University of North Texas, College of Engineering
Department of Electrical Engineering

EENG 3910: DSP System Design Project

Spring 2020
Monday, 1:00 - 3:50 PM
Classroom/Lab: NTDP B227/B288, B207

Instructor
- Dr. X. Li, Office: NTDP B231, Tel: (940) 891-6875, Email: Xinrong.Li@unt.edu
  Office hours: Tuesday and Wednesday, 1:30 –2:30 PM
  (Additional appointments can be requested by email.)
- TA: Yuan Cao, Lab: NTDP B288, Email: YuanCao@my.unt.edu;
  Lab help sessions: Tuesdays and Thursdays, 12:30 – 2:30 PM

Course Description
- To study basic theory and applications of modern digital signal processing, to learn basic theory of real-time digital signal processing, and to develop ability to implement and simulate digital signal processing algorithms using MATLAB and on real-time DSP platform.

Prerequisites
- EENG 2620

Course Objectives
- Understand basic concepts of digital signal processing theories and techniques;
- Develop basic understanding of real-time digital signal processing;
- Develop abilities to implement digital signal processing algorithms in Matlab;
- Develop abilities to implement digital signal processing algorithms on real-time DSP platform.

Required Textbook and References
- No textbook required. Lecture notes will be provided as appropriate.
- MSP432 LaunchPad Reference:
  - TI E2E: http://e2e.ti.com/
  - CCS Tutorial: https://training.ti.com/ti-rtos-workshop-series
- TI Robotics System Learning Kit (RSLK)
  https://www.pololu.com/product/unlisted/3670
- C Programming References:
  - C Reference: http://en.cppreference.com/w/c
- MATLAB References

Course Requirements and General Policies
• Class attendance is mandatory.
• Copying other's homework is a violation of academic honesty, which will be penalized.
• Phones should be kept in silent mode during the class.
• Do not wait until the last minute if you have troubles with this class.
• Visit http://www.unt.edu/csrr for your rights and responsibilities.

Disability Accommodation
• The University of North Texas (UNT) complies with Section 504 of the 1973 Rehabilitation Act and with the Americans with Disabilities Act of 1990. UNT provides academic adjustments and auxiliary aids to individuals with disabilities, as defined under the law. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring accommodation, please see the instructor and/or contact the Office of Disability Access (http://www.unt.edu/oda/) at 940-565-4323 during the first week of class. It is the responsibility of students with certified disabilities to provide the instructor with appropriate documentation from the Dean of Students Office.

Grading Policies
• Class attendance, 10%
• Lab assignment and report, 50%
• Final project report and presentation, 40%
• No extra credits.
• Final accumulated number score is on a 100 point scale.
• Final letter grade distribution: A = 90 - 100, B = 80 - 89, C = 70 - 79, D = 60 - 69, F = 0 - 59

Course Outline and Tentative Schedule
You can find the lecture notes and homework assignments in the Canvas: https://unt.instructure.com/.
• First day of classes, January 13, Monday
• Introduction to DSP, LaunchPad, and CCS
• Introduction to LaunchPad (Clock, GPIO)
• Introduction to LaunchPad (Interrupt, Timer, Power Modes)
• Introduction to LaunchPad (UART, Pushbutton)
• AD Conversion
• DA Conversion (and SPI)
• PWM Signal Output (and NI myDAQ)
• Audio Signal Input and Output
• Frame-based Processing
• Digital Filter Design
• Real-Time Digital Filtering
• Final Project
• Final Project Presentation, Monday, April 27, Pre-finals Week
• Final Project Report Due, Monday, May 4, Finals Week

Useful Links
• UNT Catalogs: http://catalog.unt.edu/ (catalogs, academic calendars, class schedule)
• Office of the Registrar: https://registrar.unt.edu/ (schedule of classes and exams, etc.)
• Eagle Student Services Center: http://essc.unt.edu/
• Canvas: https://unt.instructure.com/ (course syllabus, notes, assignments)