وزارة التعليم العالي والبحث العلمي

جامعة ديالى

كلية العلوم

قسم علوم الحاسبات

اسم المادة :- معالجة الاشارة الرقمية Digital Signal Processing (DSP)

اسم التدريسي :- الدكتور المهندس يحيى محمد حسين النعيمي

Digital Signal Processing Course Syllabus

Third Year 2025-2026
Ass. Prof. Dr. Yahiea Al Naiemy

Course Overview

Course Description:

"***Digital Signal Processing (DSP)***" is a core course. Course starts from the basic concepts of Discrete- Time Signals (DTS) and proceed to learn how to analyze data via the Fourier transform, how to manipulate data via digital filters and how to convert analog signals into digital. The solid theoretical bases are complemented by applied lab examples in Matlab. Design and Lab. exercises are also significant components of the course.

Special Features of the Course:

In order to facilitate learning process, the Matlab Simulink software is used throughout the course Lab Experiments. Some practical or almost actual environment problems and solutions are provided.

Course Aim:

The aim of the course is to introduce the basic principles, techniques, and applications of Digital Signal Processing (DSP) and to motivate and prepare students to apply them for research projects and enhanced students to apply in their future work in health facilities and for further study within advanced courses in professional fields.

Course Objectives:

To introduce student's basic techniques in designing and implementing Digital Signal Processing (DSP) systems.

1. To learn basic methods of spectral analysis.
2. To explore the data communication systems, types of filters, and design, in difference applications such as medical instruments used in medical facilities.

Learning Outcomes of the Course (module):

By the end of the course, students will know:

1. Introduction to signal processing.
2. How to design digital filters;
3. How to extract features from digital signals and manipulate them;
4. By the end of the course, students will be able to:
5. Programming in Matlab script language.
6. Use Matlab and Simulink tools.
7. Students will possess to develop DSP applications completely themselves using professional tools.

Digital Signal Processing	
Weak	***Syllabus***
Weak 1	Introduction of Signal Processing
Weak 2	Convulsion of Sampled Data System
Weak 3	Fourier series and Fourier Transform
Weak 4	Z-Transform
Weak 5	Discreet Fourier Transform (DFT)
Weak 6, 7	Fast Fourier Transform (FFT)
Weak 8,9	Digital Filtering
Weak 10,11	Infinite Impulse Response (IIR) Digital Filters
Weak 11,12	Finite Impulse Response (FIR) Digital Filters
Weak 13	Speech Processing
Weak 14,15	Image Processing