| Course code | Course Name | L-T-P - Credits | Year of Introduction |
|---|---|---|---|
| **IT405** | **Internetworking with TCP/IP** | **3-0-0-3** | **2016** |

**Prerequisite : Nil**

**Course Objectives**

- To understand the fundamental concepts in Internetworking, Internet Addressing, IP, UDP, and TCP Protocols, Routing Architecture, Network Virtualization and Software Defined Networking

**Syllabus**

Introduction and Overview, Overview of Underlying Network Technologies, Internetworking Concept and Architectural Model, Protocol Layering, Internet Addressing, Mapping Internet Addresses To Physical Addresses, Internet Protocol: Connectionless Datagram Delivery, Internet Protocol: Forwarding IP Datagrams, Internet Protocol: Error And Control Messages (ICMP), User Datagram Protocol, Reliable Stream Transport Service, Routing Architecture: Cores, Peers, And Algorithms, Routing Among Autonomous Systems, Routing Within An Autonomous System, Internet Multicasting, Label Switching, Flows, And MPLS , Packet Classification, Mobility And Mobile IP, Network Virtualization: VPNs, NATs, And Overlays, Bootstrap And Auto configuration, Voice And Video Over IP, Network Management, Software Defined Networking.

**Expected outcome** .

i. Conceptual understanding of Internetworking ,Internet Addressing, IP, UDP, and TCP Protocols, Routing Architecture, Network Virtualization and Software Defined Networking
ii. Ability to apply the net working technologies in practical situations

**References:**

1. Douglas E Comer, "Internetworking with TCP/IP Principles, Protocol, and Architecture" , Volume I, 6th Edition, Pearson Education, 2013
2. William Stallings, "Data and Computer Communications", 9th Edition, Pearson Education, 2011

| **Course Plan** | | | |
|---|---|---|---|
| **Module** | **Contents** | **Hours** | **Sem. Exam Marks** |
| **I** | Introduction and Overview, Overview Of Underlying Network Technologies, Internetworking Concept And Architectural Model, Protocol Layering<br>Internet Addressing, Mapping Internet Addresses To Physical Addresses (ARP), Internet Protocol: Connectionless Datagram Delivery (IPv4, Ipv6)<br>CIDR Sub netting | 10 | 15% |
| **II** | Internet Protocol: Forwarding IP Datagrams, Internet Protocol: Error And Control Messages (ICMP), User Datagram Protocol (UDP) | 4 | 15% |
| **FIRST INTERNAL EXAMINATION** | | | |
| **III** | Reliable Stream Transport Service (TCP)<br>Routing Architecture: Cores, Peers, And Algorithms, Routing Among Autonomous Systems (BGP), Routing Within An | 10 | 15% |

| | | | |
|---|---|---|---|
| | Autonomous System (RIP, RIPng, OSPF, IS-IS) | | |
| IV | Internet Multicasting , Label Switching, Flows, And MPLS, Packet Classification | 5 | 15% |
| **SECOND INTERNAL EXAMINATION** | | | |
| V | Mobility And Mobile IP, Network Virtualization: VPNs, NATs, And Overlays<br> Bootstrap And Auto configuration (DHCP, NDP, Ipv6-ND), Voice And Video Over IP (RTP, RSVP, QoS) | 7 | 20% |
| VI | Software Defined Networking (SDN, OpenFlow) | 6 | 20% |
| **END SEMESTER EXAM** | | | |

## QUESTION PAPER PATTERN

Maximum Marks: 100                         Exam Duration: 3 hours

The question paper shall consist of Part A, Part B and Part C.

**Part A** shall consist of three questions of 15 marks each uniformly covering Modules I and II. The student has to answer any two questions (15×2=30 marks).

**Part B** shall consist of three questions of 15 marks each uniformly covering Modules III and IV. The student has to answer any two questions (15×2=30 marks).

**Part C** shall consist of three questions of 20 marks each uniformly covering Modules V and VI. The student has to answer any two questions (20×2=40 marks).

**Note** : Each question can have a maximum of 4 subparts, if needed