# Midterm 2 Exam Guide

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What to Study:

- Lecture Slides: # **13** – # **21**
- Practice Problems.
- Homework Problems.
- Quiz questions.
- R Examples.

Topics Discussed:

1. Polynomial Regression & Regression Splines
   - how to choose the order of the polynomial
   - cubic vs natural cubic splines
   - K-fold cross validation
2. Analysis of Covariance
3. Variable Selection Methods
   - Testing-based procedures
   - Selection criteria based procedures
4. Shrinkage Methods
   - Principal components regression, ridge regression, lasso regression
5. One-way ANOVA models
   - Cell means, factor effects model, the ANOVA table, $F$-test
   - Inference for factor level means
6. Two-way ANOVA models
   - Cell means, factor effects model, the ANOVA table, $F$-test
   - Inference for factor level means
   - Unbalanced ANOVA
   - ANOVA with $n = 1$

Exam Instructions:

1. **Before Your Exam**
   (a) Download the Zoom app on your phone or tablet. Sign in using SSO with your netID and password.
   (b) Plan your testing space. You will need the following:
      i. a quiet space with good lighting and no other people. If this is impossible, let the proctor know at the beginning of the exam and refrain from talking with other people.
      ii. a place to put your phone/tablet far enough away from you to capture your face and keyboard in the same shot on Zoom. View Tips from CBTF for Positioning Your Phone for examples (posted on the course website).
      iii. optional: a phone/tablet stand. You can use CBTF's tutorials for making your own stand.
      iv. a phone/tablet charger
      v. scratch paper
      vi. a calculator
      vii. cheat sheet

2. **Exam Rules**
   - **The Student Code regarding Academic Integrity still applies.**
   - **Do not:**
     – Have someone else in the room with you. If this is impossible, let the proctor know at the beginning of the exam and refrain from talking with other people.
     – Turn your video off on Zoom.
     – Leave the room.
     – Access prohibited sites/applications on your computer.
     – Use your phone for anything other than testing purposes.
     – Use a virtual background.
   - **Do:**
     – Enter the Zoom meeting 10 minutes before the start of the exam.
     – Make sure your display name is correct. (We need to know who you are!)
     – Have your paper, writing utensils, calculator, and any other course-approved supplies you need within reach.
     – Ask the proctor any questions you have. Just wave at your camera, then use the **private chat** on Zoom.
     – If you enter the meeting after testing has started, use private chat on Zoom so as not to disturb others.

  - *Stop working when time is called.*
- **Prepare to Take Your Exam**
  - Use the restroom beforehand.
  - Make sure you have all the items you will need (scratch paper, calculator, pencils, etc.)
  - Make sure you do NOT have any unauthorized materials in your work area. This includes smart watches and headphones.
  - Make sure you are alone and others will not enter the room.
  - Plug your devices into an outlet or power bank.
  - Put your phone in Do Not Disturb mode–notifications can interrupt your connection to the Zoom meeting.

3. **Take your exam**

- Follow the link you are given to the exam Zoom meeting on your phone or tablet.
- Double check that your display name in Zoom is correct.
- Wait for the proctor to tell you to begin.
- Follow the proctor's time calls, not any timer in your exam. When time is called, stop working immediately. Whenever you finish your exam, upload your exam and let the proctor know before leaving the meeting.

4. **STAT 425 Specifics**

- This is going to be a *closed notes, closed books* exam.
- You are allowed to have a two-sided page cheat sheet.
- You need to have a *working* calculator - not an app on your phone.
- Tables with distributions will be provided to you -if needed.
- The exam will be distributed via Gradescope and the duration will be 1h20min. After the end of 1h20min, you will have an additional 15 minutes to scan and upload the exam - so a total of 1h 35min. After that Gradecope will close and will not accept any submissions.
- During the exam, you will not be asked to write R code. However, you are expected to know how to "read" R code and output and extract the necessary information to solve a problem.
- When answering questions, make sure you **show your work!** No work = No credit.