DATX 5805 - Predictive Modeling Algorithms

Fall 2026 Syllabus, Section 01, CRN 43055,

Credit hours: 3

Instructor

G. Jay Kerns

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Public Instructor Information

Instructor Title: Professor

Instructor Professional Qualifications:

- Ph. D., Mathematics, Statistics Specialization, Bowling Green State University
- M.A., Mathematics, Bowling Green State University
- B.A. Ed., Music, Mathematics, Science, Glenville State College

Instructor Office Location: 620 Cafaro Hall
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Course Description

5805. Predictive Modeling Algorithms. Predictive modeling (also referred to predictive analytics and machine learning) applies statistical techniques in analyzing data to predict outcomes. Through a hands-on approach, this course helps students develop basic skills in predictive analytics. Topics may include (not limited to) k-nearest neighbors, naïve-Bayes, linear and logistic regression models, time-series models, classification and regression trees, Principle Component/Factor Analysis, non-linear models, neural networks, random forests, and cluster analysis among others. Prereq.: Junior standing or higher and GPA of 2.5 or higher. 3 s.h.

Course Readings

Group	Title	Author	ISBN
Required	An Introduction to Statistical Learning	Gareth James, Daniela Witten, Trevor Hastie, Robert Tibshirani	978-1-0716-1420-4

The textbook is freely available at https://www.statlearning.com/.

The course readings are subject to change in the event of extenuating circumstances, research developments, current events, and/or to ensure better learning.

Schedule of Topics and Assignments

Week of	Reading(s)	Proposed Topic	Due/To Prepare for Class
8/24	Ch2: Section 1 Ch2: Section 2	Statistical Learning Assessing Model Accuracy	Quiz 1
8/31	Ch2: Section 3	Intro to R	Assignment 1
9/7	Ch3: Section 1 Ch3: Section 2 Ch3: Section 3	Simple Linear Regression Multiple Linear Regression Other Considerations	Quiz 2
9/14	Ch3: Section 4 Ch3: Section 5 Ch3: Section 6	Marketing Plan Comparison with Nearest Neighbors	Assignment 2
9/21	Ch4: Section 1 Ch4: Section 2 Ch4: Section 3	Classification Overview Logistic Regression	Quiz 3

9/28	Ch4: Section 6 Ch4: Section 7	Generalized Linear Models	Assignment 3
10/5	Ch5: Section 1 Ch5: Section 2	Cross Validation Bootstrap	Assignment 4
10/12	Ch5: Section 3		Midterm Exam
10/19	Ch6: Section 1 Ch6: Section 2	Subset Selection Shrinkage Methods	Quiz 4
10/26	Ch6: Section 3 Ch6: Section 4	Dimension Reduction High Dimensional Considerations	Assignment 5
11/2	Ch8: Section 1 Ch8: Section 2	Decision Trees Random Forests	Quiz 5
11/9	Ch8: Section 3		Assignment 6
11/16	Ch12: Section 1 Ch12: Section 2	Principal Components Analysis Clustering Methods	Quiz 6
11/23	Ch12: Section 4 Ch 12: Section 5	Unsupervised Learning	

The course schedule, policies, procedures, and assignments in this course are subject to change in the event of extenuating circumstances, by mutual agreement, and/or to ensure better learning.