Escuela Superior Politécnica del Litoral

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Course Syllabus

DIGITAL SIGNAL PROCESSING

Printed by: jfmoncay

Program: Telecommunications Engineering

1. Course number and name

TELG1011 - DIGITAL SIGNAL PROCESSING

2. Credits and contact hours

2 credits and 3 contact hours

3. Instructor's course or coordinator's name

GERMAN RICARDO VARGAS LOPEZ

4. Text book, tittle, author, and year

• Downey, Allen. Think DSP: Digital Signal Processing in Python (1st Ed.)

a.Other supplemental materials

• Richard G. Lyons. Understanding Digital Signal Processing (3rd. Ed.)

• Cyrille Rossant. Learning IPython for Interactive Computing and Data Visualization (1st Ed.)

• Proakis, John. Tratamiento Digital de Señales (4th Ed.)

5. Specific course information

a.   Brief description of the content of the course (catalog description)

This course introduces the theory of digital signal processing (DSP), as well as the simulation of discrete time systems. In addition, there are cases of DSP application that need discrete time and frequency systems, such as the selection and design of finite response digital filters, infinite response filters and the use of the fast Fourier transform.

b.   Prerequisites

SIGNALS AND SYSTEMS - TELG1001

c.   This course is: Required

6. Specific goals for the course

a.   Specific outcomes of instruction

1.- To know the basic concepts of digital signal processing for DSP algorithms understanding.

2.- To understand concepts of discrete time systems and filter structures for the finite response (FIR) and infinite (IIR) filters constructions.

3.- To analyze signals spectrally using digital processing techniques for pattern detection.

4.- To design finite and infinite digital response filters for engineering signal processing applications.

b.   Explicity indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course

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- An ability to design and conduct experiments as well as to analyze and interpret data
- An ability to use the techniques, skills and modern tools necessary for engineering practice

7. Brief list of topics to be covered

1.- Introduction to digital signal processing (DSP).

2.- Signal sampling and analog to digital conversion.

3.- Spectral analysis.

4.- Digital filters.

5.- Fast Fourier transform (FFT) and discrete cosine transform.

6.- Applications and advanced topics.