

高等数学建模 II

Advanced Mathematical Modelling II

教学大纲

Subject Syllabus

一、课程信息 Subject Information

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	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		
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.

<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>	<table border="1"> <tr> <td data-bbox="517 974 609 1350">1-1</td> <td data-bbox="609 974 1353 1350"> <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> </td> </tr> <tr> <td data-bbox="517 1350 609 1727">1-2</td> <td data-bbox="609 1350 1353 1727"> <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> </td> </tr> <tr> <td data-bbox="517 1727 609 2054">1-3</td> <td data-bbox="609 1727 1353 2054"> <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> </td> </tr> </table>	1-1	<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>	1-2	<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>	1-3	<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>
1-1	<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>						
1-2	<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>						
1-3	<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>						

	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

	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

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		

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		

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	

		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	

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	

		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.	

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	

	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	

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.		

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

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		

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		

	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	

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	
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	

	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

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.		