

# ECEN314 Signals and Systems

Spring of 2010

## 1. Instructor:

- Shuguang (Robert) Cui, Assistant Professor
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## 2. Course Description:

This course covers fundamentals of signal and system analysis, with applications drawn from filtering, audio and image processing, communications, and automatic control. Topics include convolution, Fourier series and transforms, sampling and discrete-time processing of continuous-time signals, modulation, Laplace and Z-transforms, and feedback systems.

**Class website:** <http://ece.tamu.edu/~cui/ECEN314>

**Class TA:** Shan Liu, [liu2712@neo.tamu.edu](mailto:liu2712@neo.tamu.edu)

**3. Class Time and Location:** MWF, 10:20am~11:10am, Zachry 223D;  
Recitation session, Monday, 5:30pm~6:29pm, Zachry 103.

## 4. Textbook:

Alan V. Oppenheim, Alan S. Willsky, with S. Hamid Nawab. Signals and Systems. 2nd Edition. Prentice Hall, 1997.

## 5. Exams and homework

- Two midterm exams and one final
- Weekly homework assignments

## 6. Grading Policy

- Homework and recitation exercises 20%
- Midterm 20% (each)
- Final 40%

## 7. Course Outline:

- Review of Mathematical concepts: periodicity, complex variables, even/odd symmetry, sinusoids, complex exponentials.
- Signals and Systems: continuous-time and discrete-time signals and systems, exponential and sinusoidal signals, unit impulse and unit step functions, basic system properties.

- Linear Time-Invariant Systems: the convolution sum and integral, properties of LTI systems.
  - Fourier Series and Fourier Transform: continuous-time Fourier representations, basic properties, focus on multiplication and modulation properties, and Parseval's relation.
  - Differential Equations and Laplace Transform: analysis and solution of linear constant coefficient different equations.
  - Filters and Sampling: magnitude-phase representations of the Fourier transform, ideal frequency-selective filters, non-ideal filters, the sampling theorem, interpolation.
8. **Teaching Philosophy:** I firmly believe that teaching is a gratifying form of intellectual activity involving the teacher and the students, and I view teaching as a major responsibility and privilege. As a teacher, my responsibility is to convey what is known to students and motivate them to probe what is unknown. Meanwhile, my research can be invigorated by intellectual stimulations and challenges from students.
9. **Accommodations:** The Electrical and Computer Engineering Department is committed to meeting the needs of students with disabilities. Students requiring accommodation must discuss their needs with the instructor.
10. **Attendance policy:** The department requires a mandatory attendance of this class. However, you can be absent for up to three lectures if you have approvable excuses (attending conferences and personal/family emergency). For absence above three times, each time will cause one point penalty (out of the final 100).

**Information contained in this syllabus, other than the grade policy, may be subject to change with reasonable advance notice, as deemed appropriate by the instructor. Especially for the course outline, the class hours allocated to each topic are only approximate. Depending on the class background and the level of difficulty encountered in discussing each topic, the number of hours devoted to any specific topic could be revised upwards or downwards.**

#### **Americans with Disabilities Act (ADA) Policy Statement**

The following ADA Policy Statement (part of the Policy on Individual Disabling Conditions) was submitted to the University Curriculum Committee by the Department of Student Life. The policy statement was forwarded to the Faculty Senate for information. The Americans with Disabilities Act (ADA) is a federal antidiscrimination statute that provides comprehensive civil rights protection for persons with disabilities. 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 an accommodation, please

contact the Department of Student Life, Services for Students with Disabilities in Room B118 of Cain Hall or call 845-1637.

### **Aggie Honor Code**

“An Aggie does not lie, cheat, or steal or tolerate those who do.”

Upon accepting admission to Texas A&M University, a student immediately assumes a commitment to uphold the Honor Code, to accept responsibility for learning and to follow the philosophy and rules of the Honor System. Students will be required to state their commitment on examinations, research papers, and other academic work. Ignorance of the rules does not exclude any member of the Texas A&M University community from the requirements or the processes of the Honor System. For additional information please visit: [www.tamu.edu/aggiehonor/](http://www.tamu.edu/aggiehonor/)

On all course work, assignments, and examinations at Texas A&M University, the following Honor Pledge shall be preprinted and signed by the student:

“On my honor, as an Aggie, I have neither given nor received unauthorized aid on this academic work.”