University of New Mexico, Albuquerque
Department of Electrical and Computer Engineering
ECE-314: Signals and Systems
Fall Semester 2018, 3 Credit Hours

COURSE INFORMATION:

Course Instructor	Prof. Balu Santhanam
Office Location	Room 326A, ECE Bldg.
Contact Info	Email: `bsanthan@unm.edu`
	Tel: (505) 277-1611 , Fax: (505) 277-1439
Prerequisite	ECE-213, Math 264.
Location	Woodward – 132
Lectures	TR: : 8:00 - 9:15 AM
Textbook	S. Haykin and B. Van Veen
	"Signals and Systems,"Second Edition
	John Wiley & Sons, New York, 2002.
Office Hours	TR: 10 - 11:15 AM
TA	Francisco Perez
Contact Info	Email: `franperez@unm.edu`

GRADING SCHEME:

Problem Sets/Computer Projects : 25%
Weekly Quizzes: 10%
Midterm Exam : 30%
Final Exam : Fri, Dec 15, 2000, 35%

REFERENCES:

- A. V. Oppenheim, A. S. Wilsky and S. H. Nawab, "Signals and Systems" Second Edition, Prentice Hall Inc., Upper Saddle River, New Jersey, 1997.

- M. J. Roberts, ?Signals and Systems: Analysis Using Transform Methods and MATLAB,? McGraw Hill Publications, New York, 2004.

- A. Singer, J. R. Buck, and M. M. Daniel, "Computer Explorations in Signals and Systems Using MATLAB," Second Edition, Pearson, 2002.

- H. P. Hsue, "Schaum Outlines: Signals and Systems," McGraw Hill Publications, New York, 1995.

- F. G. Stremler, " Introduction to Communication Systems," Third Edition, Addison-Wesley Inc, New York, 1990.

CONCEPTUAL OVERVIEW:

The range of topics that will be covered in this course are:

- **Properties and Classifications of Signals and Systems** :

    1. Properties of Signal and Systems,
    2. Classification of Signal and Systems,
    3. Differential/difference equation based system representation,
    4. Dirac impulse function, Kroneker Delta function.

- **LTI systems : The Convolution Operation** :

    1. Convolution integrals/sums and properties,
    2. Evaluation of the Convolution Integral/sum,
    3. System impulse and step responses.

- **Fourier series and Fourier Transform**:

    1. Fourier series representation and properties
    2. LTI systems with periodic Input.
    3. Fourier Transform and properties
    4. Frequency response and Fourier Analysis
    5. Bode Plots.
    6. Discrete Time Fourier Transform.
    7. Discrete Fourier Transform.

- **Laplace Transform and System Analysis** :

    1. Laplace transforms and properties,
    2. Inverse Laplace Transform,
    3. System Analysis via the Laplace transform.
    4. Block diagrams for LTI systems.
    5. Feedback and applications of feedback.

- **Nyquist Sampling Theorem and Reconstruction**

- **Z-transform and Discrete-time System Analysis**:

    1. Z-transform and properties.
    2. Inverse Z transform.
    3. System Functions, Signal Flow Graphs.

- **Amplitude and Frequency Modulation**

Course Webpage

The webpage for the course is located at ece-research.unm.edu/bsanthan/courses under ECE-314. Information regarding homework, homework solutions, MATLAB assignments, MATLAB resources, problem sessions etc, will be posted here so please check there often.

Library and Computer Resources

There will be a folder for ECE-314 at the centennial science and engineering library (CSEL) reserve desk. I will also be putting some of the reference material on reserve so that they can be checked out for a limited period of 2 hours. In regards to the computing resources, you should obtain a ECE computer account if you do not already have one. There is an online application form that you need to fill in and submit once you are in the ECE network this will give you access to the ECE Unix and Windows machines that have MATLAB x.x loaded on them. These will come in handy during the MATLAB assignments.

Exams and Tests

The midterm exam and the final exam for the course will be take-home type exams. You will be given 24 hours to complete the exam. These exams are open book open notes mode exams. This is so that students can concentrate on understanding the material rather than getting tested over an hour during class-time as to how many silly mistakes they can make. These exams are due back 24 hours from the date/time that is posted for the exams on the web-page (no exceptions).

Policies and Assumptions

Homework and Office Hours

Homework assignments are meant to strengthen your conceptual understanding in the course. They are not intended to be a masochistic ritual. I also recommend that you use my office hours properly and judiciously. If you have not had related material before, this material takes a while to sink in. This is not a "easy" course by any definition and if you have not had exposure to these concepts before then I suggest you do extra problems from the references to strengthen your concepts.

Attendance Policy

It is assumed that the students are aware of and understand the university attendance policy. In any case if you do not attend class, honestly I don't care, because you are assumed to be adults and it is your money going down the drain.

Make-up Exam Policy

I do not give make-up exams. If you need to take the exam ahead of time then it is your responsibility to arrange a alternative date/time with me and this will be only under extraneous circumstances.