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| **15IT303J** | **COMPUTER NETWORKS** | | **L** | **T** | **P** | **C** |
| **3** | **0** | **2** | **4** |
| *Co-requisite:* | NIL | | | | | |
| *Prerequisite:* | 15EC252 PRINCIPLES OF COMMUNICATION SYSTEMS | | | | | |
| *Data Book / Codes/Standards* | NIL | | | | | |
| *Course Category* | P | PROESSIONAL CORE | | | | |
| *Course designed by* | Department of Information Technology | | | | | |
| *Approval* | 32nd Academic Council Meeting , May 2016 | | | | | |

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| **PURPOSE** | | This course provides a foundation to understand computer networks using layered architectures. It also helps students to understand the various network models, addressing concept, routing protocols and design aspects of computer networks. . | | | | | | | |
| **INSTRUCTIONAL OBJECTIVES** | | | **STUDENT OUTCOMES** | | | | | | |
| At the end of the course, student will be able to | | |  |  |  |  |  |  |  |
|  | Understand the evolution of computer networks using the layered network architecture. | | b |  |  |  |  |  |  |
|  | Design computer networks using subnetting and routing concepts | | c |  |  |  |  |  |  |
|  | Understand the various Medium Access Control techniques and also the characteristics of physical layer functionalities. | | m |  |  |  |  |  |  |

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| **Session** | **Description of Topic** | **Contact Hours** | **C-D-I-O** | **IOs** | **Reference** |
|  | **UNIT I : INTRODUCTION TO COMPUTER NETWORKS** | **9** |  |  |  |
|  | Evolution of Computer Networks | 1 | C | 1 | 1 |
|  | Classification of Computer Networks LAN,WAN,MAN | 2 | C | 1 | 1 |
|  | Network Topology : BUS, STAR, RING, MESH - | 2 | C | 1 | 1 |
|  | OSI Layered Architecture | 2 | C | 1 | 1 |
|  | TCP/IP Model | 2 | C | 1 | 1 |
|  | **UNIT II: IPV4 ADDRESSING ARCHITECTURE** | **9** |  |  |  |
|  | IPv4 Public and Private Address | 2 | C | 2 | 1 |
|  | Subnetting | 3 | C | 2 | 1 |
|  | VLSM-CIDR | 2 | C | 2 | 1 |
|  | Network Devices:Router, Switch, HUB, Bridge. | 2 | C | 2 | 1 |
|  | **UNIT III: NETWORK LAYER PROTOCOLS** | **9** |  |  |  |
|  | Static Routing | 1 | C | 2 | 1 |
|  | Introduction to dynamic Routing Protocols | 1 | C | 2 | 1 |
|  | RIP v1 and RIP v2,OSPF | 3 | C | 2 | 1 |
|  | EIGRP | 2 | C | 2 | 2 |
|  | BGP | 2 | C | 2 | 1 |
|  | **UNIT IV: DATA LINK LAYER** | **8** |  |  |  |
|  | Medium Access Control Techniques | 1 | C | 3 | 1 |
|  | Random, Round Robin, Reservation, ALOHA | 1 | C | 3 | 1 |
|  | Pure and Slotted, CSMA/CD | 1 | C | 3 | 1 |
|  | CSMA/CA, Ethernet, Token Ring, Token Bus, | 1 | C | 3 | 1 |
|  | ARQ 3 Types, | 1 | C | 3 | 1 |
|  | Error Detection Codes, Parity Check, Checksum | 2 | C | 3 | 1 |
|  | Error Correction Codes,Hamming codes | 1 | C | 3 | 1 |
|  | **UNIT V: PHYSICAL LAYER CHARACTERISTICS** | **10** |  |  |  |
|  | Physical Layer overview | 2 | C | 3 | 1 |
|  | Latency, Bandwidth, Delay | 1 | C | 3 | 1 |
|  | Wireless: 802.11 | 2 | C | 3 | 1 |
|  | Transmission Media : Twisted pair, Coaxial, Fibre | 2 | C | 3 | 1 |
|  | 802.15, 802.15.4 | 2 | C | 3 | 1 |
|  | 802.16 | 1 | C | 3 | 1 |
|  | TOTAL CONTACT HOURS | 45 | | | |

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| **Sl. No.** | **Description of Experiments** | **Contact Hours** | **C-D-I-O** | **IOs** | **Reference** |
|  | IP Addressing and subnetting (VLSM) | 2 | D,I | 1-4 | 1,2 |
|  | LAN Configuration using straight through and cross over cables | 2 | D,I | 3 | 2 |
|  | Basic Router Configuration ( Creating Passwords, Configuring Interfaces) | 2 | I | 1 | 2 |
|  | Static and Default Routing | 4 | I | 1 | 2 |
|  | RIPv1 | 4 | I | 2 | 1,2 |
|  | RIPv2 | 2 | I | 2 | 1,2 |
|  | EIGRP Configuration, Bandwidth, and Adjacencies | 4 | I | 2 | 2 |
|  | EIGRP Authentication and Timers | 2 | I | 2 | 2 |
|  | Single-Area OSPF Link Costs and Interface | 2 | I | 2 | 1,2 |
|  | Multi-Area OSPF with Stub Areas and Authentication | 2 | I | 2 | 2 |
|  | Redistribution Between EIGRP and OSPF | 2 | I | 2 | 2 |
|  | MODEL EXAMINATION | 2 |  | | |
|  | TOTAL CONTACT HOURS | 30 | | | |

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| **SI.No** | **LEARNING RESOURCES** |
|  | Behrouz A. Forouzan, “Data Communications and Networking” 5th edition, July 1, 2010, ISBN: 9780073376226 |
|  | Todd Lammle, “CCNA Study Guide”, Edition7, Publication Date: April 5, 2011| ISB: 10:0470901071 ISBN:13: 9780470901076 |
|  | William Stallings, “Data and Computer Communications”, Edition 9, 2010. |

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| **Course nature** | | | | | | | | **Theory + Practical** | | | | | |
| **Assessment Method – Theory Component (Weightage 50%)** | | | | | | | | | | | | | |
| **In-semester** | **Assessment tool** | | Cycle test I | | Cycle test II | Cycle Test III | | | Surprise Test | | Quiz | | **Total** |
| **Weightage** | | **10%** | | **15%** | **15%** | | | **5%** | | **5%** | | **50%** |
| **End semester examination Weightage :** | | | | | | | | | | | | **50%** | |
|  | | | | | | | | | | | |  | |
| **Assessment Method – Practical Component (Weightage 50%)** | | | | | | | | | | | | | |
| **In-semester** | **Assessment tool** | Experiments | | Record | | | MCQ/Quiz/Viva Voce | | | Model examination | | **Total** | |
| **Weightage** | **40%** | | **5%** | | | **5%** | | | **10%** | | **60%** | |
| **End semester examination Weightage :** | | | | | | | | | | | | **40%** | |