



Professional Education Programs

Course **Practical Systems Modeling Signal Processing, Communications and Finance using MATLAB**

Overview Modeling and simulation is critical for rapid prototyping and design of systems in different scientific disciplines.

Whereas theory is very important, system designers are trained through practice. MATLAB and SIMULINK have become the most esteemed tools for prototyping systems in very diverse areas covering mechanical engineering, electrical engineering and finance. Speed and ease of prototyping is achieved by utilizing readymade components or modifying them for custom functionality. This modular course is designed to provide hands-on experience in system modeling with focus on fast prototyping and simulating complete systems. It offers three distinct, laboratory-based tours in the areas of Signal Processing, Communications and Finance.

Objectives Participants are first acquainted with the concepts and tools of modeling for signal processing, communications and financial systems: series statistics and prediction, linear and non-linear modeling, Markov and Hidden Markov modeling, feature extraction and classification to name a few.

Such techniques are subsequently applied to simple problems through examples and applications from all three targeted disciplines. Then, complex systems are built, simulated and analyzed using MATLAB and SIMULINK. The theoretical background for these systems is first explored, but emphasis is given to the step-by-step design of the system in the laboratory, initially by following instructions and then by acting independently from the instructor.

Who should attend

- Electrical engineers, to learn the tools and understand the methodology for complex systems' design and modeling.
- Financial analysts, to learn the tools for fast prototyping, modeling and simulating of systems based on real-time data acquisition.
- Technical managers, to exploit the methodology for task breakdown and applying ready and custom made components to get quickly and accurately results from system modeling.

Prerequisites Theoretical background in signal processing, communication or financial systems is assumed; a quick review of the basic theory will introduce each module. The course assumes no prior knowledge of MATLAB or SIMULINK;

it escalates in a fast pace from basic principles to complete system modeling.

Duration 5-day sessions

Instructor Dr. A. Pnevmatikakis
Dr. L. Polymenakos





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Course outline The course comprises of four modules. The course contents per module follow.

Introductory Module

- Tools from statistics and signal processing
- MATLAB and SIMULINK principles using simple examples

Signal Processing Module

- Oversampled Analog-to-Digital Converter
- Detection & Identification in Multidimensional Signals

Communications Module

- Modem Design
- FEC and Viterbi Illustrated

Financial Module

- Time-series Analysis
- Real-time data acquisition

Tuition Fee N/A

Discount Policy

Cancellation Policy

Program Registration www.ait.edu.gr/profPrograms/reg_form/admission_form.asp

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