

MATH/STAT 415

(Section 004, *Spring 2018*)

Course An Introduction to Mathematical Statistics

Objectives This course provides an introduction to mathematical statistics, covering the fundamentals of statistical inference. The topics covered will include: sufficiency, point estimation, interval estimation, hypothesis testing, analysis of variance, chi-square test, likelihood ratio test, regression analysis and Bayesian estimation.

Lecture 10:35 am — 11:50 am Tuesday & Thursday
Room 62 Willard Building

Textbook *Probability and Statistical Inference, 9th Ed.* (8th edition is also fine)
(2015, By Hogg, Tanis & Zimmerman) — required.

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Office Hours: 1:30 pm – 2:30 pm (Mon, Wed) (or by appointment)

Teaching Mr. Arun Srinivasan

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Office Hours: 1.30pm-2.30pm (Tue), 12.15pm-1.15pm (Fri) (or by appointment)

Course	Homework	20 %	Weekly, on Thursday
Grade	Mid-term Exam 1	25 %	February 9 th , Friday (102 Thomas, 6.30p-7.45p)
	Mid-term Exam 2	25 %	March 28 th , Wednesday (102 Thomas, 6.30p-7.45p)
	Final Exam	30 %	To Be Announced

Other course information will be distributed through CANVAS at <www.canvas.psu.edu>

Course Outline (tentative)

Week	Dates	Topics	Reading	HW Due
1	1/09, 11	Probability: Review	2, 3, 4, 5.1-5.4	
2	1/16, 18	Probability: New	5.5-5.8	#1
3	1/23	Point estimation	6.1-6.4	#2
	1/25, 30	Point estimation	6.7, 6.5	#3
4	2/1, 6	Interval estimation	7.1-7.3	#4
5	2/8	Review/Q&A		
	2/9	Mid-term Exam #1		Exam #1
6	2/13, 15	Interval estimation	7.4, 7.6	
7	2/20, 22	Hypothesis testing	8.1-8.2	#5
8	2/27, 3/1	Hypothesis Testing	8.3, 8.5	#6
9	3/6, 8	Spring Break		
10	3/13, 15	Hypothesis Testing	8.6, 8.7	#7
11	3/20, 22	Nonparametric methods	9.1, 9.2	#8
12	3/27	Review/Q&A		
	3/28	Mid-term Exam #2		Exam #2
	3/29	Nonparametric methods	8.4, 7.5	
13	4/3, 5	Linear Models	9.3, 9.4	#9
14	4/10, 12	Linear Models, Chi-square tests	9.6, 9.1	#10
15	4/17, 19	Bayesian estimation and other topics	6.8, 6.9	#11
16	4/24, 26	Revision, Q/A		#12

General Course Policies:

1. Weekly assignments will be usually given on Thursdays and will be collected at the **beginning** of class on the following Thursday. **Late assignments will not be accepted, regardless of reason**, but only your highest 10 homework scores will count toward your final grade. If you cannot be in a class on Thursday, you are encouraged to turn in your homework early or have a friend turn it in for you. If I am not in 314 Thomas, you may slide the homework under my office door. Do not turn in

any homework directly to the teaching assistant; all homework must be turned in to me.

2. The mid-term exams will be for 75 minutes. There will be no homework assignments due during weeks in which midterms occur. These exams will be closed-book and closed-notes. But you will be allowed to carry one page of cheat sheet and calculator to the exam. The second mid-term will not be comprehensive, i.e., it will cover only the period of time between the two midterms.
3. The comprehensive final exam will take place at the registrar-designated time and place during the week of April 30 - May 4. Like mid-terms, it will be closed-book and closed-notes but you will be allowed to carry two pages cheat sheet and calculator to the exam. Unlike the midterms, it will cover the entire semester and not merely the period after the second midterm.
4. No "make-up" exams will be given for **any** reason. If you miss an exam, you should provide a valid reason to the instructor. If the instructor **and** the TA both approve your excuse then your missed exam score will be replaced automatically by your score on the next mid-term exam. **No rescheduled final exams will be allowed except for those mandated by the Penn State registrar because of conflicts.** This means that you must attend the final exam and should under no circumstances make end-of-semester travel arrangements before knowing your final exam schedule.
5. Early exams *might* be allowed, with prior arrangement, for students with direct conflicts due to other required university programs (chess team, field trip, Blue Band trip, etc.), and the director of that program must provide a letter requesting that you be excused from the exam.
6. Grading errors (homeworks/exams etc) should be noted in writing and this should be done within 10 days of the date on which it was returned. Your failure to pick up the exam does not extend this deadline, unless the cause was a lengthy medical, family emergency or religious/cultural issues, in which case you **must** contact me (in advance, if at all possible).
7. Attend **all** Classes. Experience shows that there is a high correlation between class attendance and exam performance. If you must miss, **it is your responsibility** to check your classmate or TA for material and announcement you've missed. All class information are available through our course website.

Academic Integrity:

All Penn State, Eberly College of Science and Department of Statistics policies regarding ethics, honorable behavior and mutual respect apply for this course. These can be found at <http://www.psu.edu/ufs/policies/>
<http://www.science.psu.edu/academic/Integrity/Policy.html>

Of particular relevance to this course are the following policies:

- On homework assignments, you are allowed and indeed encouraged to work with other students in the class. However, each student must turn in his/her own work, and in no case is it ever acceptable to simply copy directly from another person's work.
- On exams, each student must complete his/her own work without aiding or receiving aid from anyone else in any way. Examples of infractions that will result in disciplinary action are listed under "categories of infractions" on the Eberly College of Science academic integrity page.

ECOS Code of Mutual Respect:

The Eberly College of Science's Code of Mutual Respect and Cooperation (http://www.science.psu.edu/climate/Code-of-Mutual-Respect_final.pdf) embodies the values that we hope our faculty, staff, and students possess and will endorse to make the College of Science a place where every individual feels respected and valued, as well as challenged and rewarded.

A Message from President's Office

Special Fall 2009 Flu Protocols -In compliance with Pennsylvania Department of Health and Centers for Disease Control recommendations, students should NOT attend class or any public gatherings while ill with influenza. Students with flu symptoms will be asked to leave campus if possible and to return home during recovery. The illness and self-isolation period will usually be about a week. It is very important that individuals avoid spreading the flu to others.

Most students should be able to complete a successful semester despite a flu-induced absence. Faculty will provide students who are absent because of illness with a reasonable opportunity to make up missed work. Ordinarily, it is inappropriate to substitute for the missed assignment the weighting of a semester's work that does not include the missed assignment or exam. Completion of all assignments and exams assures the greatest chance for students to develop heightened understanding and content mastery that is unavailable through the weighting process. The opportunity to complete all assignments and exams supports the university's desire to enable students to make responsible situational decisions, including the decision to avoid spreading a contagious virus to other students, staff, and faculty, without endangering their academic work.

Students with the flu do not need to provide a physician's certification of illness. However, ill students should inform their teachers (but not through personal contact in which there is a risk of exposing others to the virus) as soon as possible that they are absent because of the flu. Likewise students should contact their instructors as quickly possible to arrange to make up missed assignments or exams.

For health-related questions you can email Director, University Health Services at uhs-info@psu.edu.