** |  | Computer Models – Basic Concepts Of Clustering – Scalable Design Principles – Parallel Programming Overview – | | 6 |  |
|  | Processes, Tasks and Threads – Parallelism Issues – Interaction / Communication Issues – Semantic Issues In Parallel | |  |
|  |  |  |  |
|  |  | Programs. |  |  |  |
|  |  | ENABLING TECHNOLOGIES :System Development Trends – Principles of Processor Design – Microprocessor | |  |  |
| **II** |  | Architecture Families – Hierarchical Memory Technology – Cache Coherence Protocols – Shared Memory Consistency – | | 7 |  |
|  |  | Distributed Cache Memory Architecture – Latency Tolerance Techniques – Multithreaded Latency Hiding. | |  |  |
| **III** |  | SYSTEM INTERCONNECTS: Basics of Interconnection Networks – Network Topologies and Properties – Buses, | | 7 |  |
|  | Crossbar and Multistage Switches, Software Multithreading – Synchronization Mechanisms | |  |
|  |  |  |  |
| **IV** |  | PARALLEL PROGRAMMING: Paradigms And Programmability – Parallel Programming Models – Shared Memory | | 6 |  |
|  | Programming. |  |  |
|  |  |  |  |  |
| **V** |  | MESSAGE PASSING PROGRAMMING: Message Passing Paradigm – Message Passing Interface – Parallel Virtual | | 6 |  |
|  | Machine |  |  |
|  |  |  |  |  |
|  |  | Total |  | 32 |  |

**Reference Books:**

1.Kai Hwang and Zhi Wei Xu, “Scalable Parallel Computing”, Tata McGraw-Hill, New Delhi, 2003

**CP 451** **.NET LAB** **C(L,T,P) = 2(0,0,2+2)**

1. Web Form Fundamentals
2. The Anatomy of an Asp.Net Application, Server Controls, HTML Control
3. Access, Page Class, Application Events, Asp.Net Configuration
4. Web Controls Web Controls Basics, Web Control Classes, List Controls, Table Controls,
5. Web Controls Event and auto post back
6. State Management
7. View State, Transferring Information between Pages, Cookies, Session State,
8. Session State Configuration, Application State
9. Rich Controls
10. Calendar, AdRotator, Multiple Views
11. Styles, Themes, and Master Pages
12. Style sheets, Themes, Skins, Master Pages, Content

**CP 452** **COMPILER LAB** **C(L,T,P) = 2 (0,0,2+2)**

1,2 Write a Program to identify data storage statements in an 8086 assembly language program and estimate the size of data segment.

1. Write a program to identify macro definitions in an assembly language program.

4,5. Extend the above program to implement simple and recursive macro expansion.

6. Write a program to process ‘include’ and ‘define’ macro in C language.

7, 8 Write a program to parse source code string of C-language and identify token in terms of keywords and identifiers.

1. Construct parse tree of arithmetic statements in C language program.
2. Write a program to optimize the source program for ’operator strength reduction’, ‘dead code elimination’ and frequency reduction’ transformation.

11, 12 Design a simple high level language containing arithmetic and logic operations pointers, branch and loop instructions. Write its lexical analyzer using lex.

**CP 453** **MS & X-WINDOWS LAB** **C(L,T,P) = 2 (0,0,2+2)**

1. To understand x-windows, x-lib, x-toolkit and x network protocol and learn it’s commend line argument. Programs in C/C++ language.
2. Write a program to establish connection with x server and get the sender and protocol information.
3. Using X library of the server, write a program to create a new window of a given size, title, border, foreground and background colors. 4-5 To implement keyboard event handling/marking using x library.

6-7 To implement mouse event handling/marking using x library and interface with windows managers and drawing applications.

1. To implement a multiple windows application.

9-10 To implement various drag and drop based GUI components in Visual Basic. 11-12 To implement various drag and drop based GUI components in Motif and Lesstif.

**CP 454** **ADVANCE COMPUTER ARCHITECTURE LAB** **C(L,T,P) = 2 (0,0,2+2)**

This lab will be based on assembly programming on of RISC processor simulator SPIM. SPIM simulator is available at site

SPIM exercises

1. Read an integer from the keyboard and print it out if (n => n\_min AND n <= n\_max).
2. Read an integer from the keyboard and print out the following as per switch-case statement Switch (n)

{n <= 10 print "not a lot" n == 12 print "a dozen"

n == 13 print "a baker's dozen" n == 20 print "a score"

n >= 100 print "lots and lots" n! = 42 print "integer"

otherwise print "you have the answer!”}

1. Read a string from the keyboard and count the number of letters. Use the equivalent of following for loop to count number of chars. for (s1=0; str [s1] != '\n'; ++s1)
2. Print out a line of characters using simple procedure call.
3. Print out a triangle of characters using recursive procedure call.
4. Print factorial of a number using recursion.
5. Print reverse string after reading from keyboard.
6. Print a string after swapping case of each letter.
7. Print an integer in binary and hex.
8. Implement bubble sort algorithm.
9. Print Pascal Triangle of base size 12.
10. Evaluate and print Ackerman function.
11. Write a Program onOPEMP implantation
12. WAP on thread synchronization
13. WAP on Simple Pipelining
14. Program on Hyper Quick Sort
15. Program on Timing Routines
16. Program on Lock Routines

**CP 456** **NETWORK SYSTEM SECURITY LAB LAB** **C(L,T,P) = 1 (0,0,2)**

1. Write a Program in C++ to implement Rail Fence Technique
2. Write a Program in C++ to encrypt & decrypt a text message using stream cipher.
3. Write a Program in C++ to encrypt & decrypt a text message using block cipher.
4. Write a Program in C++ to encrypt & decrypt a text/document file.
5. Write a Program in C++ to implement fiestel Cipher model.
6. Write a Program in C++ to implement Diffie- Hellman Key Exchange.
7. Write a Program in C++ to implement Hashing Techniques.
8. Write a Program in C++ to implement RSA Algorithm.
9. Write a Program in C++ to implement enveloping of keys
10. Write a Program in C++ to implement Stegnography
11. Write a Program in C++ to implement

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| **CP 501 `** | | **ADVANCED MULTIMEDIA TECHNOLOGY** | **C(L,T,P) = 3 (3,0,0)** |  |  |
|  |  |  |  |  |  |
| **Unit** |  | **Course Contents** |  | **Total** |  |
|  |  |  |  | **Contact** |  |
|  |  |  |  | **Hrs.** |  |
| I | An Introduction –  [Multimedia applications](http://www.indiastudychannel.com/resources/35401-CS-GRAPHICS-AND-MULTIMEDIA-Syllabus-Anna.aspx) – Multimedia System Architecture – Evolving technologies for Multimedia – | | | **7** |  |
|  | Defining objects for Multimedia systems – Multimedia Data interface standards – Multimedia Databases. | | |  |  |
| II | Compression & Decompression – Data & File Format standards – Multimedia I/O technologies - Digital voice and audio – | | | **8** |  |
|  | video image and animation – Full motion video – Storage and retrieval Technologies. | |  |  |  |
| III | Multimedia Authoring &  [User Interface](http://www.indiastudychannel.com/resources/35401-CS-GRAPHICS-AND-MULTIMEDIA-Syllabus-Anna.aspx) – Hypermedia messaging - Mobile Messaging – Hypermedia message component – | | | **8** |  |
|  | creating Hypermedia message – Integrated multimedia message standards – Integrated  [Document management](http://www.indiastudychannel.com/resources/35401-CS-GRAPHICS-AND-MULTIMEDIA-Syllabus-Anna.aspx) – Distributed | | |  |  |
|  | Multimedia Systems. | |  |  |  |
| IV | Multimedia Standards, Mpeg 1, Mpeg - 2 Mpeg 4 Mpeg 7 ITU – T ,Multimedia Communications over ATM Networks & IP | | | **6** |  |
|  | Network, Mobile Networks & Broad Casting | |  |  |  |
| V | Multimedia QoS Protocols, Architecture & issues for distributed Multimedia Systems.Protocols Multimedia Systems: Video | | | **6** |  |
|  | on Demand, Video Conference | |  |  |  |
|  | Total |  |  | **35** |  |
|  |  |  |  |  |

**Text. Book:**

1. Donald Hearn and M.Pauline Baker, “Computer Graphics C Version”, Pearson Education, 2003.

(UNIT I : Chapters 1 to 6; UNIT 2: Chapter 9 – 12, 15, 16)

1. Prabat K Andleigh and Kiran Thakrar, “Multimedia Systems and Design”, PHI, 2003. (UNIT 3 to 5)
2. Multimedia Communication by K.R. Rao, Zoran J Boj kovic

**Reference Book:**

1. Judith Jeffcoate, “Multimedia in practice technology and Applications”, PHI,1998.
2. Foley, Vandam, Feiner, Huges, “Computer Graphics: Principles & Practice”, Pearson Education, second edition 2003.
3. Multimedia Systems by Chapman

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **CP 502** | | **SOFTWARE QUALITY ASSURANCE & CERTIFICATION** | **C(L,T,P) = 3 (3,0,0)** | |
|  |  |  |  |  |
| **Unit** |  | **Course Contents** |  | **Total** |
|  |  |  |  | **Contact** |
|  |  |  |  | **Hrs.** |
| I |  | Concepts and Overview: Concepts of Software Quality, Quality Attributes, Software Quality Control and Software Quality | | **7** |
|  |  | Assurance, Evolution of SQA, Major SQA activities, Major SQA issues, Zerodefect Software.Software Quality Assurance: | |  |
|  |  | The Philosophy of Assurance, The Meaning of Quality, TheRelationship of Assurance to the Software Life-Cycle, SQA | |  |
|  |  | Techniques. |  |  |
| II |  | Tailoring the Software Quality Assurance Program: Reviews, Walkthrough, Inspection, andConfiguration |  | **7** |
|  |  | Audits.Evaluation: Software Requirements, Preliminary design, Detailed design, Coding and Unit Test,Integration and | |  |
|  |  | Testing, System Testing, types of Evaluations. |  |  |
| III |  | Configuration Management: Maintaining Product Integrity, Change Management, Version Control,Metrics, Configuration | | **8** |
|  |  | Management Planning.Error Reporting: Identification of Defect, Analysis of Defect, Correction of Defect, Implementation | |  |
|  |  | of Correction, Regression Testing, Categorization of Defect, Relationship of Development Phases. |  |  |
| IV |  | Trend Analysis: Error Quality, Error Frequency, Program Unit Complexity, Compilation Frequency. Corrective Action as to | | **6** |
|  |  | Cause: Identifying the Requirement for Corrective Action, Determining theAction to be Taken, Implementing the | |  |
|  |  | Correcting the corrective Action, Periodic Review of Actions Taken |  |  |
| V |  | Traceability, Records, Software Quality Program Planning, Social Factors: Accuracy, Authority, |  | **7** |
|  |  | Benefit, Communication, Consistency, and Retaliation. |  |  |
|  |  | Total |  | **35** |
| **Text:** | |  |  |  |

1. Robert Dunn, “Software Quality Concepts and Plans”, Prentice-Hall, 1990.
2. Alan Gillies, “Software Quality, Theory and Management”, Chapman and Hall, 1992.

**Reference:**

1. Michael Dyer, “The Cleanroom approach to Quality Software Engineering”, Wiley & Sons,1992.
2. Daniel Freedman, Gerald Weinberg, “Handbook of Walkthroughts, Inspections and Technical Reviews”, Dorset House Publishing, 1990
3. Tom Gilb, “Principles of Software Engineering Management”, Addison-Wesley, 1988.
4. Tom Gilb, Dorothy Graham, “Software Inspection” Addison-Wesley, 1993.
5. Watts Humphrey, “Managing the Software Process”, Addison-Wesley, 1990.
6. Watts Humphrey, “A Discipline for Software Engineering”, Addison-Wesley, 1995.
7. Arthur Lowell, “Improving Software Quality An Insiders guide to TQM”, 1993, Wiley &Sons.

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| --- | --- | --- | --- |
| **IT 501 MOBILE & SATELLITE COMMUNICATION** | | **C3 L3 T0 P0** |  |
|  |  |  |  |
| **Units** | **Course Contents** |  | **Total** |
|  |  |  | **Contact** |
|  |  |  | **Hrs.** |
| 1 | **Wireless Communication:** Introduction**,** Cellular revolution, Global Cellular Network, Broad band and troubles with | | 7 |
|  | wireless. |  |  |
|  | **Cellular Wireless networks:** Principles of Cellular networks, First generation analog Second generation TDMA and Third | |  |
|  | generation systems |  |  |
|  | **Cordless Systems And Wireless Local Loops:** Cordless systems, WLL and IEEE 802. 16 Fixed Broadband Wireless Access | | 7 |
| 2 | standards. |  |  |
|  | **Mobile IP and Wireless Access Protocol:** Internet Control Message Protocol and Message Authentication, WAP and other | | 7 |
|  | protocols for internet access. Data transmission in GSM and UMTS, TCP in wireless environment, multi-user detection and its | |  |
| 3 | performance analysis. Blue-tooth and other wireless networks, system comparison. | |  |
|  | **Broad Cast Systems:** Overview, Cyclic repetition of data, Digital audio broadcasting-mobile object transfer protocol. Digital | | 7 |
| 4 | video broadcasting, **Wireless LAN:** Introduction, **Bluetooth-**Introduction |  |  |
| 5 | **SATELLITE COMMUNICAITON**: Introduction, Orbital parameters launching systems, Orbital mechanics and launching, | | 7 |
|  | earth station and satellite sub systems, Transponder and utilization, Satellite link design, Frequency Reuse and polarization. | |  |
|  | Earth station design and relay links, Multiplexing and multiple Access techniques. Introduction to spread spectrum, GEO, | |  |
|  | LEO and MEO satellites, Satellite link: design and analysis, multiplexing techniques, multiple accesses for satellite links: | |  |
|  | FDMA, TDMA CDMA & DAMA, propagation effects, DBS-TV, GPS. VSAT: Network architecture, access control protocol | |  |
|  | & link analysis, Mobile Satcom. Routing, Localization and Handover. |  |  |

**Reference Books:**

1. Mobile & Cellular Telecommunication by W.C.Y Lee. McGrawhill
2. Wireless Communications Principles & Practices by T. S Rappaport, IEEE Press
3. Wireless & Mobile Communication Systems by D.P Agarwal & Qing Anzen, Thomson Press
4. Satellite Communications by Tri. T. Ha .
5. Wireless Communications and Networks, William Stallings, Pearson Education.
6. Mobile Communications, John Schiller, Pearson Education.
7. The Wireless Application Protocol, Sandeep Singhal and Thomas Bridgman, Pearson Education.

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| **EC 210** | | **TELECOM ENGG. FUNDAMENTALS** | **C(L,T,P) = 4 (3,1,0)** | |  |
|  |  |  |  |  |  |
| **Unit** |  | **Contents of the Course** |  | **Total** |  |
|  |  |  |  | **Contact** |  |
|  |  |  |  | **Hrs.** |  |
|  |  | **INTRODUCTION** :- Electromagnetic Spectrum, Frequency Spectrum-Bandwidth-Allocation, Time domain and | |  |  |
|  |  | Frequency domain analysis |  |  |  |
| **I** |  | **TRANSMISSION MEDIA**:- Twisted pair, UTP cables, Coaxial and optical fiber cables, wireless, microwave and | | 8 |  |
|  | satellite transmission |  |  |
|  |  |  |  |  |
|  |  | **DATA TRANSMISSION: -** Transmission impairments. Serial and parallel transmission, Simplex, half duplex or full | |  |  |
|  |  | duplex transmission mode. |  |  |  |
|  |  | **DATA ENCODING** :- Modulation (ASK, FSK and PSK, PCM, PAM, Delta Modulations), Line coding (NRZ-L, | |  |  |
| **II** |  | NRZ–I , Bipolar AMI, Manchester and differential Manchester), |  | 8 |  |
|  |  | **MULTIPLEXING**:- FDM, Synchronous and Statistical TDM |  |  |  |
|  |  | **DATA LINK LAYER**: Channel allocation problem, pure and slotted ALOHA Protocols, Persisted And Non-Persisted | |  |  |
|  |  | CSMA Collision Free Protocols, Digital Cellular Radio and CDMA |  |  |  |
| **III** |  | Logical Link Sub Layer, MAC Sub layer. |  | 6 |  |
|  |  | Brief Introduction: Frame Relay, PPP |  |  |  |
|  |  | **PROTOCOL** :- OSI & TCP/IP Protocol Architecture |  |  |  |
|  |  | **SWITCHING NETWORKS**: Circuit switching Networks, Space and Time division switching, Routing circuit | |  |  |
| **IV** |  | switched networks, control signaling packet switching principles, fixed, flooding and adaptive routing strategies: X.25 & | | 6 |  |
|  |  | X.28 protocols Brief introduction: ISDN,ADSL |  |  |  |
|  |  | **NETWORK DEVICES**: Gateway, Router, Bridge, Switch, Hub, Repeater, Multilayer Switch, Protocol Converter, | |  |  |
| **V** |  | Router, Proxy, Firewall, Multiplexer, Network Card, Modem. |  | 7 |  |
|  |  | **NETWORK TECHNOLOGY**: DSL, GSM, Bluetooth, Infrared. |  |  |  |
|  |  | **Total** |  | 35 |  |

**Reference Books:**

1. William Stallings: Data and Computer Communications (PHI, 5th Ed.)
2. James Martin: Telecommunication and the Computer (PHI, 3rd Ed.)

|  |  |  |  |  |  |
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| **EC 221: ELECTRONIC DEVICES & CIRCUITS** | |  | **C(L,T,P) = 4 (3,1,0)** |  |  |
|  |  |  |  |  |  |
| **Unit** |  | **Contents of the Course** |  | **Total Contact** |  |
|  |  |  |  | **Hrs.** |  |
| **I** | Diode circuits: Diode as a circuit. Element, load line concept | |  | 8 |  |
| Clipping & clamping circuits, voltages multipliers. | |  |  |
|  |  |  |  |
| **II** | Devices: construction, characteristics and | working principles of the following | devices. Diodes BJT, JFET, | 7 |  |
| MOSFET, UJT, photo diodes, LEDs, photo transistorsSolar cells. Thermistor, LDR | |  |  |
|  |  |  |  |
|  | Transistors: transistor characteristics, current components, current gains. Alpha and vita operating point. High bride | | |  |  |
|  | model, h- parameter equivalent circuits |  |  |  |  |
| **III** | CE, CB and Cc configuration Dc and ac analysis of CE, CC and CB amplifiers | |  | 7 |  |
| Evers- moll model. Biasing and stabilization techniques. Thermal run away, thermal stability. Equivalent circuits | | |  |
|  |  |  |
|  | and blessing of JFETs and MOSFETs |  |  |  |  |
|  | Low frequency CS and CD JFET amplifiers. FET as a voltage variable resistor. | |  |  |  |
|  | Small signal amplifiers at low frequency: analysis of BJT and FET, dc and rc coupled amplifiers Frequency | | |  |  |
| **IV** | response |  |  | 6 |  |
| Midband gain, gains at low and high frequency. Analysis of dc and differential amplifiers, Millers’ theorem | | |  |
|  |  |  |
|  | Cascading transistor amplifiers, Darlington and cascaded circuits. Emitter and source followers. | | |  |  |
| **V** | Oscillators: concept of feedback classification, criterion for oscillation. Tuned collector, Hartley Colpitts | | | 6 |  |
| Rc- phase shift, Wein bridge and crystal oscillators, astable, monostable and bistable multivibrators. Schmitt trigger | | |  |
|  |  |  |
|  | Total |  |  | 34 |  |

**Reference Books:**

1. J.Millman & C.C. Halkias :Integrated Electronics, McGraw Hill
2. Millman Grabel: Microelectronics, McGraw Hill.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **EC 212** | | **MICROPROCESSOR AND INTERFACES** | **C(L,T,P) = 4 (3,1,0)** |  |  |
|  |  |  |  |  |  |
| **Unit** |  | **Contents of the Course** |  | **Total Contact** |  |
|  |  |  |  | **Hrs.** |  |
| **I** |  | Introduction to Micro Computer Systems: Microprocessors, microcontroller and microcomputer devices | | 6 |  |
|  | Machine and assembly language, Bus concept. Architecture & Pinout of 8085A |  |  |
|  |  |  |  |  |
|  |  | Assembly Language and Programming in 8085: Instruction set, Program structures (sequential, conditional, | |  |  |
| **II** |  | (iterative) |  | 7 |  |
|  |  | Macros and subroutines, Stack, Counter and timing delay, interrupt structure and its programming | |  |  |
|  |  | Peripherals and their interfacing with 8085-I: Memory Interfacing, Interfacing I/O ports |  |  |  |
| **III** |  | Data transfer schemes (Synchronous, asynchronous, interrupt driven), Architecture & interfacing of PPI 8255, | | 7 |  |
|  |  | Data Converters and Timer 8254 |  |  |  |
|  |  | Peripherals and their interfacing with 8085-II: |  |  |  |
| **IV** |  | Architecture & interfacing of- DMA controller 8257, |  | 8 |  |
|  | interrupt Controller 8259A, USART 8251, Level Converters MC 1488 and MC 1489 |  |  |
|  |  |  |  |  |
|  |  | Current loop, RS 232 C and RS 422 A |  |  |  |
|  |  | Comparative study of 8085 A, 8086 and 8088 (Pinout, internal architecture, timing diagrams) | |  |  |
| **V** |  | Instruction format and addressing modes – Data and Branch related. Features of Pentium processor, MMX and | | 7 |  |
|  |  | Dual core processor |  |  |  |
|  |  | Total |  | 35 |  |

**Reference Books:**

1. Gaonkar-8085 Programming, Penram Press.
2. A.P. Mathur-Introduction to Microprocessors, Tata Mc-Graw-Hill.
3. Antanakos-Introduction to Intel Family Microprocessors, Pearson Education.
4. Gilmore-Microprocessors Principles and Applications, Tata Mc-Graw Hill.
5. B.Ram-Fundamentals of Microprocessors & Micro Computers, Dhanpat Rai Pub.
6. Ray and Bhurchandi-Intel Microprocessors, Tata-Mc-Graw Hill.

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| --- | --- | --- | --- | --- | --- |
| **EC 213** | | **MEDICAL ELECTRONICS** | **C(L,T,P) = 3 (3,0,0)** |  |  |
|  |  |  |  |  |  |
| **Unit** |  | **Contents of the Course** |  | **Total Contact** |  |
|  |  |  |  | **Hrs.** |  |
|  |  | Introduction of Human Physiology: **Nerve physiology. Functions of nerves and myoneural junctions**. | |  |  |
|  |  | Membranae and action potential of nerves. |  |  |  |
| **I** |  | Function of skeletal and smooth muscle and its rhythmic contraction, cardiac muscle. |  | 8 |  |
|  |  | Blood flow system, Arterial pressure Mechanism of respiration. |  |  |  |
|  |  | COMPUTER NETWORK S function of spinal cord and cord reflexes. Myo-electrical control of paralyzed muscles. | |  |  |
|  |  | ECG, EMG and EEG: Principle & Means of recording non-electrical biological parameters. | |  |  |
| **II** |  | Signals from micro-electrodes and slat bridge Use of field electric devices as electrometers,driven shield,photon | | 7 |  |
|  |  | coupled amplifier. Artifacts |  |  |  |
|  |  | Measurement of biological events : Electronic methods of measuring blood pressure, skin & systemic body | |  |  |
| **III** |  | Temperature |  | 7 |  |
|  |  | Pulse rate and coronary care monitoring. |  |  |  |
|  |  | Biomedical Instruments: Electronic pace makers. Implantable power source. |  |  |  |
|  |  | Defibrillators. Micro power transmitter for telemeter binominals. Special characteristics of CRO in bio-medical | |  |  |
| **IV** |  | applications Surgical and therapeutic diathermy units. |  | 6 |  |
|  |  | Physiological simulators. Basic diagnostic X-ray units. Introduction to patient monitoring and intensive care unit. | |  |  |
|  |  | Interference and patient safety. Anaesthetic explosion and fires. |  |  |  |
| **V** |  | Miscellaneous : Introduction to heart Lung machines, CT scanners |  | 6 |  |
|  | Ultrasound sonography and Doppler measurements, NMR & PET Scans. Use of lasers in medical applications. | |  |
|  |  |  |  |
|  |  | Total |  | 34 |  |

**Reference Books:**

1. Webster, J.G.: Medical Instrumentation, Application and Design, John Willey and Sons.
2. Jacobson, B.Wester, J.G.: Medical and Clinical Engineering Prentice Hall, International.
3. Cromwell: Biometical Instrumentation and Measurements.et al. Prentice Hall, International.
4. R.S. Khandipur: Handbook of Biomeideal Instrumentation. Tata McGraw Hill.
5. Carr: Introduction to Biomedical Equipmens, Pearson Education.

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| **EC 223: DIGITAL ELECTRONICS** | | **C(L,T,P) = 3 (3,0,0)** |  |  |
|  |  |  |  |  |
| **Unit** | **Contents of the Course** |  | **Total** |  |
|  |  |  | **Contact Hrs.** |  |
|  | Number systems, Coding Schemes: BCD, Excess-3, Grey, r's and (r-l)’s complement. Boolean Algebra, Fundamental | |  |  |
| **I** | theorems, Simplifications of Boolean expressions |  | 7 |  |
|  | Logic gates and their truth table. Gate implementation and Truth table of Boolean functions. | |  |  |
|  | Standard forms of Boolean functions. Minterm and Maxterm designation of functions. Simplification of functions on | |  |  |
|  | Karnaugh maps |  |  |  |
| **II** | Incompletely specified functions. Cubical representation of Boolean functions and determination of prime implicants | | 7 |  |
| Selection of an optimal set of prime implicants. Multiple output circuits and map minimization of multiple output | |  |
|  |  |  |
|  | Circuits |  |  |  |
|  | Tabular determination of multiple output prime implicants. |  |  |  |
| **III** | Combinational circuits – Adder, subtractor, encoder, coder |  | 6 |  |
| Multiplexer. Design of Combinational circuit using Multiplexers. |  |  |
|  |  |  |  |
|  | Multiplexer. Design of Combinational circuit using Multiplexers. Flip Flops: RS, J-K, D, T. Sequential circuits. | |  |  |
|  | Clock, pulse and level mode sequential circuits Analysis and design of sequential circuits |  |  |  |
| **IV** | Synthesis of state diagrams, Finite memory circuits, equivalence relations equivalent states and circuits | | 7 |  |
| Determination of classes of indistinguishable states and simplification by implicants tables. Mealy and Moore | |  |
|  |  |  |
|  | Machines |  |  |  |
|  | State assignment and memory element input equations, Partitioning and state assignment. |  |  |  |
|  | Switching Devices. Positive and Negative logic of OR, AND, NOR, NAND, XOR and XNOR gates | |  |  |
| **V** | Logic Family: RTL, DTL, DCTL, TTL, RCTL, ECL, HTL, MOS and CMOS logic circuit. Speed and delay in logic | | 6 |  |
|  | circuits, integrated circuit logic and noise immunity |  |  |  |
|  | Total |  | 33 |  |

**Reference Books:**

1. Sandiege: Modern Digital Design, McGraw Hill.
2. Moris Mano :Digital Design, PHI
3. H, Taub, D.Schilling :Digital Integrated Electronics, McGraw Hill
4. Hill & Peterson :Switching Theory and Logic Design, John Wiley
5. Parag K. Lala: Practical Digital Logic Design & Testing Prentice Hall of India.

**EC 252** **MICROPROCESSORS LAB** **C(L,T,P) = 2 (0,0,2+2)**

1. Study of hardware, functions, memory, and operations of 8085 kit.
2. Program to perform integer addition (two and three numbers 8 bit)
3. Program to perform multiplication (two 8 bit numbers).
4. Program to perform division (two 8 bit numbers).
5. Transfer of a block data in memory to another place in memory in forward and reverse order.
6. Swapping of two block data in memory.
7. Addition of 10 numbers using array.
8. Searching a number in an array.
9. Sorting of array (ascending, descending order).
10. Print Fibonacci sequence. (15 elements)
11. To insert a number at correct place in a sorted array.
12. Interfacing seven segment display using 8255.

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| **EC 253** | | **ELECTRONIC DEVICES & CIRCUITS LAB** | **C(L,T,P) = 1 (0,0,2)** |  |
|  |  |  |  |  |
| **S.** |  | **List of Experiments** |  |  |
| **No.** |  |  |  |
|  |  |  |  |
| 1. |  | Study the following devices: |  |  |
|  |  | (a) Analog & digital multimeters |  |  |
|  |  | (b) Function/ Signal generators |  |  |
|  |  | (c) Regulated d. c. power supplies (constant voltage and constant current operations) |  |  |
|  |  | (d) Study of analog CRO, measurement of time period, amplitude, frequency & phase angle using Lissajous figures. | |  |
| 2. |  | Plot V-I characteristic of P-N junction diode & calculate cut-in voltage, reverse saturation current and static & dynamic resistances. | |  |
| 3. |  | Plot V-I characteristic of zener diode and study of zener diode as voltage regulator. Observe the effect of load changes and determi ne load | |  |
|  |  | limits of the voltage regulator. |  |  |
| 4. |  | Plot frequency response curve for single stage amplifier and to determine gain bandwidth product. | |  |
| 5. |  | Plot drain current - drain voltage and drain current – gate bias characteristics of field effect transistor and measure of Idss & Vp | |  |
| 6. |  | Application of Diode as clipper & clamper |  |  |
| 7. |  | Plot gain- frequency characteristic of two stage RC coupled amplifier & calculate its bandwidth and compare it with theoretical value. | |  |
| 8. |  | Plot gain- frequency characteristic of emitter follower & find out its input and output resistances. | |  |
| 9. |  | Plot input and output characteristics of BJT in CB, CC and CE configurations. Find their hparameters. | |  |
| 10. |  | Study half wave rectifier and effect of filters on wave. Also calculate theoretical & practical ripple factor. | |  |
| 11. |  | Study bridge rectifier and measure the effect of filter network on D.C. voltage output & ripple factor. | |  |

**EC 255 ELECTRONICS LAB-I** **C(L,T,P) = 2 (0,0,2+2)**

1. Experimental study of characteristics of CMOS integrated circuits.
2. Interfacing of CMOS to TTL and CMOS.
3. Study of various combinatorial circuits based on: AND/NAND Logic blocks and OR/NOR Logic blocks.
4. Study of following combinational circuits: Multiplexer; Demultiplexer and Encoder. Verify truth tables of various logic functions.
5. To study various waveforms at different points of transistor bistable multivibrators and its frequency variation with different parameters.
6. To study transistor astable multivibrators.
7. To design a frequency driver using IC-555/timer.
8. To study Schmitt trigger circuit.
9. To study OP-AMP as Current to voltage and voltage to current converter comparator.
10. BCD to binary conversion on digital/IC trainer.
11. Study various Flip flops and construct Parallel-in-Serial-out register. Testing of digital IC by automatic digital IC trainer.

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| **EC 312** | | **INTRODUCTION TO WIRELESS NETWORK** | **C(L,T,P) = 3 (3,0,0)** |  |  |
|  |  |  |  |  |  |
| **Unit** |  | **Contents of the Course** |  | **Total Contact** |  |
|  |  |  |  | **Hrs.** |  |
| **I** |  | MULTIPLE ACCESS TECHNIQUES FOR WIRELESS COMMUNICATION : Introduction, FDMA, TDMA, Spread | | 6 |  |
|  | Spectrum, Multiple access, SDMA, Packet radio, Packet radio protocols, CSMA protocols, Reservation protocols | |  |
|  |  |  |  |
| **II** |  | INTRODUCTION TO WIRELESS NETWORKING : Introduction, Difference between wireless and fixed telephone | | 6 |  |
|  | networks, Development of wireless networks, Traffic routing in wireless networks. |  |  |
|  |  |  |  |  |
|  |  |  | |  |  |
| **III** |  | WIRELESS DATA SERVICES : CDPD, ARDIS, RMD, Common channel signaling, ISDN, BISDN and ATM, SS7, SS7 | | 7 |  |
|  | user part, signaling traffic in SS7. |  |  |
|  |  |  |  |  |
|  |  |  | |  |  |
|  |  | MOBILE IP AND WIRELESS ACCESS PROTOCOL : Mobile IP Operation of mobile IP, Co-located address, | |  |  |
| **IV** | Registration, Tunneling, WAP Architecture, overview, WML scripts, WAP service, WAP session protocol, wireless | | | 7 |  |
|  |  | transaction, Wireless datagram protocol. |  |  |  |
|  |  | WIRELESS LAN TECHNOLOGY & BLUE TOOTH :: Infrared LANs, Spread spectrum LANs, Narrow bank | |  |  |
| **V** |  | microwave LANs, IEEE 802 protocol Architecture, IEEE802 architecture and services, 802.11 medium access control, | | 7 |  |
|  | 802.11 physical layer.BLUE TOOTH : Overview, Radio specification, Base band specification, Links manager | |  |
|  |  |  |  |
|  |  | specification, Logical link control and adaptation protocol. Introduction to WLL Technology. | |  |  |
|  |  | Total |  | 33 |  |
|  |  |  |  |  |  |

**Reference Books:**

1. Wireless Digital Communications – Kamilo Feher, PHI, 1999.
   1. Principles of Wireless Networks – Kaveh Pah Laven and P. Krishna Murthy, Pearson Education, 2002.
   2. Wireless Communications – Andreaws F. Molisch, Wiley India, 2006.
   3. Introduction to Wireless and Mobile Systems – Dharma Prakash Agarwal, Qing-An Zeng, Thomson 2nd Edition, 2006.

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| **EC 417** | | **SIGNAL AND SYSTEM** | **C(L,T,P) = 3 (3,0,0)** |  |  |
|  |  |  | |  |  |
| **Unit** |  | **Contents of the Course** | | **Total Contact** |  |
|  |  |  |  | **Hrs.** |  |
|  |  | Continuous time and discrete time systems, properties of a system, | |  |  |
|  |  | Linear time,invariant system(cont. & discrete),properties of LTI systems,their block | |  |  |
| **I** |  | diagram,convolution theorem,discrete time system described by different | | 6 |  |
|  |  | equations,signal flow graph representation of network,basic network structure of IIR | |  |  |
|  |  | & FIR systems |  |  |  |
|  |  | Fourier series representation of signals Fourier series representation of continuous | |  |  |
|  |  | periodic signals and its properties Fourier series representation of discrete periodic | |  |  |
| **II** |  | signals and its properties Continuous time filter & discrete time filters described by | | 7 |  |
|  |  | differential equations Design of IIR & FIR digital filters Comparison of IIR & FIR | |  |  |
|  |  | digital filters |  |  |  |
|  |  | Fourier transform Continuous time Fourier transform for periodic & aperiodic signals | |  |  |
| **III** |  | Properties of continuous time fourier transform | Discrete time Fourier transform for | 7 |  |
|  |  | periodic & aperiodic signals Properties of DTFT Convolution and modulation property | |  |  |
|  |  | Z-transform and laplas transform Introduction | Region for convergence for z- |  |  |
|  |  | transform Inverse z-transform 2-dimensional z-transform Properties of z-transform | |  |  |
| **IV** |  | Laplas transform Properties of laplas transform Application of laplas for system | | 7 |  |
|  |  | analysis FT algorithm FFT algorithm FFFt algorithm N-composite number Chirp-Z | |  |  |
|  |  | transform |  |  |  |
|  |  | Sampling:- mathematical theory of sampling, sampling theorem, ideal and real | |  |  |
| **V** |  | sampling, interpolation technique for reconstruction of signal from its sample, aliasing | | 8 |  |
|  | & sampling of discrete time signals basic principles of spectrum estimation estimation | |  |
|  |  |  |  |
|  |  | of auto co-variance power spectrum & cross-spectrum cross co-variance | |  |  |
|  |  | Total |  | 35 |  |

**Reference Books**

1. L Philips, J. M. Parr, E. A Riskin, Signals, Systems and Transforms, 3rd ed., Pearson Education, Delhi,
2. R. E. Zeimer, W. H. Tranter, and D. R. Fannin, Signals and Systems: Continuous and Discrete, 4th ,
3. M. J. Roberts, Signals and Systems: Analysis using Transform methods and MATLAB, Tata McGraw Hill,

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **EC 418** | | **CAD FOR VLSI DESIGN** | **C(L,T,P) = 3 (3,0,0)** |  |  |
|  |  |  |  |  |  |
| **Unit** |  | **Contents of the Course** |  | **Total Contact** |  |
|  |  |  |  | **Hrs.** |  |
| **I** |  | Modern digital systems, complexity and diversity of digital systems |  | 6 |  |
|  | Productivity gap and need for CAD tools. introduction to steps and CAD flow for designing with ASIC and FPGA | |  |
|  |  |  |  |
|  |  | Introduction to VHDL, background, VHDL requirement, |  |  |  |
| **II** |  | Elements of VHDL, top down design, convention and syntax, basic concepts in VHDL i.e. characterizing H/W | | 7 |  |
|  |  | languages, objects, classes, and signal assignments |  |  |  |
| **III** |  | Structural specification of H/W- Parts library, Wiring, modeling, binding alternatives, top down wiring. | | 7 |  |
|  | Design organization and parameterization. Type declaration, VHDL operators |  |  |
|  |  |  |  |  |
| **IV** |  | VHDL subprogram parameters, overloading, predefined attributes, user defined attributes, packaging basic utilities. | | 7 |  |
|  | VHDL as a modeling language- bi-directional component modeling, multi mode component modeling | |  |
|  |  |  |  |
| **V** |  | Examples of VHDL synthesis subsets- combinational logic synthesis, sequential circuit synthesis, | | 8 |  |
|  | State machine synthesis. VHDL language grammar. Introduction to synthetic circuits and circuit repositories | |  |
|  |  |  |  |
|  |  | Total |  | 35 |  |

**Reference Books:**

1. Wayne Wolf-Modern VLSI Design,3rd ed Pearson Education Asia.
2. Kiat-Sent Yeo-CMOS/BiCCMOSVLSI,Pearson Education Asia.
3. Neil H.E. Weste-Principles of CMOS VLSI Design, Pearson Education Asia.

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| --- | --- | --- | --- | --- | --- |
| **EC 419** | |  |  |  |  |
|  |  | **LOGIC SYNTHESIS** | **C(L,T,P) = 4 (3,1,0)** |  |  |
|  |  |  |  |  |  |
| **Unit** |  | **Contents of the Course** |  | **Total** |  |
|  |  |  |  | **Contact Hrs.** |  |
|  |  | Introduction to VLSI, circuits Asics and Moore's Law. Microelectronic Design, Styles, four phases in creating | |  |  |
|  |  | Microelectronics chips computer Aided Synthesis and Optimization. |  |  |  |
| **I** |  | Algorithms Review of Graph Definitions and Notations Decision and Optimization Problems, Shortest and Longest | | 6 |  |
|  |  | Path Problems, Vertex Cover, Graph, Coloring, Clique covering and partitioning Algorithms Boolean | |  |  |
|  |  | Algebra and Representation of Boolean Functions, binary Decision diagrams. Satisfiability and cover problems | |  |  |
|  |  | Hardware Modeling: Introduction to Hardware Modeling Language, State Diagrams. |  |  |  |
|  |  | Data flow and Sequencing Graphs. Compilation and Behavioral Optimization Techniques. Circuits Specifications for | |  |  |
| **II** |  | Architectural Synthesis Resources and constraints. |  | 7 |  |
|  | Fundamental Architectural Synthesis Problems Temporal Domain Scheduling Spatial Domain Binding Hierarchical | |  |
|  |  |  |  |
|  |  | Models and Synchronization Problem. |  |  |  |
|  |  | Area and performance estimation-Resource Dominated circuits and General Circuits. |  |  |  |
|  |  | Scheduling Algorithms: Model for Scheduling Problems, Scheduling without Resource |  |  |  |
|  |  | Constraints-Unconstrained Scheduling ASAP Scheduling Algorithms Latency. Constrained Scheduling. ALAP | |  |  |
| **III** |  | scheduling. |  | 7 |  |
|  |  | Under Timing Constraints and Relative Scheduling with Resource Constraints Integer Linear Programming Model, | |  |  |
|  |  | Multiprocessor Scheduling, Heuristic Scheduling Algorithms (List Scheduling). Force Directed Scheduling | |  |  |
|  |  | Two Level Combination Logic Optimization: Logic Optimization Principles-Definitions |  |  |  |
| **IV** |  | Exact Logic Minimization Heuristic, Logic Minimization, and Testability Properties Operations on Two level logic | | 6 |  |
|  | Cover-positional Cube Notation |  |  |
|  |  |  |  |  |
|  |  | Functions with Multivolume inputs and list oriented manipulation. Algorithms for logic minimization | |  |  |
|  |  | Sequential logic optimization: Introduction, Sequential circuit optimization using state based models- state | |  |  |
| **V** |  | minimization, state encoding. |  | 7 |  |
|  | Sequential circuit optimization using network models. Implicit finite state machine traversal methods. Testability | |  |
|  |  |  |  |
|  |  | consideration for synchronous circuits |  |  |  |
|  |  | Total |  | 33 |  |

**Reference Books:**

1. Giovanni De Micheli-Synthesis and Optimization of Digital Circuits, Mc-Graw Hill Inc.
2. Zainalabedin Navabi-VHDL Analysis and Modeling of Digital Systems, Mc-Graw Hill Inc.
3. J.Bhasker-VHDL Primer, Addision Wesley.
4. Brassard-Algorithms, Prentice Hall.

**EC 458** **VLSI DESIGN LAB** **C(L,T,P) = 1 (0,0,2)**

**Simple Design exercises**:

1. Half adder, Full adder, Subtractor Flip Flops, 4bit comparator.
2. Parity generator
3. Bit up/down counter with load able count
4. Decoder and encoder
5. 8 bit shift register
6. 8:1 multiplexer
7. Test bench for a full adder
8. Barrel shifter
9. N by m binary multiplier
10. RISC CPU (3bit opcode, 5bit address)

**TOOLS:**

Xilinx Tools/ Synopsis Tools/ Cadence Tools/ Model SIM/ Leonardo Spectrum Tools/VIS/SIS Tools to be used.

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| **MA 203 : ADVANCE MATHEMATICS** | | **C(L,T,P) = 4 (3,1,0)** |  |  |
|  |  |  |  |  |
| **Unit** | **Contents of the Course** |  | **Total Contact** |  |
|  |  |  | **Hrs.** |  |
|  |  **Linear Programming**: Mathematical Formulation of Linear Programming problem. Graphical method of solving | |  |  |
| **I** | Linear Programming problem |  | 7 |  |
|  Simplex method for solving Linear Programming problem |  |  |
|  |  |  |  |
|  |  Duality in Linear Programming problem. |  |  |  |
|  |  **Project Scheduling**: Project Scheduling by PERT and CPM Network Analysis. | |  |  |
| **II** |  Sequencing Theory: General Sequencing problem |  | 7 |  |
|  |  N-jobs through 2 machines & 3 machines and 2-jobs through m machine. |  |  |  |
|  |  **Transportation Problem** |  |  |  |
|  |  Find the initial solution using North West Corner rule, Least Cost Method. |  |  |  |
| **III** |  Find optimal solution using Stepping Stone method, Modified Distribution Method. | | 7 |  |
|  Solve unbalanced transportation problem using fictitious origins or destination. | |  |
|  |  |  |
|  |  **Assignment problem**- |  |  |  |
|  |  Solving Assignment problem using Hungarian Method |  |  |  |
| **IV** | **Transform Calculus** –Laplace transform with its simple properties, Applications to the solution of ordinary and | | 8 |  |
| partial differential equation having constant coefficients with special reference to the wave and diffusion equation | |  |
|  |  |  |
|  | **Numerical Methods**:- Finite differences and Interpolation , Numerical differentiation and Integration .Solution of | |  |  |
| **V** | Algebraic and transcedual equations by Graphical method, Bisection method | ,Regular Falsi method and Newton’s | 8 |  |
|  | Raphson method .Numerical solution of ordinary differential equations |  |  |  |
|  | **Total** |  | 37 |  |

**Reference Books:**

Advanced Mathematics for Engineers by Chandrika Prasad

Higher Engineering Mathematics by B.S. Grewal

Higher Engineering Mathematics by Y.N. Gaur and C.L. Koul

Higher Engineering Mathematics by K.C. Jain and M.L. Rawat

**MA 204** **INTRODUCTION TO PROBABILTY THEORY AND STOCHASTICS PROCESS** **C(L,T,P) = 4 (3,1,0)**

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| --- | --- | --- | --- | --- | --- |
|  | |  |  |  |  |
|  |  |  |  |  |  |
| **Unit** |  | **Contents of the Course** |  | **Total Contact** |  |
|  |  |  |  | **Hrs.** |  |
| **I** |  | **Probability Theory:** Axioms of probability, Probability space, Conditional probability, Independence, Baye's rule, Random variable. | |  |  |
|  |  |  |  |  |  |
|  |  |  | |  |  |
|  |  |  | |  |  |
| **II** |  | Some common discrete and continuous distributions, Distribution of Functions of Random Variable, Moments, Generating functions, Two and higher dimensional distributions. |  | 7 |  |
|  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  | |  |  |
| **III** |  | Functions of random variables, Order statistics, Conditional distributions, Covariance, correlation coefficient, conditional expectation, Modes of convergences, Law of large numbers, Central limit theorem. |  | 7 |  |
|  |  |  | |  |  |
|  |  |  | |  |  |
| **IV** |  | **Stochastic Processes:** Definition of Stochastic process, Classification and properties of stochastic processes, Simple stochastic processes, Stationary processes, Discrete and continuous time Markov chains, Classification of states, Limiting distribution, |  | 7 |  |
|  |  |  | |  |  |
|  |  |  | |  |  |
| **V** |  | Birth and death process, Poisson process, Steady state and transient distributions, Simple Markovian queuing models (M/M/1, M/M/1/N, M/M/c/N, M/M/N/N). |  | 8 |  |
|  |  | |  |
|  |  |  |  |
|  |  |  |  |  |  |
|  |  |  | **Total** | 35 |  |
| **Reference Books:** | | |  |  |  |

1.      Introduction to Probability and Stochastic Processes with Applications, Liliana Blanco Castaneda, Viswanathan Arunachalam, Selvamuthu Dharmaraja, Wiley, New Jersey, June 2012.

2.      Probability and Statistics with Reliability, Queueing and Computer Science Applications, Kishor S. Trivedi, John Wiley, second edition, 2001.

3.      Introduction to Probability Models, Sheldon M. Ross, Academic Press, ninth edition, 2000

**HS -201 COMMUNICATION SKILLS**

|  |  |  |
| --- | --- | --- |
| **Unit** | **Course Contents** | **Hours.** |
| 1 | Foundation and background of organizational behaviour, contemporary challenges-workforce diversity, cross – cultural dynamics, | 7 |
|  | changing nature of managerial work, ethical issues at work, emotional intelligence in contemporary business. Perception, |  |
|  | Personality, Learning, Motivation – Concepts and applications, individual decision making. |  |
| 2 | Understanding and managing group processes-interpersonal & group dynamics, Group cohesiveness, Group decision making | 8 |
|  | Emotional Intelligence-concept and applications, Understanding work teams, power & politics, Empowerment, Conflict & |  |
|  | Negotiation. |  |
| 3 | Purpose and process of communication; myths and realities of communication; paths of communication; oral communication; | 6 |
|  | noise, barriers to communication; listening process, types of listening, deterrents to listening process, essentials of good listening; |  |
|  | telephonic communication. |  |
| 4 | Non verbal communication; gestures, handshakes, gazes, smiles, hand movements, styles of working, voice modulations, body | 7 |
|  | sport for interviews; business etiquettes; business dining, business manners of people of different cultures, managing customer |  |
|  | care. |  |
| 5 | Written communication; mechanics of writing, report writing, circulars, notices, memos, agenda and minutes; business | 7 |
|  | correspondence-business letter format, style of letter arrangement, types of letters, telex managers, facsimiles, electronic mail; |  |
|  | diary writing; development resume. |  |
|  | Total | 35 |

**Reference Books:**

1. Enrich your English – by CIEFL (Academic Skills book)
2. Contemporary English Grammar – Raymond Murphy
3. Organizational Behavior, - Fred Luthans9thEdition, McGraw-Hill Irwin, 2002.
4. Organizational Behavior, Tenth Edition, TMG, 1998.John W. Newstorm and Keith Davis
5. Business Communication Today – By Bovee, Thill, Schazman
6. G. Business Communication – by Pal and Korlahalli

**HS 202 CONGNITIVE SKILLS**

|  |  |  |  |
| --- | --- | --- | --- |
| **Units** | **Contents of the Subject** |  | **Hours** |
| I | Introduction to Mindfulness, Mindfulness Exercise, | DBT Life Skills – Distress | 8 |
|  | Tolerance |  |  |
| II | Mindfulness Exercise, DBT Life Skills – Emotion Regulation | | 8 |
|  |  | |  |
| III | Mindfulness Exercise, DBT Life Skills – Interpersonal Effectiveness | | 7 |
|  |  | |  |
|  | Mindfulness Exercise, Anxiety Disorders, Depression, and Personality Disorders, | |  |
| IV | Acceptance: Living in the Here-and-Now as a Way of Life | | 7 |
| V |  |  | 7 |
|  | Total |  | 37 |



**Reference Books:**

1. Shivani D.R. (1998): NGO Development Initiative & Policy – Vikas Publications

**HS 203 Humanities and Social Sciences (Economics) C(L,T,P) = 3 (3,0,0)**

|  |  |  |
| --- | --- | --- |
| **Unit** | **Course Contents** | **Total Contact Hours - 37** |
| I | **Introduction:** Definition meaning, nature and scope of economics. | 6 |
| **II** | **Micro Economics**: Definition, meaning and scope of Micro Economics. Importance and limitations. | 6 |
| **III** | **Concept of Demand and supply** :Utility Analysis, Law of Demand, Demand determinants, Demand Distinctions. Law of Supply, Elasticity | 7 |
| **IV** | **Introduction to social Sciences**: impact of british rule on India(Economic Social and Cultural). Indian National movement, Psysography of India. | 10 |
| **V** | **Political Economy**: Agriculture, Socio-Economic development, Challenges to Indian Decomcracy, Polical Parties and pressure groups. | 8 |

Reference Books:-

1. Micro Economics by M.L.Sethi
2. Advance Micro Economics by M.L. Shingham

**HS 301 VERBAL AND NON-VERBAL REASONING**

|  |  |  |
| --- | --- | --- |
| **Units** | **Course Contents** | **Total** |
|  |  | **Contact** |
|  |  | **Hrs.** |
| 1 | [Logical Sequence of Words,](http://www.indiabix.com/verbal-reasoning/logical-sequence-of-words/)  [Blood Relation Test,](http://www.indiabix.com/verbal-reasoning/blood-relation-test/)  [Syllogis](http://www.indiabix.com/verbal-reasoning/syllogism/)m | 7 |
| 2 | [Series Completion,](http://www.indiabix.com/verbal-reasoning/series-completion/)  [Cause and Effect,](http://www.indiabix.com/verbal-reasoning/cause-and-effect/)  [Dic](http://www.indiabix.com/verbal-reasoning/dice/)e | 7 |
| 3 | [Venn Diagrams,](http://www.indiabix.com/verbal-reasoning/venn-diagrams/)   [Cube and Cuboids](http://www.indiabix.com/verbal-reasoning/cube-and-cuboid/)   [Analog](http://www.indiabix.com/verbal-reasoning/analogy/)y | 7 |
| 4 | [Seating Arrangement,](http://www.indiabix.com/verbal-reasoning/seating-arrangement/)  [Character Puzzles,](http://www.indiabix.com/verbal-reasoning/character-puzzles/)  [Direction Sense Tes](http://www.indiabix.com/verbal-reasoning/direction-sense-test/)t | 7 |
| 5 | [Classification,](http://www.indiabix.com/verbal-reasoning/classification/)  [Data Sufficiency,](http://www.indiabix.com/verbal-reasoning/data-sufficiency/)  [Arithmetic Reasoning,](http://www.indiabix.com/verbal-reasoning/arithmetic-reasoning/)  [Verification of Trut](http://www.indiabix.com/verbal-reasoning/verification-of-truth/)h | 7 |
|  | Total | 35 |

**Reference Books:** R.S. Aggarwal

**HS 302 TECHNICAL WRITING**

|  |  |  |
| --- | --- | --- |
| **Units** | **Course Contents** | **Total** |
|  |  | **Contact** |
|  |  | **Hrs.** |
| 1 | Writing Process- Intro of various types of writings, Gathering, Writing, Reviewing, Editing, Indexing, Testing | 7 |
| 2 | Review Writing- Internal, Friendly and Anonymous reviews, Quantity review, Quality review, Precis Wring, | 7 |
|  | Paragraph Writing, Report Writing- Science and research reports, business Reports, Business Report, Business |  |
|  | overview |  |
| 3 | Letter Writing- Letter of Inquiry, Letter of adjustment, Claim Letter and follow of Letter, Letter of acceptance, | 7 |
|  | Letter of refusal |  |
| 4 | Job search correspondence- cover letter, CV and resume | 7 |
| 5 | Writing Mails- User Guides, Reference Guide, Online helps, Website, Technical Proposal Writing. | 7 |
|  | Total | 35 |

**HS 401 TECHNICAL APTITUDE**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Units** | **Course Contents** | | |  |  |  |  |  | **Total** |
|  |  |  |  |  |  |  |  |  | **Contact** |
|  |  |  |  |  |  |  |  |  | **Hrs.** |
| 1 | PPL (Principal of Programming Language, C, C++, Java, Asp.net, DSA | | | | | |  |  | 7 |
| 2 | DBMS, RDBMS | | |  |  |  |  |  | 7 |
| 3 | Networking & Related topics | | |  |  |  |  |  | 8 |
| 4 | Software Engineering and Related topics | | | |  |  |  |  | 7 |
| 5 | Operating System (Windows, Linux, MS office) | | | | | |  |  | 7 |
|  |  |  |  |  |  |  |  | Total | 36 |
| Reference Books: | | |  |  |  |  |  |  |  |
| MCQs in Computer Science by Timothy Williams, TMH | | | | |  |  |  |  |  |
| **HS 402 ENGLISH COMPREHENSION MODULE** | | | | |  |  |  |  |  |
|  |  |  | |  |  |  |  |  | |
| Unit |  | Content of subject | |  |  |  | Hours |  | |
| 1 |  | Synonyms/Antonyms/Word Meaning (Vocabulary) | | | |  | 7 |  |  |
| 2 |  | Complete the Sentence (Grammar ) | | |  |  | 7 |  |  |
| 3 |  | Spot | error/Correct | sentence | (Grammar/sentence |  | 7 |  |  |
|  |  | construction) | |  |  |  |  |  |  |
| 4 |  | Sentence Ordering (Comprehension skills) | | | |  | 7 |  |  |
| 5 |  | Questions based on passage (Comprehension skills) | | | |  | 7 |  |  |
|  |  | Total Hours | |  |  |  | 35 |  |  |
|  |  |  |  |  |  |  |  |  |  |