Telecommunication

**Course Objectives:**  
Course objectives:  To continue the study of modern communication systems, their characteristics and design.

1. **Telecommunication Networks[4 hours]**
   1. Evolution of telecommunications
   2. Classification of switching system

1. **Transmission Media[4 hours]**
   1. Transmission media characteristics
   2. Transmission lines
   3. Hybrid Transformer and circuits
   4. Signal and noise measurement

1. **Signal Multiplexing[4 hours]**
   1. Frequency division multiplex, Wavelength division multiplex
   2. Space division multiplex
   3. Time division multiplex; North American TDM system, The European E1

1. **Digital Switching[8 hours]**
   1. Digital Telephone Exchange
   2. Space(S) Switch
   3. Time(T) Switch
   4. ST, TS, STS and TST switch
   5. Comparison between TST and STS switch

1. **Signaling System[4 hours]**
   1. Classification of Signaling Systems: Channel Associated Signaling and Common Channel Signaling
   2. ITU Common Channel Signaling System # 7 (SS7)

1. **Telephone Traffic[9 hours]**
   1. Network Traffic load and parameters
   2. Loss System: Grade of service (GOS)  and Blocking probability
   3. Delay System:  Queuing theory
   4. Routing
   5. Numbering Plans, Charging Plans

1. **Telecommunication Regulation[2 hours]**
   1. Purpose of ITU(International Telecommunications Union),
   2. NTA(Nepal Telecommunications Authority)

1. **Data Communication[10 hours]**
   1. Switching Techniques in data Communication
   2. IP Switching
   3. Soft Switching
   4. Routing and Flow control
   5. ISDN
   6. DSL

**Practical:**   Six laboratory to illustrate course principles

**References:**

1. John C. Bellamy “Digital Telephony“  John Wiley & Sons, Inc.
2. Roger L. Freeman “Telecommunication System Engg. “ John Wiley & Sons, Inc.
3. A. S. Tanenbaum “Computer Networks” Prentice Hall.
4. Telecommunication Switching Systems and Networks, by Thiagarajan Vishwanathan

**Evaluation Scheme:**

|  |  |  |
| --- | --- | --- |
| **Chapters** | **Hours** | **Marks Distribution\*** |
| 1 | 4 | 7 |
| 2 | 4 | 7 |
| 3 | 4 | 7 |
| 4 | 8 | 14 |
| 5 | 4 | 7 |
| 6 | 9 | 16 |
| 7 | 2 | 4 |
| 8 | 10 | 18 |
| **Total** | **45** | **80** |

**\*Note: There may be minor deviation in marks distribution.**