DIGITAL SWITCHING SYSTEMS

B.E., VI Semester, Electronics & Communication Engineering/ Telecommunication Engineering

[As per Choice Based Credit System (CBCS) scheme]

Subject Code	15EC654	IA Marks	20
Number of Lecture Hours/Week	03	Exam Marks	80
Total Number of Lecture Hours	40 (8 Hours / Module)	Exam Hours	03

CREDITS – 03

Course Objectives: This course will enable students to

- Understand the basics of telecommunication networks and digital transmission of data.
- Study about the evolution of switching systems and the digital switching.
- Study about the telecommunication traffic and its measurements.
- Learn the technologies associated with the data switching operations.
- Understand the use of software for the switching and its maintenance

Module-1	RBT Level
DEVELOPMENT OF TELECOMMUNICATIONS: Network structure, Network services, terminology, Regulation, Standards. Introduction to telecommunications transmission, Power levels, Four wire circuits, Digital transmission, FDM,TDM, PDH and SDH [Text-1]	L1, L2
Module-2	
EVOLUTION OF SWITCHING SYSTEMS: Introduction, Message switching, Circuit switching, Functions of switching systems, Distribution systems, Basics of crossbar systems, Electronic switching. **DIGITAL SWITCHING SYSTEMS:** Switching system hierarchy, Evolution of digital switching systems, Stored program control switching systems, Building blocks of a digital switching system, Basic call processing. [Text-1 and 2]	L1, L2
Module-3	
TELECOMMUNICATIONS TRAFFIC: Introduction, Unit of traffic, Congestion, Traffic measurement, Mathematical model, lost call systems, Queuing systems. **SWITCHING SYSTEMS:** Introduction, Single stage networks, Gradings, Link Systems, GOS of Linked systems. [Text-1]	L1, L2
Module-4	
TIME DIVISION SWITCHING: Introduction, space and time switching, Time switching networks, Synchronisation. **SWITCHING SYSTEM SOFTWARE:** Introduction, Basic software architecture, Software architecture for level 1to 3 control, Digital switching system software classification, Call models, Software linkages during call, Feature flow diagram, Feature interaction. [Text-1 and 2]	L1, L2
Module-5	
MAINTENANCE OF DIGITAL SWITCHING SYSTEM: Introduction , Software maintenance, Interface of a typical digital switching system central office, System outage and its impact on digital switching system reliability, Impact	L1, L2

of software patches on digital switching system maintainability, A methodology for proper maintenance of digital switching system **A GENERIC DIGITAL SWITCHING SYSTEM MODEL:** Introduction, Hardware architecture, Software architecture, Recovery strategy, Simple call through a digital system, Common characteristics of digital switching systems. Reliability analysis. [Text-2]	

Course Outcomes: At the end of the course, students should be able to:

- Describe the electromechanical switching systems and its comparison with the digital switching.
- Determine the telecommunication traffic and its measurements.
- Define the technologies associated with the data switching operations.
- Describe the software aspects of switching systems and its maintenance.

Question paper pattern:

- The question paper will have ten questions
- Each full question consists of 16 marks.
- There will be 2 full questions (with a maximum of Three sub questions) from each module.
- Each full question will have sub questions covering all the topics under a module
- The students will have to answer 5 full questions, selecting one full question from each module

Text Books:

1. Telecommunication and Switching, Traffic and Networks - J E Flood: Pearson Education, 2002.
2. Digital Switching Systems, Syed R. Ali, TMH Ed 2002.

Reference Book:

Digital Telephony - John C Bellamy: Wiley India Pvt. Ltd, 3rd Ed, 2008.

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