

## 理学院（统计学专业）课程简介

课程编号：1713001121

课程名称：应用统计软件(1)

学分/学时： 3/48

先修课程：数学分析、概率论基础、统计学基础

适用专业：统计学，数学与应用数学

课程性质：限选

教材：薛毅，陈丽萍 编著. R 语言实用教程. 清华大学出版社，2014 年

主要参考书：

1. 王小宁、刘擷芯、黄俊文 译. R 语言实战(第 2 版)，人民邮电出版社，2016
2. 郝智恒、何通、邓一硕 译. R 语言统计入门(第 2 版)，人民邮电出版社，2014
3. 李洪成、朱文佳、沈毅诚 译. R 语言经典实例，机械工业出版社，2013

内容简介：（600 字以内）

统计应用软件(1)是一门理论和实践性均较强的统计专业限选课，该课程先修为《数学分析》、《概率论基础》、《统计学基础》等。该课程与计算机的使用密切结合，是一门实用性很强的课程。课程以 R 语言为依托，旨在加强学生对于统计学基本理论的理解和掌握，使学生能够利用 R 语言进行基本的数据分析和统计制图。R 语言是一种自由软件编程语言与操作环境，主要用于统计分析、绘图、数据挖掘。本课程主要利用最基本的统计知识，介绍 R 函数的使用方法，以及如何使用 R 的内置函数解决统计中的问题。课程首先介绍 R 语言的入门，如 R 软件的下载与安装；R 语言中向量、矩阵、数组、数据框、列表等对象的特点，以及数据文件的读写、控制流、程序设计。其次介绍 R 语言绘图，主要包括 R 语言中高水平绘图函数和低水平绘图函数的使用，以及绘图参数的设置。再次介绍利用 R 语言计算概率和常见的分布函数，以及利用 R 语言进行随机抽样和随机模拟。最后介绍 R 语言在统计学中的应用，包括常用的参数检验与非参数检验，线性和非线性回归分析等。

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Course Description

School of Science

Course Code: 1713001121

Course Name: applicable statistical software (1)

Credit/Hours: 3/48

Textbooks: Yi Xue、Liping Chen, Practical Tutorial for R Language, Tsinghua University Press, 2014

Reference Books:

1. Xiaoning Wang、Xiexin Liu、Junwen Huang, R in Action (Second Edition), People's Posts and Telecommunications Press, 2016
2. Zhiheng Hao、Tong He、Yishuo Deng, Introduction to statistics with R language (Second Edition), People's Posts and Telecommunications Press, 2014
3. Hongcheng Li、Wenjia Zhu、Yicheng Shen, Classic examples of R language, China Machine Press, 2013

Course Description:

APPLICABLE STATISTICAL SOFTWARE (I) is a distributional elective course with a strong theoretical dimension and a broad practical application for students majoring in statistics. It is an intermediate course after fundamental courses, such as mathematical analysis, foundations of probability theory, foundations of statistics and so on. It is a mathematical subject which has a strong relationship with computer technology and plays an important role in practical applications. The object of this course is to help the students get a better understanding of the basic theory of statistics based on R and to conduct basic data analysis and statistical graphing with R. R is an open source software and is mainly used in statistical analysis, graphing and data mining. This course introduces the instruction of R and how to solve statistical problems with built-in functions in R by using basic statistical knowledge. The first part of this course is the introduction of R, including the download and installation of R; the properties of objects in R such as vector, matrix, array, data frame and list; the read-write, control flow and programming of data files. The second part of this course is graphing with R, including the use of high-level graphics functions and low-level graphics functions and how to set the parameters of graphing. The third part of this course is to compute probability and common distributions and to conduct stochastic sampling and stochastic simulation. The last part of this course is the application of R in statistics, including parameter and non-parameter tests, linear and nonlinear regression analysis.