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**SECOND SEMESTER 2022 – 2023**

Date: 16-Jan.-2023

**COURSE HANDOUT (PART II)**

In addition to Part I (General Handout for all courses appended to the timetable) this handout gives further details regarding the course.

Course No : **CS F413**

Course Title : Internetworking Technologies

Instructor-in-charge : Dr. Nikumani Choudhury

1. **Scope and Objective of the Course:** Internetworking is a term utilized by the system items and services as a far-reaching term for all the ideas, innovations, and generic devices that permit individuals and their PCs to communicate across different kinds of networks. For instance, somebody at a PC on a token ring local area network may need to communicate someone at a computer on an Ethernet local area network in another country using a wide area network interconnection. The common internetwork protocols, routing tables, and related network devices required to achieve this communication constitute internetworking.

The main objective of this course is to give the students exposure to:

1. Different addresses used in an internetwork
2. LAN/WAN protocols, architectures and topologies
3. Path selection and routing protocols, MAC sub-layer and frame formats
4. Mobile IP and Mobile TCP
5. **Text Book:**

T1. Behrouz Forouzan. Data Communications and Networking. McGraw Hill Education, Fifth edition.

**3. Reference Books:**

(i) James F. Kurose and Keith W. Ross, Computer Networking: A Top-Down Approach, Pearson Education, 6th Edition, 2022.

(ii) J.H.Schiller. Mobile Communications. Person Education, 2nd Ed.

1. **Course Plan:**

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| **Lecture No.** | **Learning Objectives** | **Topics to be covered** | **Chapter in the Text Book** |
| 1-2 | Learn what makes up an internetwork. Learn about the different types of addresses used in an internetwork. | Introduction to Internetworking and Internetworking Technologies | T1: Chapter 1 |
| 3-8 | * Learn about different LAN protocols. * Understand the different methods used to deal with media contention. * Learn about different LAN topologies. | Introduction to Wired and Wireless LAN protocols | T1: Ch.13/class notes  Ch.15/class notes |
| 9-12 | * Become familiar with WAN terminology. * Learn about different types of WAN connections. * Become familiar with different types of WAN equipment. | Introduction to WAN Technologies | T1: Ch. 13/class notes |
| 13-15 | Learn about different LAN protocols. Learn about the different methods used to deal with media contention. Learn how to connect different LANs. | Bridging basics | T1: Ch. 13/class notes |
| 16-19 | Learn the basics of internetworking routing protocols. Learn about the metrics used by routing protocols to determine path selection. Understand the difference between routed protocols and routing protocols. | Internetworking routing protocols. | T1: Ch. 21/class notes |
| 20-21 | Become familiar with the basic functions of a network management system | Basics of network management | T1: Ch. 27/class notes |
| 22-23 | Understand the required and optional MAC frame formats, their purposes, and their compatibility requirements. List the various Ethernet physical layers, signalling procedures, and link media requirements/limitations. | Ethernet | T1: Ch. 13, class notes |
| 24 | Describe the background of Token Ring technology. Learn how Token Ring works | Token Ring | T1: Ch.12 |
| 25 | Describe how Frame Relay works. Describe the primary functionality traits of Frame Relay. Describe the format of Frame Relay frames and implementations. | Frame relay | T1: Ch. 12, class notes |
| 26 | Describe ISDN devices and how they operate. Describe the specifications for ISDN data transmittal for the three layers at which ISDN transmits. | ISDN | T1: Ch. 14, Class Notes |
| 27 | Describe the development of PPP. Describe the components of PPP and how they operate. Provide a summary of the basic protocol elements and operations of PPP. | P2P protocol | T1: Ch. 11, Class Notes |
| 28 | Understand the basics of how L2TP can be used to build a VPN. Learn how L2TP's Layer 2 protocols enable secure passage through unsecured networks. Explain the relationship between L2TP and IPSec. | Virtual Private Networks | T1: Ch. 17, class notes |
| 29-31 | Learn about different LAN bridging technologies such source-route bridging, transparent bridging, etc. | Bridging technologies and LAN switching | T1: Ch. 13, Class Notes |
| 32-35 | Understand the ATM cell structure. Identify the ATM model layers. Know the ATM connection types. Understand the advantages of MPLS. Learn the components of an MPLS system | ATM switching and MPLS | T1: Ch. 14, class notes |
| 36-39 | Learn wireless LAN architecture. Channel access protocols. | WLAN Architecture | T1: Ch. 15, class notes |
| 40-42 | Learn basics of Mobile IP and its architecture. Learn mobile TCP and some popular protocols. | Mobile IP and TCP | T1: Ch. 19, class notes |

1. **Evaluation Scheme**:

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| **EC No.** | **Evaluation Component** | **Duration**  (Min) | **Weightage**  **(%)** | **Date**  **& Time** | **Nature of Component** |
| 1. | Mid-Sem | 90 | 30 | 16/03 11:30-1:00 PM | Closed Book |
| 2. | Comprehensive | 180 | 40 | 15/05 AN | Closed Book |
| 3. | Quiz (Best 2 out of 3) | 20 | (5+5=10) | TBA  (One Pre-Mid semester) | Open Book |
| 4. | Assignment/Project | NA | 20 | TBA | Open Book |

6. Chamber Consultation Hour: Every Thursday 10-11 A.M.

7. Notices: Notices regarding the course will be put up in CMS.

8. Makeup Policy: Makeup for mid-sem and comprehensive exams will be allowed only in genuine cases and with prior permission from the I/C. No makeup for quizzes.

9. Academic Honesty and Integrity Policy: Academic honesty and integrity are to be maintained by all the students throughout the semester and no type of academic dishonesty is acceptable.

INSTRUCTOR-IN-CHARGE