MATE110011	先进功能材料导论	学分：2	周学时:2
	Introduction to Advanced Functional Materials	总学时：36	
预修课程：大学物理，普通化学			
修读对象：全校本科生			

中文课程简介（150 字以内）

科技的进步强烈依赖于新材料的研发。目前先进功能材料是材料科学研究的一个重要前沿，并且对诸如航空航天、航海、生能源及信息技术等领域的进步起到越来越重要作用。本课程目标在于向本科生介绍先进功能材料的性能、工作理论和实际应用以及研究的前沿。本课程包括基础和应用两部分内容。第一部分包括导电材料、双电子材料、压电材料、热电材料、光电材料、磁性材料、发光材料和激光材料。第二部分关注最新开发的纳米尺度材料和新型能源转换材料。为帮助学生更好地理解课程，本课程将列举大量的实例，并勾勒出其发展前景。通过本课程学习，学生们能够对先进功能材料结构和性能间的关系有基础而广泛的认识，并为其今后的科研打下坚实的基础。

英文课程简介

The advancement of science and technology depends strongly on the R&D of new materials. Currently, advanced functional materials are one of the important frontiers in material science and technology, and becoming increasingly imperative for the innovation of high technologies in areas of aerospace, bio-energy navigation and information technology. This course is purposely arranged to provide undergraduate students with general ideas about the characteristics, working theory, and practical applications of advanced functional materials, and the cutting-edge research as well.

The course is composed of two parts, ranging from fundamentals to applications. Part I includes, in terms of the physical properties, conductive materials, dielectric materials, piezoelectric materials, thermoelectric materials, optoelectronic materials, magnetic materials, luminescent materials and laser materials. Part II focuses on the latest developed nanoscale materials and novel energy conversion materials. To help students better understand the course contents, the representative examples will be given in parallel, and the prospective will be outlined.

The course enables students to achieve a broad and basic understanding of the interactive relationship between structure and property in advanced functional materials, and lays a solid background for their scientific careers.