

Course Syllabus

ELCT 321 – Digital Signal Processing

Course Coordinator:	Undergraduate Program Committee
Catalog Description:	An introduction to analysis, design and applications of discrete time systems; z- and discrete Fourier transforms; frequency and impulse responses, FIR and IIR filters
<i>Credit Hours</i>	3
<i>Prerequisite(s) by course</i>	C or better in ELCT 222
<i>Prerequisites by topics</i>	Fourier series and transform, differential equations
<i>Required Textbook</i>	DSP First, by McClellan, Schafer, and Yoder, 2 nd Edition, Pearson, 9780136019251
<i>Other Materials</i>	Class notes posted on Blackboard

Learning Outcomes:

Students who successfully complete the course will be able to:

1. determine the spectral coefficients of discrete-time signals.
2. determine the frequency response and the z-transform representation of discrete-time systems.
3. determine the discrete Fourier transform of discrete-time signals.
4. calculate the outputs of discrete-time systems in response to inputs.
5. design Finite Impulse Response (FIR) and Infinite Impulse Response (IIR) filters, and evaluate the performance to meet expected system specifications using MATLAB.
6. demonstrate an understanding of contemporary issues by reviewing recent technical articles and establishing relationships between the course material and the content of the article.

Course Topics:

- Spectrum Representation
- Fourier Series Expansion
- Sampling and Aliasing, Shannon's Theorem
- FIR (Finite Impulse Response) Filter
- MATLAB Programming for DSP
- Frequency Response
- Z-Transform
- IIR (Infinite Impulse Response) Filter
- Discrete Fourier Transform
- Fast Fourier Transform

Course Contribution to Program Outcomes:

ELCT 321 contributes to an achievement of:

- Outcome 1 – an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
- Outcome 4 – an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgements, which must consider the impact of engineering solutions in global, economic, environmental, and societal context.

General Course Policies

Academic Integrity

Unless otherwise stated, assignments and examination work are expected to be the sole effort of the student submitting the work. Students are expected to follow the University of South Carolina Honor Code and they should expect that every instance of a suspected violation will be reported. Students found responsible for violations of the Code will be subject to academic penalties under the Code in addition to whatever disciplinary sanctions are applied.

Accommodating Disabilities

Reasonable accommodations are available for students with a documented disability. If you have a disability and may need accommodations to fully participate in this class, contact the Office of Student Disability Services: 777-6142, TDD 777-6744, email sasds@mailbox.sc.edu, or stop by LeConte College Room 112A. All accommodations must be approved through the Office of Student Disability Services.

Diversity

When scheduling exams, I have attempted to avoid conflicts with major religious holidays. If, however, I have inadvertently scheduled an exam or major deadline that creates a conflict with your religious observances, please let me know as soon as possible so that we can make other arrangements.

Recommended Study Habits

- Read the assigned material before class.
- Bring thoughtful questions to class for discussion.
- Prepare for the exams in study groups.
- Take notes during class discussions and while completing reading assignments.

Deviations

Minor deviations from the syllabus are a normal part of any adaptive teaching and learning process.