

**ADIKAVI NANNAYA UNIVERSITY:: RAJAMAHENDRAVARAM**  
**UNIVERSITY COLLEGE OF ENGINEERING**  
**ELECTRONICS AND COMMUNICATION ENGINEERING**  
**COURSE STRUCTURE**

**B.Tech, Four Year Degree Course**  
*(From the admitted batch of 2017-2018 under CBCS Scheme)*



**UNIVERSITY COLLEGE OF ENGINEERING**  
**ADIKAVI NANNAYA UNIVERSITY**  
**RAJAMAHENDRAVARAM – 533 296**

**IV<sup>TH</sup> B TECH (ECE) STRUCTURE & SYALLBUS****IV B.Tech II Semester ECE w.e.f 2017-18**

Sub Code	Subject	Hrs/Week		Max Marks		Total Marks	Credits
		Theory	Lab	Internal	External		
BTECE801	MOBILE CELLULAR COMMUNICATIONS	4	--	25	75	100	4
BTECE802	SATELLITE COMMUNICATION	4	--	25	75	100	4
BTECE803	PROJECT	---	---	100	100	200	8
<b>Total</b>		<b>8</b>		<b>150</b>	<b>250</b>	<b>400</b>	<b>16</b>

**BTECE801: MOBILE CELLUAR COMMUNICATIONS****Theory: 4hrs/Week****Credits: 4****Int Marks: 25****Ext.Marks: 75****UNIT I**

**Cellular Mobile Radio Systems:** Introduction to Cellular Mobile System, uniqueness of mobile radio environment, operation of cellular systems, consideration of the components of Cellular system, Hexagonal shaped cells, Analog and Digital Cellular systems. **Cellular Concepts:** Evolution of Cellular systems, Concept of frequency reuse, frequency reuse ratio, Number of channels in a cellular system, **Cellular traffic:** trunking and blocking, Grade of Service; Cellular structures: macro, micro, Pico and femto cells; Cell splitting, Cell sectoring.

**UNIT II**

**Interference:** Types of interferences, Introduction to Co-Channel Interference, real time Co-Channel interference, Co-Channel measurement, Co-channel Interference Reduction Factor, desired C/I from a normal case in a Omni directional Antenna system, design of Antenna system, antenna parameters and their effects, diversity receiver, non-co channel interference-different types. **Frequency Management And Channel Assignment:** Numbering and grouping, setup access and paging channels, channel assignments to cell sites and mobile units: fixed channel and non-fixed channel assignment, channel sharing and borrowing, overlaid cells.

**UNIT III**

**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, 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. **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 IV**

**Handoff Strategies:** Concept of Handoff, types of handoff, handoff initiation, delaying handoff, forced handoff, mobile assigned handoff, intersystem handoff, vehicle locating methods, dropped call rates and their evaluation.

**Digital Cellular Networks:** GSM architecture, GSM channels, multiple access schemes; TDMA, CDMA, OFDMA; architecture of 3G cellular systems.

**TEXTBOOKS:**

1. Mobile Cellular Communication – G Sasibhushana Rao Pearson
2. Mobile Cellular Telecommunications – W.C.Y. Lee, Tata McGraw Hill, 2nd Edn, 2006.

**REFERENCE BOOKS:**

1. Wireless Communications – Theodore. S. Rappoport, Pearson education, 2<sup>nd</sup> Edn, 2002.
2. Wireless and Mobile Communications – Lee McGraw Hills, 3<sup>rd</sup> Edition, 2006.

**UNIT – I**

**INTRODUCTION AND ORBITAL ASPECTS OF SATELLITE COMMUNICATIONS:** A brief history of Satellite Communications, Types of Orbits, Orbital Mechanics: Developing the Equation of the orbit, Kepler's laws of planetary motion, locating the satellite in the orbit, locating the Satellite with respect to the Earth, Orbital elements, Look angle determination, Orbital perturbations, launch and launch vehicles, Orbital effects in Communication System performance.

**UNIT – II**

**SATELLITE SUBSYSTEMS:** Introduction, Attitude and Orbit Control System (AOCS), Telemetry, Tracking, Command and Monitoring (TTC&M), Power Systems, Communication Subsystems, Satellite Antennas.

**MULTIPLE ACCESS TECHNIQUES:** Introduction, FDMA, TDMA, DAMA and CDMA Satellite Systems Encoder, Decoder, Comparison between FDMA, TDMA & CDMA.

**UNIT – III**

**SATELLITE LINK DESIGN:** Basic transmission theory, System Noise Temperature and  $G / T$  ratio. Design of Uplink and down link models, Design of Satellite links for specified  $C / N$  ratio.

**EARTH STATION TECHNOLOGY:** Earth Station Design, Design of large antennas, Small earth station Antennas, Propagation Effects on Satellite: Quantifying Attenuation and Depolarization, Rain and Ice Effects, Prediction of Rain Attenuation.

**UNIT – IV**

**VSAT SYSTEMS:** Introduction, overview of VSAT Systems, Network Architectures, One – way Implementation, Split – Two-Way (Split IP) Implementation, Two-Way Implementation, Access Control Protocols, Delay Considerations, Basic Techniques: Multiple Access Selection, Signal Formats, Modulation, Coding, and Interference Issues.

**VSAT Earth Station Engineering:** Antennas, Transmitters and Receivers, Calculation of Link Margins for a VSAT Star Network, System Design Procedure.

**Introduction to GPS Position:** Location Principles, Position Location in GPS, GPS Time, GPS Receivers and Codes.

**TEXT BOOKS:**

1. T Pratt and W Bostian, Satellite Communications, 2nd Edition, John Wiley,
2. W Tomasi, Advanced Electronic Communication Systems, 4th Edition, Pearson Education, 2002.
3. Taub and Schilling, Principles of Communication Systems, TMH, 2003.

**REFERENCE BOOKS:**

1. D C Agarwal, Satellite Communications, Khanna Publishers, 2003.
2. Robert M Gagliardi, Satellite Communications.

## BTECE 803: PROJECT WORK

Internal Marks:100

Credits:08

External Marks:100

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		Theory	Lab	Internal	External		
BTECE 803	PROJECT	--	--	100	100	200	8

