

COURSE NUMBER: VE414	COURSE TITLE: Bayesian Analysis
CREDIT: 4	PREREQUISITES: VE401
TEXTBOOKS/REQUIRED MATERIAL: Gelman et al. (2014) Bayesian Data Analysis	PREPARED BY: Jing Liu DATE OF PREPARATION: Mar 11, 2019 DATE OF UC APPROVAL: May, 2019
INSTRUCTOR(S): Jing Liu	SCIENCE/DESIGN: Science
CATALOG DESCRIPTION: This course is about Bayesian statistical modelling and inference, and the related computational strategies and algorithms. Programming languages Julia, R and Stan are introduced.	COURSE TOPICS: Principles of Bayesian statistics, linear model, hierarchical model, generalized linear models, Bayesian network, MCMC, Gibbs and Metropolis-Hasting algorithms.
COURSE STRUCTURE/SCHEDULE: two and half 90-minute lectures per week	
COURSE OBJECTIVES [Course Outcomes in brackets]	<ul style="list-style-type: none"> ● To introduce the principle of Bayesian analysis ● To discuss the strength and weakness of Bayesian analysis. ● To introduce various Bayesian models ● To introduce and discuss various computational algorithms in Bayesian analysis. ● To illustrate convergence diagnostics in Bayesian analysis.
COURSE OUTCOMES [Student Outcomes in brackets]	<p>After successful completion of this course, you should be able to</p> <ul style="list-style-type: none"> ● Understand the principle of Bayesian analysis. ● Understand the difference between Bayesian and non-Bayesian data analysis. ● Have a general idea on Bayesian models. ● Have a general idea on Bayesian Networks. ● Be able to implement various computational techniques in Bayesian analysis. ● Be able to perform various convergence diagnostics using R and Stan.
ASSESSMENT TOOLS [Course Outcomes in brackets]	<ul style="list-style-type: none"> ● Assignment 25% ● Project 25% ● Midterm 25% ● Final Exam 25%