

Physics 321: Signal Processing Fall 2011

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My Webpage: <http://userpages.wittenberg.edu/pvoytas/index.html>
Class Web site: http://userpages.wittenberg.edu/pvoytas/courses/p321_f11/index.html, where homework and reading assignments and other material for the course will be available.

Text: Various online and handouts

Course description: Study of Fourier methods, with emphasis on digital signal processing, digital data acquisition and digital analysis systems. Prerequisites: Physics 218 and Mathematics 202..

Office hours: TBA.

Monday		Tuesday		Wednesday		Thursday		Friday	
8:00		8:00		8:00		8:00		8:00	
9:10		9:40		9:10		9:40		9:10	
10:20		11:20	Dept Meeting (tentative)	10:20		11:20		10:20	
11:30		12:30		11:30		12:30		11:30	
12:40		2:10	Physics 321	12:40		2:10	Physics 321	12:40	
1:50		3:40	Fac mtg (some weeks)	1:50		3:40		1:50	
3:00		5:00		3:00	Physics 360/460 Sci 319	5:00		3:00	
4:10				4:10				4:10	

Grading policy: assignments..... 30%
 midterm..... 30%
 final..... 40%
TOTAL 100%

Letter grades will be assigned according to the percentage of possible points you have accumulated at the end of the semester. You are guaranteed that the divisions between grades will be no higher than the following: 90%≤ A, A≤100%, 80%≤ B, B, B+<90%, 70%≤ C, C, C+<80%, 60%≤ D, D, D+<70%, F<60%. In borderline cases, attendance, class participation, and trend in exam scores will be used to decide whether to award the higher grade.

Accommodations: Wittenberg University is committed to providing reasonable accommodations for students with documented disabilities. However, students are responsible for registering with the Academic Services Office, 203 Recitation Hall. If you are eligible for course accommodation due to a disability, please provide me with your self-identification letter from the Academic Services Office and arrange to talk with me about your learning needs as soon as possible. Early identification at the start of the term is essential to ensure timely provision of services. If you have questions about services for students with disabilities, please contact Vancenia Rutherford, assistant provost for academic services, 203 Recitation Hall, extension 7924.

Readings and homework: Reading, problems, and questions will generally be assigned for each class period and will be due at the beginning of the next class. Some will be over material covered the previous class period (review questions), and some will be over the material for the upcoming class period (preparation questions). Late homework will be accepted for half credit until the beginning of the next class after the assignment was due.

Exams: There will be a midterm exam after the first half of the course as well as a comprehensive final exam.

Attendance: Unless something physically prevents you from doing so, contact me *before* class if you are going to be absent. Makeup exams will be available only in cases of excused absences.

Tentative course schedule:

Here are some more-or-less fixed dates

10/13: Overview/Syllabus

10/18: Fall Break

11/8: Exam 1

11/24: Thanksgiving break

12/6: Final Exam

I'm not going to fix a rigid schedule. Below are the main topics/themes we will be looking at, vaguely in the order we will address them. We may not get to all of them, we will play it by ear.

Signals

Noise(s)

Johnson

Shot

“Pink”/Flicker

“White”

...

Signal to noise ratio

Bandwidth

Analysis/Processing

Averaging

Smoothing

Fourier Series

Orthogonality

Even/Odd

Complex

Synthesis

Decomposition

Details: Periodic?

Faking periodic—padding/windows

Bandwidth

Sampling/Aliasing

Signals revisited

DFT

Fourier Transform (continuous)

Convolution/Deconvolution

Filtering

Other kernels

Wavelets(?)

Lock-in technique

Gated Integrator