

Bhoj Reddy Engineering College for Women, Hyderabad.

Department of Electronics and Communication Engineering

Lesson Plan for the academic year 2015-16, II Semester

Name of the faculty member & Department: Dr. K Yedukondalu, ECE

Branch & Section: ECE - A

Class: IV B.Tech

Subject: Satellite Communications (SC)

Semester: II

No. of lectures per week: 3+1(Tutorial)

Lecture Number	Expected Date	Topic to be covered
UNIT I : INTRODUCTION		
1.	10/12/15	Origin, Back ground and basic concepts of satellite communications
2.	11/12/15	Frequency allocations for Satellite services and applications
3.	12/12/15	Limitations* and Future trends of satellite communications
4.	10/12/15, 11/12/15, 12/12/15	Tutorial (G3, G2, G1): Indian Satellites and launch pads available world wide
UNIT-II: ORBITAL MECHANICS AND LAUNCHERS		
5.	17/12/15	Orbital Mechanics
6.	18/12/15	Orbital Mechanics
7.	19/12/15	Look angle Determination
8.	17/12/15, 18/12/15, 19/12/15	Tutorial (G3, G2, G1): Problems on Orbital mechanics and look angles
9.	31/12/15	Orbital Perturbations
10.	01/01/16	Orbit determinations, Launches and Launch vehicles
11.	02/01/16	Orbital effects in communications system performance
12.	31/12/15, 01/01/16, 02/01/16	Tutorial (G3, G2, G1): Problems on Orbital mechanics and look angles
UNIT-III: SATELLITE SUBSYSTEMS		
13.	07/01/16	Attitude and Orbit Control Systems (AOCS)
14.	08/01/16	Telemetry, Tracking, Command (TT&C) and Monitoring
15.	09/01/16	Power systems and communication Subsystems
16.	07/01/16, 08/01/16, 09/01/16	Tutorial (G3, G2, G1): Problems on AOCS and TTC & M
17.	16/01/16	Satellite Antennas, Equipment Reliability
18.	16/01/16	Tutorial (G1): Problems on satellite antennas, Equipment reliability and space qualification
19.	21/01/16	Satellite Space Qualification
UNIT-IV: SATELLITE LINK DESIGN		
20.	22/01/16	Basic Transmission Theory
21.	23/01/16	Satellite Link Equation Derivation*
22.	21/01/16, 22/01/16, 23/01/16	Tutorial (G3, G2,G1): Problems on satellite link equation
23.	28/01/16	System Noise Temperature and G/T Ratio
24.	29/01/16	Design of Down and Uplinks
25.	30/01/16	Design of Satellite links for Specified C/N
26.	28/01/16, 29/01/16, 30/01/16	Tutorial (G3, G2, G1): Problems on G/T and C/N ratios and up and down links

27.	25/02/16	System Design Examples-I, System Design Examples-II
UNIT-V: MULTIPLE ACCESS TECHNIQUES		
28.	26/02/16	Frequency Division Multiple Access (FDMA)
29.	27/02/16	Intermodulation, Calculation of C/N
30.	25/02/16, 26/02/16, 27/02/16	Tutorial (G3, G2, G1): Problems on link design
31.	03/03/16	Non linear distortion effects
32.	04/03/16	Time Division Multiple Access (TDMA)
33.	05/03/16	TDMA Frame Structure
34.	03/03/16, 04/03/16, 05/03/16	Tutorial (G3, G2, G1): Problems on FDMA, TDMA
35.	10/03/16	Satellite Switched TDMA and On board Processing
36.	11/03/16	Demand Access Multiple Access (DAMA)
37.	12/03/16	Code Division Multiple Access (CDMA), Spread Spectrum
38.	10/03/16, 11/03/16, 12/03/16	Tutorial (G3, G2, G1): Problems on CDMA
39.	17/03/16	Transmission and Reception
UNIT-VI: EARTH STATION TECHNOLOGY		
40.	17/03/16	Introduction and Satellite Transmitters
41.	18/03/16	Satellite Receivers, Satellite Antennas
42.	19/03/16	Tracking Systems and Terrestrial Interface
43.	17/03/16, 18/03/16, 19/03/16	Tutorial (G3, G2, G1): Satellite antennas
44.	24/03/16	Primary Power Test Methods
UNIT-VII: LOW EARTH ORBIT AND NON GEOSTATIONARY SATELLITE SYSTEMS		
45.	26/03/16	Orbit Considerations
46.	24/03/16, 26/03/16	Tutorial (G3, G1): Problems on satellite orbits
47.	31/03/16	Coverage and Frequency Considerations
48.	01/04/16	Operational NGSO Constellation Designs
49.	02/04/16	Delay and Throughput Considerations,
50.	31/03/16, 01/04/16, 02/04/16	Tutorial (G3, G2, G1): Problems on NGSO considerations
UNIT-VIII: SATELLITE NAVIGATION AND GLOBAL POSITIONING SYSTEM		
51.	07/04/16	Radio and satellite Navigation, GPS C/A Code Accuracy and Differential GPS
52.	09/04/16	GPS Position Location Principles, Receivers and Codes
53.	07/04/16, 09/04/16	Tutorial (G3, G1): Problems on GPS errors
54.	16/04/16	Satellite Signal Acquisition, GPS Navigation Message, Signal Levels, GPS Receiver Operation
55.	16/04/16	Tutorial (G1): Problems

Text Books:

1. Satellite Communications – Timothy Pratt, Charles Bostian and Jeremy Allnutt, WSE Wiley Publications, 2nd Edition, 2003 (for Units-II, III, IV, V, VII and VIII).
2. Satellite Communications Engineering – Wilbur L Pritchard, Robert A Nelson and Henri G. Suyderhoud, 2nd Edition, Pearson Publications, 2003 (for Units-I and VI).

Reference Books:

1. Satellite Communications: Design Principles- M. Richharia, B S. Publications, 2nd Edition 2003.
2. Satellite Communication – D.C Agarwal, Khanna Publications, 5th Edition.
3. Fundamentals of Satellite Communications – K.N. Raja Rao, PHI, 2004.
4. Satellite Communications- Dennis Roddy, McGraw Hill, 4th, Edition, 2009.

Name of the Faculty: Dr. K Yedukondalu

Signature of the faculty with date:

HoD Signature: