

Digital signal processing

Course description

The course description provides a comprehensive overview of its most important features and educational objectives expected of the student. It focuses on evaluating the extent to which the student benefits from the available learning opportunities, by linking it to a description of the academic program as a whole. This link helps understand how the course integrates with the rest of the program's courses, which enhances the student's ability to achieve his educational goals in general.

Organization	Tikrit University / College of Computer Science and Mathematics
Department	Department of Computer Science
Topic	Digital signal processing
Attendance	Attendance weekly
Course	Second Term
No of Hours	30 Theory+30 Practical
Date of preparation	28/1/2024

Course objectives

The aim of this course is to teach the student the basic topics of signal processing in the time and frequency domains and their uses in processing audio and video signals, in addition to the use of digital filters.

10 .Course outcomes and teaching, learning and evaluation methods

A- Cognitive objectives

If the student successfully completes this course, he will be able to:

A1- Understanding and classifying digital signal processing systems.

A2- Understand how to convert an analogue signal to digital.

A3-Understanding the pulse and frequency analysis of intermittent signals.

A4- Design digital filters and study their response.

B - The skills objectives of the course.

B1 - The student should be able to apply engineering-mathematical analyses.

B2 - The ability to identify, formulate and solve engineering problems.

B3- Mastery of the mathematical, basic, and engineering sciences necessary to conduct the analysis and design of electrical engineering systems.

B4- The ability to use systems simulation programs.

Teaching and learning methods

1. Theoretical lectures
2. Practical application in the laboratory of curriculum vocabulary.
3. Using some general engineering principles, which are related to the analysis and design of the engineering problem, in addition to using the laws and rules for signal processing in order to identify the source of the problem and solve it.

Evaluation methods

1. Periodic and quarterly theoretical exams
2. Periodic and quarterly practical exams
3. Quizzes
4. Duties (Homeworks)

C- Emotional and value goals

C1- Realizing the requirements of the engineering profession and ethical responsibility.

C2- Understanding the impact of engineering solutions on economic and environmental activities and the societal context.

C3- Recognizing the need for lifelong learning and the ability to engage in it.

Teaching and learning methods

- Theoretical lectures
- Practical lectures and practical application in the laboratory
- Group discussions
- Case Study

Evaluation methods Present the results in class to be discussed and the rest of the students can participate in the discussion.

D - Transferable general and qualifying skills (other skills related to employability and personal development.

D1- The ability to identify, formulate and solve engineering problems.

D2- The ability to design and conduct experiments and analyze and interpret data.

D3- The ability to use modern engineering techniques, skills, and tools necessary to practice the engineering profession.

11. The structure of the academic material

Evaluation	Learning Method	Topic	learning outcomes	Hours	WEEK
quiz	Theory+Practical	Introduction to digital signal processing	The student understands the topic	2 Theory 2 Practical 1	First
quiz	Theory+Practical	Basic elements of DSP, DSP vs. ASP, application of DSP,	The student understands the topic	2 Theory 2 Practical 1	Second
quiz	Theory+Practical	Continues time signals vs. discrete time signals	The student understands the topic	2 Theory 2 Practical	Third
quiz	Theory+Practical	Discrete time signals and sequences	The student understands the topic	2 Theory 2 Practical	Fourth

quiz	Theory+Practical	Discrete time signals and sequences	The student understands the topic	2 Theory 2 Practical	Fifth
quiz	Theory+Practical	Discrete time signals and sequences	The student understands the topic	2 Theory 2 Practical	Sixth
quiz	Theory+Practical	Standard of discrete time signals (sequences)	The student understands the topic	2 Theory 2 Practical	Seventh
quiz	Theory+Practical	Unit sample sequence, Unit step sequence,	The student understands the topic	2 Theory 2 Practical	Eighth
quiz	Theory+Practical	Unit ramp sequence Exponential sequence.	The student understands the topic	2 Theory 2 Practical	Ninth
quiz	Theory+Practical	(classification of discrete time signals) system properties	The student understands the topic	2 Theory 2 Practical	Tenth
quiz	Theory+Practical	Static and dynamic system, shift invariant and shift variant system,	The student understands the topic	2 Theory 2 Practical	Eleventh
quiz	Theory+Practical	Causal and non-causal system, linear and nonlinear system, stable and unstable	The student understands the topic	2 Theory 2 Practical	Twelvth

References	<p>Hwei P. Hsu, "Schaum's Outlines of * ,"Theory and Problems of Signals and Systems .McGraw- Hill Companies Monson H. Hayes," Schaum's Outline of Theory and * ,"Problems of Digital Signal Processing .McGraw- Hill Companies ",John G. Proakis, Dimitris G. Manolakis* [?] .Digital Signal Processing", 3rd Edition Pall A. lynn," Digital signal processing with computer * .applications", 2nd edition John W. Leis,"Digital Signal Processing Using Matlab for * ."Students And Researchers Vinay K. Ingle,John G. Proakis," Digital Signal Processing * ."Using MATLAB</p>
References & Websites	<p>"Signals and systems Introduction", Tutorials Point website, http://www.tutorialspoint.com/dip/signals_and_system_introduction.htm</p>

12. Course development plan

1. Familiarity with everything new and innovative in teaching and learning -
.strategies
2. Providing seminars and student projects regarding digital signal processing
systems