CELLULAR AND MOBILE COMMUNICATION

UNIT-1

CELLULAR MOBILE RADIO SYSTEMS: Introduction to Cellular Mobile System,Performance criteria,Uniqueness of mobile radio environment, Operation of cellular systems,Hexagonal shaped cells,Analog and Digital Cellular systems.

UNIT-2

ELEMENTS OF CELLULAR RADIOSYSTEM DESIGN: General description of the problem,Concept of frequency channels,Co-channel Interference,Reduction Factor,Desired C/I from a normal case in a omni directional Antenna system, Cell splitting,Consideration of the components of the cellular system.

UNIT-3

INTERFERENCE: Introduction to Co-Channel interference,Real time Co-Channel interference,Co-Channel measurement,Design of antenna system,Antenna parameters and their effects,Diversity Receiver,Non-Cochannel interference-Different types.

UNIT-4

CELL COVERAGE FOR SIGNAL AND TRAFFIC: Signal reflections in flat and hilly terrain,Effect of human made structures,Phase difference between direct and reflected paths,Constant standard deviation,Straight line path loss slope,General formula for mobile propagation over water and flat open area,Near and long distance propagation antenna height gain,Form of a point to point model.

UNIT-5

CELL SITE AND MOBILE ANTENNAS : Sum and difference patterns and their synthesis,Omni directional antennas,Directional antennas for interference reduction,Space diversity antennas,Umbrella pattern antennas,Minimum separation of cell site antennas,High gain antennas.

UNIT-6

FREQUENCY MANAGEMENT AND CHANNEL ASSIGNMENT: Numbering and grouping, Setup access and paging channels channel assignments to cell sites and mobile units,Channel sharing and borrowing,Sectorization,Overlaid cells, Non fixed channel assignment.

UNIT-7

Handoff,Dropped calls and Cell splitting,Types of handoff, handoff invitation,Delaying handoff,Forced handoff,Mobile assigned handoff,Intersystem handoff,Cell splitting,Micro cells,Vehicle locating methods,Dropped call rates and their evaluation.

UNIT-8

DIGITAL CELLLULAR NETWORKS:GSM architecture,GSM channels,multiplex access scheme,TDMA,CDMA.

TEXTBOOKS:

I. Mobile Cellular Telecommunications-**W.C.Y.LEE,TATA MC GRAW HILL 2rd Edn., 2006.**

2. PrincipIes of Mobile Communications-**GORDAN L STUBER,SPRINGLE International 2nd Edition. 2007.**

REFERENCES:

1. Wireless Communications- **Theodore. S. Rapport. Pearson education, 2nd Edn., 2(X)2.**

2. Wireless and Mobile Communications —**Lee McGraw I-liNs, 3rd Edition, 2006.**

3. Wireless Communication and Networking — **Jon W. Mark and Weihua Zhqung, P111,2005.**

4. Wireless Communication Technology — **R. Blake Thompson Asia Pvt.Ltd., 2(X)4.**

SATELLITE COMMUNICATION

UNIT-1

INTRODUCTION :Origin of Satellite Communications,Historical Back ground,Basic Concepts of Satellite Communications,Frequency allocations for Satellite Services,Applications,Future Trends of Satellite Communications.

UNIT -2

ORBITAL MECHANICS AND LAUNCHERS: Orbital Mechanics,Look Angle determination,Orbital perturbations,Orbit determination,Launches and launch vehicles,Orbital effects in communication.

UNIT-3

SATELLITE SUBSYSTEMS: Attitude and tracking,Command and monitoring,Power subsystems,Satellite antenna Equipment reliability and space qualification.

UNIT-4

SATELLITE LINK DESIGN: Basic transmission theory,System noise temperature and G/T ratio,Design of down links,Up link design,Design of satellite links for specified C/N,System design example.

UNIT-5

MULTIPLE ACCESS: Frequency division multiple access(FDMA)Intermodulation, Calculation **of** C/N,Time division MultipleAccess (TDMA) Frame structure, Examples,Satellite Switched TDMA Onboard processing,DAMA,Code Division Multiple access (CDMA),Spread spectrum transmission and reception.

UNIT-6

EARTH STATION TECHNOLOGY : Introduction,Transmitters,Receivers, Antennas,Tracking systems,Terrestrial interface,Primary power test methods.

UNIT-7

LOW EARTH ORBIT AND GEOSTATIONARY SATELLIIE SYSTEMS: Orbit consideration,Coverage and frequency considerations,Delay &Throughput considerations,System considerations,Operational NGSO constellation Designs

UNIT-8

SATELLITE NAVIGATION & THE GLOBAL POSITIONING SYSTEM: Radio and Satellite Navigation,GPS Position Location principles,GPS Receivers and codes,Satellite signal acquisition,GPS Navigation Message,GPS signal levels,GPS receiver operation,GPS C/A code accuracy,Differential GPS.

TEXT BOOKS:

1.Satellite Communications – **Timothy Pratt,Charles Bostian and Jeremy Allnutt,WSE,Wiley Publications,2nd Edition,2003.**

2.Satellite Communications Engineering **– Wilbur L. Pritchard, Robert A Nelson and Henri G.Suyderhoud. 2nd Edition. Pearson Publications,2003.**

REFERENCES:

1.Satellite Communications Design Principles- **M. Richharia, RS Publications, 2nd Edition, 2003.**

2.Satellite Communication **- D.CAgarwal. Khanna Publications. 5th Ed.**

3.Fundamentals of Satellite Communications – **KN.Raja Rao,PHI,2004**

4.Satellite Communications – **Dennis Roddy. McGraw HILL,2nd Edition, 1996.**

OPERATING SYSTEMS

UNIT-1

Computer System and Operating System Overview: Overview of Computer System hardware – Instruction execution – I/O function – Interrupts – Memory hierarchy – I/O Communication techniques,Operating System Objectives and functions-Evaluation of operating System – Example Systems.

UNIT 2

Process Description: Process Control-process states-Process and Threads - Examples of Process description and control.

UNIT-3

Concurrency : Principles of Concurrency,Mutual Exclusion— Software and hadware approaches— Semaphores-Monitors-Message Passing —Reader writer Problems.

UNIT-4

Principles of deadlock— Deadlock prevention,Detection and avoidance dining philosophers problem — Example Systems.

UNIT-5

Memory Management: Memory Management requirements —Loading programmes into main memory —Virtual memory —Hardware and Control structures — OS Software — Examples of Memory Management.

UNIT-6

Uniprocessor Scheduling: Types of Scheduling —Scheduling algorithms —I/O management and Disc Scheduling — I/o devices—Organization — of I/O function — OS design issues,I/o buffering - Disk I/O - disk scheduling Policies — examples System.

UNIT-7

File Management and Security: Overview of file management-file organization and access - File Directories - File sharing - Record blocking secondary Storage Management-Example system.

UNIT-8

Security: Security threats- Protection-Intruders-Viruses-Trusted System.

TEXT BOOKS:

1.Operating Systems- Internal and Design Principles,**Fifth Edition 2005, Pearson education PHI**
2.Operating System Principles- **Abraham Silberchatz. Peter B Galvin,Greg Gagne,7th Edition John Wiley**

REIERËNCFS:

1.Operating Systems A design approach- **Crowley.TMH.**
2.Modern Operating Systems- **Andrew S Tanenbaum. 2nd Edition. PHI PEARSON.**

ANALYTICAL INSTRUMENTATION

UNIT-1: PH AND CONDUCTIVITY & DISSOLVED COMPONENT ANALYSER
Conductivity meters—PH meters - Dissolved oxygen,Hydrogen analyzers-Sodium analyzer — Silica analyzer and sampling systems

UNIT- 2: GAS ANALYSERS

Thermal conductivity types — CO monitor - NOX analyzer — H2S analyzer system and sampling — Industrial analyzer circuits, Theory and problems on Beer - Lamberts Law. .

UNIT-3:CHROMOTOGRAPHY 1
GAS chromotography-LIQUID chromotography-their principles and applications.

UNIT-4:CHROMAIOGRAPHY — II
Oxygen analyser-Paramagnetic type—Detectors and sampling systems.

UNIT—5:SPECTROPHOTOMETERS-I

UV,VIS Spectrophotometers — Single beam and double beam instruments — Instrumentation associated with the above Spectrophotometers — Sources and detectors — Sources and detectors for IR Specirophotometers.

UNIT—6: SPECTROPHOTOMETERS-II

FT-IR Spectrometer -Flame emission and atomic absorption Spectrophotometer — Atomic emission Spectrophotometer -Sources for Flame Photometers and Online calorific value measurements.

UNIT-7: PRINCIPLE OF NUCLEAR MAGNETIC RESONANCE

Instrumentation associated with NMR Spectrophotometer — Introduction to Mass spectrophotometers,Principle and brief discussion on ELECTRON SPIN RESONANCE (ESR)

UNIT-8:APPLICATIONS

Nuclear radiation detectors —Ionization chamber — GM Counter — Proportional Counter — Solid state detectors.

TEXT BOOK:

L Handbook of Analytical Instruments **- by Khandpur. TMH**

REFERENCE

1. Instrumental Methods of Analysis — by **Willard HH.,Merrit L.L. Dean J.A., and Seattlc FL., CBS Publishing and Distributors. 6/e, 1995.**
2. Instrument Technology — by **Jones B.E., Butterworth Scientific Pubi.. London, 1987.**
3. Mechanical and Industrial Measurements - by **Jam R.K.. Khanna Publishing, New Delhi, 2/e, 1992.**
4. Principles of Instrumental Analysis — by **Skoog D.A. and West D.M.. Holt Sounder Publication, Philadelphia, 1985.**
5. Instrumental Analysis — **by Mann C.K., Vickerks T.J. & Gullick W.H.. Harper and Row Publishers. New York, 1974. `**