Faculty of Computers and Information Technology

Digital Signals Processing

Information :

| **Course Code :** DM331 | **Level** | **:** | Undergraduate | **Course Hours :** | 3.00- Hours |

Department : Digital Media Technology

Instructor Information :

Title	Name	Office hours
Lecturer	Amal Safwat Mehanna	
Teaching Assistant	Nadia Alaa Talaat Tawfik	

Area Of Study :

˝Use and adopt fundamental concepts and properties of discrete linear time invariant systems.
˝Solve problems using mathematical knowledge to convolve two discrete time signals.
˝Use all available principles and tools to solve difference equations and system function, and design digital filters.
˝Compare and evaluate different methods to learn discrete-time Fourier series, discrete time Fourier transform (DTFT), Z-transform, and Fast Fourier transform (FFT).

Description :

Review of principles of discrete signals in time and frequency; Transform-domain representations of discrete time sequences; Fast Fourier transform ; Structural representations of digital filters ; Digital Filter design problems; Implementation aspect of DSP algorithms; Introduction to filter banks and wavelets; Introduction to spectral estimation ; Applications

Course outcomes :

a.Knowledge and Understanding: :

1 -	Discuss the fundamental concepts and theories related to discrete-time signals and systems description and classification, know the different types of Digital signals and systems.
2 -	Discuss the fundamental mathematics required toFourier series in different forms, and learn discrete time and fast Fourier transforms.
3 -	Identify the fundamental topics of implementation of discrete time systems, and digital filter design

b.Intellectual Skills: :

1 -	Analyze the discrete signals in time and frequency domains
2 -	Propose set of alternative solutions for discrete systems in time and frequency domains by examples on electric systems
3 -	Select appropriate methodologies and techniques for digital filter design

c.Professional and Practical Skills: :

1 -	Deploy MATLAB for implementing different discrete time signal processing techniques
2 -	Create technical reports according to professional standards
3 -	Apply effective information storage and retrieval skills indifferent signal transforms

d.General and Transferable Skills: :

1 -	Exploit a range of learning resources	
2 -	Work on a team for the development of a requirements document, and manage time to meet deadlines	
3 -	Apply communications skills in presentation and report writing of requirements engineering deliverables	

ABET Course outcomes :

1 -	Use and adopt fundamental concepts and principles of discrete linear time invariant systems.
2 -	Solve problems using mathematical knowledge to convolve two discrete time signals.
3 -	Use advanced techniques and tools to solve difference equations and system function, and design digital filters.
4 -	Compare and evaluate different methods and techniques of discrete-time Fourier series, discrete time Fourier transform, Z-transform, and Fast Fourier transform.

Course Topic And Contents :

Topic	No. of hours	Lecture	Tutorial / Practical
Introduction to Digital Signal Processing	4	2	2
Discrete-Time Signals	4	2	2
Discrete-Time Systems	4	2	2
The Z- Transform	4	2	2
Sampling of Continuous Time Signals (p1)	4	2	2
Sampling of Continuous Time signals (p2)	4	2	2
Structures for Discrete-Time Systems	4	2	2
Filter Design Techniques (p1)	4	2	2
Mid-Term Exam	2		
Filter Design Techniques (p2)	4	2	2
The Discrete-Fourier Transform (p1)	4	2	2
The Discrete-Fourier Transform (p2)	4	2	2
Computation of the Discrete Fourier Transform	4	2	2
Final Exam	2		

Teaching And Learning Methodologies :

Interactive Lectures including Discussions
Practical Lab Sessions
Self-Study (Project / Reading Materials / Online Material / Presentations)
Problem Solving

Course Assessment :

Methods of assessment	Relative weight %	Week No	Assess What
Assignments	5.00	4	
Final Exam	40.00	14	
Midterm Exam (s)	30.00	9	

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Others (Participations)	5.00		
Quizzes	5.00	5	
Research and Reporting	5.00		

<u>Course Notes :</u>

An Electronic form of the Course Notes and all the slides of the Lectures is available on the Students Learning Management System (Moodle)

<u>Recommended books :</u>

A. Oppenheim, A. Willsky and S. Hamid, Signals and Systems, Latest edition, ISBN: 978-0138147570

<u>Web Sites :</u>

http://www.mathworks.com

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