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Hankuk University of Foreign Studies

2025 Summer Session

STAT 240 Introduction to Bayesian Inference

Course Outline

Course Code: STAT 240

Instructor: Weining Shen, Ph.D. (https://faculty.sites.uci.edu/weinings/)

Home Institution: University of California, Irvine

Office Hours: TBA and By Appointment

Email: swn1989@gmail.com

Credit: 4

Class Hours:

This course will have 52 class hours, including 32 lecture hours, professor 8 office hours, 8-hour TA discussion sessions, 4-hour review sessions.

Course Description：

This course provides a basic introduction to Bayesian concepts and methods. We will discuss topics including Bayes formula, single and multiple parameter models with conjugate priors, prior specification, posterior sampling using MCMC, Bayesian linear models, hierarchal Bayesian models, model choice and diagnosis. We will discuss computation using R.

Required Course Materials：

We will mainly use the following textbook:

A First Course in Bayesian Statistical Methods by Peter Hoff (2009)

Here are two other additional references (not required):

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1. Bayesian Data Analysis by Gelman et al., 3rd Edition

2. Bayesian Ideas and Data Analysis, An Introduction for Scientists and Statisticians by Christensen et al.

Grading:

Late homework will not be accepted unless arrangements are made well in advance. You are encouraged to discuss with other students for the homework, but the final work you submit must be your own, and each student must complete and submit their own assignment.

Grading Policies:

The final score will be based on Homework (30%), Midterm (30%), and Final exam (40%).

Grading System (1 ~ 100)

A+ : 96 - 100	A : 91 - 95
B+ : 86 - 90	B : 81 - 85
C+ : 76 - 80	C : 71 - 75
D+ : 66 - 70	D : 60 - 65
F : 0 - 59	
Pa : Pass	Fa : Fail

Course Schedule

WEEK 1 Overview of Bayesian inference, likelihood, Bayes theorem, conjugate models, and posterior summary.

WEEK 2 Introduction to Monte Carlo simulation and MCMC (Gibbs sampling and Metropolis-Hasting sampling).

WEEK 3 Choice of priors and Bayesian linear model.

WEEK 4 Hierarchical models and model diagnosis.