

Syllabus § Digital Time Series Analysis

PHYS 628 – Spring 2010

Credits: 3.0
Laboratory: n/a
Lecture: REIC 207 09:15 – 10:15 MWF

Prerequisites: MATH F401; MATH F402 or equivalent; familiarity with a programming language such as C or Fortran; graduate standing; or permission of instructor

Instructor: Curt A. L. Szuberla

Office: ELVEY 706D (Geophysical Institute) and REIC 110

Office Hours: One hour following each lecture or at the GI by appointment. My schedule at the GI is uncertain; arrange an appointment via email or telephone prior to visiting.

Contact:

GI	474-7347 (V) + voicemail 474-7290 (F)
REIC	474-6973 (V) office hours 474-6130 (F)
Cell	687-7979 (V,T)
URL	http://www.gi.alaska.edu/~cas/physics
URL (alt)	http://www.anaxamandar.com/physics
Email	cas@gi.alaska.edu

Text: *Statistical Signal Processing and Modeling*, by M. H. Hayes, Wiley, Hoboken, NJ, 1996. (The text is *not* available via the UAF Bookstore. Various supplements will be discussed in class.)

Grading:

Homework	50%
Mid-term exam	20%
Final exam	30%

Letter grades will be assigned as follows: [100%,90%] A, (90%,80%] B, (80%,70%] C, (70%,60%] D, (60%,0%] F. **Late work will be penalized 10%/day.** I reserve the right to make adjustments to final course grades based on participation and work ethic demonstrated during the semester.

Course Outline

This course is intended as a graduate-level introduction to the art and science of statistical digital signal processing. As the title implies, our emphasis will be on the analysis of data that comprise discrete time series. With a balance of application and theory, we will cover various topics in time series analysis, including: correlation, convolution, filters and spectral estimation of multivariate data. We will also investigate the statistical properties of estimators, signal detection and the processing of array data. Ideally, the course will serve as a springboard into your own research.

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Homework

There will be ten homework assignments given during the semester. Each will be assigned on a Monday and due at the beginning of the following Monday's lecture. Assignments will require a mixture of theory (mathematics), application (computation) and explanation (language). Success on the homework assignments tends to correlate highly with success in the course. Since these assignments are excellent preparation for your exams and the course is part of your career preparation, homework solutions should be professionally prepared and presented.

Exams

A take-home mid-term examination will be assigned following lecture on 19 March. It will be due at the start of lecture 26 March. A take-home final examination will be assigned following lecture on 7 May. It will be due NLT 10:00 on 12 May, per the UAF Final Exam Schedule. As with your homework solutions, examination papers should be professionally prepared and presented.

MATLAB

While not specifically required for the course, facility with MATLAB or another of the popular computation and visualization packages is advantageous. The course will not directly address programming or computer skills – I assume that a graduate student either has these skills or will acquire them rapidly as the semester progresses.

Student Code of Conduct

You are expected to submit work that is your own and properly acknowledge the work of others. You are responsible for understanding and adhering to the Student Code of Conduct that is printed in the UAF Course Catalog. **Abide by it.** Violations of the Code will be reported to the appropriate academic authorities.

Disability Services

The UAF Center for Health and Counseling provides services for UAF students with disabilities to ensure equal access to educational opportunities. The Center's Disability Services Program ensures compliance with section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act (ADA) of 1990. If you believe you are eligible for 504 and/or ADA accommodations, please contact them at 474-7043 (203 WHIT).

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Initial Questionnaire

Name _____ Student # _____

Academic Major(s) _____ Email _____

Data analysis and signal processing experience:

Computer and programming experience:

I have read & understand the course syllabus. _____, _____
Signature Date