# 2017 SISG MODULE 1: Bayesian Statistics for Genetics
# Introduction and Overview

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# Logistics

Background Text: P.D. Hoff (2009), *A First Course in Bayesian Statistical Methods*, Springer.

Supplementary Text: J.C. Wakefield (2013), *Bayesian and Frequentist Regression Methods*, Springer.

Demonstrations of methods via `R` implementations will be carried out in class. Students are encouraged to follow along.

Code and other materials (course notes, papers, R code) are available at the course website:

http://faculty.washington.edu/kenrice/sisgbayes/

# Course Outline

DAY 1:

- Lecture 1 (Rice): Why Bayes? Introduction.
- Lecture 2 (Wakefield): Review of probability.
- Lecture 3 (Wakefield) Binomial sampling.
- Lecture 4 (Rice) Continuous sampling. Linear regression. MCMC.

DAY 2:

- Lecture 5 (Wakefield) Multinomial sampling.
- Lecture 6 (Rice) Model selection and averaging.
- Lecture 7 (Wakefield) Generalized linear modeling and mixed modeling.
- Lecture 8 (Rice) Meta analysis.

DAY 3:

- Lecture 9 (Wakefield) Bayesian and frequentist testing: Single tests and multiple tests.
- Lecture 10 (Rice) Imputation and Software (WinBUGS/JAGS/INLA/Stan).