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| University of Mumbai | | | |
| CLASS: T.E. (Electronics Engineering) | | Semester - VI | |
| SUBJECT: Communication Systems and Application (Elective-1) | | | |
| Periods per week (each of 60 min.) | Lecture | 4 | |
| | Practical | 2 | |
| | Tutorial | - | |
| | | Hours | Marks |
| Evaluation System | Theory Examination | 3 | 100 |
| | Practical examination | | |
| | Oral Examination | - | |
| | Term Work | - | 25 |
| | Total | | 125 |

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| Objective | This course acquaints the students with antenna fundamentals and continues with a consideration of overview of different communication systems. This study emphasizes the requirements and standards of a quality television systems, both monochrome and color TV, Wide usage of satellite communication and Optical Fiber communication around us . Focus is also on RADAR ,its fundamentals and performance factors , that gave birth to microwave technology in later years. | |
| Pre-requisite | Concepts of basic communication techniques , characteristics of guided and unguided media | |
| Module | Contents | Hours |
| 1 | Antennas: The half wave dipole, Antenna characteristics, effects of Ground on antennas, Effects of Antenna height, Antenna coupling, and Antenna arrays: directional HF Antennas, UHF and microwave antennas. | 08 |
| 2 | Television principles: Television system and standards, The composite video signal, Blanking and synchronizing pulses, video modulation and VSB signal. | 06 |

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| 3 | Color TV : Color TV transmission, Color reception, PAL –B Standard color TV Transmitter and Receiver (block diagram only) , features of Cable TV, Digital TV, HDTV, LCD and Plasma T.V. | 08 |
| 4 | Satellite Communication: Kepler's Laws, Satellite orbits, Spacing and frequency allocation, Look angles, Satellite system link models, multiple access: FDMA, TDMA, Direct broadcast satellite services. Applications of LEO, MEO and Geo-stationary satellites. | 10 |
| 5 | Radar systems : Basic principles, Radar performance factors, Antenna scanning and tracking, MTI and Pulsed Doppler radar, Continuous wave Doppler radar, FM-CW Radar | 8 |
| 6 | Optical communication systems: key elements of Optical fiber communication link, Fiber configurations and classifications, Losses in fiber cables, Optical sources, Optical Detectors. | 8 |

Text Books:

1. Kennedy, Davis – Electronic Communication Systems, Tata Mcgraw Hill, fourth ed, 1999
2. Wayne Tomasi – Advanced Electronic communication Systems, PHI , Sixth ed,2004
3. Gulati – Monochrome and Color Television , New Age International (P) Ltd.
4. Roy Blake- Electronic communication systems ,Thomson Learning, 2nd ed, 2002
5. A M Dhake - Television & Video engineering ,Tata Mcgraw Hill, 2nd Ed, 2002

Reference Books:

1. Jordan , Balmian – Electromagnetic waves and Radiating systems , PHI , 2nd Ed, 1988
2. Merrill skolnik-Introduction to Radar System,, Tata Mcgraw Hill, Third edition , 2001
3. Michoel O Kolawole- Radar system peak detection & Tracking, Elsevier
4. Dennis Roddy – Satellite Communication, Mcgraw Hill, third ed, 2001
5. Pratt Bostian – Satellite Communication, John Wiley and sons, 1986
6. Gerd Keiser – Optical Fiber Communications, Tata Mcgraw Hill, fourth ed,2008

PRACTICAL SETUP:

The experimental list should consist of minimum 8 experiments:

- (i) 2 experiments on Antennas,
- (ii) 2 experiments on color TV
- (iii) 2 experiments on satellite communication
- (iv) 2 experiments on Optical fiber communication

Term work:

Term work shall consist of minimum eight experiments, and student presentation (not more than two student per group) on communication Application and written test.

The distribution of marks for term work shall be as follows:

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| Laboratory work (Journal and Presentation) | : 10 marks. |
| Test (at least one) | : 10 marks. |
| Attendance (Practical and Theory) | : 05 marks. |

The final certification and acceptance of term-work ensures the satisfactory performance of laboratory work and minimum passing in the term-work.

Theory Examination:

1. Question paper will comprise of total 7 questions, each of 20 marks.
 2. Only 5 questions need to be solved.
 3. Question number 1 will be compulsory and will cover all modules.
 4. Remaining questions will be from the same module or mixed in nature. (e.g.-
Suppose Q.2 has part (a) from, module 3 then part (b) will be from any
module other than module 3.)
 5. In the question paper, weightage of each module will be proportional to
number of respective lecture hours as mentioned in the syllabus.
 6. No question should be asked from pre-requisite module
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