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课程编号	Course number	10421133	课程名：	Course	复变函数与数理方程	Complex variable functions and mathematical
			Name:	equations		
总学时：	Total Credit Hours:	66	总学分：	Total	3	
			Credits:			
课程内容简介：	Course Description:	<p>该课程为电子系课改课程，由数学系教师负责。我们将传统复变函数引论（2学分）和数理方程引论（2学分）合并成复变函数与数理方程（3学分），并强化与后续课程的衔接。前半部分讲授复变函数与积分变换，介绍了复变函数的基本概念、性质和应用。重点讲授了留数定理及应用，为后续信号与系统的学习打好基础。由于课时原因，删除了辅角原理、共形映射等内容，因为电子系（对比航院、热能系）在这方面的要求相对较低。另外，积分变换在传统讲授中多次涉及，我们一次搞定，节约了时间。对于数理方程和特殊函数，我们做了较大调整。传统上，先讲如何求解方程，再根据结果认识方程的性质。这在逻辑上是有问题的，方程的性质是本质的，不应该依赖于求解方法或过程。因此，我们在相对抽象、整体的框架下讲解。这样的讲解不如前者形象，学生压力较大，我们放慢速度强调重点。一旦学生掌握，可以利用数理方程对实际问题建模和求解，也为他们通过数值方法求解数理方程埋下伏笔。为配合电动力学课程，我们集中讲授极坐标、球坐标等，仔细讲解特殊函数导出的全过程，通过类比法介绍特殊函数的各种重要性质。</p> <p>This course is a curriculum reform course of the Department of Electronics, which is led by the teachers of the Department of Mathematics. We combine the traditional Introduction to Complex Variable Functions (2 credits) and Introduction to Mathematical Equations (2 credits) into Complex Functions and Mathematical Equations (3 credits), and strengthen the connection with subsequent courses. In the first half, we will introduce complex functions and integral transformations, and introduce the basic concepts, properties and applications of complex functions. The theorem and its application are emphatically taught, which lays a good foundation for the subsequent learning of signals and systems. Due to the class time, the auxiliary angle principle, conformal mapping, etc. have been deleted, because the requirements of the Department of Electronics (compared with the Institute of Aeronautics and the Department of Thermal Energy) are relatively low. In addition, the integral transformation is involved many times in traditional lectures, and we do it all at once, saving time. For mathematical equations and special functions, we have made major adjustments. Traditionally, we talk about how to solve equations first, and then understand the properties of equations based on the results. This is logically problematic, the nature of the equation is essential and should not depend on the method or process of solving. Therefore, we will explain it in a relatively abstract, holistic framework. This kind of explanation is not as good as the former, and the students are under more pressure, so we slow down and emphasize the main points. Once mastered, students can use mathematical equations to model and solve practical problems, which also lays the groundwork for them to solve mathematical equations numerically. In order to cooperate with the electrodynamics course, we focus on polar coordinates, spherical coordinates, etc., carefully explain the whole process of deriving special functions, and introduce various important properties of special functions through analogy.</p>				
	Course Description	<p>第一部分：复变函数（14课时）； Part I: Complex Variable Functions (14 hours);</p> <p>第二部分：积分变换（5课时）； Part II: Integral Transformation (5 hours);</p> <p>第三部分：数理方程（20课时）； Part 3: Mathematical Equations (20 hours);</p> <p>第四部分：特殊函数（6课时）； Part 4: Special Functions (6 hours);</p> <p>习题课：15课时。 Exercises: 15 hours.</p>				
考核方式：	Assessment Method:	考试，总成绩=平时作业20+期末考试80 Exam, total score = 20 usual homework + 80 final exam	教材及参考书：	Textbooks and reference books: Textbooks: Self-compiled lesson plans Reference books: (1) [Main] Methods in Mathematical Physics (4th Edition); Liang Kunmiao, ed.; Higher Education Press; In 2010; (2) Complex Variable Functions and Integral Transformations; Yu Shengen, Yang Yongfa, Zhang Xiangmei; Nankai University Press; In 2006; (3) Mathematical Physics Equations and Special Functions (4th Edition); WANG Yuanming; Higher Education Press; In 2012.		
	主教材：	Main Textbook:				
	参考书：	Reference book:				
合开教师：	Co-opening Teachers:		选课指导：	Course Selection Guidance:		
			教师教学特色：	Teachers' Teaching Characteristics:		
先修要求：	Prerequisites:	微积分、线性代数 Calculus, linear algebra	成绩评定标准：	Grading Criteria: 成绩记载方式：等级制 Grades: Grading system		
	Office Hour:					
教学日历：	Teaching Calendar:	查看教学日历 View the teaching calendar				