	VIETNAM NATIONAL UNIVERSITY OF HO CHI MINH CITY UNIVERSITY OF NATURAL SCIENCES **FACULTY OF INFORMATION TECHNOLOGY**

COURSE SYLLABUS

Course Code: TH138

Title: Digital Signal Processing

Credits: 4

Workload:

Lecture hours:	**3** periods * **15** weeks = **45** periods
Laboratory hours:	**2** periods * **15** weeks = **30** periods
Preparative hours:	**2** periods * **15** weeks = 3**0** periods

Prerequisites: Calculus

TH012 – Intermediate Programming A2

TH105 – Data Structures 2

TH109 – Computer Graphics

Course Objectives:
Digital signal is physical representation of information in forms of numeric arrays. This subject presents processing methods on such arrays in order to get the desired information, such as: analysis, synthesis, noise filter, coding, spectrum extraction, transforming signal into another more suitable form… These methods basically rely on discrete-time signal transform on the linear time-invariant system. Their appropriate implementation will be introduced.

Main Text: N/A

References:

- *Digital signal processing* (In Vietnamese)
  Quach Tuan Ngoc, The Education Publisher, 1997.
- *Discrete-Time Signal Processing*
  Alan V. Openheim, Ronald W. Schafer. _New York: Prentice Hall, 1989.
- *Digital Signal Processing. A Practical Approach*
  Emmanuel C. Ifleachor, Barrie W. Jervis. Workingham: Addison- Wesley, 1995.

Course Outline:

Chapter 0: Some supplementary mathematical knowledge

1. Complex numbers
2. Fourier series and Fourier transform

Chapter 1: Overview about signal and discrete systems

1. Signal
   1. Concepts
   2. Classification

2. Discrete signal processing systems
    1. Definition
    2. Some special systems
3. Time-invariant linear system
4. Signal representation and discrete system based on frequency range

Chapter 2: Continuous Signal Sampling

1. Continuous signal sampling
2. Recover continuous signals from discrete signals
3. Practical installation

Chapter 3: Basic transforms

1. Z-transform
2. Linear Prediction Coding Algorithm (LPC)
3. Fourier Transform

Chapter 4: Digital Signal Compression

1. Importance
2. Basic Algorithms

Chapter 5: Digital Signal Recognition

1. Importance
2. General Recognition Algorithms
3. Some Recognition Models

Grading

Final exam:	70%
Assignments:	30%