Introduction to Signal Analysis

ECE 201
Fall 2016

Instructor  Dr. B.-Peter Paris
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Time and Place  Tuesday and Thursday, 10:30-11:45am, Planetary Hall, room 131.

Office Hours  Tuesday 3:00-4:00 pm and Wednesday 3:00-4:00 pm or by appointment.

Course Goals  This course introduces students to key concepts in Electrical Engineering, including the description of signals in the time and frequency domains. Students will learn the fundamental role played by sinusoidal or complex exponential signals for connecting these domains. Students will learn properties of signal processing systems, including linearity and time-invariance, and the operation of linear, time-invariant systems in the time and frequency domains.


Lab  Five lab sections meet once a week in the Engineering Building. Lab experiments are designed and intended to complement material discussed in class. Students are expected to be well prepared for the lab sessions to maximize the use of time in the lab.

Recommended Further Reading  The Student Edition of MATLAB.

Homework  will be assigned every week and is due the following week. You are encouraged to work on the assignments in small groups; however, each student must submit a unique homework.

Multiple Quizzes, one Midterm Exam and a Final Exam  will be given during the semester. Quizzes will not be announced and may be given at any time during the class. Make-up exams are rarely given. In case of an emergency, contact the instructor as soon as possible and always before the exam. Failure to take an exam, will result in no credit for the exam.
All exams are conducted under the rules and regulations of the **Honor Code** (see University Catalog).

**Teaching Assistants**

- Lab Instructor: Negar Etemadyrad (netemady@gmu.edu) or Philip Chakram (pchakram@gmu.edu)
  Office Hours: see syllabus for the lab.
- Grader: Susheela Meyyappan (smeyyapp@masonlive.gmu.edu)
  Office Hours: TBA.

**On-line Class Material** Class and lab material will be distributed electronically via the World-Wide Web. Use a browser to find the ECE 201 home-page at URL: 
  [http://www.spec.gmu.edu/~pparis/classes/ece201.html](http://www.spec.gmu.edu/~pparis/classes/ece201.html)
I will also correspond with you through your Mason e-mail account - check your e-mail regularly. The BlackBoard page for this course will contain homework assignments, syllabus, and your grades.

**Final Grades** are determined by a weighted average of homeworks, projects, exams, and labs in the following manner:

- Homework and quizzes: 20%
- Midterm Exam: 25%
- Final Exam: 35%
- Labs: 20%

**Academic Integrity** Mason is an Honor Code university; please see the University Catalog for a full description of the code and the honor committee process. The principle of academic integrity is taken very seriously and violations are treated gravely. When in doubt (of any kind) please ask for guidance and clarification.

**Mason E-mail Accounts** Students must use their MasonLIVE email account to receive important University information, including messages related to this class. See [http://masonlive.gmu.edu](http://masonlive.gmu.edu) for more information.

**Office of Disability Services** If you are a student with a disability and you need academic accommodations, please see me and contact the Office of Disability Services (ODS) at 993-2474. All academic accommodations must be arranged through the ODS, [http://ods.gmu.edu](http://ods.gmu.edu).

**Other Useful Campus Resources**

- University Libraries Ask a Librarian [http://library.gmu.edu/ask](http://library.gmu.edu/ask).
Counseling and Psychological Services (CAPS): (703) 993-2380; http://caps.gmu.edu

University Policies The University Catalog, http://catalog.gmu.edu, is the central resource for university policies affecting student, faculty, and staff conduct in university academic affairs. Other policies are available at http://universitypolicy.gmu.edu/. All members of the university community are responsible for knowing and following established policies.

Class Schedule

Week 1: Introduction to DSP; Sinusoids

Week 2: Sinusoids; Introduction to MATLAB

Week 3-4: Complex Numbers; MATLAB plotting and programming

Week 5: Complex Exponential Signals and Phasors; MATLAB programming

Week 6: Phasor Addition Rule

Week 7: Midterm Exam (on March 4)

Week 8: Frequency domain and spectrum representation of signals

Week 9: Beat Notes and amplitude modulation.

Week 10-11: Sampling and Aliasing

Week 12: Introduction to FIR filters and convolution

Week 13: Convolution and linearity and time-invariance

Week 14: Superposition and frequency response

Tuesday, December 13 10:30 am – 1:15 pm: Final Exam