# *Fall 2019 Course Syllabus for*
# Generalized Linear Models (BST 479)

July 22, 2019


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| Instructor: | Derick R Peterson, PhD |
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| Phone: | (585) 275-6686 |
| Office Location: | Saunders Research Building (SRB) 4.132 |
| Office Hours: | By appointment (SRB 4.132) |
| Lecture Times: | 2:00–3:15 Tues/Thurs (SRB 1.412); 11:00–11:50 Fri (SRB 1.402) |
| Lecture Dates: | 8/29/2019 – 12/10/2019 (except November 28–29, Thanksgiving Weekend) |
| Take-Home Final Due: | Friday 12/20/2019 at NOON |
| CRN (Credit Hours): | 90851 (4 credit hours) |


**Prerequisites**:
Statistical Inference (BST 411) and Linear Models (BST 426).

**Required Text**:
Agresti A, Foundations of Linear and Generalized Linear Models (2015). John Wiley & Sons, Inc. http://ebookcentral.proquest.com/lib/rochester/detail.action?docID=1895564.

**Recommended Text**:
Dunn PK and Smyth GK, Generalized Linear Models With Examples in R (2018). Springer Texts in Statistics.

**Additional References**:
Hastie TJ and Tibshirani RJ, Generalized Additive Models (1990). Chapman & Hall.
McCullagh P and Nelder JA, Generalized Linear Models, 2nd ed. (1989). Chapman & Hall.
Wood SN, Generalized Additive Models: An Introduction with R, 2nd ed. (2017). CRC Press LLC. http://ebookcentral.proquest.com/lib/rochester/detail.action?docID=4862399.

**Assignments and Grading**:
Homework assignments, including but not limited to applied data analyses, will be collected approximately every other week throughout the semester. The Take-Home Final will be due by **NOON Friday 12/20/2019**, at the end of Final Exam Week. Note that only assignments for students registered for credit will be graded. Course grades will be based on class participation and primarily on homework performance, including the Take-Home Final. *There will be no in-class Midterm Exam nor closed book Final Exam.* The Take-Home Final Exam will be like a Final Homework assignment.

**Course Description**:
This course will emphasize the application and interpretation of generalized linear models (GLM), and some supporting theoretical material also will be covered. Topics will include: generalized linear models (GLM); computational techniques for model fitting; logistic and conditional logistic regression for independent and clustered binary outcome data; Poisson and negative binomial regression for count data; log-linear models for categorical data; models for nominal and ordinal categorical data, including multinomial logit and proportional odds models; model checking and regression diagnostics; over-dispersion; parameterizations, functional forms and splines; model selection; and generalized additive models (GAM).

**Statistical Computing and Software**:
There are many statistical software packages available, and students are free to use whichever they prefer to complete the homework assignments. R and SAS are recommended, but Matlab and Stata are also relatively popular.

**Academic integrity:**
Academic integrity is a core value of the University of Rochester. Students who violate the University of Rochester University Policy on Academic Honesty are subject to disciplinary penalties, including the possibility of failure in the course and/or dismissal from the University. Since academic dishonesty harms the individual, other students, and the integrity of the University, policies on academic dishonesty are strictly enforced. For further information on the University of Rochester Policy on Academic Honesty, please see the *Jurisdiction and Responsibility for Academic and Nonacademic Misconduct* section in the **Regulations and University Polices Concerning Graduate Studies**: `http://www.rochester.edu/GradBulletin/PDFbulletin/Regulations.pdf`

**Accommodations for Students with Disabilities**:
Students needing academic adjustments or accommodations because of a documented disability must contact the Access Services Coordinator. For information regarding access services and support at SMD, please refer to the following webpage:
`https://www.urmc.rochester.edu/education/graduate/current-students/disability-supports-services.aspx`