

CPSE/IP&T 745  
MULTIPLE REGRESSION  
Winter 2023  
Mondays, 1-4, 112 SWKT  
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CPSE/IP&T 745 will provide a thorough exposure to multiple regression analysis which is the foundation for a wide variety of subsequent statistical procedures including path analysis, factor analysis, structural equation modeling, and hierarchical linear modeling.

Objectives: Students will:

- Demonstrate ability to design and interpret multiple regression models (including categorical and continuous variables and their interactions) and their coefficients including  $F$ ,  $R$ ,  $R^2$ ,  $a$ ,  $b$ ,  $\beta$ ; zero-order, partial & semi-partial correlations.
- Demonstrate ability to design and interpret variations in regression models including logistic regression.
- Demonstrate ability to design and interpret path models with manifest variables.

Required Textbook:

Multiple Regression & Beyond: An Introduction to Multiple Regression and Structural Equation Modeling, 3<sup>rd</sup> Edition. (2019) Timothy Z. Keith. Routledge: ISBN 9781315162348

Recommended Textbook:

Advanced and Multivariate Statistical Methods 5<sup>th</sup> Edition. (2013).  
Craig Mertler and Rachel Vannatta, Pyrczak, ISBN 978-1-936523-09-2

Learning/Teaching Style:

My preferred style of learning and teaching statistics is to work in small groups. That approximates how good statistical analysis is accomplished. I am a strong advocate of a conceptual approach to the teaching of statistics (I could have written Keith's preface. 😊) and have found it to be effective in helping students love the beauty of statistics.

**PLEASE COMPLETE EACH READING BEFORE CLASS.** It is only an average of 25 pages per week. We will answer questions, demonstrate cool stuff, and do exercises in class, before sending you home with homework.

Grading:

I prefer competency-based grading. You will re-do each assignment until it is correct.

Schedule:

Date	Topic	Readings
1/9	Bivariate Regression and Review of Basics Writing Equations Variance/Covariance Matrices	Ch 1 Appendix B
1/16	MLK HOLIDAY	
1/23	Intro to Multiple Regression (MR)	Ch 2
1/30	MR: More Depth	Ch 3
2/6	MR: Three + Variables	Ch 4
2/13	Review for Midterm	
2/20 (Monday)	PRESIDENTS' HOLIDAY	
2/21(Tuesday)	Take Home Midterm ???	
2/27	Three Approaches to MR	Ch 5
3/6	Categorical Variables	Ch 6
3/13	Categorical and Continuous Variables	Ch 7
3/20	Interactions and Curves	Ch 8 (9?)
3/27	Assumptions and Diagnostics	Ch 10
4/3	Logistic Regression and MLM	Ch 11
4/10	Path Analysis the Hard Way (Little Joe from Kokomo)	Ch 12
4/17	Review for Final Exam	