



<b>Course Code</b> ECE-530	<b>Course Title</b> Adaptive Signal Processing	<b>ECTS Credits</b> 8
<b>Department</b> Engineering	<b>Semester</b> Fall or Spring	<b>Prerequisites</b> ECE-430
<b>Type of Course</b> Elective	<b>Field</b> Engineering	<b>Language of Instruction</b> English
<b>Level of Course</b> 2 <sup>st</sup> Cycle	<b>Year of Study</b> 1 <sup>st</sup>	<b>Lecturer(s)</b> Dr Ioannis Kyriakides
<b>Mode of Delivery</b> Face-to-face	<b>Work Placement</b> N/A	<b>Co-requisites</b> None

### Objectives of the Course:

The main objectives of the course are to:

- explain the mean square error
- identify the Wiener least-squares solution
- explain gradient search
- explain LMS and RLS algorithms
- explain LMS FIR and IIR adaptive filters

### Learning Outcomes:

After completion of the course students are expected to be able to:

- formulate mean square error
- use the Wiener least-squares solution
- derive autocorrelation matrices
- use gradient search
- use LMS and RLS algorithms
- use block LMS FIR and IIR adaptive filters

### Course Contents:

- Adaptive linear combiner
- Mean square error
- Wiener least-squares solution
- Autocorrelation matrices
- Eigenvalues - eigenvectors and geometrical interpretation
- Gradient search and performance surfaces
- The LMS and the RLS algorithms
- Block time and frequency domain LMS FIR and IIR adaptive filters

### Learning Activities and Teaching Methods:

Lectures, in-class assignments.

### Assessment Methods:

Homework, in-class assignments, projects, exams, final exam.

**Required Textbooks/Reading:**

<b>Authors</b>	<b>Title</b>	<b>Publisher</b>	<b>Year</b>	<b>ISBN</b>
Simon Haykin	Adaptive Filter Theory	Prentice-Hall	2001	0130901261

**Recommended Textbooks/Reading:**

<b>Authors</b>	<b>Title</b>	<b>Publisher</b>	<b>Year</b>	<b>ISBN</b>
Selected research papers to be assigned				