



Course Title: TELECOM SWITCHING AND NETWORKS

Credit Units:4

Course Level: PG

Course Code: TELE609

L	T	P/S	SW/F W	TOTAL CREDIT UNITS
3	1	0	0	4

Course Objectives: This subject aims at introducing to the students the knowledge about the telecommunication industry: its services and market, the theoretical basis about performance (queuing theory) and operation (multiplexing, switching, routing, and signaling) in telecom networks.

Pre-requisites: Analog and Digital Communication

Course Contents/Syllabus:

	Weightage (%)
Module I : Introduction	15
Introduction to telephone communication, manual switching system, Automatic strowger switching system, crossbar switching system, Signaling in Automatic Strowger Switching System, Elements of a Switching System, Design parameters of Switching System.	
Module II : Elements of Tele-Traffic	15
Network traffic Load and parameters, grade of service, Trunking Efficiency and blocking probability, modeling switching systems, incoming traffic and service time characterization, blocking models and loss estimates, delay systems.	
Module III : Switching	25

Electronic space division switching: Stored program control; centralized and distributed, software architecture, application software, enhanced services, single and multistage networks. Time division switching; Basic time division space switching, basic time division time switching, time multiplexed space switching, time multiplexed space switching, combination switching, multistage combination switching	
Module IV : Telephone Networks	25
Analog termination requirements, BORSCHT configuration, digital termination requirements, signaling tones, touch tone dial generation, design consideration, touch tone detection, switching hierarchy and routing, transmission plan, numbering plan- CCITT No. 7 Signaling systems.	
Module V: Data Networks	20
Data transmission in PSTN's switching, techniques for data transmission, data communication architecture, link to link layers, end to end layers, PABX, data network standards, Metropolitan Area Network (MAN),Satellite based data networks, fibre optic networks.. Network Hierarchy: Network hierarchy in the telephone network, Network hierarchy in other networks; Network Intelligence.	

Student Learning Outcomes:

1. Describe and apply fundamentals of telecommunication systems and associated technologies.
2. Apply the principles of queuing theory in evaluating the performance of congested telecommunication networks.
3. Solve problems and design simple systems related to tele-traffic and trunking efficiency.
4. Understand and explain the reasons for switching, and the relative merits of the possible switching modes, e.g. packet and circuit switching.
5. Understand the principles of the internal design and operation of telecommunication switches, and the essence of the key signaling systems that are used in telecommunication networks .

Pedagogy for Course Delivery: Delivery of lectures with class notes followed by presentations and uploading course material on Amizone

Lab/ Practicals details, if applicable: NA

Assessment/ Examination Scheme:

Theory L/T (%)	Lab/Practical/Studio (%)	Total
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100%	NA	100
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Theory Assessment (L&T):

Continuous Assessment/Internal Assessment					End Term Examination
Components (Drop down)	Class Test	Home Assignment	S/V/Q	Attendance	
Weightage (%)	10%	10%	5%	5%	70%

Text Reading:

- Thiagarajan Vishwanathan/ Telecommunication Switching Systems and Networks/PHI
- Joseph Y. Hui/Switching and Traffic Theory for Integrated Broad Band Networks/Kleewer Academic publishers, 1990
- V.E. Benes/Mathematical Theory of connecting Networks & Telephone Traffic/Academic Press, 1965.
- G. Hebuterve / Traffic Flow in Switching Systems / Artech House, 1987.
- J.C. Bellamy/Digital Telephony/John Wiley 2nd Ed., 1992
- Anders Hellman & Gudrun Bager/ Understanding Telecommunication 1/Printed in Sweden, Student literature, Lund Ericsson Telecom AB, Competence Development centre