

高等数学建模 II

Advanced Mathematical Modelling II

教学大纲

Subject Syllabus

一、课程信息 Subject Information

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| 课程编号: Subject ID | EQV-CS-33130 | 开课学期: Semester | 2 |
| 课程分类: Category | 专业教育 PA | 所属课群: Section | 专业基础 MF |
| 课程学分: Credit Points | 6 | 总学时/周: Total Hours/Weeks | 96/16 |
| 理论学时: LECT. Hours | 96 | 实验学时: EXP. Hours | 0 |
| PBL 学时: PBL Hours | 0 | 实践学时/周: PRAC. Hours/Weeks | 0 |
| 开课学院: College | 东北大学 悉尼智能科技学院 Sydney Smart Technology College Northeastern University | 适用专业: Stream | CST/CE |
| 课程属性: Pattern | 必修 Compulsory | 课程模式: Mode | 互认 EQV |
| 中方课程协调人: NEU Coordinator | 李晓奇 Li Qiaoqi | 成绩记载方式: Result Type | 百分制 Marks |
| 先修课程: Requisites | 无 None | | |
| 英文参考教材: EN Textbooks | 1. Mo Huixia, Li Xiaohua, Yuan Jianhua, Yuan Jianhua, Ai Wenbao, Zhu Ping, Advanced Mathematics (I) & (II), 2nd Edition, Beijing University of Posts and Telecommunications Press, 2018. 2. J.L. Devore, Probability and Statistics for Engineering and the Science, Beijing CENGAGE, 2015. | | |
| 中文参考教材: CN Textbooks | 同济大学数学系, 高等数学(第七版)上、下册, 高等教育出版社, 2014 浙江大学数学系, 概率论与数理统计(第五版), 高等教育出版社, 2007 | | |
| 教学资源: Resources | https://sstc.cloudcampus.com.cn/course/view.php?id=9 | | |
| 课程负责人(撰写人): Subject Director | 李晓奇 Li Qiaoqi | 提交日期: Submitted Date | 3/1/2023 |
| 任课教师(含负责人): Taught by | 杜瑞燕、郭静梅、李晓奇 Du Ruiyan, Guo Jingmei, Li Xiaoqi | | |

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| 审核人: Checked by | 韩鹏 | 批准人: Approved by | 史闻博 |
| 批准日期: Approved Date | | | 3/3/2023 |

二、教学目标 Subject Learning Objectives (SLOs)

注：毕业要求及指标点可参照悉尼学院本科生培养方案，可根据实际情况增减行数

Note: GA and index can be referred from undergraduate program in SSTC website. Please add/reduce lines based on subject.

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| <p>整体目标: Overall Objective</p> | <p>高等数学建模是理工科专业课程的基础，通过学习极限、微分、积分等重要概念，为学生学习其它学科以至于专业课程打下坚实基础。培养学生较强的动手能力，以及思维的逻辑性、严谨性、创新性，以及利用数学原理和方法解决实际问题的意识、兴趣和能力的。培养学生掌握高等数学的基本理论和方法，尤其是思维方式，掌握知识技能的同时发展创造能力。</p> <p>Advanced mathematical modeling is the foundation of science and engineering courses. By learning the important concepts of limit, differential and integral, it can lay a solid foundation for students to learn other subjects and even professional courses. To cultivate students' strong practical ability, logical, rigorous and innovative thinking, as well as the consciousness, interest and ability of solving practical problems by using mathematical principles and methods. Cultivate students to master the basic theories and methods of higher mathematics, especially the way of thinking, master knowledge and skills, and develop creative ability at the same time.</p> | |
| <p>(1) 专业目标: Professional Ability</p> | <p>1-1</p> | <p>具有扎实的专业基础与学科特长，系统掌握统计与数据分析、智能仿真建模技术、量化管理优化技术、试验设计与分析、项目管理与决策及其相关领域的专门知识与技能。</p> <p>A solid professional foundation and competency, systematical mastery of the specialized knowledge and skills in statistics and data analysis, intelligent simulation modeling technology, quantitative management optimization technology, experimental design and analysis, project management and decision-making.</p> |
| | <p>1-2</p> | <p>具有扎实的专业基础与学科特长，系统掌握信息通信系统、项目管理与决策及其相关领域专门知识与技能。</p> <p>Excellent engineering literacy, outstanding practical skills in information technology, and capable of creatively solving complex engineering problems in information and communication and related fields through scientific and technological theories and engineering practical methods, as well as the ability of doing academic cutting-edge project research.</p> |
| | <p>1-3</p> | <p>具有扎实的专业基础与学科特长，系统掌握大数据与人工智能系统、项目管理与决策及其相关领域专门知识与技能。</p> <p>Excellent engineering literacy, outstanding practical skills in information technology, and capable of creatively solving complex engineering problems in computer science and related fields through scientific and technological theories and engineering practical methods, as well as the ability of doing academic cutting-edge project research.</p> |

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| | 1-4 | 具有卓越的技术素养和突出的应用统计学实践能力,具备在应用统计学及其相关领域通过科学技术理论和方法创造性的解决复杂问题、从事学术前沿问题研究的能力。 Excellent technical literacy, outstanding practical skills in applied statistics, and capable of creatively solving complex engineering problems in applied statistics and related fields through scientific and technological theories and engineering practical methods, as well as the ability of doing academic cutting-edge project research. |
| (2) 德育目标: Essential Quality | 2-1 | 理解高等数学理论知识对于刻画工程实践问题的重要意义。 Understand the significant meanings of the advanced mathematics in depicting the practical engineering problems. |
| | 2-2 | 认知当前全球,数学理论的发展对提升中国工程关键技术及核心竞争力的重要意义。 Understand the technology development, key techniques and the core competitiveness in the area of the China engineering in the world. |
| 课程教学目标与毕业要求的对应关系 Matrix of GA & SLOs | | |
| 毕业要求 GA | 指标点 GA Index | 教学目标 SLOs |
| 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。 Apply knowledge of mathematics, natural science, fundamentals and an engineering specialization to the solution of complex engineering problems. | 指标点 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。 Capable of deductive reasoning, accurate calculation, analysis and induction and abstract thinking. Establishing correct mathematical and physical models with the professional knowledge of mathematics, natural science, etc. to solve complex practical problems. | 1-1, 1-2 |
| 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。 Identify, formulate, research literature and analyze complex practical problems reaching substantiated conclusions using first principles of mathematics and sciences. | 2-1 能够应用数学、自然科学和工程学的基本原理、方法和手段, 分析、识别、表达本专业相关的复杂工程问题。 Capable of analyzing, identifying and elaborating complex practical problems related to this major with the applying of the basic principles of Applied Statistics. | 1-2, 1-3, 2-1 |
| | 2-2 能够应用数学、自然科学和工程学的基本原理、方法和手段, 针对实际复杂工程问题设计针对性的技术方案, 并综合运用文献、科学基座和技术手段予以解决。 Capable of drawing on the basic principles of applied statistics to design targeted | 1-3, 1-4, 2-1, 2-2 |

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| | schemes for complex practical problems, and using literature, scientific theories and technical means to solve them. | |
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三、教学内容 Content (Topics)

注：以中英文填写，各部分内容的表格可根据实际知识单元数量进行复制、扩展或缩减

Note: Filled in both CN and EN, extend or reduce based on the actual numbers of knowledge unit

(1) 理论教学 Lecture

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| 知识单元序号: Knowledge Unit No. | 1 | 支撑教学目标: SLOs Supported | 1-1, 1-2, 1-3, 1-4 |
| 知识单元名称 Unit Title | 微分方程及其应用 Differential equations and its applications | | |
| 知识点: Knowledge Delivery | 一阶微分方程及其应用 First Order Differential Equations and Its Applications | | |
| | 可分离变量一阶微分方程解法 Solving rules for Equations can be Reduced to Equations with Variables Separable | | |
| | 高阶线性微分方程解法 Solving rules for Higher Order Linear Differential Equations | | |
| | 高阶微分方程的应用 Some Examples of Linear Differential Equation of Higher Order | | |
| 学习目标: Learning Objectives | 了解: Recognize | 一阶微分方程及其应用 First Order Differential Equations and Its Applications 高阶微分方程的应用 Some Examples of Linear Differential Equation of Higher Order | |
| | 理解: Understand | 可分离变量一阶微分方程解法 Solving rules for Equations can be Reduced to Equations with Variables Separable | |
| | 掌握: Master | 高阶线性微分方程解法 Solving rules for Higher Order Linear Differential Equations | |
| 德育目标 Moral Objectives | 2-2 认知当前全球，数学理论的发展对提升中国工程关键技术及核心竞争力的重要意义。 Understand the technology development, key techniques and the core competitiveness in the area of the China engineering in the world. | | |
| 重点: Key Points | 可分离变量一阶微分方程解法 Solving rules for Equations can be Reduced to Equations with Variables Separable | | |
| 难点: Focal points | 高阶线性微分方程解法 Solving rules for Higher Order Linear Differential Equations | | |

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| 知识单元序号: Knowledge Unit No. | 2 | 支撑教学目标: SLOs Supported | 1-1, 1-2, 1-3, 1-4 |
| 知识单元名称 Unit Title | 级数及其应用 Series and its applications | | |
| 知识点: Knowledge Delivery | 常数级数的概念与性质 Concepts and properties of Series with Constant Terms | | |
| | 常数级数的收敛判据 Convergence criteria for Series with Constant Terms | | |
| | 幂级数及其收敛性 Power Series and Their Convergence | | |
| | 幂级数的展开 Expansion of Functions in Power Series | | |
| 学习目标: Learning Objectives | 了解: Recognize | 常数级数的概念与性质 Concepts and properties of Series with Constant Terms | |
| | 理解: Understand | 常数级数的收敛判据 Convergence criteria for Series with Constant Terms | |
| | 掌握: Master | 幂级数及其收敛性 Power Series and Their Convergence 幂级数的展开 Expansion of Functions in Power Series | |
| 德育目标 Moral Objectives | 2-2 认知当前全球, 数学理论的发展对提升中国工程关键技术及核心竞争力的重要意义。 Understand the technology development, key techniques and the core competitiveness in the area of the China engineering in the world. | | |
| 重点: Key Points | 常数级数的收敛判据 Convergence criteria for Series with Constant Terms | | |
| 难点: Focal points | 幂级数及其收敛性 Power Series and Their Convergence 幂级数的展开 Expansion of Functions in Power Series | | |

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| 知识单元序号: Knowledge Unit No. | 3 | 支撑教学目标: SLOs Supported | 1-1, 1-2, 1-3, 1-4 |
| 知识单元名称 Unit Title | 向量与解析几何 Vectors and Analytic Geometry | | |
| 知识点: Knowledge Delivery | 平面与空间的向量 Vectors in plane and surface | | |
| | 向量的积 Product of vector | | |
| | 空间中的平面与直线 Planes and lines in plane | | |
| | 平面与空间曲线 Surfaces and Space Curves | | |
| 学习目标: Learning Objectives | 了解: Recognize | 平面与空间的向量 Vectors in plane and surface | |

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| | | 向量的积 Product of vector |
| 理解: Understand | | 空间中的平面与直线 Planes and lines in plane |
| | | 平面与空间曲线 Surfaces and Space Curves |
| 掌握: Master | | 空间中的平面与直线的求法与性质 Properties and evaluation of planes and lines in plane |
| | | 平面与空间曲线的求法与性质 Properties and evaluation of surfaces and Space Curves |
| 德育目标 Moral Objectives | 2-2 认知当前全球，数学理论的发展对提升中国工程关键技术及核心竞争力的重要意义。 Understand the technology development, key techniques and the core competitiveness in the area of the China engineering in the world. | |
| 重点: Key Points | 空间中的平面与直线的求法与性质 Properties and evaluation of planes and lines in plane | |
| 难点: Focal points | 平面与空间曲线的求法与性质 Properties and evaluation of surfaces and Space Curves | |

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| 知识单元序号: Knowledge Unit No. | 4 | 支撑教学目标: SLOs Supported | 1-1, 1-2, 1-3, 1-4 |
| 知识单元名称 Unit Title | 多元函数及其分析性质 Multiple variables function and its analytic properties | | |
| 知识点: Knowledge Delivery | 多变量函数, n 维空间的定义以及其性质; Definition of and properties of multi-variable function and n -dimensional space. | | |
| | 二元函数极限的定义与性质以及二元函数连续性的定义与性质 The definition and properties of two-variable function. | | |
| | 多元函数的偏导数与全微分的概念与应用 The definition and application of partial derivative of multiple-variable function | | |
| | 多元复合函数的偏导数求法 The partial derivation rule of multiple-variable composite function | | |
| | 由方程组确定的隐函数求偏导方法 Derivation method of finding partial derivative of implicit functions determined by equation systems. | | |
| | 多元函数的几何应用 Applications of multiple-variable functions in Geometry | | |
| | 多元函数的极值 Extreme values of multiple-variable functions | | |
| 学习目标: Learning Objectives | 了解: Recognize | 多变量函数及性质; Properties of multi-variable function | |

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| | | 二元连续函数在闭区域上的性质 The properties of two-variable function on a closed region |
| | 理解: Understand | 多元函数全微分的概念与应用 Definition and utilization of total differential of multiple-variable function 高阶偏导数的概念与应用 Definition and utilization of higher order partial derivative |
| | 掌握: Master | 多元复合函数求偏导的链式法则 Chain rule of finding partial derivative of multiple-variable composite function 拉格朗日函数构造方法 Formulation method of Lagrange multipliers finding extreme values. |
| 德育目标 Moral Objectives | 2-1 理解高等数学理论知识对于刻画工程实践问题的重要意义。 Understand the significant meanings of the advanced mathematics in depicting the practical engineering problems. | |
| 重点: Key Points | 多元函数全微分的概念与应用 Definition and utilization of total differential of multiple-variable function 高阶偏导数的概念与应用 Definition and utilization of higher order partial derivative | |
| 难点: Focal points | 多元复合函数求偏导的链式法则 Chain rule of finding partial derivative of multiple-variable composite function 拉格朗日函数构造方法 Formulation method of Lagrange multipliers finding extreme values. | |

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| 知识单元序号: Knowledge Unit No. | 5 | 支撑教学目标: SLOs Supported | 1-1, 1-2, 1-3, 1-4 |
| 知识单元名称 Unit Title | 多重积分及其分析性质 Multiple Integral and its analytic properties | | |
| 知识点: Knowledge Delivery | 二重积分的概念与性质 Definition and properties of double integrals | | |
| | 求解二重积分的方法 Evaluation of double integrals | | |
| | 三重积分的概念与性质 Definition and properties of triple integrals | | |
| | 求解三重积分的方法 Evaluation of triple integrals | | |
| 学习目标: Learning Objectives | 了解: Recognize | 二重积分的几何意义 Geometric meaning of double integrals 三重积分的几何意义 Geometric meaning of triple integrals | |

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| | 理解: Understand | 直角坐标系下二重积分求法 Double integrals in rectangular coordinates 极坐标系下二重积分求法 Double integrals in polar coordinates |
| | 掌握: Master | 二重、三重积分的性质 Properties of double and triple integrals |
| | | 直角坐标系下三重积分求法 Triple integrals in rectangular coordinates |
| | | 球坐标系下三重积分求法 Triple integrals in spherical coordinates |
| 德育目标 Moral Objectives | 2-1 理解高等数学理论知识对于刻画工程实践问题的重要意义。 Understand the significant meanings of the advanced mathematics in depicting the practical engineering problems. | |
| 重点: Key Points | 直角坐标系下三重积分求法 Triple integrals in rectangular coordinates | |
| 难点: Focal points | 球坐标系下三重积分求法 Triple integrals in spherical coordinates | |

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| 知识单元序号: Knowledge Unit No. | 6 | 支撑教学目标: SLOs Supported | 1-1, 1-2, 1-3, 1-4 |
| 知识单元名称 Unit Title | 线积分、面积分 Line Integrals, Surface Integrals | | |
| 知识点: Knowledge Delivery | 线积分的概念与性质 Definition and properties of line integrals | | |
| | 求解线积分的方法 Evaluation of line integrals | | |
| | 面积分的概念与性质 Definition and properties of surface integrals | | |
| | 求解面积分的方法 Evaluation of surface integrals | | |
| 学习目标: Learning Objectives | 了解: Recognize | 线积分的几何意义 Geometric meaning of line integrals 三重积分的几何意义 Geometric meaning of surface integrals | |
| | 理解: Understand | 格林公式、斯托克斯公式 Green's Formula, Stokes' Formula | |
| | 掌握: Master | 线积分与路径无关性质 Properties of path independence of line integral | |
| | | 求解线积分的方法 Evaluation of line integrals 面积分的概念与性质 Definition and properties of surface integrals | |
| 德育目标 Moral Objectives | 2-1 理解高等数学理论知识对于刻画工程实践问题的重要意义。 Understand the significant meanings of the advanced mathematics in depicting the practical engineering problems. | | |

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| 重点: Key Points | 格林公式、斯托克斯公式 Green's Formula, Stokes' Formula |
| 难点: Focal points | 线积分与路径无关性质 Properties of path independence of line integral |

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| 知识单元序号: Knowledge Unit No. | 7 | 支撑教学目标: SLOs Supported | 1-1, 1-2, 1-3, 1-4 |
| 知识单元名称 Unit Title | 统计学概念及性质 Definitions of Statistics and its properties | | |
| 知识点: Knowledge Delivery | 描述性统计学概述; Overview and descriptive statistics | | |
| | 样本空间、事件, 概率的公理化定义、解释和性质、概率的计算; Sample spaces and events, axioms, interpretations, and properties of probability, counting techniques | | |
| | 条件概率, 事件的独立; Conditional probability, independence | | |
| 学习目标: Learning Objectives | 了解: Recognize | 统计学基本概念; Basic concepts in statistics | |
| | 理解: Understand | 概率的性质、计算; Properties of probability and counting techniques | |
| | 掌握: Master | 全概率公式, 贝叶斯定理, 事件的独立; the Law of total probability, Bayes' theorem, independence | |
| 德育目标 Moral Objectives | 2-2 认知当前全球, 数学理论的发展对提升中国工程关键技术及核心竞争力的重要意义。 Understand the technology development, key techniques and the core competitiveness in the area of the China engineering in the world. | | |
| 重点: Key Points | 概率的性质、计算; Properties of probability and counting techniques | | |
| 难点: Focal points | 全概率公式, 贝叶斯定理, 事件的独立; the Law of total probability, Bayes' theorem, independence | | |

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| 知识单元序号: Knowledge Unit No. | 8 | 支撑教学目标: SLOs Supported | 1-1, 1-2, 1-3, 1-4 |
| 知识单元名称 Unit Title | 随机变量以及概率分布 Random variable and probability distribution | | |
| 知识点: Knowledge Delivery | 随机变量、离散性随机变量的分布以及期望; Random variables, probability distributions for discrete random variables, expected values | | |
| | 二项分布及泊松分布; The binomial probability distribution and the Poisson probability distribution | | |
| | 概率密度函数, 分布函数和期望; Probability density functions, cumulative distribution functions and | | |

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| | expected values | |
| | 正态分布，指数分布及 Gamma 分布； The normal distribution, the exponential and Gamma distributions | |
| | 多维随机变量的联合分布； Jointly distributed random variables | |
| | 期望，方差和相关系数； Expected values, covariance, and correlation | |
| 学习目标: Learning Objectives | 了解: Recognize | 离散性随机变量的分布律及期望； Probability distributions and expected values for discrete random variables |
| | | 离散型随机变量的几种特殊分布； Several special distributions of discrete random variables |
| | 理解: Understand | 连续型随机变量的概率密度函数及其分布函数； Probability density functions and cumulative distribution functions of continuous random variables |
| | | 连续型随机变量的几种特殊分布； Several special distributions of continuous random variables |
| | 掌握: Master | 联合分布律、联合概率密度及边缘概率密度及随机变量的独立； The joint probability mass function, the joint probability density function and the marginal probability density functions |
| | | 期望，方差和相关系数的性质； The properties of expected values, covariance, and correlation |
| 德育目标 Moral Objectives | 2-2 认知当前全球，数学理论的发展对提升中国工程关键技术及核心竞争力的重要意义。 Understand the technology development, key techniques and the core competitiveness in the area of the China engineering in the world. | |
| 重点: Key Points | 连续型随机变量的概率密度函数及其分布函数； Probability density functions and cumulative distribution functions of continuous random variables | |
| | 连续型随机变量的几种特殊分布； Several special distributions of continuous random variables | |
| 难点: Focal points | 联合分布律、联合概率密度及边缘概率密度及随机变量的独立； The joint probability mass function, the joint probability density function and the marginal probability density functions | |
| | 期望，方差和相关系数的性质； The properties of expected values, covariance, and correlation | |

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| 知识单元序号: Knowledge Unit No. | 选择一项。 | 支撑教学目标: SLOs Supported | 1-1, 1-2, 1-3, 1-4 |
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| 知识单元名称 Unit Title | 统计量及检验方法 Statistics and estimation method | |
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| 知识点: Knowledge Delivery | 期望, 方差和相关系数; Expected values, covariance, and correlation | |
| | 统计量及其分布, 样本均值的分布, 随机变量线性组合的分布; Statistics and their distributions, the distribution of the sample mean, and the distribution of a linear combination | |
| | 点估计的概念; Some general concepts of point estimation | |
| | 点估计的方法; Methods of point estimation | |
| | 基于单一样本的假设检验; Tests of hypotheses based on a single sample | |
| | 简单线性回归和相关性; Simple linear regression and correlation | |
| 学习目标: Learning Objectives | 了解: Recognize | 期望, 方差和相关系数的性质; The properties of expected values, covariance, and correlation |
| | | 样本均值及随机变量线性组合的分布, 中心极限定理, 来自正态总体的统计量的分布; the distribution of the sample mean, and the distribution of a linear combination, the central Limit theorem, the cases of a normal population distribution |
| | 理解: Understand | 点估计的概念; Some general concepts of point estimation |
| | | 矩估计法和最大似然估计法; the method of moments and maximum likelihood estimation |
| | 掌握: Master | 单个正态总体均值的 Z 检验和 T 检验; Z tests and T tests for the mean of a single normal population |
| | | 简单线性回归, 最小二乘法; The simple linear regression model, principle of least squares |
| 德育目标 Moral Objectives | 2-2 认知当前全球, 数学理论的发展对提升中国工程关键技术及核心竞争力的重要意义。 Understand the technology development, key techniques and the core competitiveness in the area of the China engineering in the world. | |
| 重点: Key Points | 点估计的概念; Some general concepts of point estimation | |
| | 矩估计法和最大似然估计法; the method of moments and maximum likelihood estimation | |
| 难点: Focal points | 单个正态总体均值的 Z 检验和 T 检验; Z tests and T tests for the mean of a single normal population | |

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| | 简单线性回归，最小二乘法； The simple linear regression model, principle of least squares |
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二、教学安排 Teaching Schedule

注：可根据实际情况增减行数

Note: Please add/reduce lines based on subject.

| 教学内容 Teaching Content | 学时(周)Hour(Week) | | | |
|--|-----------------|------------|-------------|-----|
| | 理论 LECT. | 实验 EXP. | 实践 PRAC. | PBL |
| 微分方程及其应用 Differential equations and its applications | 10 | 0 | 0 | 0 |
| 无穷级数 Infinite Series | 12 | 0 | 0 | 0 |
| 向量与解析几何 Vectors and Solid Analytic Geometry | 6 | 0 | 0 | 0 |
| 多元函数微分学 The Differential Calculus for Multi-variables Function | 14 | 0 | 0 | 0 |
| 多重积分 Multiple Integrals | 12 | 0 | 0 | 0 |
| 线积分、面积分 Line Integrals, Surface Integrals | 12 | 0 | 0 | 0 |
| 统计学概念及性质 Definitions of Statistics and its properties | 8 | 0 | 0 | 0 |
| 随机变量以及概率分布 Random variable and probability distribution | 10 | 0 | 0 | 0 |
| 统计量及检验方法 Statistics and estimation method | 12 | 0 | 0 | 0 |
| 总计 Total | 96 | 0 | 0 | 0 |

三、教学方法 Teaching Methodology

注：可根据实际情况增减行数或修改内容

Note: Please add/reduce lines or revise content based on subject.

| 勾选 Check | 教学方法与特色 Teaching Methodology & Characters |
|-------------------------------------|---|
| <input checked="" type="checkbox"/> | 多媒体教学：基于信息化设备的课堂教学 Multi-media-basedlecturing |
| <input checked="" type="checkbox"/> | 实践能力传授：理论与行业、实际案例相结合 Combining theory with industrial practical problems |
| <input checked="" type="checkbox"/> | 课程思政建设：知识讲授与德育相结合 Knowledge delivery with ethical education |

| | |
|--------------------------|--|
| <input type="checkbox"/> | PBL 教学: 问题驱动的分组学习与交流 Problem-based learning |
| <input type="checkbox"/> | 其他: 单击或点击此处输入文字。 Other: 单击或点击此处输入文字。 |

四、成绩评定 Assessment

注: 可根据实际情况增减行数或修改内容

Note: Please add/reduce lines or revise content based on subject.

| | | | |
|-----------------------------|--|-------------------------------|----------|
| 考核环节: Assessment Content | 平时 Behavior | 环节负责人: Director | 李晓奇, 郭静梅 |
| 给分形式: Result Type | 百分制 Marks | 课程总成绩比重(%): Percentage (%) | 30 |
| 考核方式: Measures | <p>平时成绩, 以学生平时课堂表现、课堂教师随机提问, 学生平时作业完成情况综合评定, 其中, 学生平时课堂表现、课堂教师随机提问占比 10%, 学生平时作业(课前预习作业、课后作业)完成情况占比 90%.</p> <p>According to instant answer to the teacher's questions, comprehensive report and question performance, the mark is evaluated, where question performance and instant answer accounts for 10%, assignments performance (pre-lecture and post-lecture) accounts for 90%.</p> | | |
| 考核环节: Assessment Content | 期中 Mid-term | 环节负责人: Director | 李晓奇, 郭静梅 |
| 给分形式: Result Type | 百分制 Marks | 课程总成绩比重(%): Percentage (%) | 20 |
| 考核方式: Measures | <p>120 分钟 Threshold test, 共计 1 次, 考试满分 100 分, 每次考试成绩占 Threshold test 的比例, 与课程知识点学时占总理论学时的比例, 保持一致. 该部分成绩列入期中考试成绩科目。</p> <p>One hundred and twenty minutes Threshold test, there is a mid-term test, the full mark is 100 mark and percentage of each test accounting on the final mark conforms to the same percentage of corresponding theoretical term hour accounting on the whole theoretical term hour. The marks are listed in the mid-term exam score</p> | | |
| 考核环节: Assessment Content | 期末 Final | 环节负责人: Director | 李晓奇, 杜瑞燕 |
| 给分形式: Result Type | 百分制 Marks | 课程总成绩比重(%): Percentage (%) | 50 |

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| 考核方式: Measures | 考试, 2 小时答题时间 Examination, and the examinations lasts for two hours time. |
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五、改进机制 Improvement Mechanism

注: 未尽事宜以教学团队以及学院教学指导委员会商定为准。

Note: Matters not covered in this file shall be determined by TAB of SSTC, NEU.

| 教学大纲改进机制 Subject Syllabus Improvement Mechanism | | | |
|--|---|--------------------------------|---|
| 考核周期(年): Check Period (YR) | 4 | 修订周期(年): Revise Period (YR) | 4 |
| 改进措施: Measures | 课程负责人根据课程教学内容与人才培养目标组织课程团队讨论并修改教学大纲, 报分管教学工作副院长审核后由执行院长批准。 The subject coordinator shall be responsible for the syllabus discussion and improvement, and the revised version shall be submitted to deputy dean (teaching affairs) for reviewing then to executive dean for approval. | | |
| 成绩评定改进机制 Assessment Improvement Mechanism | | | |
| 考核周期(年): Check Period (YR) | 1 | 修订周期(年): Revise Period (YR) | 1 |
| 改进措施: Measures | 课程负责人根据课程教学内容、课堂教学效果以及成绩分布, 对课程教学方法和成绩评定环节进行改进, 并同步优化评定办法。 The subject coordinator shall revise the syllabus based on the teaching content, effect and result distribution while optimize the assessment measures. | | |