STAT 550 Course Calendar

Homework assignments, project instructions, lecture notes and handouts will be posted in Canvas. Readings will be denoted by "550" for the *Course Notes: Statistics 550 Advanced Mathematical Statistics* and by "505" for *A Pair of Primers: Primer on Matrix Analysis and Primer on Linear Statistical Models.* Topics on calendar are subject to change.

Week 1: Jan 13, 15

Reading:

- Course syllabus and Canvas exploration
- 505: Chapters 2 and 7, Sections 8.1-8.4 and 8.11
- 550: Chapter 2

Tuesday

- Introductions to the course and to each other
- Spot the math errors
- Deep dive into matrix algebra

Thursday

- Kronecker products and the vec operator

Week 2: Jan 20, 22

Tuesday

- Kronecker products and the vec operator (cont)

Thursday

- Application of matrix operations in linear models
- **Homework 1 Due in class**

Week 3: Jan 27, 29

Reading:

- 505: Chapter 12
- 550: Chapter 3

Tuesday

- Matrix differentiation

Thursday

- Matrix differentiation (cont)
- **Quiz 1: Matrix operations, Kronecker products, Vec**

Week 4: Feb 3, 5

Reading:

- 505: Chapter 9, Chapter 11 (skim), Section 15.1
- 550: Chapter 5

Tuesday

- Matrix differentiation (cont)
- Minimizing SSE from a projection operator perspective

Thursday

- Eigenvalue/eigenvector review
- Order of magnitude
- **Homework 2 Due in class**

Week 5: Jan 10, 12

Reading:

- 505: Sections 13.1-13.4
- 550: Chapters 4 and 7
- Sections 5.5.1-5.5.3 in Casella and Berger

Tuesday

- Types of convergence in probability
- Order of magnitude in probability

Thursday

- Multivariate Taylor series expansions
- Newton-Raphson and Fisher Scoring algorithms
- **Quiz 2: Matrix differentiation and matrix representation of linear models**

Week 6: Feb 17, 19

Tuesday

- Newton-Raphson and Fisher Scoring algorithms for logistic regression

Thursday

- Missing data and the EM algorithm

Week 7: Feb 24, 26

Tuesday

- *No class*: Either attend the CLS Teaching Workshop with Dr. James Lang (registration required) or spend this time working on your project.
- **Project: Journal article proposal due in Canvas by 5pm**

Thursday

- Missing data and the EM algorithm (cont)

Week 8: Mar 3, 5

Tuesday

- TBD

Thursday

- TBD

Week 9: Mar 10, 12

Tuesday

- TBD

Thursday

- TBD

Spring break: Mar 16-20

Week 10: Mar 24, 26

Tuesday

- TBD

Thursday

- TBD

Week 11: Mar 31, Apr 2

Tuesday

- **Project: Executive summary due in Canvas by 5pm**

Thursday

- TBD

Week 12: Apr 7, 9

Tuesday

- TBD

Thursday

- TBD

Week 13: Apr 14, 16

Tuesday

- **Project: Proof sketch due in Canvas by 5pm**

Thursday

- TBD

Week 14: Apr 21, 23

Tuesday

- TBD

Thursday

- TBD

Week 15: Apr 28, 30

Project: Presentation slides due in Canvas by 5pm on *Monday*

Tuesday

- Project presentations

Thursday

- Project presentations

Finals week

- Final exam in Wilson Hall 1-128 on **Tuesday, May 5, 8:00am-9:50am**