

# 课程名称 电路分析与设计

英文名称 English Title Circuit analysis and design

## 一、课程信息 Subject Information

课程编号: Subject ID	3100113012	开课学期: Semester	4
课程分类: Category	学科素养 SE	所属课群: Section	专业基础 MF
课程学分: Credit Points	3.5	总学时/周: Total Hours/Weeks	56
理论学时: LECT. Hours	56	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	通信工程 CE
课程属性: Pattern	必修 Compulsory	课程模式: Mode	引进 UTS
中方课程协调人: NEU Coordinator	韩鹏	成绩记载方式: Result Type	百分制 Marks
先修课程: Requisites	高等数学、线性代数、复变函数与积分变换、电路原理		
英文参考教材: EN Textbooks	James W. Nilsson, Susan Riedel - Electric Circuits, Global Edition-Pearson (2019)		
中文参考教材: CN Textbooks	教材《电路（邱关源）》第五版		
教学资源: Resources	<a href="https://www.icourse163.org/course/xidian-483006">https://www.icourse163.org/course/xidian-483006</a>		
课程负责人(撰写人): Subject Director	韩鹏	提交日期: Submitted Date	3/25/2023
任课教师(含负责人): Taught by	陈霞, 曹知奥		
审核人: Checked by	韩鹏	批准人: Approved by	史闻博
		批准日期: Approved Date	3/25/2023

## 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>通过本课程的学习，使学生掌握电路分析与设计的基本概念、基本原理和基本分析方法，包括：电路模型的建立、时域和频域的分析方法以及对结果的物理解释、物理意义等；理解各种变换（傅里叶变换、拉普拉斯变换等）的基本内容、性质和应用。特别要建立电路系统的频域分析的概念以及系统函数的概念，为学生进一步学习后续课程（通信原理、数字信号处理等）打下坚实的基础。激发学生对本专业信号与系统学科方面的兴趣与学习热情，使学生分析问题和解决问题的能力有所提高。</p> <p>Through the study of this course, students will master the basic concepts, basic principles and basic analysis methods of signal and system theory, including: the establishment of mathematical models of circuits, time-domain and frequency-domain analysis methods, and the physical interpretation of the results, Physical meaning, etc.; understand the basic content, properties and applications of various transforms (Fourier transform, Laplace transform, etc.). In particular, the concept of frequency domain analysis of systems and the concept of system functions should be established to lay a solid foundation for students to further study subsequent courses (communication principles, digital signal processing, etc.). Stimulate students' interest and learning enthusiasm in the signal and system disciplines of this major, and improve their ability to analyze and solve problems</p>	
<p>(1) 专业目标: Professional Ability</p>	<p>1-1</p>	<p>理解电路分析的概念和方法，熟练掌握电路的时域、频域以及变换域分析方法。</p> <p>Understand the concept and classification of circuits, and be proficient in circuits analysis methods in the time domain, frequency domain, and transform domain.</p>
	<p>1-2</p>	<p>理解时域频域电路的概念和分类，掌握系统数学模型的建立方法，熟练掌握系统的时域、频域以及变换域分析方法。</p> <p>Understand the concept and classification of the system, master the method of establishing the mathematical model of the system, and be proficient in the time domain, frequency domain and transform domain analysis methods of the system.</p>
	<p>1-3</p>	<p>熟练掌握电路分析方法在电子、控制等领域的工程应用。</p> <p>Familiar with the engineering application of system analysis methods in the fields of electronic and control.</p>
	<p>1-4</p>	<p>培养科学与工程应用的意识和素质，逐步培养学生的探索精神和创新能力。</p> <p>Cultivate the consciousness and quality of science and engineering application, and gradually cultivate students' exploration spirit and innovation ability.</p>
<p>(2) 德育目标:</p>	<p>2-1</p>	<p>激发学生对电路分析与设计方向的兴趣与学习热情，提高学</p>

Essential Quality		生分析和解决实际工程问题的能力,为将来从事电子设备设计与研发奠定必要的基础。 Stimulate students' interest and learning enthusiasm in the direction of circuits processing, improve students' ability to analyze and solve practical engineering problems, and lay the necessary foundation for future electronic device design and research and development.
	2-2	提高学生思维、判断、分析与解决问题能力,形成敬业、守信、高校、精益求精的职业素养。 Improve students' thinking, judgment, analysis and problem-solving abilities, and form professionalism of dedication, trustworthiness, colleges, and excellence.
<b>课程教学目标与毕业要求的对应关系 Matrix of GA &amp; SLOs</b>		
毕业要求 GA	指标点 GA Index	教学目标 SLOs
1、工程知识: 能够将数学、自然科学、工程基础和专业知 识用于解决电子信息工程 相关问题。	指标点 1-1: 掌握数学、自然科学、工程基础和专业知 识,并能够将其运用到复 杂电子信息工程问题的恰 当表述中。	1-1、1-8、2-1、 2-4、3-1、3-4、 3-5。
	指标点 1-2: 掌握电路与系统分析、时域 电路转换,频域电路分析等 专业知识,具备分析设计电 路的能力。	
	指标点 1-5: 掌握在电子信息工程专业的 相关领域进行工程设计、技 术创新的能力。	1-3, 1-4
2、问题分析: 能够应用数学、 自然科学和工程科学的基本 原理,识别、表达、并通过 文献研究分析复杂工程问 题,以获得有效结论。	指标点 2-1: 能够针对实际问题设计针对 性的技术方案,并综合运用 所学科学理论和技术手段 分析解决。	1-2、1-3、1-4、 1-6、1-7、2-2、 2-3、3-2、3-3、 3-5。
	指标点 2-2: 能够有效分析和处理电路系 统、电力系统网络、模拟及 数字电路等方面的技术与 管理问题。	
3、设计/开发解决方案: 能够 设计针对复杂工程问题的 解决方案,设计满足特定需 求的系统、单元(部件)或 工艺流程,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。	指标点 3-1: 具备本专业所需的设计/开发 技能,能够设计针对复杂工 程问题的解决方案,设计满 足特定需求的系统或工艺 流程。	1-5、2-1、2-2、 2-3、2-4、3-3、 3-4、3-5。
	指标点 3-2: 能够在工作中表现出创新意 识,创新的解决复杂问题;	
	指标点 3-3: 能够在工程设计中综合考虑 社会、健康、安全、法律、 文化等因素。	

### 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

#### 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、2-1、3-1、3-3
知识单元名称 Unit Title	绪论 Introduction		
知识点: Knowledge Delivery	电压和电流源定义 Voltage and Current Sources		
	电路的基尔霍夫定律 Kirchhoff's Laws		
	分析具有独立电源的电路 Analyzing a Circuit Containing Dependent Sources		
	阶跃信号与冲激信号 Step signal and impulse signal		
	分压器和分流器电路 The Voltage-Divider and Current-Divider Circuits		
	分压和分流概念与方法 Voltage Division and Current Division		
	三角星型电路转换 Delta-to-Wye (Pi-to-Tee) Equivalent Circuits		
学习目标: Learning Objectives	了解: Recognize	电压和电流源定义 Voltage and Current Sources 电路的基尔霍夫定律 Kirchhoff's Laws	
	理解: Understand	分析具有独立电源的电路 Analyzing a Circuit Containing Dependent Sources	
	掌握: Master	阶跃信号与冲激信号 Step signal and impulse signal 分压和分流概念与方法 Voltage Division and Current Division	
德育目标: Moral Objectives	<p>激发学生对电路分析与设计方向的兴趣与学习热情，提高学生分析和解决实际工程问题的能力，为将来从事电子设备设计与研发奠定必要的基础</p> <p>Stimulate students' interest and learning enthusiasm in the direction of signal and information processing, improve students' ability to analyze and solve practical engineering problems, and lay the necessary foundation for future electronic device design and research and development.</p> <p>提高学生思维、判断、分析与解决问题能力，形成敬业、守信、高校、精益求精的职业素养</p> <p>Improve students' thinking, judgment, analysis and problem-solving abilities, and form professionalism of dedication, trustworthiness, colleges, and excellence.</p>		
重点:	分析具有独立电源的电路 Analyzing a Circuit Containing Dependent		

Key Points	Sources
	阶跃信号与冲激信号 Step signal and impulse signal
	分压器和分流器电路 The Voltage-Divider and Current-Divider Circuits
	分压和分流概念与方法 Voltage Division and Current Division
难点: Focal points	分析具有独立电源的电路 Analyzing a Circuit Containing Dependent Sources
	分压器和分流器电路 The Voltage-Divider and Current-Divider Circuits

知识单元序号: Knowledge Unit No.	2	支撑教学目标: SLOs Supported	1-2、2-1、3-1、3-3
知识单元名称 Unit Title	一阶 RL,RC 电路响应 Response of First-Order RL and RC Circuits		
知识点: Knowledge Delivery	RL 电路的自然响应 The Natural Response of an RL Circuit		
	RC 电路的自然响应 The Natural Response of an RC Circuit		
	RL,RC 电路的阶跃响应 The Step Response of an RL and RC Circuit		
	阶跃和自然响应的通用解 A General Solution for Step and Natural Responses		
	一阶 RL, RC 电路的顺序切换 Sequential Switching of first-order RL, RC circuits		
	积分放大器 The Integrating Amplifier		
学习目标: Learning Objectives	了解: Recognize	积分放大器 The Integrating Amplifier	
	理解: Understand	RL 电路的自然响应 The Natural Response of an RL Circuit RC 电路的自然响应 The Natural Response of an RC Circuit	
	掌握: Master	阶跃和自然响应的通用解 A General Solution for Step and Natural Responses	
德育目标: Moral Objectives	激发学生对于电路分析与设计方向的兴趣与学习热情, 提高学生分析和解决实际工程问题的能力, 为将来从事电子设备设计与研发奠定必要的基础  Stimulate students' interest and learning enthusiasm in the direction of signal and information processing, improve students'		

	<p>ability to analyze and solve practical engineering problems, and lay the necessary foundation for future electronic device design and research and development.</p> <p>提高学生思维、判断、分析与解决问题能力, 形成敬业、守信、高校、精益求精的职业素养</p> <p>Improve students' thinking, judgment, analysis and problem-solving abilities, and form professionalism of dedication, trustworthiness, colleges, and excellence.</p>
重点: Key Points	RL 电路的自然响应 The Natural Response of an RL Circuit
	RC 电路的自然响应 The Natural Response of an RC Circuit
	RL,RC 电路的阶跃响应 The Step Response of an RL and RC Circuit
	阶跃和自然响应的通用解 A General Solution for Step and Natural Responses
难点: Focal points	RL,RC 电路的阶跃响应 The Step Response of an RL and RC Circuit
	阶跃和自然响应的通用解 A General Solution for Step and Natural Responses

知识单元序号: Knowledge Unit No.	3	支撑教学目标: SLOs Supported	1-3、2-1、2-2、3-1、 3-3、3-5
知识单元名称 Unit Title	RLC 电路自然与阶跃响应 Natural and Step Responses of RLC Circuits		
知识点: Knowledge Delivery	并联 RLC 电路的自然响应简介 Introduction to the Natural Response of a Parallel RLC Circuit		
	并联 RLC 电路的自然响应形式 The Forms of the Natural Response of a Parallel RLC Circuit		
	并联 RLC 电路的阶跃响应 The Step Response of a Parallel RLC Circuit		
	串联 RLC 电路的自然和阶跃响应 The Natural and Step Response of a Series RLC Circuit		
	具有两个积分放大器的电路 A Circuit with Two Integrating Amplifiers		
学习目标: Learning Objectives	理解: Understand	并联 RLC 电路的自然响应简介 Introduction to the Natural Response of a Parallel RLC Circuit	

		串联 RLC 电路的自然和阶跃响应 The Natural and Step Response of a Series RLC Circuit
	掌握: Master	并联 RLC 电路的自然响应形式 The Forms of the Natural Response of a Parallel RLC Circuit
德育目标: Moral Objectives	<p>激发学生对电路分析与设计方向的兴趣与学习热情, 提高学生分析和解决实际工程问题的能力, 为将来从事电子设备设计与研发奠定必要的基础</p> <p>Stimulate students' interest and learning enthusiasm in the direction of signal and information processing, improve students' ability to analyze and solve practical engineering problems, and lay the necessary foundation for future electronic device design and research and development.</p> <p>提高学生思维、判断、分析与解决问题能力, 形成敬业、守信、高校、精益求精的职业素养</p> <p>Improve students' thinking, judgment, analysis and problem-solving abilities, and form professionalism of dedication, trustworthiness, colleges, and excellence.</p>	
重点: Key Points	并联 RLC 电路的自然响应形式 The Forms of the Natural Response of a Parallel RLC Circuit	
	并联 RLC 电路的阶跃响应 The Step Response of a Parallel RLC Circuit	
	串联 RLC 电路的自然和阶跃响应 The Natural and Step Response of a Series RLC Circuit	
难点: Focal points	并联 RLC 电路的阶跃响应 The Step Response of a Parallel RLC Circuit	
	串联 RLC 电路的自然和阶跃响应	
	The Natural and Step Response of a Series RLC Circuit	

知识单元序号: Knowledge Unit No.	4	支撑教学目标: SLOs Supported	1-4、2-1、2-3、3-3、 3-4、3-5
知识单元名称 Unit Title	正弦稳态电路分析 Sinusoidal Steady-State Analysis		
知识点: Knowledge Delivery	正弦稳态电源的概念和表示形式 Concept and representation of sinusoidal steady-state power supply		
	电路在正弦电源下的响应分析 Analysis of the response of the circuit under sinusoidal power		
	相量法的概念和表示方法 Concepts and representations of phasor methods		
	频域中的无源电路元件 The Passive Circuit Elements in the Frequency Domain		

	频域中的基尔霍夫定律 Kirchoff's Laws in the Frequency Domain
	串联、并联和三角形到星形简化 Series, Parallel, and Delta-to-Wye Simplifications
	源变换和戴维宁-诺顿等效电路 Source Transformations and Thévenin–Norton Equivalent Circuits
	节点电压法 The Node-Voltage Method
	网孔电流法 The Mesh-Current Method
学习目标: Learning Objectives	了解: Recognize 正弦稳态电源的概念和表示形式 Concept and representation of sinusoidal steady-state power supply
	理解: Understand 电路在正弦电源下的响应分析 Analysis of the response of the circuit under sinusoidal power
	掌握: Master 频域中的无源电路元件 The Passive Circuit Elements in the Frequency Domain 频域中的基尔霍夫定律 Kirchoff's Laws in the Frequency Domain 节点电压法 The Node-Voltage Method 网孔电流法 The Mesh-Current Method
德育目标: Moral Objectives	激发学生对电路分析与设计方向的兴趣与学习热情, 提高学生分析和解决实际工程问题的能力, 为将来从事电子设备设计与研发奠定必要的基础  Stimulate students' interest and learning enthusiasm in the direction of signal and information processing, improve students' ability to analyze and solve practical engineering problems, and lay the necessary foundation for future electronic device design and research and development.  提高学生思维、判断、分析与解决问题能力, 形成敬业、守信、高校、精益求精的职业素养  Improve students' thinking, judgment, analysis and problem-solving abilities, and form professionalism of dedication, trustworthiness, colleges, and excellence.
重点: Key Points	相量法的概念和表示方法 Concepts and representations of phasor methods
	频域中的无源电路元件 The Passive Circuit Elements in the Frequency Domain



	频域中的基尔霍夫定律 Kirchoff's Laws in the Frequency Domain
	串联、并联和三角形到星形简化 Series, Parallel, and Delta-to-Wye Simplifications
难点: Focal points	频域中的基尔霍夫定律 Kirchoff's Laws in the Frequency Domain 串联、并联和三角形到星形简化 Series, Parallel, and Delta-to-Wye Simplifications

知识单元序号: Knowledge Unit No.	5	支撑教学目标: SLOs Supported	1-3、2-1、2-4、3-4、 3-5
知识单元名称 Unit Title	正弦稳态电路功率分析 Sinusoidal Steady-State Power Calculations		
知识点: Knowledge Delivery	瞬时功率定义 Instantaneous power definition		
	有功、无功功率定义 Average and Reactive Power		
	rms 值和电路功率的计算 The rms Value and Power Calculations		
	正弦稳态电路的复功率计算 Complex power calculation for a sinusoidal steady-state circuit		
	最大功率传输的定义和计算 Definition and calculation of Maximum Power Transfer		
学习目标: Learning Objectives	了解: Recognize	瞬时功率定义 Instantaneous power definition 有功、无功功率定义 Average and Reactive Power	
	理解: Understand	rms 值和电路功率的计算 The rms Value and Power Calculations	
	掌握: Master	正弦稳态电路的复功率计算 Complex power calculation for a sinusoidal steady-state circuit	
德育目标: Moral Objectives	激发学生对电路分析与设计方向的兴趣与学习热情, 提高学生分析和解决实际工程问题的能力, 为将来从事电子设备设计与研发奠定必要的基础 Stimulate students' interest and learning enthusiasm in the direction of signal and information processing, improve students' ability to analyze and solve practical engineering problems, and lay the necessary foundation for future electronic device design		

	and research and development. 提高学生思维、判断、分析与解决问题能力，形成敬业、守信、高校、精益求精的职业素养 Improve students' thinking, judgment, analysis and problem-solving abilities, and form professionalism of dedication, trustworthiness, colleges, and excellence.
重点: Key Points	有功、无功功率定义 Average and Reactive Power
	rms 值和电路功率的计算 The rms Value and Power Calculations
	正弦稳态电路的复功率计算 Complex power calculation for a sinusoidal steady-state circuit
	最大功率传输的定义和计算 Definition and calculation of Maximum Power Transfer
难点: Focal points	正弦稳态电路的复功率计算 Complex power calculation for a sinusoidal steady-state circuit

知识单元序号: Knowledge Unit No.	6	支撑教学目标: SLOs Supported	1-6、2-1、3-3、3-4
知识单元名称 Unit Title	电路 Laplace 转换与分析 The Laplace Transform in Circuit Analysis		
知识点: Knowledge Delivery	电路元件的 S 域表示 Circuit Elements in the s Domain		
	S 域范围内的电路分析 Circuit Analysis in the s Domain		
	Laplace 变换在电路的应用 The application of Laplace transform in circuits		
	部分分数展开中的传递函数 The Transfer Function in Partial Fraction Expansions		
	传递函数和卷积积分 The Transfer Function and the Convolution Integral		
	传递函数和稳态正弦响应 The Transfer Function and the Steady-State Sinusoidal Response		
	电路分析中的脉冲函数 The Impulse Function in Circuit Analysis		
学习目标: Learning Objectives	理解: Understand	Laplace 变换的定义、收敛域及其性质; Laplace 变换在电路中的表示方法 The definition, convergence domain and properties of Laplace transform.	

		The representation of the Laplace transformation in a circuit
	掌握: Master	逆 Laplace 变换的部分分式展开法; Partial fraction expansion methods of inverse Laplace transform.
德育目标: Moral Objectives		<p>激发学生对电路分析与设计方向的兴趣与学习热情, 提高学生分析和解决实际工程问题的能力, 为将来从事电子设备设计与研发奠定必要的基础</p> <p>Stimulate students' interest and learning enthusiasm in the direction of signal and information processing, improve students' ability to analyze and solve practical engineering problems, and lay the necessary foundation for future electronic device design and research and development.</p> <p>提高学生思维、判断、分析与解决问题能力, 形成敬业、守信、高校、精益求精的职业素养</p> <p>Improve students' thinking, judgment, analysis and problem-solving abilities, and form professionalism of dedication, trustworthiness, colleges, and excellence.</p>
重点: Key Points		S 域范围内的电路分析 Circuit Analysis in the s Domain
		Laplace 变换在电路的应用 The application of Laplace transform in circuits
		部分分数展开中的传递函数 The Transfer Function in Partial Fraction Expansions
		传递函数和卷积积分 The Transfer Function and the Convolution Integral
		传递函数和稳态正弦响应 The Transfer Function and the Steady-State Sinusoidal Response
		S 域范围内的电路分析 Circuit Analysis in the s Domain
难点: Focal points		Laplace 变换在电路的应用 The application of Laplace transform in circuits
		部分分数展开中的传递函数 The Transfer Function in Partial Fraction Expansions

知识单元序号: Knowledge Unit No.	7	支撑教学目标: SLOs Supported	1-7、2-1、3-3、3-4
知识单元名称 Unit Title	电路 Fourier 转换与分析 The Fourier Transform in Circuit Analysis		
知识点: Knowledge Delivery	Fourier 转换的微分形式 The Derivation of the Fourier Transform		
	Fourier 积分的收敛性分析		

	The Convergence of the Fourier Integral	
	利用 Laplace 转换推导 Fourier 变换 Using Laplace Transforms to Find Fourier Transforms	
	极限形式下的 Fourier 变换 Fourier Transforms in the Limit	
	Fourier 的运算型转换 Operational Transforms	
	Fourier 变换的电路应用 Circuit Applications	
	序列的傅里叶变换 Fourier transform of sequences.	
学习目标: Learning Objectives	理解: Understand	Fourier 变换的定义、收敛域及其性质; LTI 离散时间系统的系统函数的定义 The definition, convergence domain and properties of Fourier transform. Definitions of system function of LTI discrete-time system.
	掌握: Master	逆 Fourier 变换的部分分式展开法; Partial fraction expansion methods of inverse Fourier transform.
德育目标: Moral Objectives	<p>激发学生对电路分析与设计方向的兴趣与学习热情, 提高学生分析和解决实际工程问题的能力, 为将来从事电子设备设计与研发奠定必要的基础</p> <p>Stimulate students' interest and learning enthusiasm in the direction of signal and information processing, improve students' ability to analyze and solve practical engineering problems, and lay the necessary foundation for future electronic device design and research and development.</p> <p>提高学生思维、判断、分析与解决问题能力, 形成敬业、守信、高校、精益求精的职业素养</p> <p>Improve students' thinking, judgment, analysis and problem-solving abilities, and form professionalism of dedication, trustworthiness, colleges, and excellence.</p>	
重点: Key Points	Fourier 积分的收敛性分析 The Convergence of the Fourier Integral	
	利用 Laplace 转换推导 Fourier 变换 Using Laplace Transforms to Find Fourier Transforms	
	极限形式下的 Fourier 变换 Fourier Transforms in the Limit	
	Fourier 的运算型转换 Operational Transforms	
	Fourier 变换的电路应用 Circuit Applications	

	Fourier 的逆变换的电路应用 Circuit Applications of inverse Fourier
难点: Focal points	Fourier 变换的电路应用 Circuit Applications
	Fourier 的逆变换的电路应用 Circuit Applications of inverse Fourier

知识单元序号: Knowledge Unit No.	8	支撑教学目标: SLOs Supported	1-8、2-1、3-3、3-4
知识单元名称 Unit Title	两端口网络分析 Two-Port Circuits		
知识点: Knowledge Delivery	两端口网络概念 Concept of Two-Port Circuits		
	两端口网络模型 Two-Port Circuits models		
	两端口网络等式建立 Establishment of equations of Two-Port Circuits		
	两端口网络参数设置 Two-Port Circuits parameters setting		
	两端口网络分析 Two-Port Circuits analysis		
	两端口网络内部互联 Interconnected Two-Port Circuits		
	学习目标: Learning Objectives	理解: Understand	两端口网络的模型和电路分析 Model and circuit analysis of two-port networks
掌握: Master		两端口网络的意义、建立和求解方法 Significance, establishment and solution of Two-Port Circuits	
德育目标: Moral Objectives	<p>激发学生对电路分析与设计方向的兴趣与学习热情, 提高学生分析和解决实际工程问题的能力, 为将来从事电子设备设计与研发奠定必要的基础</p> <p>Stimulate students' interest and learning enthusiasm in the direction of CAD, improve students' ability to analyze and solve practical engineering problems, and lay the necessary foundation for future electronic device design and research and development.</p> <p>提高学生思维、判断、分析与解决问题能力, 形成敬业、守信、高校、精益求精的职业素养</p> <p>Improve students' thinking, judgment, analysis and problem-solving abilities, and form professionalism of dedication, trustworthiness, colleges, and excellence.</p>		
重点: Key Points	两端口网络模型的建立与求解 Establishment and solution of Two-Port Circuits		
难点: Focal points	两端口网络方程的建立 Establishment of Two-Port Circuits		

	等式方程的分析 Analysis of equation equations
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#### 四、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.	课外实践 PBL	集中实践 PRAC.
知识单元一：绪论 Knowledge Unit 1: Introduction	4	0	0	0
知识单元二：一阶 RL, RC 电路响应 Knowledge Unit 2: Response of First-Order RL and RC Circuits	4	0	0	0
知识单元三：RLC 电路自然与阶跃响应 Knowledge Unit 3: Natural and Step Responses of RLC Circuits	12	0	0	0
知识单元四：正弦稳态电路分析 Knowledge unit 4: Sinusoidal Steady-State Analysis	10	0	0	0
知识单元五：正弦稳态电路功率分析 Knowledge unit 5: Sinusoidal Steady-State Power Calculations	6	0	0	0
知识单元六：电路 Laplace 转换与分析 Knowledge Unit 7: The Laplace Transform in Circuit Analysis	4	0	0	0
知识单元七：电路 Fourier 转换与分析 Knowledge unit 8: The Fourier Transform in Circuit Analysis	10	0	0	0
知识单元八：两端口网络分析 Knowledge Unit 10: Two-Port Circuits	6	0	0	0
总计 Total	56	0	0	0

#### 五、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
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<input checked="" type="checkbox"/>	多媒体教学：基于信息化设备的课堂教学 Multi-media-based lecturing
<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 ethic 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。

## 六、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	陈霞, 曹知奥
给分形式: Result Type	百分制 Marks	课程总成绩比重(%): Percentage (%)	50
考核方式: Measures	满分 100 分, 使用学习通记录学生平时的课堂表现, 每次考勤计 10 分, 缺勤不得分, 缺勤五次及以上取消考试资格。每次作业计 10 分, 抄袭、给他人抄袭或未交作业不得分。每次课堂正确回答问题计 5 分, 每次课堂注意力不集中、影响课堂纪律等情况扣 5 分。最后总分不超过 100 分, 不低于 0 分。		

考核环节: Assessment Content	期末 Final	环节负责人: Director	陈霞, 曹知奥
给分形式: Result Type	百分制 Marks	课程总成绩比重(%): Percentage (%)	50
考核方式: Measures	满分 100 分, 通过批阅期末考试试卷给出学生成绩。		

## 七、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	<p>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。</p> <p>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.</p>		
<b>成绩评定改进机制 Assessment Improvement Mechanism</b>			
考核周期(年): Check Period (YR)	1	修订周期(年): Revise Period (YR)	1
改进措施: Measures	<p>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。</p> <p>The subject coordinator shall revise the syllabus based on the teaching content, effect and result distribution while optimize the assessment measures.</p>		