

WEEK 1
MAY 11 – MAY 15

TOPICS:

- Introduction to the course
- Introduction to experimentation
- Experimentation fundamentals

VIDEOS:

- Welcome_to_STAT430-830.mp4 (41:13)
- Notation_and_Nomenclature.mp4 (30:21)
- Experiments_vs_Observational_Studies.mp4 (29:56)
- QPDAC.mp4 (43:39)
- Fundamental_Design_Principles.mp4 (21:16)

LECTURE NOTES:

- Week_1_Lecture_Notes.pdf

COURSE NOTE READINGS:

- Preface
- Chapter 1

QUIZ NOTES:

- No quiz this week.

ASSIGNMENT NOTES:

- Assignment 1 will be posted on Friday May 15.

FAQ FRIDAY LINK

- <https://usfca.zoom.us/j/93050963883>

WEEK 2

MAY 18 – MAY 22

TOPICS:

- Experiments with Two Conditions

VIDEOS:

- Anatomy_of_an_AB_test.mp4 (38:34)
- Comparing_two_means.mp4 (56:11)
- Comparing_two_proportions.mp4 (28:14)
- A_power_calculation.mp4 (46:37)

LECTURE NOTES:

- Week_2_ Lecture_Notes.pdf

COURSE NOTE READINGS:

- Appendices A.1 and A.2 as necessary
- Chapter 2 (skip Subsection 2.2.5 and Section 2.3 and the discussion of Permutation/Randomization tests)

QUIZ NOTES:

- Quiz 1 will open on Tuesday May 19 at 12:00AM (EST) and close on Wednesday May 20 at 11:59PM (EST).
- The quiz will cover Week 1 material.
- [Click here](#) to access this quiz.

ASSIGNMENT NOTES:

- You should be working on Assignment 1 this week.

FAQ FRIDAY LINK

- <https://usfca.zoom.us/j/98183458099>

WEEK 3

MAY 25 – MAY 29

TOPICS:

- Permutation & Randomization test
- Experiments with More Than Two Conditions

VIDEOS:

- Randomization_tests.mp4 (49:29)
- Anatomy_of_an_ABn_test.mp4 (14:56)
- Comparing_multiple_means.mp4 (51:52)
- Comparing_multiple_proportions.mp4 (45:17)

LECTURE NOTES:

- Week_3_ Lecture_Notes.pdf

COURSE NOTE READINGS:

- Section 2.1.5 (the part about permutation and randomization tests)
- Section 2.2.5
- Chapter 3 (except 3.3, this is under construction and will be assigned next week)
- Appendix A.3, as necessary

QUIZ NOTES:

- Quiz 2 will open on Tuesday May 26 at 12:00AM (EST) and close on Wednesday May 27 at 11:59PM (EST).
- The quiz will cover Week 2 material.
- [Click here](#) to access this quiz.

ASSIGNMENT NOTES:

- Assignment 1 is due by 11:59PM (EST) on Friday May 29.

FAQ FRIDAY LINK

- <https://usfca.zoom.us/j/93393429178>

WEEK 4

JUNE 1 – JUNE 5

TOPICS:

- The multiple comparison problem

VIDEOS:

- The_multiple_comparison_problem.mp4 (16:21)
- FWER_Bonferroni_and_Sidak.mp4 (36:33)
- Holms_procedure.mp4 (39:43)
- Adjusted_p-values.mp4 (13:16)
- FDR_and_BenjHoch.mp4 (22:11)
- R_examples.mp4 (12:23)
- Sample_size_considerations.mp4 (17:05)

LECTURE NOTES:

- Week_4_ Lecture_Notes.pdf

COURSE NOTE READINGS:

- Section 3.3

QUIZ NOTES:

- Quiz 3 will open on Tuesday June 2 at 12:00AM (EST) and close on Wednesday June 3 at 11:59PM (EST).
- The quiz will cover Week 3 material.
- [Click here](#) to access this quiz.

ASSIGNMENT NOTES:

- Assignment 2 will be posted on Friday June 5.

FAQ FRIDAY LINK

- <https://usfca.zoom.us/j/93820871997>

WEEK 5

JUNE 8 – JUNE 12

TOPICS:

- Blocking
- Logistic Regression

VIDEOS:

- Primer_on_logistic_regression.mp4 (33:10) ← Optional if you know logistic regression
- Recap_of_nuisance_factors.mp4 (17:57)
- Randomized_complete_block_designs.mp4 (31:41)
- RCBD_means.mp4 (25:09)
- The_Gap_example.mp4 (25:31)
- RCBD_proportions.mp4 (16:48)
- Enterprise_example.mp4 (24:13)

LECTURE NOTES:

- Week_5_ Lecture_Notes.pdf

COURSE NOTE READINGS:

- Chapter 4 intro piece and Section 4.1
- Appendix A.4 as necessary

QUIZ NOTES:

- Quiz 4 will open on Tuesday June 9 at 12:00AM (EST) and close on Wednesday June 10 at 11:59PM (EST).
- The quiz will cover Week 4 material.
- [Click here](#) to access this quiz.

ASSIGNMENT NOTES:

- You should be working on Assignment 2 this week.

FAQ FRIDAY LINK

- <https://usfca.zoom.us/j/95209524449>

WEEK 6

JUNE 15 – JUNE 19

TOPICS:

- Balanced Incomplete Block Designs
- Latin Squares

VIDEOS:

- Balanced_incomplete_block_designs.mp4 (55:23) ← Consider splitting at 21:00 and 48:30
- Latin_square_designs.mp4 (32:56)
- LSD_means.mp4 (25:43)
- Netflix_example.mp4 (32:22)
- LSD_proportions.mp4 (11:01)
- Uber_example.mp4 (23:51)

LECTURE NOTES:

- Week_6_ Lecture_Notes.pdf

COURSE NOTE READINGS:

- Sections 4.2 and 4.3

QUIZ NOTES:

- Quiz 5 will open on Tuesday June 16 at 12:00AM (EST) and close on Wednesday June 17 at 11:59PM (EST).
- The quiz will cover Week 5 material.
- [Click here](#) to access this quiz.

ASSIGNMENT NOTES:

- Assignment 2 is due by 11:59PM (EST) on Friday June 19.

FAQ FRIDAY LINK

- <https://usfca.zoom.us/j/95208957813>

WEEK 7

JUNE 22 – JUNE 26

TOPICS:

- Experiments with multiple design factors

VIDEOS:

- Experiments_with_multiple_design_factors.mp4 (11:14)
- The_factorial_approach.mp4 (36:10)
- Designing_factorial_experiments.mp4 (19:20)
- Analyzing_factorial_experiments.mp4 (20:58)
- Continuous_response.mp4 (55:07)
- Instagram_example_with_R.mp4 (18:36)
- Binary_response.mp4 (6:24)

LECTURE NOTES:

- Week_7_ Lecture_Notes.pdf

COURSE NOTE READINGS:

- Chapter 5

QUIZ NOTES:

- Quiz 6 will open on Tuesday June 23 at 12:00AM (EST) and close on Wednesday June 24 at 11:59PM (EST).
- The quiz will cover Week 6 material.
- [Click here](#) to access this quiz.

ASSIGNMENT NOTES:

- Assignment 3 will be posted on Friday June 26.

FAQ FRIDAY LINK

- <https://usfca.zoom.us/j/96662804132>

WEEK 8

JUNE 29 – JULY 3

TOPICS:

- Revisiting main effects, interactions, and linear predictors
- Logistic regression factorial example
- Intro to 2-level designs
- The Big Picture

VIDEOS:

- Linear_predictor_pit_stop.mp4 (39:29)
- TinyCo_example.mp4 (38:43)
- TinyCo_example_in_R.mp4 (30:55)
- Intro_to_two_level_designs.mp4 (17:55)
- Big_picture.mp4 (28:15) ← **OPTIONAL**

LECTURE NOTES:

- Week_8_Lecture_Notes.pdf

COURSE NOTE READINGS:

- Sections 5.3.2 and 5.4

QUIZ NOTES:

- Quiz 7 will open on Tuesday June 30 at 12:00AM (EST) and close on Thursday July 2 at 11:59PM (EST).
- The quiz will cover Week 7 material.
- [Click here](#) to access this quiz.

ASSIGNMENT NOTES:

- You should be working on Assignment 3 this week.

FAQ FRIDAY LINK

- <https://usfca.zoom.us/j/91838805299>

WEEK 9

JULY 6 – JULY 10

TOPICS:

- Design and analysis of 2^k factorial experiments

VIDEOS:

- Design_of_2K_factorial_experiments.mp4 (38:12)
- Intuition_based_analysis.mp4 (38:16)
- Regression_based_analysis_model.mp4 (8:47)
- Regression_based_analysis_estimation.mp4 (39:13)
- Regression_based_analysis_testing.mp4 (6:42)
- Credit_card_example.mp4 (24:02)
- Credit_card_example_in_R.mp4 (13:16)

LECTURE NOTES:

- Week_9_ Lecture_Notes.pdf

COURSE NOTE READINGS:

- Sections 6.1 and 6.2

QUIZ NOTES:

- Quiz 8 will open on Tuesday July 7 at 12:00AM (EST) and close on Wednesday July 8 at 11:59PM (EST).
- The quiz will cover Week 8 material.
- [Click here](#) to access this quiz.

ASSIGNMENT NOTES:

- Assignment 3 is due by 11:59PM (EST) on Friday July 10.

FAQ FRIDAY LINK

- <https://usfca.zoom.us/j/94783344172>

WEEK 10
JULY 13– JULY 17

TOPICS:

- Designing 2^{K-p} Fractional Factorial Experiments

VIDEOS:

- Intro_2K-p_Fractional_Factorial_Designs.mp4 (30:25)
- Aliasing.mp4 (31:27)
- The_Defining_Relation.mp4 (44:18)
- Resolution.mp4 (39:49)
- Minimum_Aberration.mp4 (17:02)

LECTURE NOTES:

- Week_10_ Lecture_Notes.pdf

COURSE NOTE READINGS:

- Chapter 7 up to, but not including Section 7.2

QUIZ NOTES:

- Quiz 9 will open on Tuesday July 14 at 12:00AM (EST) and close on Wednesday July 15 at 11:59PM (EST).
- The quiz will cover Week 9 material.
- [Click here](#) to access this quiz.

ASSIGNMENT NOTES:

- Assignment 4 will be posted on Friday July 17.

FAQ FRIDAY LINK

- <https://usfca.zoom.us/j/91264278812>

WEEK 11

JULY 20– JULY 24

TOPICS:

- Analyzing 2^{K-p} Fractional Factorial Experiments
- Introduction to Response Surface Methodology

VIDEOS:

- Analyzing_fractional_factorial_experiments.mp4 (30:53)
- The_Chehalem_example.mp4 (46:16)
- The_Chehalem_example_in_R.mp4 (21:57)
- Intro_to_RSM.mp4 (4:57)
- Coded_factors.mp4 (25:00)
- The_models.mp4 (23:05)
- Finding_the_optimum.mp4 (15:02)
- Visualizing_response_surfaces.mp4 (19:09) ← OPTIONAL

LECTURE NOTES:

- Week_11_Lecture_Notes.pdf

COURSE NOTE READINGS:

- Section 7.2
- Chapter 8 up to, but not including Sections 8.2 or 8.3

QUIZ NOTES:

- Quiz 10 will open on Tuesday July 21 at 12:00AM (EST) and close on Wednesday July 22 at 11:59PM (EST).
- The quiz will cover Week 10 material.
- [Click here](#) to access this quiz.

ASSIGNMENT NOTES:

- You should be working on Assignment 4 this week.

FAQ FRIDAY LINK

- <https://usfca.zoom.us/j/98818698774>

WEEK 12

JULY 27– JULY 31

TOPICS:

- Method of Steepest Ascent/Descent
- Central Composite Designs

VIDEOS:

- Method_of_steepest_ascent_descent.mp4 (42:50) ← If you've already done the course evaluation start at 11:00
- Checking_for_curvature.mp4 (36:59)
- The_Netflix_example.mp4 (27:16)
- The_Netflix_example_in_R.mp4 (20:19)
- The_CCD.mp4 (24:37)
- The_Lyft_example.mp4 (16:53)
- The_Lyft_example_in_R.mp4 (14:52)
- RSM_with_categorical_factors.mp4 (14:35) ← OPTIONAL for STAT 430 students

LECTURE NOTES:

- Week_12_ Lecture_Notes.pdf

COURSE NOTE READINGS:

- Sections 8.2, 8.3 (and 8.4 if you're a STAT 830 student)

QUIZ NOTES:

- Quiz 11 will open on Tuesday July 28 at 12:00AM (EST) and close on Wednesday July 29 at 11:59PM (EST).
- The quiz will cover Week 11 material.
- [Click here](#) to access this quiz.

ASSIGNMENT NOTES:

- You should be working on Assignment 4 this week.

FAQ FRIDAY LINK

- <https://usfca.zoom.us/j/94997684952>

WEEK 13
AUGUST 3 – AUGUST 5

TOPICS:

- No new material will be taught this week.

VIDEOS:

- No new material will be taught this week.

LECTURE NOTES:

- No new material will be taught this week.

COURSE NOTE READINGS:

- No new material will be taught this week.

QUIZ NOTES:

- Quiz 12 will open on Tuesday August 4 at 12:00AM (EST) and close on Wednesday August 5 at 11:59PM (EST).
- The quiz will cover Week 12 material.
- [Click here](#) to access this quiz.

ASSIGNMENT NOTES:

- Assignment 4 is due by 11:59PM (EST) on Tuesday August 4.

FAQ FRIDAY LINK

- <https://usfca.zoom.us/j/92094228350>
- Note this session is from 12:00-2:00pm EST