

SYLLABUS

Course Name:	Digital Signal and Image Processing
Course Code:	DSP501
No of credits:	03
Time Allocation:	30 sessions - 20 <i>Study in Class</i> - 4 <i>Self Study</i> - 2 <i>Presentation</i> - 4 <i>Assignment</i>
Prerequisite:	No

I. DESCRIPTION

The course is to provide students with knowledge in Digital Signal Processing. The course focuses on DSP theory and the practical applications of DSP. The course has the following contents:

1. Introduction to DSP
2. Discrete-Time Signals & Systems
3. Tools and Software for Digital Signal Processing
4. z-Transform
5. Frequency Analysis of Signals & Systems
6. Discrete Fourier Transform
7. Efficient Computation of DFT: Fast Fourier Transform
8. Implementation of Discrete-Time Systems
9. Design of Digital Filters
10. Sampling & Reconstruction of Signals
11. Multirate Digital Signal Processing

12. Power Spectrum Estimation
13. Introduction DS Processor & Realization of FIR filter on the hardware

II. MAIN OBJECTIVES

By the end of the course, students will be able to:

- Master The Underlying Principles Of Digital Signal And Image Processing And Its Many Applications;
- Understand The Transformations: Zt, Dft, Fft
- Design Digital Filters
- Design Digital Systems

III. TEACHING METHODS

To achieve the best course objectives, teaching methods and activities are used spontaneously, including:

- Teaching theory
- Group activities
- Group presentations

In addition, during the learning process, faculty can use different methods to achieve the teaching goals in the best way.

IV. STUDENT'S TASK

- Students are responsible for doing all exercises given by the instructor in class or at home and submitting them on time.
- Constantly follow announcements on intranet/CMS for up-to-date course information.

V. ASSESSMENT SCHEME

On-going assessment:

- 01 Assignment: 40%
- 01 theory presentation: 15%
- 02 exercises: 30%

- 01 quiz: 15%

Final Result: 100%

Completion Criteria:

- Assignment ≥ 4 & Final Result ≥ 5

VI. TEACHING & LEARNING MATERIALS

Textbook:

- Digital signal processing using matlab for students and researchers John W. Leis, 2011 by John Wiley & Sons.
- The Scientist and Engineer's Guide to Digital Signal Processing by Steven W. Smith, Ph.D. Information website: <http://www.dspguide.com/>

Reference:

- Documents at <http://www.mathworks.com/index.html?sec=training>

VII. SCHEDULE

Session	Content
1	Course introduction Introduction to DSP
2	Softwares for Digital Signal Processing Matlab programming
3	Self-study at home
4	Self-study at home
5	Statistics, Probability and Noise
6	Complex Numbers Exercise 1
7	Sampling & Reconstruction of Signals

8	Discrete-Time Signals
9	Self-study at home
10	Convolution
11	Random Signals
12	Self-study at home
13	Temporal and spatial Signal Processing Topics for Presentations and Assignments
14	Frequency Analysis of Signals & Systems
15	Discrete Fourier Transform
16	Efficient Computation of DFT: Fast Fourier Transform Exercise 2
17	Introduction to Digital Filters QUIZ
18	Moving Average Filters, Windowed-Sinc Filters, Custom Filters
19	Self-study at home
20	Exercise 2 Recursive Filters
21	Chebyshev Filter & Filter Comparison
22	Z Transform
23	Audio Processing
24	Biomedical Signal Processing
25	

26	Theory Presentation
27	Theory Presentation
28	Self-study at home
29	Presentation of Assignment
30	Presentation of Assignment