EE-4253
Real Time Signal Processing

Curricular Designation:  CpE: elective, EE: elective

Catalog Description:  Practical implementation of digital signal processing concepts as developed in EE4252. Emphasis on applications of DSP to communications, filter design, speech processing, and radar. Laboratory provides practical experience in the design and implementation of DSP solutions. Credits: 3.0 Lec-Rec-Lab: (0-2-2) Semesters Offered: Spring Pre-requisites: EE 4252

Textbooks(s) and/or Other Required Materials:

Prerequisites by Topic:
Familiarity with DSP algorithms and non-real-time implementations.
Familiarity with the MATLAB programming language.

Course Objectives:
1. Mastery of the fundamentals of digital data issues, digital filter design, implementation, performance criteria, computational issues, and testing.
2. Familiarity with design, implementation, and testing of real-time DSP systems.
Topics Covered:

1. Sampling and analog/digital conversion.
2. Discrete Fourier transform, fast Fourier transform, and zero-padding
3. z-transform analysis techniques
4. Circular convolution implementations
5. Windowing implementations and effects.
7. Written laboratory reports required.

Relationship of Course to Program Outcomes (See UPAC SOP, Tables 1 and 2):

- **CpE:**
  - Outcome: a via topic(s): 1-6
  - Outcome: c via topic(s): 6
  - Outcome: e via topic(s): 6
  - Outcome: g via topic(s): 7

- **EE:**
  - Outcome: a via topic(s): 1-6
  - Outcome: b via topic(s): 6
  - Outcome: c via topic(s): 1-6
  - Outcome: e via topic(s): 1-6
  - Outcome: g via topic(s): 7

Contribution of Course to Meeting the Professional Component:

- **EE:** Engineering topics, engineering design
- **CpE:** Engineering topics, engineering design

Class/Laboratory Schedule (note: 1 hour = 50 minutes):

- Lecture: 30 hours = 2 hours/week for 15 weeks
- Instructional Lab: 26 hours = (1 session/week @ 2 hours/session) for 13 weeks
- Working Lab: open hours

Prepared by:
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