



ESCUELA SUPERIOR POLITÉCNICA DEL LITORAL
Faculty of Electrical and Computer Engineering
COURSE SYLLABUS
Electronic Constructions

1. CODE AND NUMBER OF CREDITS

CODE	FIEC01537	
NUMBER OF CREDITS: 4	Theoretical: 4	Practical: 0

2. COURSE DESCRIPTION

This subject will allow students to:

- 1.-Learn to select electronic components in order to design printed circuit boards.
- 2.-Know and use electronic symbols.
- 3.-Know how to construct printed circuit boards.

3. PRE-REQUISITES AND CO-REQUISITES

PRE-REQUISITES	FIEC00190 Electronics II
CO-REQUISITES	

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

CORE TEXT	1. Newark Electronics; Electronic Components Catalog. 2012.
REFERENCES	1. Wedlock, Roberge; Componentes Electrónicos y Mediciones. 2nd Edition. 1973. Prentice Hall. 2. Departamento de Ingeniería Eléctrica; Construcciones Electrónicas. 1st Edition. 1981. ESPOL. 3. Waters; Electronic Components. 1st Edition. 1972. Radio Shack

5. COURSE LEARNING OUTCOMES

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

- 1.-Know the different components used in the design and construction of printed circuits
- 2.-Design and build printed circuits
- 3.-Document, program and execute an electronic construction project that concludes in a prototype

6. COURSE PROGRAM

1. INTRODUCTION (1 session – 2 hours)
 - Importance of the electronic constructions
2. RESISTORS (4 sessions – 8 hours)
 - Basics
 - Resistors made of particles
 - Resistors made of wire
 - Resistors made of films
3. CAPACITORS (4 sessions – 8 hours)
 - Basics
 - Low losses capacitors
 - Med losses capacitors
 - Polar capacitors
4. INDUCTORS (1 session – 2 hours)
 - Design of basic coils
 - Transformers
5. ELECTROMECHANICAL DEVICES (2 sessions – 4 hours)
 - Relays
 - Contactors
 - Switches
 - Fuses
6. SEMICONDUCTORS (2 sessions – 4 hours)



- Manufacture of transistors
- Cases
- 7. COOLING TECHNIQUES IN ELECTRONIC CIRCUITS (1 session – 2 hours)
 - Cooling techniques
- 8. TECHNOLOGY OF PRINTED CIRCUITS (5 sessions – 10 hours)
 - What is a printed circuit? How, when and why to use it
 - Material types used in the construction of printed circuits
 - Art design: use of CAD programs
 - Stamping method
- 9. FINAL PROJECT (8 sessions – 16 hours)
 - Basics
 - Tools necessary for the construction
 - Test points
 - Assembly of components

7. WORKLOAD: THEORY/PRACTICE

Number of sessions: 2 classes of theory per week
 Each session lasts 2 hours

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

This subject, despite of being a complementary course, is necessary to strength the students' knowledge. Contributes with skills to design and construct printed circuit boards, using commercial software and following international rules of design.

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*	CONTRIBUTIO N (High, Medium, Low)	LEARNING OUTCOMES OF THE COURSE**	THE STUDENT MUST:
a) An ability to apply knowledge of mathematics, science and engineering.	Medium	1,2,3	Learn to select electronic components
b) An ability to design and conduct experiments, and to analyze and interpret data	Low	1,2,3	
c) An ability to design a system, component or process to satisfy realistic constraints.	Medium	1,2,3	Learn to design and construct printed circuit boards according to commercial rules
d) An ability to function on multidisciplinary teams.	Medium	2,3	Construct the final project
e) An ability to identify, formulate and solve engineering problems.	Low	3	
f) An understanding of ethical and professional responsibility.	Low	1,2	
g) An ability to communicate effectively.	Medium	1,2	Develop a research on new technologies



h) A broad education necessary to understand the impact of engineering solutions in a social, environmental, economic and global context.	High	1,2,3	Recognize the importance of electronic in the development of actual technology
i) A recognition of the need for, and an ability to engage in life-long learning.	Low	1	
j) A knowledge of contemporary issues.	Medium	1	Explain new advances in technology
k) An ability to use the techniques, skills, and modern tools necessary for engineering practice.	Medium	1,3	Use computer programs to design, and tools to assembly components on the board
l) Capacity to lead, manage and undertake projects.	Medium	1,3	Procure to finish the project considering it will be a commercial device

10. EVALUATION IN THE COURSE

Evaluation activities	
Exams	x
Tests	
Homework/tasks	x
Projects	x
Laboratory/Experiments	x
Class participation	
Visits	x
Other	

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

Created by	Ing. Miguel Yapur
Date	25 APRIL 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:
Date of approval by the Directive Council: 2013-537 2013-10-7	ESCUELA SUPERIOR POLITÉCNICA DEL LITORAL Ing. Marcos Mendoza V. DIRECTOR DE LA SECRETARÍA TÉCNICA ACADÉMICA

13. VALIDITY OF THE SYLLABUS

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