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By K B Hemanth Raj

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DIGITAL SWITCHING SYSTEMS
B.E., VI Semester, Electronics & Communication Engineering/ Telecommunication Engineering
[As per Choice Based Credit System (CBCS) Scheme]

Course Code	17EC654	CIE Marks	40
Number of Lecture Hours/Week	03	SEE Marks	60
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

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 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) **L1, L2**

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.

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.