



**ESCUELA SUPERIOR POLITÉCNICA DEL LITORAL**  
**Faculty of Electrical and Computer Engineering**  
**COURSE SYLLABUS**  
*Telecommunication Laboratory*

**1. CODE AND NUMBER OF CREDITS**

|                              |                       |                     |
|------------------------------|-----------------------|---------------------|
| <b>CODE</b>                  | FIEC05009             |                     |
| <b>NUMBER OF CREDITS : 3</b> | <b>Theoretical: 0</b> | <b>Practical: 3</b> |

**2. COURSE DESCRIPTION**

The Telecommunications Laboratory course is the last laboratory for Engineering in Telecommunications. Reinforces the concepts acquired in theoretical courses and Communications Analog, Communications Digital. The student must submit reports and lessons from the practices, and develop a final project which applies the knowledge acquired throughout their studies.

**3. PRE-REQUISITES AND CO-REQUISITES**

|                       |  |
|-----------------------|--|
| <b>PRE-REQUISITES</b> | FIEC04960 DIGITAL COMMUNICATION<br>FIEC01347 ELECTRONIC B LABORATORY |
| <b>CO-REQUISITES</b>  |  |

**4. CORE TEXT AND OTHER REQUIRED REFERENCES FOR THE TEACHING OF THE COURSE**

|                   |   |
|-------------------|---|
| <b>CORE TEXT</b>  | 1. Manual of telecommunication laboratory   |
| <b>REFERENCES</b> | 1. R. E. Ziemer, W. H. Tranter, Principles of Communications: Systems, Modulation, and Noise. 4th Edition, John Wiley & Sons, 1995.<br>2. Leon Couch, Digital and Analog Communication Systems. 5th Edition, Prentice Hall, 1995. |

**5. COURSE LEARNING OUTCOMES**

At the end of the course, the student will be able to:

1. Integrate the knowledge acquired in the communications area courses: Systems Linear, Analogue and Digital Communications, Data Networks, Electromagnetic Theory I and II, Antennas and Propagation.
2. Know different measuring devices used in communications.
3. Understand the use of manuals and data provided by manufacturers to manage devices and to select circuit elements in the design of communications equipment.

**6. COURSE PROGRAM**

- I. PRACTICE No. 1. (Session - 3 hours).
  - Introduction to laboratory equipment
- II. PRACTICE No. 2. (Session - 3 hours).
  - AM
- III. PRACTICE No. 3. (Session - 3 hours).
  - FM
- IV. PRACTICE No. 4. (Session - 3 hours).
  - ASK
- V. PRACTICE No.5. (Session - 3 hours).
  - FSK
- VI. PRACTICE No.6. (Session - 3 hours).
  - PSK
- VII. 1ST ADVANCE OF PROJECT (Session - 3 hours).
- VIII. PRACTICE No.7 (Session - 3 hours).
  - Manchester CVDS
- IX. PRACTICE No.8 (Session - 3 hours).



- Digital communication systems Simulating using MATLAB.
- X. PRACTICE No.9. (Session - 3 hours).
  - Digital filters Design using Xilinx ISE and System Generator.
- XI. PRACTICE No.10. (Session - 3 hours).
  - RF generator and Spectral Analyzer
- XII. PRACTICE No.11. (Session - 3 hours).
  - Route configuration and static routes
- XIII. PRACTICE No.12. (Session - 3 hours).
  - Measurement equipments introduction for optics fiber
- XIV. FINAL PROJECT. (Session - 3 hours).

**7. WORKLOAD: THEORY/PRACTICE**

1 session per week for three hours

**8. CONTRIBUTION OF THE COURSE TO THE EDUCATION OF THE STUDENT**

Fundamental to engineering area.

| BASIC TRAINING | PROFESSIONAL TRAINING | SOCIAL SKILLS DEVELOPMENT |
|----------------|-----------------------|---------------------------|
|                | X                     |                           |

**9. THE RELATIONSHIP BETWEEN THE LEARNING OUTCOMES OF THE COURSE AND THE LEARNING OUTCOMES OF THE DEGREE PROGRAM**

| LEARNING OUTCOMES OF THE DEGREE PROGRAM*  | CONTRIBUTION (High, Medium, Low) | LEARNING OUTCOMES OF THE COURSE** | THE STUDENT MUST:   |
|---|----------------------------------|-----------------------------------|---|
| a) An ability to apply knowledge of mathematics, science and engineering.   | ---                              |                                   |   |
| b) An ability to design and conduct experiments, and to analyze and interpret data                                    | High                             | 1, 2                              | Development of reports during the experiments   |
| c) An ability to design a system, component or process to satisfy realistic constraints.                              | High                             | 1, 3                              | Design of a prototype according to specifications.                                      |
| d) An ability to function on multidisciplinary teams.   | ---                              |                                   |   |
| e) An ability to identify, formulate and solve engineering problems.  | Medium                           | 1,3                               | Development a design and prototype solution of Communications, according to objectives. |
| f) An understanding of ethical and professional responsibility.   | ----                             |                                   |   |
| g) An ability to communicate effectively.   | Low                              |                                   | Report and presentation of the project.   |
| h) A broad education necessary to understand the impact of engineering solutions in a social, environmental, economic | ----                             |                                   |   |



|   |      |         |  |
|---|------|---------|--|
| and global context.   |      |         |  |
| i) A recognition of the need for, and an ability to engage in life-long learning.                 | Low  |         | Research and readings development of final project |
| j) A knowledge of contemporary issues.  | ---- |         |  |
| k) An ability to use the techniques, skills, and modern tools necessary for engineering practice. | High | 1, 2, 3 | Using programs for design and simulation.          |
| l) Capacity to lead, manage and undertake projects.   | ---- |         |  |

**10. EVALUATION IN THE COURSE**

| Evaluation activities  |   |
|------------------------|---|
| Exams                  |   |
| Tests                  | X |
| Homework/tasks         |   |
| Projects               | X |
| Laboratory/Experiments | X |
| Class participation    |   |
| Visits                 |   |
| Other                  | X |

**11. PERSON RESPONSIBLE FOR THE CREATION OF THE SYLLABUS AND THE DATE OF ITS CREATION**

|                   |                              |
|-------------------|------------------------------|
| <b>Created by</b> | Eng. María Antonieta Alvarez |
| <b>Date</b>       | 03 MAY 2013                  |

**12. APPROVAL**

| ACADEMIC SECRETARY OF THE ACADEMIC DEPARTMENT                    | DIRECTOR OF TECHNICAL ACADEMIC SECRETARY                                  |
|--|---|
| NAME:<br>Mrs. Leonor Caicedo G                                   | NAME:<br>Eng. Marcos Mendoza  |
| SIGNATURE<br>  | SIGNATURE<br><br>ESCUELA SUPERIOR POLITÉCNICA DEL LITORAL                 |
| Date of approval by the Directive Council:<br>2013-537 2013-10-7 | <br>Ing. Marcos Mendoza V.<br>DIRECTOR DE LA SECRETARIA TÉCNICA ACADÉMICA |

**13. VALIDITY OF THE SYLLABUS**

|                                      |            |
|--------------------------------------|------------|
| RESOLUTION OF THE POLYTECHNIC BOARD: | 13-12-343  |
| DATE:                                | 2013-12-12 |