

# Digital Signal Processing

Stony Brook University, in partnership with Robert A Shade, Systems Engineering Consultant, is pleased to present this series of Digital Signal Processing (DSP) programs.

The enormous speed available in even the smallest computers has enabled evolution from analog to digital processing for many electronics products. In this workshop, the applications and advantages of DSP are discussed, the underlying mathematical principles are introduced and a number of relevant applications are presented. Attendance at this course is recommended as a way of introducing employees of those companies currently utilizing DSP to the technology, as well as for managers of those companies tasked with the introduction of DSP into their product development methodology. This course is designed for engineers and managers possessing at least minimal understanding of mathematics and electrical engineering. At the completion of the workshop, the student will have a basic understanding of the fundamentals of DSP, how they are applied, and the insight to see how they apply to his own products and services.

**Note\*** - While it is also recommended for Level I of the series, *Discrete – Time Signal Processing, 2nd Edition* is a required text for Level II and Level III. Please purchase this material to experience the full benefits of the program.

*Discrete – Time Signal Processing, 2nd Edition*  
Alan V. Oppenheim, Ronald W. Schaffer, John R. Buck  
Prentice Hall, Pearson Education  
ISBN-10 – 0 13 754920 2  
ISBN-13 – 978 0 13 754920 7

**Special Offer: Register for all three levels of Introduction to Radar Systems and pay a specially reduced fee of \$1495**

**Course Title:** *Digital Signal Processing - Level I*

**Fee:** \$325

## The Program

- Signals and Systems
- Basic Fourier Analysis
- Sampling and A/D Conversion
- Signal Synthesis
- Definition of FFTs and IFFTs
- Principles of Time Domain vs. Frequency Domain Signal Processing
- Filtering Concepts
- Principles of Detection of Signals in Noise
- Simple Applications including RF and Acoustic Signal Detection and Classification

**Who Should Attend?** Corporate Officers, Technical Managers, and Engineers who have not studied DSP or who are in need of a refresher.

**Duration:** 4 Hours (1 Session)

**Prerequisites:** Technical degree with some engineering background

**Text:** Recommended - *Discrete – Time Signal Processing, 2nd Edition*

**Course Title: *Digital Signal Processing - Level II*****Fee:** \$675**The Program**

Level II will cover all the topics in Level I including the underlying mathematics and derivations of the processes. Many examples worked out in MATLAB will be shown. Filter design will not be included at this level. The examples used for illustration of the principles will be taken primarily from the fields of Radar and Sonar.

- Signals and Systems
- Basic Fourier Analysis
- Sampling and A/D Conversion
- Signal Synthesis
- Antenna Design
- Definition of FFTs and IFFTs
- Principles of Time Domain vs. Frequency Domain Signal Processing
- Filtering Concepts
- Principles of Detection of Signals in Noise
- Simple Applications including RF and Acoustic Signal Detection and Classification

**Who Should Attend?** Managers and Engineers who have not studied DSP or who are in need of a refresher.

**Duration:** 12 Hours (3 Sessions at 4 Hours Each)

**Prerequisites:** Level I plus a technical degree with some engineering background

**Text:** Required - *Discrete – Time Signal Processing, 2nd Edition*

**Course Title: *Digital Signal Processing - Level III*****Fee:** \$675**The Program**

Level III will continue the explorations started in Level II. It will cover all the topics in Level I and II with additional mathematics formalism. Examples worked out in MATLAB will be shown. Mathematical techniques used for antenna design will be explained, along with continuous time, discrete time, and discrete time/frequency Fourier processing. Several different approaches to Filter Design will be included at this Level. Hardware implementations will also be introduced. The examples used for illustration of the principles will be taken primarily from the fields of Radar and Sonar. Signal detection will be covered with more emphasis on the real-time algorithms and the statistical nature of the detection process including the concepts of false alarm rate calculation and reduction

- Signals and Systems
- Basic Fourier Analysis
- Sampling and A/D Conversion
- Signal Synthesis
- Antenna Design
- Definition of FFTs and IFFTs
- Principles of Time Domain vs. Frequency Domain Signal Processing
- Filtering and Filter Design Concepts
- Principles of Detection of Signals in Noise
- Simple Applications including RF and Acoustic Signal Detection and Classification

**Who Should Attend?** Electronics and Software Engineers who need to apply these principles to their products.

**Duration:** 12 Hours (3 Sessions at 4 Hours Each)

**Prerequisites:** Level I and Level II plus an engineering or mathematics degree.

**Text:** Required - *Discrete – Time Signal Processing, 2nd Edition*

**To Register:** For schedules and to register, please visit our website at: [www.licet.org](http://www.licet.org)

For further information about this or any of our other courses, please email; sbucet@stonybrook.edu