

**MEETING TIMES AND PLACES:**

14:20 - 15:35, Monday, Tuesday, Wednesday, Thursday, and Friday, Willard Bldg 103;

14:20 - 15:35, Friday, IST Bldg 205.

**TAUGHT BY:**

Zheyuan Yuan, 331A Thomas Bldg, zxy124@psu.edu

OFFICE HOURS: Wednesday 10 - 11, Monday 3 - 4, or by appointment.

**TEACHING ASSISTANT:**

Ben Straub, 333 Thomas Bldg, bbs5179@psu.edu

OFFICE HOURS: Tuesday, Thursday 11 - 12, or by appointment.

**PREREQUISITES:** MATH 111 or MATH 141.

**TEXT:** We will use the book *Probability & Statistics with R for Engineers and Scientists*, by Mr. Akritas. The hard cover version of this book is available at the Penn State Book Store, a loose leaf edition is available from [www.amazon.com](http://www.amazon.com), and an electronic version can be rented from [www.coursesmart.com](http://www.coursesmart.com). Used copies should also be available.

**REFERENCE TEXTS AND USEFUL LINKS:**

1. Rao, C. Radhakrishna. *Statistics and Truth: Putting Chance to Work*, second edition. World Scientific, 1997.
2. Feller, William. *An Introduction to Probability Theory and Its Applications: Volume I*, third edition. John Wiley & Sons, 1968.
3. Venables, William N., and Ripley, Brian D.. *Modern Applied Statistics with S*, fourth edition. Springer, 2003.
4. <http://cran.r-project.org/>
5. <http://stats.stackexchange.com/>

**COURSE OBJECTIVE:** To familiarize students with the basic concepts and ideas of statistics and probability. To provide training in the use of statistical methods and graphics for the analysis and presentation of data encountered in the sciences and engineering. The free software R, used by over 90% of statistics graduate students for their research programming needs, will be used as an integral part of the course. The particular topics covered are:

1. Basic concepts of probability and statistics.

2. Probability and conditional probability.
3. Univariate and multivariate distributions, correlation and regression.
4. The Central Limit Theorem.
5. Basic concepts of estimation, confidence intervals and hypothesis testing for one sample and regression.
6. Comparison of two means and two proportions (independent and paired data), including rank tests.
7. Comparison of more than two means and proportions. Bonferroni and Tukey simultaneous confidence intervals and multiple comparisons, and rank methods.

**SUMMARY OF COURSE REQUIREMENTS:** The final grade for the course will be based on a midterm, homework and lab activities, and a final exam.

Midterms	30%
Homework	20%
Lab Activities	10%
Final Exam	40%

**MIDTERM:** One double sided sheet of paper will be permitted on the midterm.

If, due to sickness, family emergency, team obligations etc, you need to miss midterm, you should inform me (e.g., by email) BEFORE the midterm date in order to make alternate arrangements. There will be NO make-up midterm for those who miss it without pre-notification, and a zero grade will assigned for that midterm.

**HOMEWORK:** The homework problems usually will consist of exercises problems taken from our text book.

Homework MUST be turned in in class on the due date. NO LATE HOMEWORK WILL BE ACCEPTED without pre-notification.

If, due to sickness, family emergencies etc, you need to miss class when homework is due, you should inform me (e.g., by email) BEFORE the due date to make alternate arrangements for turning in your homework.

**COMPUTING (LAB) ASSIGNMENTS:** The purpose of the lab sessions is to reinforce statistical and probabilistic concepts, and to provide hands-on experience in computer-based data analysis and statistical graphics. In this course we will use the statistical packages R which can be accessed in the computer labs on campus. It is most convenient, however, if you download R on your personal computer (the download is free).

**FINAL EXAM:** The final exam will be comprehensive. Because of this it will be open book and open notes. However, no electronic devices should be used.

**FINAL GRADES (tentative plan):**

93%	A
90%	A-
87%	B+
83%	B
80%	B-
77%	C+
70%	C
60%	D
<60%	F

**DISABILITIES SERVICES:** Penn State welcomes students with disabilities into the University's educational programs. If you have a disability-related need for reasonable academic adjustments in this course, contact the Office for Disability Services (ODS) at 814-863-1807 (V/TTY). For further information regarding ODS, please visit the Office for Disability Services Web site at <http://equity.psu.edu/ods/>.

**SICKNESS AND COMPASSIONATE WAIVERS:** As described under Midterm and Homework.

**ACADEMIC INTEGRITY:** The University policy on academic integrity, covering cheating, plagiarizing, and other acts of academic dishonesty, given in Section 49-20 of the Student Guide on Policies and Rules of the University <http://www.psu.edu/ufs/policies/>, will be adhered to in this course.

**POLICY FOR CLASSROOM USE:** All food and drink (except bottled water) is disallowed from classrooms. See <http://guru.psu.edu/policies/AD62.html> for more details.