

# STAT 8004: Statistical Methods II

## Syllabus/Spring 2015

### Basic Information

Instructor: Dr. Cheng-Yong Tang      Phone: 215-204-3191  
Office: Speakman Hall 337              Email: yongtang@temple.edu  
Time: Thursdays 5:30pm – 8:00 pm      Location: Alter Hall A745  
Office Hours: Mondays 4:00 pm – 5:15 pm, or by appointment  
Course Webpage: <https://blackboard.temple.edu>

### Prerequisites

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**Disability Statement:** This course is open to all students who meet the academic requirements for participation. Any student who has a need for accommodation based on the impact of a disability should contact the instructor privately to discuss the specific situation as soon as possible. Contact Disability Resources and Services at 215-204-1280 in 100 Ritter Annex to coordinate reasonable accommodations for students with documented disabilities.

**Statement on Academic Freedom:** Freedom to teach and freedom to learn are inseparable facets of academic freedom. The University has adopted a policy on Student and Faculty Academic Rights and Responsibilities (Policy # 03.70.02) which can be accessed through the following link: [http://policies.temple.edu/getdoc.asp?policy\\_no=03.70.02](http://policies.temple.edu/getdoc.asp?policy_no=03.70.02).

### Course Description

This course covers statistical methods including linear models and applications, analysis of multi-factor experiments, linear mixed-effects models, generalized linear models. Topics like nonparametric smoothing and bootstrap will also be introduced if time permits.

### Blackboard

<https://blackboard.temple.edu> is the link for accessing Blackboard. I will be using email and Blackboard to contact you about important course information. I am usually available via email at [yongtang@temple.edu](mailto:yongtang@temple.edu). This is the best way to reach me. Please indicate [STAT 8004] in the subject line.

You need your Temple University AccessNet credentials to sign in Blackboard. The resource from the Blackboard webpage is the best for solving all problems related to accessing Blackboard. Please go to the Blackboard earliest possible to get familiar with it. You are required to check Blackboard and your email (known to Blackboard) frequently so that you do not miss out on class material and announcements.

### Software

- R <http://www.r-project.org/>. All computing for the course will be done in R. It will be fundamentally your own responsibility to learn how to use R.

## Course Materials

Course materials will be taken from multiple textbooks. Main reference for the course includes

- [R&S] Rencher, R. C. and Schaalje, G. B. (2008). Linear Models in Statistics (2nd Edition), Wiley.

Electronic copy of [R&S] is available via the Temple library. We will primarily use this book for the first half of the course. Library link

- Faraway, J. J. (2014). Linear Models with R (2nd Edition), Chapman & Hall CRC.
- Faraway, J. J. (2006). Extending the Linear Models with R: Generalized linear, Mixed Effects and Nonparametric Regression Models, Chapman & Hall CRC.

## Course Policies and Procedures

### – Course Grade

Component	Weight
Homework	15%
Exam 1	25%
Exam 2	25%
Final Exam	35%

- \* Individual students will prepare and turn in the homework assignments by announced due dates.
- \* One in-class Exam 1 will be held on designated date. More instructions on Exam 1 TBA.
- \* One take-home Exam 2 will be announced. You are expected to answer questions, to analyze data from some scenario(s) with methods introduced in the course, and/or to present your analysis.
- \* There is an in-class final exam to be held in the final exam week, tentatively scheduled on April 30, 5:45pm–7:40pm. The final exam will be comprehensive, covering all material of the course. More instructions on the final exam TBA.

### – Attendance and Participation

I anticipate active and regular participation in this course at a level consistent with general expectations about graduate students and graduate-level coursework: coming to class prepared for discussion and participation, and doing a thorough and high-quality job on assignments.

### – Group Work and Individual Work

You may discuss homework assignments with fellow students and ask the instructor for (limited) help with them. But each individual must write up his or her own assignments for turning in. You must write your own code where it is needed. Each individual must complete and write up his or her own Midterm Exam for turning in.

### – Policy on Academic Honesty

The section in italics is quoted verbatim from the Temple University Bulletin for 2006-2007. *Temple University believes strongly in academic honesty and integrity. Plagiarism and academic cheating are, therefore, prohibited. Essential to intellectual growth is the development*

*of independent thought and a respect for the thoughts of others. The prohibition against plagiarism and cheating is intended to foster this independence and respect.*

*Plagiarism is the unacknowledged use of another person's labor, another person's ideas, another person's words, another person's assistance. Normally, all work done for courses – papers, examinations, homework exercises, laboratory reports, oral presentations – is expected to be the individual effort of the student presenting the work. Any assistance must be reported to the instructor. If the work has entailed consulting other resources – journals, books, or other media – these resources must be cited in a manner appropriate to the course. It is the instructor's responsibility to indicate the appropriate manner of citation. Everything used from other sources – suggestions for organization of ideas, ideas themselves, or actual language – must be cited. Failure to cite borrowed material constitutes plagiarism. Undocumented use of materials from the World Wide Web is plagiarism.*

*Academic cheating is, generally, the thwarting or breaking of the general rules of academic work or the specific rules of the individual courses. It includes falsifying data; submitting, without the instructor's approval, work in one course which was done for another; helping others to plagiarize or cheat from one's own or another's work; or actually doing the work of another person.*

– **Late Assignments**

Please pay close attention to the assignment due dates and time; any assignment turned in late will receive a grade of zero. Please keep pace as best as you can with the after-class assignments given the other demands on your time.

– **Classroom Courtesies**

As a courtesy to your instructor and peers, please turn off all noise-producing electronics during class.

– **Campus Closings**

The Inclement Weather and Unscheduled Campus Closings policy (04.31.12) is available online at <http://policies.temple.edu>. You must register your mobile phone to receive a TU Alert ([www.temple.edu/tuready](http://www.temple.edu/tuready)) to receive an emergency notification.

**Tentative Course Outline (Subjective to Change)**

Date	Schedule
Jan 15	Overview and introduction
Jan 22	The Gauss-Markov linear model
Jan 29	No class. Make-up to be arranged if necessary
Feb 5	Ordinary least squares
Feb 12	Normal theory inference
Feb 19	Analysis of multi-factor experiments
Feb 26	In-class Exam 1
Mar 5	No class, Spring Break
Mar 12	Linear mixed models I
Mar 19	Linear mixed models II
Mar 26	Generalized linear models
Apr 2	Non-linear models
Apr 9	No class, take-home Exam 2
Apr 16	Bootstrap methods
Apr 23	Smoothing methods
Apr 30	Final Exam