STAT 553: Asymptotic Tools

Instructor: Lingzhou Xue
Email: Through ANGEL or lxx6@psu.edu
Office: 318 Thomas
Office Hours: Tue. Thur. 9:30am – 10:30am, and by appointment

TA: Zhanxiong Xu
Email: zux106@psu.edu
Office: 331B Thomas
Office Hours: Wed. Fri. 3:30pm – 4:30pm, and by appointment

Time and Location
Lecture: MWF 1:25pm – 2:15pm 220 Thomas (attendances are required.)

Course Description: this course covers most asymptotic theory but it does not require any knowledge of measure theory, including convergence of random variables, Slutsky's theorem and delta method, Lindeberg-Feller central limit theorem, power and sample size, likelihood-based estimation and testing, U-statistics, etc. Although no measure theory is required, it is a mathematically rigorous course and major results are proved. If time permits, I will talk about high-dimensional inference, such as compressed sensing/sparse linear regression, statistical inference on high-dimensional covariance structure, and so on.

Prerequisite: Stat 513 and Stat 514

Course Website: announcements and materials will be regularly posted on ANGEL

Textbook: Notes on Asymptotic Tools by Dave Hunter, May 2014
http://stat.psu.edu/~dhunter/asymp/lectures/

Optional Textbook:

Course Rules:
• You have one week to appeal a homework or exam grade. No grade changes will be made one week after a graded homework or exam is returned
• Make-up midterm exams might be allowed, with prior arrangement, for students with direct conflicts due to other exams or required university activities.
• Students are responsible for all announcements and supplements given within any lecture and email. Cell phones must be turned off before you enter the classroom
• Two double-sided sheets of notes are permitted for each exam. This is similar to the Ph.D. qualifying exam.
Grading:

1. **Homework (25%)**:  
   There will be approximately twelve (12) homework assignments.  
   - The homework will be collected on Monday at the beginning of class.  
   - You must show all work on the homework problems to receive full credit.  
   - A reasonable amount of collaboration is allowed, and homework should reflect your own understanding of the material.  
   - **NO LATE HOMEWORK WILL BE ACCEPTED unless the student has PRIOR permission from the instructor.**  
   - The *lowest grade will be dropped* prior to calculating the final grade.

2. **Quizzes (5%)**:  
   There are five (5) quizzes administered in-class, each worth 1% of the final grade.  
   - Quizzes **CANNOT be made up without a legitimate excuse**.

3. **Midterm Exams (40%)**:  
   There are two (2) midterm exams administered in-class, each worth 20% of the final grade.  
   - Tentative dates for the two midterm exams are February 22 and March 21.  
   - Midterm exams **CANNOT be made up without a legitimate excuse**.

4. **Final Exam (30%)**:  
   There is one (1) final exam administered in-class, worth 30% of the final grade.  
   - Final exam **CANNOT be made up without a legitimate excuse**.

**Academic Integrity:**  
All Penn State and Eberly College of Science policies regarding academic integrity apply to this course. See [http://science.psu.edu/current-students/Integrity](http://science.psu.edu/current-students/Integrity) for details.

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

**Accommodations for Students with Disabilities:**  
Penn State welcomes students with disabilities into University's educational programs. If you have a disability-related need for reasonable academic adjustments, contact Office for Disability Services at 814-863-1807 (V/TTY) or [http://equity.psu.edu/ods/](http://equity.psu.edu/ods/).