Telecommunication N/W
MIE 122

Semester: Second **Full Marks: 75**
Credit Hour: 3 **Internal: 30**
Final Exam: 45

General Objective:
The objective of this course is to provide the student with an understanding of the evolution of telecommunication networks from traditional Public Switched Telephone Network (PSTN), through the emergence of data networks, local area networks, integrated services digital network (ISDN), development of fast packet switching, to the Internet.

Specific Objectives

- To understand the key theoretical concepts in communications system engineering,
- To be familiar with the working of the various types of commonly used communication systems
- To be able to design some of the communication systems

COURSE CONTENTS

Unit 1: Introduction **5 Hrs**

Overview on Telecommunications, Evolution and History, Telecommunications, in Nepal, Role of Telecommunications in the overall development of nation, Role of ICT in the overall development of a nation

Unit 2: Telecom Policies **5 Hrs**

Policy, Legal, Regulatory framework of telecommunication/ICT in Nepal, Operational Framework of Telecommunications/ICT sector in Nepal.

Unit 3: Telecom Regulatory Bodies for Standardization **6 Hrs**

Administrative Organizations: ITU, National PTTs, APT, FCC, Standardization Bodies: ITU-T, ITU-R, ISO, ETSI, etc.

Unit 4: Transmission Media **8 Hrs**

Transmission Media: Copper Pairs; Optical Fibers; Radio Waves, Overview on Transmission Systems, Microwave Radio Relay Lines, Satellite Communications, Networks, Optical Fiber Communication Networks, Mobile Communication Systems, Wireless Local Loop Systems

Unit 5: Switching Techniques **5 Hrs**

Circuit Switching**,** Packet Switching

Unit 6: Next Generation Network (NGN) 8 Hrs

Introduction, Definition, Benefits of NGN, Regulating issues & approaches, Network Architecture of NGN.

Unit 7: Technology evolution and Migration strategies in the telecommunications sector. 8 Hrs

1G to 2G to 3G to 4G migration in wireless technology, narrowband to broadband, copper based to optical fiber based, monopoly to competitive market, voice to data, individual service to converge services.

References

1. T. Aattalainen: **"Introduction to telecommunications Network Engineering"**, Artech House (1999)
2. J. Bellamy: **"Digital telephony"**, John Wiley & Sons (1991)
3. T. Saadawi: **"Fundamentals of Telecommunication Networks"**, John Wiley & Sons (1994)
4. M. P. Clark: **"Networks and Telecommunications"**, John Wiley & Sons (1991)
5. R. L. Freeman: **"Telecommunication System Engineering"**, John Wiley & Sons (1991)
6. Pramode K. Verma: **"ISDN Systems"**, Prentice Hall (1991)
7. William Stallings: **"Advances in ISDN and Broadband ISDN"**, IEEE Press (1991)
8. B. G. Lee: **"Broadband telecommunications Technology"**, Artech House (1991)
9. P. G. Fonteolliet: **"Telecommunication Systems"**, Artech House (1991)
10. R. L. Freeman: **"Reference Manual for Telecommunications"**, John Wiley & Sons (1991)
11. Huang Hung-chia, A.W.Snyder: **"Optical Waveguide Seiences"**, Martinus Nijhoff (1983)
12. **"ITU-T Recommendations given in CCITT Blue books related to PSTN, ISDN, Data Networks**

Reference Journals:

1. IEEE Communications Magazine
2. IEEE Transactions on Communications
3. IEEE Network Magazine
4. IEEE Journal on Selected Areas in Communications
5. IEEE/ACM Transactions on Networking
6. Telecommunication Journal (ITU) Telephony