

Brief Course Description

Course number: ECE 374	Course name: Digital Signal Processing
لغة تدريس المقرر: English	Pre-requisites: ECE 270
Credit hours: 3 (3+ 0 + 0)	Course level: Level 7-Year 4

Course Description : وصف المقرر :

Review of signals and systems. Discrete-time systems classification. Linear shift-invariant system response, difference equations, convolution, and frequency response. Discrete Fourier transform. z-transform and its application to system analysis. Realization forms. Sampling and aliasing. Finite-impulse response (FIR). Design windowing technique. Introduction to infinite impulse response (IIR). Filter design techniques.

Course objectives : أهداف المقرر :

- ✓ To enable the use of the z-transform and its properties to analyze LTI discrete-time systems.
- ✓ To explain the Discrete Fourier Transform and its computation using the Fast Fourier Transform.
- ✓ To explain sampling in frequency domain and analog to digital and digital to analog conversion.
- ✓ To acquire the analytical tools and software skills to analyze and design digital filters.

Course Outcomes : مخرجات التعليم :

Upon completing the course, the student should be able to:

- Understand and analyze discrete-time signals and systems in the z-transform-domain.
- Grasp the Discrete Fourier Transform; its properties; and its efficient computation using the FFT algorithms.
- Assimilate sampling theorem, and analog to digital and digital to analog conversion.
- Design and analyze digital filters to meet certain frequency domain specifications.

Textbook and references : الكتاب المقرر والمراجع المساندة :

Book	Authors	Publisher	Publication year
<i>Digital Signal Processing: Principles, Algorithms and Applications</i>	J. G. Proakis and D. G. Manolakis	Prentice Hall	2007
Discrete-Time Signal Processing	A. V. Oppenheim and W. Schafer	Pearson Education	2011
<i>Digital-Time Signal Processing- A Computer-based Approach</i>	S. K. Mitra	McGraw-Hill	2011
Digital Signal Processing in Communications Systems	Marvin E. Frerking	Springer	1994