

Math 532 Regression II.

Spring 2016

- **Instructor:** [Ganggang Xu](#)
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- **Office:** OW-133
- **Meeting time & location:** MWF 1:10 - 2:10pm at OW 100E.
- **Office hours:** MW 3:30-5:00pm or by appointment.

If you need to reach me, please e-mail gang@math.binghamton.edu.

Please include [Math532] in the subject line of your email, or your email may not be read promptly.

Prerequisite

Math 502 and Math 531, or equivalent. A course in linear algebra. **Graduate students from outside of the mathematical department and senior undergraduate students may take this course with Instructor's approval.**

Learning Objectives

1. More advanced techniques of regression models: nonparameteric regression models, mixed effects models and Generalized linear models
2. Proficient use of programming language R with applications to regression models.
3. More advanced training in scientific writing.
4. More advanced training in presentation.

This course is a 4-credit course, which means that students are expected to do at least 12.5 hours of course-related work or activity each week during the semester. This includes scheduled class lecture/discussion meeting times as well as time spent completing assigned readings, studying for tests and examinations, preparing written and computing assignments, and other course-related tasks.

Recommended Texts

The required texts is **Faraway (2005)** (see below for details).

▪ Required text

- Faraway (2005). Extending the Linear Model with R: Generalized Linear, Mixed Effects and Nonparametric Regression Models. (Chapman & Hall/CRC Texts in Statistical Science)
- Link to the book website: <http://www.maths.bath.ac.uk/~jjf23/ELM/index.html>

▪ **Recommended additional reading**

- James et al. (2013). An Introduction to Statistical Learning with Applications in R.
- Free PDF copy available online: <http://www-bcf.usc.edu/~gareth/ISL/>

Software

R is chosen to be the statistical software used in this course. There are many online resources where the students can learn the basics of R.

1. An Introduction to R
2. R tutorial by Kelly Black
3. Here is a pointer to R blogs.

Please install R before the beginning of the semester. In addition to R, some may find RStudio to be handy. Downloads:

- R - mirror hosted at UC Berkeley.
- R Studio - a more user friendly platform for R.

Note: This is not an R class. R will not even be taught in class. You are expect to learning R programming by yourself.

Grading

▪ **Homework (20%):**

1. Assigned every day. Don't skimp on the homework if you want a good grade.
2. You may discuss the problems with each other in general terms, but you must write your own solution.
3. All sources, including friends and colleagues, must be cited.

▪ **Midterm exam (25%):** March 23rd (tentative, subject to change)

▪ **Final Exam (25%):** May 17th, 8:00am-4:00pm.

▪ **Team project (30%):** [Guidelines](#)

Presentation Schedule

May 4th: Team 1: Dong/Gu

May 6th: Team 1: Kline/Yuan/Gao; Team 2: Zhou

May 9th: Team 1: Wang/Qi/Chu; Team 2: Yao/Liu

May 11st: Team 1: Xu/Qi; Team 2: Cheng/Deng/Li

Grading points:

Slides (40%): you need to prepare slides that are clear, concise with great visualization of your results; Do not include too much technical detail;

Team presentation performance (30%, graded individually): you need to tell a story about your project; try to be as organized as possible and get right into the points; Your presentation should not be longer than 25 minutes; otherwise, you will be penalized;

Question/Answer performance (30%): you need to reserve 5 minutes for questions. The way you handle all questions must clearly show that you have sufficient knowledge of what you are doing. Otherwise, you will be penalized. I also encourage questions from the crowd, and if you ask a good question I will take a note in my heart :)

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