Course: STAT8330 – Binary Classification (PhD)
Instructor: Dr. Jennifer Priestley
Office: CL3005
Office Hours: F after class and by appt
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Course Pre-requisite: STAT8210 (or Supervised Modeling Experience)

Course Text:
Students will receive a packet of course notes on the first day of class.

Meeting Schedule:
This course will meet on Fridays from 9:30 – 12:15.

Course Software:
This is a SAS-based course. We will be using Base SAS within SAS Studio. Students are expected to have a strong working knowledge of SAS to be successful in this course. While knowledge of Regression (supervised modeling) from STAT8210 is negotiable, SAS programming skills are not. Students can execute their work in any programming language…however, the material will be taught using SAS.

Course Description:
This course is an upper division course in statistical modeling. Students will develop classification models using a real world, large (>1MM obs) dataset. Although the dataset comes from the commercial credit risk domain, no previous experience with commercial credit risk is assumed.
Learning Outcomes:
By the end of the course, students should be able to:

1. Execute a regression model to isolate significant variables from a very large number of potential predictors;
2. Utilize tools such as correlation matrices, Variable Clustering and Variance Inflation Factors to detect and correct multicollinearity and reduce the number of variables;
3. Transform continuous variables into ordinal and categorical variables (we will be executing 6 types of discretization);
4. Develop Logistic prediction models using discretized variables;
5. Evaluate implications of type 1 and type 2 errors;
6. Maximize the profitability of a model by determining an optimal cut point;
7. Evaluate binary models using multiple tools, including the K-S test, Profit functions and lift curves;
8. Utilize segmentation (cluster analysis) to optimize profitability and minimize likelihood of risk;
9. Summarize results in a pre-publication white paper and a formal presentation;
10. Comfortably work with massive datasets.

Grading will consist of four components:

Grading:
Deliverable 1 – Statement of Research Hypothesis and Report of Identified variables for modeling 10%
Deliverable 2 – Interim Research Report 20%
Deliverable 3 – SAS Day Poster Presentation 20%
Deliverable 4 – Final Research White Paper 50%

Notes on the Course Project:

Over the course of a 15 week semester, students will be working to develop models from a large unstructured dataset. This project is intended to replicate a real world practical modeling experience combined with a research paper.

Students will be given a schedule of deliverables for the project. It is expected that these deliverables will be met on time (within 5 minutes of the beginning of class), and that all deliverables will be executed with professionalism and excellence.
The final deliverable requires students to “present” their code on a flash drive. The code must execute WITHOUT fail, in less than 30 minutes, for full credit.

**Attendance & Assignment Policies:** While I don’t take attendance, you have to come to class to pass – it’s a really hard class.

**Withdrawal Policy…**The last day to withdraw from the course and possibly receive a "W" is March 1, 2017.

Students who find that they cannot continue in college for the entire semester after being enrolled, because of illness or any other reason, need to complete an online form. To completely or partially withdraw from classes at KSU, a student must withdraw online at [www.kennesaw.edu](http://www.kennesaw.edu), under Owl Express, Student Services.

The date the withdrawal is submitted online will be considered the official KSU withdrawal date which will be used in the calculation of any tuition refund or refund to Federal student aid and/or HOPE scholarship programs. It is advisable to print the final page of the withdrawal for your records. Withdrawals submitted online prior to midnight on the last day to withdraw without academic penalty will receive a “W” grade. Withdrawals after midnight will receive a “WF”. Failure to complete the online withdrawal process will produce no withdrawal from classes. Call the Registrar’s Office during business hours if assistance is needed.

Students may, by means of the same online withdrawal and with the approval of the university Dean, withdraw from individual courses while retaining other courses on their schedules. This option may be exercised up until March 1, 2017.

This is the date to withdraw without academic penalty for Spring, 2017 classes. Failure to withdraw by the date above will mean that the student has elected to receive the final grade(s) earned in the course(s). The only exception to those withdrawal regulations will be for those instances that involve unusual and fully documented circumstances.

**Academic Integrity Statement:** Every KSU student is responsible for upholding the provisions of the Student Code of Conduct, as published in the Undergraduate and Graduate Catalogs. Section II of the Student Code of Conduct addresses the university’s policy on academic honesty, including provisions regarding plagiarism and cheating, unauthorized access to university materials, misrepresentation/falsification of university
records or academic work, malicious removal, retention, or destruction of library materials, malicious/intentional misuse of computer facilities and/or services, and misuse of student identification cards. Incidents of alleged academic misconduct will be handled through the established procedures of the Department of Student Conduct and Academic Integrity (SCAI), which includes either an “informal” resolution by a faculty member, resulting in a grade adjustment, or a formal hearing procedure, which may subject a student to the Code of Conduct’s minimum one semester suspension requirement. See also http://www.kennesaw.edu/scai/content/ksu-student-code-conduct.

Unauthorized Collaboration: Submission for academic credit of a work product, or a part thereof, represented as its being one’s own effort, which has been developed in substantial collaboration with or without assistance from another person or source, is a violation of academic honesty. It is also a violation of academic honesty knowingly to provide such assistance. Collaborative work specifically authorized by a faculty member is allowed. Although I do not expect cheating, plagiarism, or unauthorized collaboration in my classroom, the penalty is an F for the course...AND I will do everything within my power to have you dismissed from the University and the University System of Georgia. And, I will tell your mother.