STAT021 Statistical Methods II

Fall 2018

Professor:

Lu Chen
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610-690-5764
Science Center 139

Office hours:

Tuesdays 2:40-4:10 pm
Thursdays after class by appointment

Software:

- R Programming Language www.r-project.org.
- RStudio www.rstudio.com.
- Instead of installing these softwares on your computer, it is more convenient to use RStudio Server online at rstudio.swarthmore.edu by logging in with your Swarthmore user ID and password.
- It is always good to start early!
  - DataCamp.com Introduction to R.
  - R tutorial: cran.r-project.org/doc/manuals/R-intro.pdf.

Requirements and grading:

- Class participation (5%): in class, Moodle discussion forum. Attendance will be taken at three randomly picked classes.
- Homework (40%): assigned weekly on Thursday; due on ***Wednesday 11:55 pm*** on Moodle. No late homework will be accepted. Discussions of problems are encouraged. However, the solutions must be prepared by yourself.
  - Late homework will not be accepted except for ***documented*** illness, family emergencies or other excuses.
- Midterm exam (20%): in class, closed book. One two-sided cheat-sheet is allowed.
- Take-home data analysis project (15%):.
- Final exam (20%): in class, closed book. One two-sided cheat-sheet is allowed.
  - Rearrangements of exams are discouraged and will be given ONLY under extraordinary circumstances.

Important dates:

09/04/2018, Tuesday	First day of class
10/13/2018 - 10/21/2018	Fall break
10/25/2018, Thursday	Midterm exam
11/22/2018	Thanksgiving
11/29/2018 - 12/05/2018	Take-home data analysis project
12/14/2018 - 12/22/2018 (to be determined)	Final review, final exam

How to get help:

1. Moodle discussion forums.
2. Stat clinics: SC 158; Sundays, Mondays and Wednesdays at 7:00-10:00 pm. For more information, visit webpage.
3. Office hours: SC 139; Tuesday 2:40-4:10 pm and Thursday after class by appointment.
4. Email: lchen6@swarthmore.edu; asking questions or scheduling meetings with me.
5. *If none of the above is helpful*, you may apply for a tutor.

Diversity and Inclusion in the classroom

We all come to class with different backgrounds and experiences, and having this diversity of thoughts and perspectives is exactly what will make our learning environment richer. It is expected that you will respect other's identities and contributions, and that we all will support each other in our statistical journey. Please let me know if there is any personal information that you want to share that will help you thrive in this course.

Disability accommodations statement

If you believe you need accommodations for a disability or a chronic medical condition, please contact Student Disability Services (Parrish 113W, 123W) via e-mail at studentdisabilityservices@swarthmore.edu to arrange an appointment to discuss your needs. As appropriate, the office will issue students with documented disabilities or medical conditions a formal Accommodations Letter. Since accommodations require early planning and are not retroactive, please contact Student Disability Services as soon as possible. For details about the accommodations process, visit the Student Disability Services website. You are also welcome to contact me privately to discuss your academic needs. However, all disability-related accommodations must be arranged, in advance, through Student Disability Services.

Definition and consequences of Academic Misconduct.

Any comments are appreciated! Please never hesitate to let me know your thoughts/feedback/comments/suggestions about this course and homework by email or in person.

Calendar:

Week	Tuesday	Thursday	Homework & Due
1. 09/04/2018	***Intro***. Overview	***Intro***. Variables and Distributions	***HW 1*** *09/12 Wed. 11:55 pm*
2. 09/11/2018	***Intro***. Statistical modeling	***Intro***. Variance	***HW 2*** *09/19 Wed. 11:55 pm*
3. 09/18/2018	***Analysis of Variance*** One-way ANOVA model	***ANOVA*** One-way ANOVA table	***HW 3*** *09/26 Wed. 11:55 pm*
4. 09/25/2018	***ANOVA*** Multiple comparisons	***ANOVA*** Two-way ANOVA	***HW 4*** *10/03 Wed. 11:55 pm*
5. 10/02/2018	***Simple Linear Regression*** Model, Inference and Checking Assumptions	***SLR*** ANOVA and Transformation	***HW 5*** *10/10 Wed. 11:55 pm*
6. 10/09/2018	***SLR*** Prediction	***SLR*** Outliers and Influential points	***HW 6*** *10/22 Mon. 11:55 pm*
7. 10/16/2018	**Fall break**		
8. 10/23/2018	***SLR*** Review	**Midterm** *(in class)*	
9. 10/30/2018	***Multiple Linear Regression*** Model and Inference	***MLR*** ANOVA and Assessment	***HW 7*** *11/07 Wed. 11:55 pm*
10. 11/06/2018	***MLR*** Categorical predictors	***MLR*** Interactions	***HW 8*** *11/14 Wed. 11:55 pm*
11. 11/13/2018	***MLR*** Transforming predictors	***MLR*** Multicollinearity and Model selection	***HW 9*** *11/21 Wed. 11:55 pm*
12. 11/20/2018	***MLR*** Model building	**Thanksgiving**	***HW 10*** *11/26 Mon. 11:55 pm*
13. 11/27/2018	***MLR*** Review	**Project** *(take home)* *Due on 12/5 Wed. 11:55 pm*	
14. 12/04/2018	***Logistic Regression*** Model and Odds ratio	***Logistic Regression*** Inference and Assessment	***HW 11*** *12/12 Wed. 11:55 pm*
15. 12/11/2018	***Logistic Regression*** Genome-wide association studies (GWAS)		