**TEMPLE UNIVERSITY**
**COLLEGE OF ENGINEERING**
**ELECTRICAL & COMPUTER ENGINEERING DEPARTMENT**

**FALL** **ENGR541** **DR. Li Bai**

# COURSE OUTLINE

**TITLE:** Probability and Random Process
**LECTURE:** Thursday 6:00-8:30pm (Fort Washington 118)

**REQUIRED TEXT:** John W. Woods, Henry Stark
Probability and Random Processes with Applications to Signal Processing (3rd Edition)
ISBN: 0-13-020071-9

**RECOMMENDED TEXT:**
"Applied Linear Algebra and Matrix Analysis", Thomas Shores

**INSTRUCTOR:** Dr. Bai - CEA Building, Room 710, (215) 204-6616
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**TU PORTAL –** http://tuportal.temple.edu

This course provides the background for the following courses:

**EE 510 - Digital Signal Processing**
**EE 551 – Computer Network**
**EE 520 Telecommunication**

**COURSE OBJECTIVES:**

We will focus this course in two areas: 1) random variables 2) random signals. More specifically:

Random variables: probability density function, function of random variables, and expectation of random variables.

Random signals: classification of stochastic system, and evaluation of statistical parameters for such a system using random signals.

At the end of semester:

> Students shall be able to demonstrate properties of some basic probability density functions such Gaussian, binomial, uniform, exponential and Poission, etc. Also, they can evaluate different expectation functions for a random variable.
>
> Exceptional students, in additionally, shall be able to understand whitening process for a random sequences (vectors) and some basic stochastic processes in linear systems.

This guide has been written to provide you with information concerning the grading philosophy and other aspects of this course.

**I. MIDTERMS AND FINAL.**

There will be 1 midterm and a final given during this course. You will be given ample notice of when the midterms and final are to be given! The final exam will be cumulative but with some emphasis on the material covered after the last test.

All examinations will be closed book, but students can take four pages of HANDWRITTEN notes (8.5x11) and a nonprogrammable scientific calculator. Failure to take the final will result in a grade of F. Partial credit on questions will be given where there is a clear indication that the student was proceeding in the proper direction and gave good evidence that he or she had a good grasp of the material.

## II. GRADE BREAKDOWN/SCALE

| Activity | Percent | | Grade | Points |
|---|---|---|---|---|
| Homework (weekly) | 10 | | A | 90-100 |
| Midterm | 40 | 15 | B | 80-89 |
| Project | 10 | | C | 70-79 |
| Final | 40 | | D | 60-69 |
| | | | F | 59 or below |

**Note -** The grades include plus and minus. Therefore, 90 is not a A but rather an $A^-$ and 88 would be a $B^+$.

## III. LATE SUBMISSIONS

All homework assignments will be announced in classes. Unless stated otherwise, the homework assignment is due on Thursday (5:59pm, before the class starts) following the week it was assigned. No late homework or project will be accepted for any reason.

If you miss an examination or quiz...

You need send me an email notification at least 48-hours before the examination.

## IV. INCOMPLETE

There will be no incomplete granted except for serious medical problems. No incomplete will be given on the basis of missed exams.

## V. ACADEMIC INTEGRITY

Sharing of thoughts and ideas is encouraged; sharing of work, computer code, etc. is not! You are strongly encouraged to discuss assignments and course material with your classmates! Note that discussion does not mean copying. For any incident of copying the person or persons who copied as well as the person or persons who were copied from will receive **zero** for that assignment. A second incident of copying will result in an **automatic F** for the course for all parties involved!

## VI. CELL PHONES

During class, you can turn cell phone on as silence mode. If you absolutely need to answer your cell phone, you have to leave the classroom.

## VII. WITHDRAWAL & REPEAT COURSE POLICIES

Beginning in Fall 2003, you may withdraw from a course within the first two weeks and no record of that course will appear on your transcript. However from week three through nine week you may withdraw and will receive a “W” on your transcript. It should be noted that you are not allowed to withdraw from a course after week nine. You may not withdraw from the same course more than once. Also you may withdraw from no more than five courses during the duration of your undergraduate career. Students thinking about withdrawing from a course should consult with their instructor and must receive approval from their academic adviser. (policy #02.10.14)

The **Repeat Course Policy** - now, instead of only the highest grade occurrence of a class counting, only the lowest will be removed. Which means if you take a course three times, the two highest grades will be averaged together. (policy #02.10.12)

## VIII. STUDENT INPUT

Your input is considered very important not only to this semester's class but to those who will take this course in the future. If you have any comments concerning the book, the quizzes or tests, or the material presentation, please let me know, either by stopping by my office to talk, sharing your thoughts or ideas with your class representative or dropping off an anonymous note.

## ENGR 541 LECTURE OUTLINE

Course Plan (Tentative)

| Week | Subject | Reference |
|---|---|---|
| 1 | Introduction to probability | Chapter 1 |
| 2, 3 | Random variables | Chapter 2 |
| 4 | Function of random variable | Chapter 3 |
| 5,6 | Expectation | Chapter 4 |
| 7 | Midterm Examination | |
| 8,9 | Random Vectors | Chapter 5 |
| 10,11 | Random sequence | Chapter 6 |
| 12,13 | Random process | Chapter 7 |
| 14 | **Thursday 12/14** | **6:00 -8:30pm** |

* Approximate times when tests will be given

**Revised 9/5/2006**