ESCUELA SUPERIOR POLITÉCNICA DEL LITORAL
Faculty of Electrical and Computer Engineering
COURSE SYLLABUS
Electronics Laboratory A

1. CODE AND NUMBER OF CREDITS

CODE	FIEC01099	
NUMBER OF CREDITS: 3	**Theorical: 0**	**Practical: 3**

2. COURSE DESCRIPTION

To complement the theoretical knowledge with a group of basic electronics experiments with a tendency that combine the use of discrete and power integrated components. Within the course tools for the simulation of electronic circuits are used as a part of the practices. The students must do a project in which all the acquire knowledge for the math analysis and experimental of the same have to be implement.

3. PRE-REQUISITES AND CO-REQUISITES

PRE-REQUISITES	FIEC01800 Electrical Networks Laboratory. FIEC00075 Electronics I. FIEC00299 Digital systems I.
CO-REQUISITES	

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

CORE TEXT	1. "Electronic Laboratory Practices A", Publisher: Teachers of the Laboratory.
REFERENCES	1. "Electronics Circuit Theory", Author: Robert Boylestad. 2. "Theory and would solve problems", Authors: FIEC-ESPOL teachers. 3. "Microelectronic Circuits", Author: Adel S. Sedra and Kenneth C. Smith.

5. COURSE LEARNING OUTCOMES

At the end of the course, the student will be able to:
1. Complement the theorical knowledge with a group of experiments about basic electronic with tendency of the use of discrete components, intergrades and power.

6. COURSE PROGRAM

I. PRACTICE No. 1: Introduction to PSpice

II. PRACTICE No. 2: Introduction to Scilab.

III. PRACTICE No. 3: Introduction to Scicos.

IV. PRACTICE No. 4: Two/terminal elements (LED)
- Characteristics and polarization of the diode and the zener.
- Clippers and limiting circuits.
- Transfer Functions.

V. PRACTICE No. 5: Rectifiers and capacitive filters (Half wave and Full wave.)
- Single-phase half wave rectifiers.
- Single-phase full-wave rectifiers.
- Unregulated sources.

VI. PRACTICE No. 6: Other- two terminal device (LED, photodiode and phototransistor)
- LEDs.
- Photodiodes.
- Thermistors.

VII. PRACTICE No. 7: Bias of the bipolar junction transistor (BJT)
- Basic settings
- Operation point and load line
- Use of BJT as a switch
- Applications with relays

VIII. PRACTICE No. 8: Voltage Regulators BJT based.
- Series regulator
- Parallel regulator

IX. PRACTICE No. 9: Small Signals amplifiers with BJT.
- Varied amplifiers.

X. PRACTICE No. 10: Transducers and Thyristors.
- SCR, TRIAC, UJT.
- Relaxation Oscillator.

XI. PRACTICE No. 11: Operational Amplifier Basics.
- Comparator.
- Inverting amplifier, noninverting.
- Adder, subtractor.

XII. PRACTICE No. 12: Basic Applications of Operational Amplifier.
- Comparator applications.
- Signal Conditioning.

XIII. PROJECT: (6hours -sessions)
- Topic of the project
- Revision of advances of the project.
- Revision of the finish project and exposition.

7. WORKLOAD: THEORY/PRACTICE

1 week session of 3 hours

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

In the curriculum of the subject of information for the carrers of engineering with electronic circuits analysis, solutions of electronic and design of basic electronics circuits problems.
Learn how to use updated computational software for the simulation of circuits, and the use of programs like MatLab/Simulink for the acquisition of data and analysis signals.

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.	Medium	0	Apply concepts of basic electronic for the analysis of electronic circuits.
b) An ability to design and conduct experiments, and to analyze and interpret data	Medium	0	Run experiments for the complementation of basic electronic knowledge.
c) An ability to design a system, component or process to satisfy realistic constraints.	High	0	Perform projects of design using basic knowledge of electronic.
d) An ability to function on multidisciplinary teams.	Medium	0	The projects are in group.
e) An ability to identify, formulate and solve engineering problems.	---	0	
f) An understanding of ethical and professional responsibility.	Medium	0	Always speak of values.

g)	An ability to communicate effectively.	High	0	Show abilities to present the reports of laboratory and realize the oral presentations.
h)	A broad education necessary to understand the impact of engineering solutions in a social, environmental, economic and global context.	Low	0	In the moment of realize the projects it is remembered the impact of the project in the society.
i)	A recognition of the need for, and an ability to engage in life-long learning.	Medium	0	Always have to search and be updated to have in mind the present facilities for the designs.
j)	A knowledge of contemporary issues.	---	0	
k)	An ability to use the techniques, skills, and modern tools necessary for engineering practice.	High	0	Present the reports using text readers, spreadsheet, and software of electronic circuits simulations
l)	Capacity to lead, manage and undertake projects.	---	0	

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

Created by	Ing. Efrén Herrera Muentes, Msc.
Date	02 ABR 2013

12. APPROVAL

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

13. VALIDITY OF THE SYLLABUS

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