

|                              |                                                                                                              |
|------------------------------|--------------------------------------------------------------------------------------------------------------|
| <b>Branch Name:</b>          | Information and Communication Technology                                                                     |
| <b>Program Code:</b>         | ET107                                                                                                        |
| <b>Semester/Year:</b>        | Semester VII / Fourth Year                                                                                   |
| <b>Course Name:</b>          | Wireless Communication Practical                                                                             |
| <b>Course Code:</b>          | 2ET1070701P                                                                                                  |
| <b>Pre-requisite Course:</b> | Digital and Analog Communication, Signals & Systems, Electromagnetic Theory, Probability & Random Processes. |

**Course Objectives:**

1. To understand the functioning of wireless communication system and evolution of different wireless communication systems and standards.
2. To compare recent technologies used for wireless communication.
3. To explain multiple access techniques for Wireless Communication.

**Teaching and Examination Scheme:**

| Credit | Teaching Scheme<br>Hours per week |   |   |       | Evaluation Scheme (Marks) |      |      |      |                   |      |      |      |                  |
|--------|-----------------------------------|---|---|-------|---------------------------|------|------|------|-------------------|------|------|------|------------------|
|        |                                   |   |   |       | Theory (Marks)            |      |      |      | Practical (Marks) |      |      |      | Total<br>(Marks) |
|        | L                                 | T | P | Total | SEE                       |      | CCA  |      | SEE               |      | CCA  |      |                  |
|        |                                   |   |   |       | Min.                      | Max. | Min. | Max. | Min.              | Max. | Min. | Max. |                  |
| 1      | -                                 | - | 2 | 2     | -                         | -    | -    | -    | 10                | 25   | 10   | 25   | 50               |

| Sr. No | List of Practical                                                                           | Content Hours |
|--------|---------------------------------------------------------------------------------------------|---------------|
| 1.     | Study of Baseband communication.                                                            | 2             |
| 2.     | Study of GSM Architecture.                                                                  | 2             |
| 3.     | Study of Capacity & Coverage of GSM network.                                                | 2             |
| 4.     | Study of CDMA Architecture.                                                                 | 2             |
| 5.     | Study of QPSK with help of coding in Scilab.                                                | 2             |
| 6.     | Study of 16 QAM with help of coding in Scilab.                                              | 2             |
| 7.     | Study of 64 QAM with help of coding in Scilab.                                              | 2             |
| 8.     | Study of OFDM with help of coding Scilab                                                    | 2             |
| 9.     | To write a program to calculate the link budget for any kind of communication.              | 2             |
| 10.    | To write a program to calculate the median path loss for any model for outdoor propagation. | 2             |
| 11.    | To write a program to calculate the BER with QPSK.                                          | 2             |
| 12.    | To write a program to calculate the BER with 16 QAM.                                        | 2             |

**List of Reference Books:**

1. David Tse and Pramod Viswanath, "Fundamentals of Wireless Communication", Wiley Series in Telecommunications, Cambridge University Press, 2005.
2. Theodore.S. Rappaport, "Wireless Communications: Principles and Practice", 2nd Edition, Pearson Education, India, 2009.
3. Arogyaswami Paulraj, Rokit Nabar, Dhananjay Gore, "Introduction to Space-Time Wireless Communication", 1st Edition, Cambridge University Press, 2008.
4. W.C.Y.Lee, "Mobile Cellular Telecommunications - Analog and Digital Systems", 2nd Edition. Tata McGraw Hill, 2006.
5. Andrea Goldsmith, "Wireless Communications", Cambridge University Press, 2005.

**e-Resources (If any):**

1. <https://nptel.ac.in/courses/106106167>

**Course Learning Outcomes (CLO): On completion of this course, the students will be able to:**

| CLO  | Description                                                                                               | Bloom's Taxonomy Level           |
|------|-----------------------------------------------------------------------------------------------------------|----------------------------------|
| CLO1 | Understand cellular concepts and signal propagation in mobile communication                               | 1 Remembering<br>2 Understanding |
| CLO2 | Understand the fundamental principles of signal propagation in wireless communication                     | 2 Understanding                  |
| CLO3 | Compare and contrast various multiple access techniques and their suitability for different applications. | 4 Analyze                        |
| CLO4 | Evaluate the advantages and limitations of different modulation schemes                                   | 3 Applying                       |
| CLO5 | Understand the architecture of mobile communication networks                                              | 2 Understanding<br>3 Applying    |

**Mapping of CLOs with POs & PSOs**

| Course Learning Outcomes | Program Outcomes (POs) |     |     |     |     |     |     |     |     |      |      |      | Program Specific Outcomes(PSOs) |      |      |      |
|--------------------------|------------------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|---------------------------------|------|------|------|
|                          | PO1                    | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1                            | PSO2 | PSO3 | PSO4 |
| <b>CLO1</b>              | H                      | M   |     | L   | L   | M   |     |     |     |      |      |      | H                               | L    |      |      |
| <b>CLO2</b>              |                        | L   |     | H   | L   | L   |     |     |     |      | L    | L    | M                               | L    |      |      |
| <b>CLO3</b>              | L                      | M   | M   | L   | M   | H   |     |     |     |      |      | M    | M                               | L    |      |      |
| <b>CLO4</b>              | M                      | M   | M   | L   | M   | H   |     |     |     |      |      | M    | M                               | L    |      |      |
| <b>CLO5</b>              | M                      | L   | L   | L   | M   | H   |     |     |     |      |      |      | H                               | L    |      |      |

**H: High, M: Medium, L: Low**