SPPU B.E./B.Tech ENTC Sem 8 syllabus

Mobile Communication

Mobile Communication(404189)

Unit I : Telecommunication Switching & Traffic 8L
Telecommunication switching: Message switching, Circuit switching, Manual System,
Electronic Switching. Digital switching: Switching functions, Telecommunication Traffic: Unit of
Traffic, Traffic measurement, A mathematical model, Lost- call systems: Theory, traffic
performance, loss systems in tandem, traffic tables. Queuing systems: Erlang Distribution,
probability of delay, Finite queue capacity, Systems with a single server, Queues in tandem,
delay tables and application of Delay formulae.

Unit II: Switching Networks and Signaling 8L
Single Stage Networks, Gradings, Link Systems, Grades of service of link systems. Time
Division Switching: Space and time switching, Time division switching networks,
Synchronization, Call processing Functions, Common Control, Reliability, Availability and
Security. Signaling: Customer line signaling. FDM carrier systems, PCM signaling, Inter-register
signaling, Common channel signaling principles, CCITT signaling No. 6, CCITT signaling No.
7, Digital customer line signaling.

Unit III: Cellular Concepts6L
Evolution of Wireless systems, Introduction to cellular telephone system, Frequency reuse,
Channel Assignment, Handoff strategies, Cell Splitting, Propagation Mechanism: Free space

loss, Reflection, Diffraction, Scattering. Fading and Multipath: Small scale multipath
propagation, Impulse response model of multipath channel. Multiple Access Techniques-TDMA,
FDMA, CDMA

Unit IV: First and Second Generation Mobile Systems6L
First Generation Cellular Systems, AMPS, GSM Cellular Telephony: Introduction, Basic GSM
Architecture, Basic radio transmission parameters in GSM system, Logical Channels, GSM time
hierarchy, GSM burst structure, Description of call setup procedure, Handover, Modifications
and derivatives of GSM.

Unit V: GSM Services 8L
GSM Physical layer: Speech Coding and decoding, GMSK modulation, Data transmission in
GSM: Data Services, SMS, HSCSD, GPRS, EDGE.

Unit VI : CDMA Based Mobile Systems 8L
Motivation for CDMA use, Spreading Sequences, Basic Transmitter and Receiver schemes,
Rake Receiver, IS-95 system: Frequency Range, Downlink transmission, Uplink transmission,
Power control, Introduction to 3G mobile systems: W-CDMA and cdma-2000.

Text Books
1. J. E. Flood , “Telecommunications Switching, Traffic and Networks”, Pearson Education
2. Krzysztof Wesolowski, “Mobile Communication Systems”, Wiley Student Edition.

Reference Books
1. Theodore S Rappaport, “Wireless Communications Principles and Practice” Second
Edition, Pearson Education
2. John C. Bellamy, “Digital Telephony”, Third Edition; Wiley Publications
3. ThiagarajanVishwanathan, “Telecommunication Switching Systems and Networks”; PHI
Publications
4. Wayne Tomasi, “Electronic Communications Systems”; 5th Edition;

Pearson Education
5. Vijay K Garg, Joseph E Wilkes, “Principles and Applications of GSM” Pearson
Education
6. Vijay K Garg, Joseph E Wilkes, “IS-95CDMA and CDMA 2000 Cellular/PCS Systems
Implementation” Pearson Education
7. Mischa Schwartz, “Mobile Wireless Communications”, Cambridge University Press

Broadband Communication Systems

Broadband Communication Systems(404190)

UNIT I: Light wave System Components
Key Elements of Optical Fiber Systems, Optical Fibers as a Communication Channel: Optical Fiber Modes and Configurations , Mode Theory for Circular Waveguides , Single-mode Fibers, Graded-index Fiber Structure, Signal Degradation in Optical Fibers.Optical Sources: Basic Concepts and characteristics of LEDs and LASERs. Photodetectors: Basic Concepts, Common Photodetectors.

UNIT II: Lightwave Systems
System Architectures, Point-to-Point Links: System Considerations, Design Guidelines: Optical Power Budget, Rise Time Budget, Long-Haul Systems.

UNIT III: Multichannel Systems
Overview of WDM, WDM Components: 2 x 2 Fiber Coupler, Optical Isolators and Circulators, Multiplexers and De-multiplexers, Fiber Bragg Grating, FBG applications for multiplexing and De-multiplexing function, Diffraction Gratings, Overview of Optical Amplifiers: SOA, EDFA and RFA in brief.

UNIT IV: Orbital Mechanics and Launchers
History of Satellite Communication, Orbital Mechanics, Look angle determination, Orbital perturbations, Orbital determination, Launchers and Launch Vehicles, Orbital effects in communication system performance.

UNIT V: Satellites
Satellite Subsystems, Attitude and control systems (AOCS), Telemetry, Tracking, Command and Monitoring, Power systems, Communication subsystems, Satellite antennas, EquipmentReliability

and space qualification.

UNIY VI: Satellite Communication Link Design
Introduction, Basic transmission Theory, System Noise Temperature and G/T Ratio, Design of Downlinks, Satellite Systems using Small Earth Stations, Uplink Design, Design specified C/N : Combining C/N and C/I values in Satellite Links, System Design Examples

Text Books
1. Gerd Keiser, “Optical fiber Communications”, Tata McGraw Hill, 4th edition.
2. Timothy Pratt, Charles Bostian, Jeremy Allnutt “Satellite Communications”, John Wiley & Sons.

Reference Books
1.Govind P. Agrawal, Fiber-Optic Communication Systems, Wiley, 3rd edition.
2. Dennis Roody, “Satellite Communications”, McGraw Hill