Faculty of Computers & Information Technology

Digital Signals Processing

Information :

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

Department :   Department of Computer Science

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, Identify 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

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

Course Notes :

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

Recommended books :

http://www.fue.edu.eg

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

Web Sites :

http://www.mathworks.com