NATIONAL UNIVERSITY OF ENGINEERING
COLLEGE OF ELECTRICAL AND ELECTRONICS ENGINEERING
TELECOMMUNICATIONS ENGINEERING PROGRAM

EE131 – LABORATORY OF ELECTRICAL CIRCUITS I

I. GENERAL INFORMATION

CODE	: EE131 Laboratory of Electrical Circuits I
CYCLE	: 5
CREDITS	: 1
HOURS PER WEEK	: 2 (Laboratory)
PREREQUISITES	: EE111 Analysis of electrical circuits I
CONDITION	: Mandatory

II. SUMMARY

The course prepares the student so that at the end of the course, using measuring instruments and appropriate equipment, they can structure DC circuits; selecting the appropriate components. They will also prepare a technical report; explaining the structured electrical circuits, as well as their operation; supporting the results obtained.

III. COMPETENCES

The student:

1. Structures DC electrical circuits from the interconnection of electrical elements.
2. Proves experimentally the main laws and properties of DC circuits.
3. Determines the main electrical quantities of a DC electric circuit using electrical measuring instruments.
4. Recognizes and explains the characteristics of the elements of an electric circuit of direct current.

IV. LEANING UNITS

1. KIRCHHOF'S LAWS, RECOGNITION OF EQUIPMENT, INSTRUMENTS AND COMPONENTS IN LINEAR / 2 HOUR ELECTRICAL CIRCUITS

Theoretical Explanation / Implementation of electrical circuits / Procedures of the Experience / Presentation of results report.

2. SUPERPOSITION AND RECIPROCITY THEOREMS / 2 HOURS

Theoretical Explanation / Implementation of electrical circuits / Procedures of the Experience / Presentation of results report.

3. THEVENIN AND NORTON THEOREMS / 2 HOURS

Theoretical Explanation / Implementation of electrical circuits / Procedures of the Experience / Presentation of results report.

4. MAXIMUM POWER TRANSFERING THEOREM / 2 HOURS
Theoretical Explanation / Implementation of electrical circuits / Procedures of the Experience / Presentation of results report.

5. EXPERIMENTAL STUDY AND ASSOCIATION OF QUADRIPOLES / 2 HOURS

Theoretical Explanation / Implementation of electrical circuits / Procedures of the Experience / Presentation of results report.

6. WAVE GENERATOR AND OSCILLOSCOPE USES: CHARACTERISTIC VALUES OF PERIODIC WAVES / 2 HOURS

Theoretical Explanation / Implementation of electrical circuits / Procedures of the Experience / Presentation of results report.

7. FIRST ORDER TRANSITIONAL CIRCUITS: DIFFERENTIAL AND INTEGRATOR CIRCUITS / 2 HOURS

Theoretical Explanation / Implementation of electrical circuits / Procedures of the Experience / Presentation of results report.

8. SECOND ORDER TRANSITIONAL CIRCUITS: RLC SERIES / 2 HOURS
Theoretical Explanation / Implementation of the electric circuit RLC in series / Procedures of the Experience / Presentation of results report.

V. LABORATORIES AND PRACTICAL EXPERIENCES

Laboratory 1: Laws of Kirchhoff; Recognition of Equipment, Instruments and Components in Linear Electrical Circuits.
Laboratory 2: Superposition and Reciprocity Theorems.
Laboratory 3: Thevenin and Norton Theorems.
Lab 4: Maximum Transfer Power Theorem.
Laboratory 5: Experimental study and association of quadripoles.
Laboratory 6: Uses of Wave Generator and Oscilloscope: Characteristic values of periodic waves.
Laboratory 7: First Order Transient Circuits: Differentiator and Integrator Circuits.
Laboratory 8: Second Order Transient Circuits: RLC Circuit in series. Laboratorio

VI. METHODOLOGY

The course is developed in 8 sessions of laboratory, in each session a brief summary of the theoretical basis of the experience to realize the form of arming the circuit and the form to realize the experimental tests is presented. The report of the results obtained in the experience are presented in the following session of the same and are subsequently exhibited by the students. In all the sessions the active participation of the student is promoted.

VII. EVALUATION FORMULA

Evaluation System "D". Calculation of Final Average: PL = PL1 + PL2 + PL4 + PL6 + PL6 + PL7 + PL8) / 8 PL1: Practice Lab 1 PL2: Practice Lab 2 PL3: Practice Lab 3 PL4: Practice Lab 4 PL5: Practice Lab 5 PL6: Practice Lab 6 PL7: Practice Lab 7 PL8: Practice Lab 8.

VIII. BIBLIOGRAPHY

1. BOYLESTAD ROBERT. Introduction to Circuit Analysis. Editorial Pearson Education, 2004.
2. JOHNSON DAVID. Basic Analysis of Electrical Circuits. Editorial PRENTICE-HALL HISPANOAMERICANA, 2005.
3. DORF RICHARD. Electrical Circuits, Introduction to Analysis and Design. Editorial ALFA Y OMEGA, 2000.