东北大学秦皇岛分校本科课程教学大纲

一、课程基本信息

<table>
<tr><td>开课单位</td><td colspan="3">悉尼智能科技学院</td><td>课程代码</td><td colspan="5">3100313046</td></tr>
<tr><td>中文名称</td><td colspan="8">统计设计与评价模型</td></tr>
<tr><td>英文名称</td><td colspan="8">Statistical Design and Models for Evaluation Studies</td></tr>
<tr><td>总学时</td><td>48</td><td rowspan="2">理论学时</td><td rowspan="2">24</td><td rowspan="2">实验学时</td><td rowspan="2">24</td><td rowspan="2">上机学时</td><td rowspan="2">0</td><td rowspan="2">设计学时</td><td rowspan="2">0</td><td rowspan="2">课外学时</td><td rowspan="2">0</td></tr>
<tr><td>学分</td><td>2.5</td></tr>
<tr><td>课程类型</td><td colspan="8">☐理论课程 ☑理论（含实验）课程 ☐实践类课程</td></tr>
<tr><td>课程类别</td><td colspan="8">☐通识类☐学科基础类 ☑专业方向类 ☐实践类</td></tr>
<tr><td>适用专业</td><td colspan="8">应用统计学</td></tr>
<tr><td>先修课程</td><td colspan="8">回归分析与线性模型 Regression and Linear Models</td></tr>
<tr><td>建议开课学期</td><td colspan="8">☐1-1 ☐1-2 ☐2-1 ☑2-2 ☐3-1 ☐3-2
☐4-1 ☐4-2 ☐5-1 ☐5-2 ☐*（代表每学期都开设）</td></tr>
<tr><td>考核方式</td><td colspan="3">☑考试☐考查</td><td>成绩分制</td><td colspan="4">☑百分制☐五级制☐二级制</td></tr>
<tr><td>使用教材</td><td colspan="8">无</td></tr>
<tr><td>参考书及教学资源</td><td colspan="8">1、Montgomery D. Design and Analysis of Experiments, Wiley, 2013.
2、茆诗松，周纪芗，周迎春等. 试验设计，中国统计出版社，2020.</td></tr>
<tr><td>其他说明</td><td colspan="8">无</td></tr>
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二、课程简介

中文描述

本课程为应用统计专业的专业方向类必修课程。课程涵盖了试验设计与分析，抽样调查，时间序列分析的相关专业知识，本课程旨在让学生较为透彻地理解各种统计设计和评价模型的基本思想及其实践过程，并在将来能运用自如，不断创新。

English Description

This course is a compulsory course in the professional direction of applied statistics. The course covers relevant professional knowledge such as experimental design and analysis, sampling surveys, and time series analysis. The aim of this course is to enable students to have a thorough understanding of the basic ideas and practical processes of various statistical design and evaluation models, and to be able to apply them freely and continuously innovate in the future.

三、课程目标

1、知识目标：

1-1：掌握试验设计与分析的相关专业知识。

1-2：掌握抽样调查的相关专业知识。

1-3：掌握时间序列分析的相关专业知识。

2、能力目标：

2-1：能够结合本专业知识对数据进行分析与解释，设计并优化实验方案，并通过信息综合得到合理有效的结论。

2-2：能够基于统计设计与评价模型的原理并采用科学方法，选择与使用恰当的技术、资源、现代信息技术工具，在本专业相关理论指导下对复杂实际问题进行研究能够针对本专业相关复杂实际问题。

3、德育/素养目标：

3-1：面对复杂问题时要实事求是、抓住主要矛盾，并在学习过程中培养自己的细心、耐心和敢于尝试、迎难而上的勇气和精神。

3-2：培养有条理和计划，做到心中有数、有条不紊、循序渐进地完成一项工作。

表 1 课程目标与毕业要求的对应关系

毕业要求	指标点	课程目标	关联 (H/M/L)
1、理学知识：具有扎实的数学基础，能够将数学、自然科学和专业知识用于解决复杂实际问题。	1.1 具有较强的演绎推理能力、准确计算能力、分析归纳能力、抽象思维能力，掌握数学、自然科学和相关专业知识，并使用其建立正确的数学、物理学等模型以解释复杂实际问题。	1-1、1-2、1-3、2-2、3-1、3-2	H
2、问题分析：能够借助应用统计学的基本原理、方法和手段，识别、表达、并通过文献研究分析复杂实际问题，以获得有效结论。	2.2 能够借助应用统计学的基本原理、方法和手段，针对复杂实际问题设计针对性的方案，并综合运用文献、科学理论和技术手段予以解决。	1-1、1-2、1-3、2-1、3-1、3-2	M
3、设计/开发解决方案：能够设计针对复杂实际问题的解决方案，设计满足特定需求的系统、单元或流程，并能够在设计环节中体现创新意识，考虑社会、健康、安全、法律、文化以及环境等因素。	3.3 能够在设计和开发的各个环节中综合考虑社会、健康、安全、法律、文化以及环境等因素。	1-1、1-2、1-3、2-1、2-2、3-1、3-2	H
4、研究：能够基于科学原理并采用科学方法对复杂实际问题进行研究，包括设计实验、分析与解释数据、并通过信息综合得到合理有效的结论。	4.3 能够追踪国际前沿技术动态，掌握本专业涉及的重要技术指标以及达到指标所需的技术途径。	1-1、1-2、1-3、2-1、2-2、3-1、3-2	M

四、主要教学内容

（一）理论教学

第 1 章：Randomization and Design（支撑教学目标 1-1、2-1、2-2、3-1、3-2）

【1】知识点：

(1)Types of experiments and terminologies.

(2)Replication.

(3)Randomization.

(4)Blocking.

(5)Design checklist.

(6)Commonly used designs with examples.

【2】学习目标：

理解： The experimental design is specified by treatments, experimental units andassignment method.

掌握： Types of experiments and terminologies, replication,randomization and commonly used designs.

【3】重点内容：

(1)Terminologies.

(2) Randomization.

(3)Commonly used designs.

【4】难点内容：

(1) Randomization.

(2) Commonly used designs.

【5】思政案例：

The effectiveness of a new brand of toothpaste in reducing tooth decay is testedusing volunteer university students. Each student is given free toothpaste and ischecked regularly over a period of a year by the dentist. Things to consider: No control group (e.g., no toothpaste? another brand of toothpaste?)How to control for different brushing techniques/durations/frequency/types and other factorsof toothbrush?Cultivate students to be organized and planned when solving problems, to achieve a clear understanding, orderliness, and gradual completion of a task.

第 2 章：Completely Randomized Designs（支撑教学目标 1-1、2-1、2-2、3-1、3-2）

【1】知识点：

(1) Mathematical setup.

(2) ANOVA.

(3) Analysis in R.

【2】学习目标：

理解：We will develop the design and tests necessary to compare a treatments ortreatment levels. Assume there is no structural relationship among the treatments.Assume we have a set of identical experimental units on which to comparethe treatments.

掌握：Estimate model parameters, analysis of Variance (ANOVA), ANOVA hypotheses,variability decomposition, mean squared Error, treatment mean square, ANOVA test, sampling distribution, the Fisher’s F-distribution,ANOVA test: p-value.

【3】重点内容：

(1)ANOVA hypotheses.

(2)Mean squared Error, treatment mean square.

(3)ANOVA test.

【4】难点内容：

(1)The Fisher’s F-distribution.

(2)ANOVA test: p-value.

第 3 章：Diagnostics: assumptions, transformations（支撑教学目标 1-1、2-1、2-2、3-1、3-2）

【1】知识点：

(1) Checking assumptions.

(2) Variance-stabilizing transformations.

(3) Box-Cox transformation.

(4) Non-parametric tests.

【2】学习目标：

理解：ANOVA works if assumptions are satisfied.

掌握：How to check the assumptions, variance-stabilizing transformations, Box-Cox transformation, Non-parametric test.

【3】重点内容：

(1)Various normality tests, qq-plot.

(2) Box-Cox transformation.

(3)Shapiro-Wilk test, Kolmogorov-Smirnov test, Cramer-von Mises test, Anderson-Darling test.

(4)Durbin-Watson test,levenetest, Kruskal-Wallis test.

(5)Variance-stabilizing transformations.

(6) Non-parametric test.

【4】难点内容：

(1)Box-Cox transformation.

(2)Non-parametric test.

第 4 章：Comparing Treatments（支撑教学目标 1-1、2-1、2-2、3-1、3-2）

【1】知识点：

(1) Contrasts.

(2) Multiple contrast testing.

【2】学习目标：

理解：Often we have more specific question e.g. compare a set of new treatmentsvs a control treatment or do pairwise comparisons between many (or all)treatments.

掌握：Multiple contrast testing: Fisher's LSD method, Scheffe's method, Tukey's HSD test and Dunnett's test.

【3】重点内容：

(1) Fisher's LSD method.

(2) Scheffe's method.

(3) Tukey's HSD test.

(4)Dunnett's test.

【4】难点内容：

(1)Fisher's LSD method.

(2)Tukey's HSD test.

第 5 章：Introduction to Design Based Sampling（支撑教学目标 1-2、2-1、2-2、3-1、3-2）

【1】知识点：

(1) Fixed-finite-population.

(2) A bit of history.

(3) Basic Framework.

(4) Horvitz -Thompson estimator.

【2】学习目标：

理解：Focus on an approach to sampling design and estimation with a Fixed-finite-population.

掌握：Basic framework, The Horvitz-Thompson Estimator.

【3】重点内容：

(1)Fundamental concepts – design-based approach.

(2)Sample frames and auxiliary information.

(3)Population variables.

(4) Finite population parameters.

(5) Sample statistics.

(6) Sample error and sample error distribution.
(7) Bias, variance and mean squared Error.
(8) Design-based inference for population totals.
(9) Properties of the sampling method.
(10) The Horvitz-Thompson Estimator.

【4】难点内容：

(1)Finite population parameters.
(2)Bias, variance and mean squared Error.
(3) Properties of the sampling method.
(4) The Horvitz-Thompson Estimator.

第 6 章：Design Based Framework (SRS & Stratified)（支撑教学目标 1-2、2-1、2-2、3-1、3-2）

【1】知识点：

(1) Properties of the H-T Estimator.
(2) Estimating Variance.
(3) Application to SRSWOR & Stratified SRS.

【2】学习目标：

理解：Design-based inference for population totals.
掌握：The Horvitz-Thompson Estimator.

【3】重点内容：

(1)Estimator unbiased.
(2) Estimate the sampling variance.
(3)Simple Random Sampling(Without Replacement).
(4) Stratified SRSWOR.

【4】难点内容：

(1)Estimate the sampling variance of Simple Random Sampling (Without Replacement).
(2)Stratified SRSWOR.

第 7 章：Using Auxiliary Data in Estimation（支撑教学目标 1-2、2-1、2-2、3-1、3-2）

【1】知识点：

(1) Using a size measure in the design – proportional to size sampling.
(2) Estimating a ratio.
(3) Hajek estimator of population total.
(4) Ratio estimator of total.
(5) Regression estimator of total.

【2】学习目标：

理解：Proportional to size sampling
掌握：Hajek estimator of total,Ratio estimator,Regression estimator.

【3】重点内容：

(1)Estimating a ratio.
(2)Hajek estimator of total.
(3)Regression estimator.

【4】难点内容：

(1)Hajek estimator of total.
(2)Regression estimator.

第 8 章：Two-Stage Designs（支撑教学目标 1-2、2-1、2-2、3-1、3-2）

【1】知识点：

(1) Why we need a multi-stage (two-stage) design.

(2) Basic set-up.

(3) Results for SRSWOR at each stage.

(4) Self-weighting designs.

(5) Combining elements (stratification with two-stage).

【2】学习目标：

理解：Why do we need a multi- (two-) stage design.

掌握：Basic set-up, SRSWOR at each stage, Self-Weighting design, bringing elements together (at design).

【3】重点内容：

(1)SRSWOR at each stage.

(2)Self-Weighting design.

(3)Bringing elements together (at design).

【4】难点内容：

(1)SRSWOR at each stage.

(2)Bringing elements together (at design).

第 9 章：Basic Framework of Evaluation（支撑教学目标 1-2、2-1、2-2、3-1、3-2）

【1】知识点：

(1) Introduction to evaluation and monitoring.

(2) Process evaluation.

(3) Impact evaluation.

(4) Average treatment effect.

(5)Internal and external validity.

(6) Randomized control trials.

【2】学习目标：

理解：Find out if, and how, programmers work and the extent of their effects.

掌握：Evaluation, process evaluation, impact evaluation, measuring impact, evaluation problem,treatment or intervention, outcome variable, counterfactual framework, effect of treatment, means, estimation of ATE, randomized treatment allocation.

【3】重点内容：

(1)Evaluation.

(2)Measuring impact.

(3)Randomized treatment allocation.

【4】难点内容：

(1)Effect of treatment.

(2) Estimation of ATE.

(3) Commonly used designs.

第 10 章：Non-randomized Designs（支撑教学目标 1-1、1-3、2-1、2-2、3-1、3-2）

【1】知识点：

(1) Overview of quasi-experimental design.

(2) Adjusting for measured confounders.

(3) Adjusting for unmeasured confounders.

(4) Matching.

(5) Regression.

【2】学习目标：

理解：Random allocation may not be possible due to ethical or practicalreasons.However, random allocation may not be possible due to ethical or practicalreasons.

掌 握 ： Randomized Control Trials (RCT), replication,Non-experimental methods, Quasi-experimental design, challenges to evaluation, matching, regression.

【3】重点内容：

(1)Challenges to evaluation.

(2)Pair matching.

(3)Non-pair matching.

(4) Multivariate matching methods.

(5) Basic idea of (any) matching.

(6) Propensity score.

(7) Selecting sub-sample with ‘common support’.

(8) Methods of matching on $\hat{S}$.

(9) Compare T with PSID and CPS

(10) Other propensity score methods.

【4】难点内容：

(1)Multivariate matching methods.

(2)Regression.

第 11 章：Non-randomized Designs II（支撑教学目标 1-3、2-1、2-2、3-1、3-2）

【1】知识点：

(1) Interrupted time series design.

(2) Difference-in-difference methods.

(3) Instrumental variable method.

(4) Regression discontinuity.

【2】学习目标：

理解：A sequence of measurements of the same variable collected over time.

掌握：Time series, popular models.

【3】重点内容：

(1)Autoregressive (AR) models.

(2)Moving average (MA) models.

(3)Interrupted time series (ITS).

(4) Difference-in-Difference (DID).

(5) Instrumental variable (IV) methods

(6) Two equation model.

(7) IV and two stage least squares (2SLS).

(8) Regression discontinuity (RD).

【4】难点内容：

(1)Interrupted time series (ITS).

(2)Difference-in-Difference (DID).

(3) IV and two stage least squares (2SLS).

（二）实验教学

The teaching mode is mainly based on students' practical operation and supplemented by teachers' teaching, fully utilizing R software resources, tapping into students' potential, laying a solid foundation of operational skills, and enhancing students' ability to solve practical problems. The project names and class hour allocation related information of experimental teaching are shown in Table 2.

表 2　实验教学信息表

序号	实验项目名称	实验学时	每组人数	实验类型	实验性质

1	Randomization and Design	2	1	Comprehensive	must do
2	Completely Randomized Designs	2	1	Comprehensive	must do
3	Diagnostics: assumptions, transformations	2	1	Comprehensive	must do
4	Comparing Treatments	4	1	Comprehensive	must do
5	Introduction to Design Based Sampling	2	1	Comprehensive	must do
6	Design Based Framework (SRS & Stratified)	2	1	Comprehensive	must do
7	Using Auxiliary Data in Estimation	2	1	Comprehensive	must do
8	Overview and Discussion Questions	2	1	Comprehensive	must do
9	Non-randomized Designs	4	1	Comprehensive	must do
10	Non-randomized Designs II	2	1	Comprehensive	must do

实验项目一：Randomization and Design（支撑教学目标 1-1、2-1、2-2、3-1、3-2）

【1】实验内容：

(1)Basic usage of R programming.

(2)Complete four questions related to the use of basic R packages.

(3)Simple Debug.

【2】实验目的：

(1) Familiar toR programming.

(2) Able to edit, compile and run simple programs.

(3) Able to debug simple programs.

【3】教学要求：

(1) The method of programming, i.e.,editing, compiling and running the simple R program.

(2) Basic mathematical calculations related to statistics.

(3) The basic technique of debugging simple program.

【4】实验方式：Programming.

【5】实验场地与设备：Laboratory, Computer.

实验项目二：Completely Randomized Designs（支撑教学目标 1-1、2-1、2-2、3-1、3-2）

【1】实验内容：

(1)Basic usage of R programming.

(2)Complete four questions related to the completely randomized designs.

(3)Simple Debug.

【2】实验目的：

(1) Familiar toR programming.

(2) Able to edit, compile and run simple programs.

(3) Able to debug simple programs.

【3】教学要求：

(1) The method of programming, i.e.,editing, compiling and running the simple R program.

(2) Experiments related to the analysis of variance (ANOVA).

(3) The basic technique of debugging simple program.

【4】实验方式：Programming.

【5】实验场地与设备：Laboratory, Computer.

实验项目三：Diagnostics: assumptions, transformations（支撑教学目标 1-1、2-1、2-2、3-1、3-2）

【1】实验内容：

(1)Basic usage of R programming.

(2)Complete three questions related to the Diagnostics: assumptions, transformations.

(3)Simple Debug.

【2】实验目的：

(1) Familiar toR programming.

(2) Able to edit, compile and run simple programs.

(3) Able to debug simple programs.

【3】教学要求：

(1) The method of programming, i.e.,editing, compiling and running the simple R program.

(2)Experiments related to the Checking assumptions, Variance-stabilizing transformations, Box-Cox transformation and Non-parametric tests.

(3) The basic technique of debugging simple program.

【4】实验方式：Programming.

【5】实验场地与设备：Laboratory, Computer.

实验项目四：Comparing Treatments（支撑教学目标 1-1、2-1、2-2、3-1、3-2）

【1】实验内容：

(1)Basic usage of R programming.

(2)Complete two questions related to the comparing treatments.

(3)Simple Debug.

【2】实验目的：

(1) Familiar toR programming.

(2) Able to edit, compile and run simple programs.

(3) Able to debug simple programs.

【3】教学要求：

(1) The method of programming, i.e.,editing, compiling and running the simple R program.

(2)Experiments related to themultiple contrast testing: Fisher's LSD method, Scheffe's method, Tukey's HSD test and Dunnett's test.

(3) The basic technique of debugging simple program.

【4】实验方式：Programming.

【5】实验场地与设备：Laboratory, Computer.

实验项目五：Introduction to Design Based Sampling（支撑教学目标 1-2、2-1、2-2、3-1、3-2）

【1】实验内容：

(1)Basic usage ofExcel.

(2)Complete questions related to thesampling statistician.

(3)Simple Debug.

【2】实验目的：

(1) Conduct statistical experiments using Excel.

(2) Able to edit, compile and run simple programs.

【3】教学要求：

(1) The method of programming, i.e.,editing, conduct statistical experiments using Excel.

(2) Experiments related to the H-T estimator and the naïve approach.

(3) The basic technique of debugging simple program.

【4】实验方式：Programming.

【5】实验场地与设备：Laboratory, Computer.

实验项目六：Design Based Framework (SRS & Stratified)（支撑教学目标 1-2、2-1、2-2、3-1、3-2）

【1】实验内容：

(1)Basic usage of Excel.

(2)Complete questions related to the SRSWOR & Stratified SRS.

(3)Simple Debug.

【2】实验目的：

(1) Conduct statistical experiments using Excel.

(2) Able to edit, compile and run simple programs.

【3】教学要求：

(1) The method of programming, i.e., editing, conduct statistical experiments using Excel.

(2) Experiments related to theSimple Random Sampling (Without Replacement) and Stratified SRSWOR.

(3) The basic technique of debugging simple program.

【4】实验方式：Programming.

【5】实验场地与设备：Laboratory, Computer.

实验项目七：Using Auxiliary Data in Estimation（支撑教学目标 1-2、2-1、2-2、3-1、3-2）

【1】实验内容：

(1)Basic usage of Excel.

(2)Complete questions related to the using auxiliary data in estimation.

(3)Simple Debug.

【2】实验目的：

(1) Conduct statistical experiments using Excel.

(2) Able to edit, compile and run simple programs.

【3】教学要求：

(1) The method of programming, i.e., editing, conduct statistical experiments using Excel.

(2) Experiments related to the Hajek Estimator and Ratio Estimator with SRSWOR.

(3) The basic technique of debugging simple program.

【4】实验方式：Programming.

【5】实验场地与设备：Laboratory, Computer.

实验项目八：Overview and Discussion Questions（支撑教学目标 1-2、2-1、2-2、3-1、3-2）

【1】实验内容：

Complete questions related to the Census Coverage Survey.

【2】实验目的：

Read and search for relevant literature.

【3】教学要求：

Based on literature, answer questions to complete the evaluation of the plan.

【4】实验方式：Independently complete literature review.

【5】实验场地与设备：Laboratory, Computer.

实验项目九：Non-randomized Designs（支撑教学目标 1-1、1-3、2-1、2-2、3-1、3-2）

【1】实验内容：

(1)Basic usage of R programming.

(2)Complete two questions related to theNon-randomized designs.

(3)Simple Debug.

【2】实验目的：

(1) Familiar toR programming.

(2) Able to edit, compile and run simple programs.

(3) Able to debug simple programs.

【3】教学要求：

(1) The method of programming, i.e.,editing, compiling and running the simple R program.

(2) Experiments related to theNon-randomized designs (comparison group, matching,linear regression model).

(3) The basic technique of debugging simple program.

【4】实验方式：Programming.

【5】实验场地与设备：Laboratory, Computer.

实验项目十：Non-randomized Designs II（支撑教学目标 1-3、2-1、2-2、3-1、3-2）

【1】实验内容：

(1)Basic usage of R programming.

(2)Complete two questions related to the Non-randomized designs.

(3)Simple Debug.

【2】实验目的：

(1) Familiar toR programming.

(2) Able to edit, compile and run simple programs.

(3) Able to debug simple programs.

【3】教学要求：

(1) The method of programming, i.e.,editing, compiling and running the simple R program.

(2) Experiments related to the Non-randomized designs (time series, linear regression model, 2SLS regression).

(3) The basic technique of debugging simple program.

【4】实验方式：Programming.

【5】实验场地与设备：Laboratory, Computer.

五、教学安排与学时分配

This course mainly focuses on classroom teaching, supplemented by experimental teaching. Classroom teaching revolves around the basic concepts, theories, principles, and practical operations of this course. Taking the fundamental principles of classic machine learning algorithms as the main line, we will leverage theoretical knowledge transmission, experimental practical operations, and value guidance to solidify basic knowledge, enhance practical skills, and foster innovative spirit. The allocation of offline classroom hours is shown in Table 3.

表 3 学时分配表

讲课内容		学时				
		讲课	实验	上机	设计	课外
第 1 章	Randomization and Design	2	2	0	0	0
第 2 章	Completely Randomized Designs	2	2	0	0	0
第 3 章	Diagnostics: assumptions, transformations	2	2	0	0	0
第 4 章	Comparing Treatments	2	4	0	0	0
第 5 章	Introduction to Design Based Sampling	2	2	0	0	0

第 6 章	Design Based Framework (SRS & Stratified)	2	2	0	0	0
第 7 章	Using Auxiliary Data in Estimation	2	2	0	0	0
第 8 章	Two-Stage Designs	2		0	0	0
第 9 章	Basic Framework of Evaluation	2	2	0	0	0
第 10 章	Non-randomized Designs	4	4	0	0	0
第 11 章	Non-randomized Designs II	2	2	0	0	0
小计		24	24	0	0	0
总计	48					

六、教学方法

1、Teach basic principles, integrate theory with practice, emphasize the design and application of machine learning methods, and cultivate students' innovative abilities

2、Using a combination of multimedia courseware and traditional teaching methods to give the classroom vitality.

3、Combining theoretical teaching with discussion forms to stimulate students' learning enthusiasm, cultivate their self-learning ability and problem-solving ability.

七、成绩评定

1、The evaluation method for this course is a percentage system. The course assessment consists of three parts, namely regular assessment, laboratory assessment, and final assessment. The specific requirements and scoring methods are as follows.

(1) Regular grades account for 10%, mainly including comprehensive evaluations such as classroom communication, homework, and online learning materials.

(2) The experimental score accounts for 40%, mainly for hands-on experimental exercises, assignments, and assessments.

(3) The final grade accounts for 50%, mainly for the final assessment.

2、Those who have missed more than one-third of the required amount of experiments, assignments, etc., or missed more than one-third of the planned class hours, or whose experimental assessment results are not qualified, will have their course assessment qualifications cancelled.

八、评价及持续改进

1、教学大纲

考核周期：4 年，修订周期：4 年。

改进措施：课程负责人组织课程团队所有教师讨论后提出改进意见，经教研室主任审核后由教学院长批准。

2、成绩评定考核

考核周期：1 学年，评价依据：学生最终成绩综合分析。

改进措施：根据学生最终成绩的分布，进行相应的内容调整和优化，并改进教学方法。

1、Teaching syllabus

Assessment cycle: 4 years, revision cycle: 4 years.

Improvement measures: The course leader organizes all teachers in the course team to discuss and propose improvement suggestions, which are reviewed by the head of the teaching and research department and approved by the dean of the teaching department.

2、Performance evaluation and assessment

Assessment cycle: 1 academic year, evaluation basis: comprehensive analysis of students' final

grades.

Improvement measures: Based on the distribution of students' final grades, adjust and optimize the content accordingly, and improve teaching methods.

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撰写： 张琨

审核： 薛昌涛

批准： 史文博

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