Final Exam 633

10 questions – 5 points each

[**Module 1**](https://miamioh.instructure.com/courses/209927/modules/723258)

* Understand the concept of a counterfactual
* Understand the different components of the decomposition of the difference in means.
* Understand why experiments prove causality and what assumption we need to make.

[**Module 2**](https://miamioh.instructure.com/courses/209927/modules/723259)

* **Know how to obtain an empirical estimate for a standard error by simulation.**
* **Know to calculate the theoretical standard error for means and proportions.**
  + **Both from first exam**
* Understand the confidence interval for a difference in means or proportions.
* Use a confidence interval to make conclusions about a test for the difference in means or proportions.

[**Module 4**](https://miamioh.instructure.com/courses/209927/modules/723262)

* Know how to recognize factors as blocking factors.
* Know how to calculate the degrees of freedom for a blocked experiments.

[**Logistic Regression**](https://miamioh.instructure.com/courses/209927/files/31436402?wrap=1) - REVIEW

* Understand the relationship between the logit (p) and the logistic regression coefficients.
* Understand the relationship between P(y=1) and the logistic regression coefficients.
* **How to interpret (simple and multiple logistic regression model) coefficients**

[**Module 6**](https://miamioh.instructure.com/courses/209927/modules/723264)

* Be able to explain the advantages of using a factorial plan vs. one-factor-at-a-time when you have multiple factors to study.
* Be able to create a factorial design plan with any number of factors.
* Be able to interpret/assess interactions in a factorial design.
* **Understand why we want to use fractionation for efficiency.**
* **Understand the resolution of fractional factorial designs and why it is important.**
* Know how to analyze a fractional factorial design with a binary or numeric response.

[**Module 7**](https://miamioh.instructure.com/courses/209927/modules/723267)

* **Understand when casual methods might be necessary**
  + **And know what they do**
* Understand the output from a regression discontinuity analysis.
* **Understand the regression out from a difference in difference analysis.**
  + **Be able to calculate**
    - R code with NJ and PA
* Be able to calculate a simple difference in difference estimate using means.
* On a high level, understand what Synthetic Control does (optimization).

**Other**

* Can you read a situation and recommend a design?
  + Q15 on Exam 2