

UB - School of Engineering & Applied Sciences  
EAS 305: Applied Probability & Statistics Inference  
Summer 2015  
Syllabus

## 1 COURSE CONTACT

- Class Meetings: Wed Fri, 9:00 AM - 12:10 PM [337 Bell Hall](#)
- Course Website: <http://ublearns.buffalo.edu>
- Instructor: Iakovos Toumazis
  - E-mail: [iakovost@buffalo.edu](mailto:iakovost@buffalo.edu)
  - Office: 339A Bell Hall
  - Office hours:
    - \* Monday 10:00 AM – 12:00 PM
    - \* Wednesday 12:10 PM – 2:30 PM
    - \* Friday 12:10 PM – 2:30 PM , or by appointment

## 2 COURSE DESCRIPTION

This is an introductory course in probability & statistics that is designed for engineering and science major students. It covers data analysis, the role of statistics in engineering, introductory probability concepts, discrete and continuous random variables and probability distributions, joint probability distributions, random sampling and data description, point estimation of parameters and statistical intervals for a single sample. Some topics may be deleted and some further topics may be added depending on time and schedule. No prior knowledge or familiarity with the subject is needed. The only requirement for this course is prior knowledge on derivatives, series operations and integration.

## 3 LEARNING OUTCOMES

After successfully completing the course, students should be able to do the following:

- Use statistical methodology and tools in the engineering problem-solving process.
- Compute and interpret descriptive statistics using numerical and graphical techniques.
- Understand the basic concepts of probability, random variables, probability distributions, and joint probability distributions.
- Compute point estimation of parameters, explain sampling distributions, and understand the central limit theorem.
- Construct confidence interval on parameters for a single sample.

## 4 REQUIRED TEXTBOOK

- Jay L. Devore, *Probability & Statistics for Engineering and the Sciences (8th Edition)*.

## 5 GRADING

There will be 5 homework assignments, 1 midterm exam and 1 final exam. Final exam will be **non-accumulative**, and not include any direct question from the subjects that are covered prior to and included in the Midterm exam. While students are welcome to discuss homework problems with colleague students, you are **not allowed to copy the solutions** from another student. The grading will be determined as follows:

- Assignments: 25% for all assignments (will be announced via email and be available through the course website)
- Midterm I: 35% (Tentatively scheduled on June 12, in class)
- Final: 40% (Tentatively scheduled on July 3, in class)

## 6 COURSE POLICY

- Students are expected to check his or her email and the course website frequently, at least once a day, especially before the class day. Important announcements including homework assignments will be made via emails and the course website.
- Note that attendance is not included in the grading. However, attendance will be very important to learn the course material. Please try not to be late to the class. It is your responsibility for being a college student.
- Exams must be taken on the dates scheduled. Unless there is a medical emergency, make-up exams will not be given. Proof will be required.
- **No kind of cheating is allowed.** If you do, you will not receive a grade higher than 'F'.
- Homework will be assigned at least a week prior to the due dates.
- Please turn in your assignments before or on the due date. **No late turn-in will be accepted**

## 7 ACADEMIC HONESTY AND INTEGRITY

The University at Buffalo has a responsibility to promote academic honesty and integrity and to develop procedures to deal effectively with instances of academic dishonesty. Students are responsible for the honest completion and representation of their work, for appropriate citation of sources, and for respect for others' academic endeavors. By placing their name on academic work, students certify the originality of all work not otherwise identified by appropriate acknowledgments. Please take your time to visit <http://academicintegrity.buffalo.edu/>

One simple rule: If you fail to meet the UB policy and the instructor's policy for academic honesty and integrity, you will at least receive 'F', and it is possible that you are suspended or expelled from the university.

## 8 EXAMPLES OF ACADEMIC DISHONESTY

Academic dishonesty includes, but is not limited to, the following:

- *Previously submitted work.* Submitting academically required material that has been previously submitted in whole or in substantial part in another course, without prior and expressed consent of the instructor.
- *Plagiarism.* Copying or receiving material from any source and submitting that material as one's own, without acknowledging and citing the particular debts to the source (quotations, paraphrases, basic ideas), or in any other manner representing the work of another as one's own.
- *Cheating.* Soliciting and/or receiving information from, or providing information to, another student or any other unauthorized source (including electronic sources such as cellular phones and PDAs), with the intent to deceive while completing an examination or individual assignment.
- *Falsification of academic materials.* Fabricating laboratory materials, notes, reports, or any forms of computer data; forging an instructor's name or initials; resubmitting an examination or assignment for reevaluation which has been altered without the instructor's authorization; or submitting a report, paper, materials, computer data, or examination (or any considerable part thereof) prepared by any person other than the student responsible for the assignment.
- *Misrepresentation of documents.* Forgery, alteration, or misuse of any University or Official document, record, or instrument of identification.
- *Confidential academic materials.* Procurement, distribution or acceptance of examinations or laboratory results without prior and expressed consent of the instructor.
- *Selling academic assignments.* No person shall sell or offer for sale to any person enrolled at the University at Buffalo any academic assignment, or any inappropriate assistance in the preparation, research, or writing of any assignment, which the seller knows, or has reason to believe, is intended for submission in fulfillment of any course or academic program requirement.
- *Purchasing academic assignments.* No person shall purchase an academic assignment intended for submission in fulfillment of any course or academic program requirement.

## 9 DISABILITY SERVICES

If you have a disability and may require some type of instructional and/or examination accommodation, please inform me early in the semester so that we can coordinate the accommodations you may need. If you have not already done so, please contact the Disability Services office. The office is located at 25 Capen Hall and the telephone number is (716) 645-2608. The website is at: <http://www.ub-disability.buffalo.edu/>

## 10 COURSE OUTLINE

1. Descriptive Statistics
2. Probability
  - Basic Concepts
  - Counting Rules, Permutation and Combination
  - Conditional Probability and Bayes' Rule
  - Independence
3. Mathematical Expectations and Variance
4. Discrete Random Variables
  - Binomial Distribution
  - Poisson Distribution
  - General Discrete Distributions
5. Continuous Random Variables
  - Uniform Distribution
  - Normal Distribution
  - Exponential and Gamma Distributions
  - General Continuous Distributions
6. Joint Probability Distributions, Covariance and Correlation
7. Sampling Distributions, Central Limit Theorem and Confidence Intervals
8. Maximum Likelihood Estimation \*
9. Hypotheses Testing \*

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\*These topics are relatively broader and advanced compared to others, and will be covered only if time and schedule allows