## 《贝叶斯统计》课程中英文简介

Bayesian Statistics

课程代码：2021012B **Course Code：**2021012B

课程名称：贝叶斯统计 **Course Name：**Bayesian Statistics

学 时：32 **Periods：32**

学 分：2 **Credits：2**

考核方式：考查 **Assessment：**Assignment

先修课程：计量经济学 **Preparatory Courses：**Econometrics

近年来，贝叶斯统计方法在很多领域逐渐流行。本课程旨在向学生介绍贝叶斯统计方法的基本概念和贝叶斯方法在实证研究中的应用。经过对本课程的学习，学生应建立对贝叶斯方法及其应用的初步了解，理解贝叶斯方法和传统统计方法的区别，并掌握实际应用贝叶斯方法所需的相关计算机编程技能。通过课程内容的学习以及实际应用，学生应逐步建立严谨的辩证思维框架与学术规范，形成科学的世界观与价值观。

本课程的主要内容包括：贝叶斯定理， 先验分布和后验分布，用贝叶斯方法进行模型比较和预测，线性与非线性回归方法，后验分布的Markov Chain Monte Carlo抽样方法（例如Gibbs抽样法和Methopolis-Hastings抽样法），以及边缘似然函数和贝叶斯因子的估计等。 课程也会对贝叶斯方法利用计算机编程技术的实际应用作出介绍。

Bayesian methods have become increasingly popular in many fields. This course is intended to expose the students to the basic concepts of Bayesian statistics and the use of Bayesian methods in empirical study. Students will develop their understanding of the idea and application of Bayesian statistics, the differences between the Bayesian viewpoint and the frequentist perspective, and the computer skills for the practical use of Bayesian methods. Throughout the course, students should establish rigorous framework of critical thinking and academic norms, and form scientific world conceptions and value system.

Main topics to be covered in this course include: the Bayes rule, the concepts of the prior and the posterior, basic ideas on Bayesian model comparison and prediction, Bayesian linear and nonlinear regression, the Markov Chain Monte Carlo algorithm to simulate the posterior distribution (such as the Gibbs sampler and the Metropolis-Hastings algorithm), methods to estimate the marginal likelihood and the Bayes factor, and etc. Computer programming skills are also introduced for the practical use of Bayesian methods.