Syllabus
EESC 6367 – Applied Digital Signal Processing

Course Information

Course Number/Section	EESC 6367- 001 & 301 (lecture+lab)
Course Title	Applied Digital Signal Processing
Semester	Spring 2023
Days & Times	MW 4:00pm-6:45pm
	ECSN 2.112 & ECSN 3.118/3.120

Instructor Contact Information

Instructor	Nasser Kehtarnavaz
Office Phone	x6838
Email Address	kehtar@utdallas.edu
Office Location	ECSN 4.622
Office Hours	MW 2:00pm-3:30pm (virtual)
Course Website	eLearning

Course Pre-requisites, Co-requisites, and/or Other Restrictions

EE4361 Introduction to Digital Signal Processing or equivalent course, and knowledge of C programming

Course Description

Implementation of signal processing algorithms, real-time signal processing, fixed-point versus floating-point implementation, architecture of processors used for signal processing, software development tools, code optimization, application project (2-3).

This lab course covers software implementation and real-time execution of signal processing algorithms written in C/MATLAB on the embedded ARM processors of smartphones as apps.

Course Learning Outcomes

Ability to implement signal sampling
Ability to implement convolution and digital filtering
Ability to implement adaptive filtering
Ability to implement frequency domain processing
Ability to implement application project, write project report, and communicate results

Course Textbooks or Lab Manuals

Smartphone-Based Real-Time Digital Signal Processing, Third Edition
by N. Kehtarnavaz, A. Sehgal, S. Parris, A. Azarang, Morgan and Claypool Publishers, 2020.
PDF copy can be downloaded for free via the UTD Library subscription to IEEE Xplore.

Anywhere-Anytime Signals and Systems Laboratory: From MATLAB to Smartphones – Third Edition by N. Kehtarnavaz, F. Saki, A. Duran, and A. Azarang, Morgan and Claypool Publishers, 2020. PDF copy can be downloaded for free via the UTD Library subscription to IEEE Xplore.

Lab Schedule

Dates	Lab sessions
Jan 18/23/25/30	Lab 1 – Installation of Android software tools and app creation
Feb 1/6	Lab 2 – Installation of Matlab and Matlab Coder
Feb 8/13	Lab 3 – Signal sampling and real-time processing
Feb 15/20	Lab 4 – Solving systems in time domain
Feb 22/27	Lab 5 – FIR filtering implementation
March 1/6	Lab 6 – IIR filtering and adaptive filtering implementation
March 8/20	Lab 7 – FFT versus DFT implementation
March 13/15	Spring Break – no lab
March 22/27	Lab 8 – Solving systems in frequency domain
March 29, April 3/5	Project – Progress report 1
April 10/12/17	Project – Progress report 2
April 19/24/26	Project – Final report and codes delivery April 26
May 1	Project – Code questioning
May 3	Project – Presentations/demos

Grading Distribution

Labs attendance (10%)
Labs reports/codes (40%, each lab 5%); labs are graded using a 10-point scale
Project (50%); final report/codes due April 26, code questioning May 1,
project presentations/demos May 3; project is graded using a 100-point scale

Any grading issue must be brought into the instructor's attention within one week from the date of posting grades on eLearning. After one week, no change in grades is done.

Lab Codes and Reports

You must write your own codes and reports. Copying of codes or reports, no matter how small, is absolutely not allowed and will be regarded as plagiarism and a violation of the academic honesty code. You will be asked to explain your codes as part of their grades. Not being able to explain your codes is a clear indication of violation of this requirement.

Any lab report submitted after its solution is posted on eLearning or after its due date will be assigned a grade of 0. Lab reports are to be typed and should include a discussion of results (limit to one page) and outputs of your codes which may be presented as figures and graphs. Your source codes and report for a lab need to be placed in a folder, zipped and uploaded to eLearning by its due date. The names of the folder, report, and code should follow the following naming convention Lastname-lab# (1 point will be deducted for not following this naming convention).

Comet Creed

This creed was voted on by the UT Dallas student body in 2014.
It is a standard that Comets choose to live by and encourage others to do the same:
"As a Comet, I pledge honesty, integrity, and service in all that I do."

UT Dallas Syllabus Policies and Procedures

The information contained in the following link constitutes the University's policies and procedures segment of the course syllabus. Please go to http://go.utdallas.edu/syllabus-policies for these policies.