OR 531 Analytics & Decision Analysis
Thurs 7:20 – 10:00 pm
IN 137 and ONLINE

Instructor: Ronald F. A. Woodaman, rwoodama@gmu.edu. Office hours are 4:00-6:30 Thursday in the SEOR Adjunct faculty office, ENGR 2248. However, my schedule is not always firm, so its best if you **make an appointment.**

Description: Course provides the prospective data scientist a *tour de force* of analytic techniques. After a brief review of descriptive analytics, the first half of the course covers a range of predictive methodologies. After spring break the course transitions to prescriptive methodologies. Weekly graded homework reinforces lecture and suggested readings.

Prerequisites: Graduate standing. Understanding of descriptive and inferential statistics is assumed. Students are encouraged to familiarize themselves with first five chapters of the text before the first lecture, particularly if they have limited Excel experience.

Textbook: Business Analytics: The Art of Modeling with Spreadsheets, Fifth Edition: The Art of Modeling with Spreadsheets by Stephen G. Powell and Kenneth R. Baker.

Software: This course requires **Frontline Analytic Solver Platform for Education**. The software used to be provided with the purchase of the above textbook. The instructor will provide instructions on how to download a free student version of the software (valid for 140 days). Note *this software requires Microsoft Excel*, and runs *only on Windows*. If you use a Mac, you must run the software on MS Excel for Windows using dual-boot or a virtual machine.

Class Format: Course is taught in person and remotely with Blackboard Collaborate Ultra, allowing recording of the sessions. Most of the lectures are based on PowerPoint slides and detailed, walk-through examples using MS Excel and Frontline Analytic Solver Platform. Students are encouraged to follow along using their personal laptops or tablets, but the instructor generally will not stop the class to address any software problems.

Grading: The course comprises twelve projects worth 10 points each (best ten scores are kept) and a final project worth 20 points (120 points total). Final grades are determined as follows: [97, 100] = A+; [94, 97) = A; [90, 94) = A-; [87, 90) = B+; [84, 87) = B; [80, 84) = B-; [77, 80) = C+; [74, 77) = C; [70, 74) = C-; < 70 = F.

Academic Integrity: All students must abide by the **GMU Honor Code**. Collaboration on the home works is encouraged to accelerate learning, but students must turn in their own work. However, no collaboration allowed on the final project.

Course Schedule (subject to change)
- 25 Jan **Course intro:** Review of descriptive analytics
- 1 Feb **Predictive 1:** Time series
- 8 Feb **Predictive 2:** Linear regression
- 15 Feb **Predictive 3:** Surveys, odds ratios, and logistic regression
- 22 Feb **Predictive 4:** Classification methods
- 1 Mar **Predictive 5:** Monte Carlo simulation
- 8 Mar **Predictive 6:** Queuing model simulation
- 15 Mar SPRING BREAK
- 22 Mar **Prescriptive 1:** Linear programming
- 29 Mar **Prescriptive 2:** Network models
- 5 Apr **Prescriptive 3:** Integer programming
- 12 Apr **Prescriptive 4:** Heuristic optimization
- 19 Apr **Prescriptive 5:** Decision trees
- 26 Apr **Prescriptive 6:** Stochastic optimization
- 3 May **Course review**