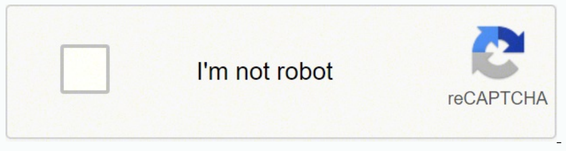

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Clemson materials science and engineering curriculum

This site uses cookies to provide you with a better user experience and to help us understand how our site is being used. By continuing to use this site, you consent to the use of cookies. Materials scientists and engineers design, develop, and produce both traditional and new advanced materials with diverse applications intended for use in a wide variety of industries. These include traditional materials-intensive industries such as the structural clay, foundry, white ware, polymers, plastics, fibers, textiles, composite materials, and automotive industries. Also included are high performance technology industries such as semiconductor, defense, biomaterials, aerospace, and communication industries. The broad career responsibilities of this discipline require competence in science, engineering, mathematics, and the social sciences. The curriculum develops skills in problem solving, engineering analysis, and design, as well as oral and written communication. The Department of Materials Science and Engineering offers two areas of concentration within the Bachelor of Science degree in Materials Science and Engineering. The Inorganic Materials Concentration provides for more in-depth study of the engineering and science of materials such as ceramics, glasses, metals, optical, and electronic materials; while the Polymeric Materials Concentration provides more emphasis on the chemistry and processing of plastics, elastomers, fibers and fibrous materials, films, coatings and adhesives. Students select either the Inorganic Materials Concentration or the Polymeric Materials Concentration when they declare their major at the completion of the General Engineering requirements. Both concentrations in Materials Science and Engineering integrate laboratory with classroom experiences to prepare students for life-long learning and exciting career opportunities. Courses covering thermodynamics, kinetics, mechanical behavior, processing, fabrication and characterization of materials prepare students for careers in industry and for professional and graduate school. In addition to the common educational objectives of all engineering programs, baccalaureate degree graduates in Materials Science and Engineering will be able to: Demonstrate learning consistent with ABET Criteria 2014 for materials engineering programs; Perform well in the laboratory and plant environments; and Serve the local, national, and international materials communities. Specifically, the ABET Engineering Criteria 2014 requires that baccalaureate degree graduates in Materials Science and Engineering be able to: Apply advanced science (such as chemistry and physics) and engineering principles to materials systems implied by the program modifier, e.g., ceramics, metals, polymers, composite materials; Demonstrate an integrated understanding of the scientific and engineering principles underlying the four major elements of the field; structure, properties, processing, and performance related to materials systems appropriate to the field; Apply and integrate knowledge from each of the above four elements of the field to solve materials selection and design problems; Utilize experimental, statistical, and computational methods consistent with the program educational objectives. Are you planning to take an English language test? Sign up for free IELTS webinars and prep material Sign up today Research Assistant Professor Position in the Department of Materials Science and Engineering at Clemson University This position will be available Jan. 1, 2022 in the Urban Research Group (www.clemson.edu/cecas/urbanresearch) The selected candidate is expected to develop innovative program in self-healing and stimuli-responsive polymers, with the focus on upcycling polymers. The successful candidate will have a strong background in experimental polymer science as demonstrated by prior publications. Spectroscopic background is desired but not required. Responsibilities will include polymer synthesis, spectroscopic and thermo-mechanical polymer analysis, and interest in teaching of advanced polymer science courses. Salary is commensurate with experience. A doctoral degree in polymer chemistry, polymer science, chemistry or chemical engineering, materials science and engineering, or a closely related field is required. Prior publication record in polymer materials science is desired. Applicants must have a completed Ph.D. degree by the time of employment. Interested candidates should send the following materials by email to mareku@urban.edu 1) A cover letter describing relevant skills and career objectives 2) A curriculum vitae 3) Arrange three recommendation letters sent directly to mareku@clemson.edu Page 2 LEARN MORE Designed for students who wonder how and why materials behave the way they do, the materials science and engineering program is a perfect fit for those who want to discover the next revolutionary material. This major explores the building blocks of all materials and develops the understanding of the processing, structure and properties of polymers, glasses, ceramics, metals and composites in all forms — particles, thin films, fibers and bulk materials. Since engineered materials are a critical enabling technology for almost all engineering applications, students graduating from this major are able to work in a broad spectrum of industries. Within this major, you will choose an emphasis area to achieve a greater depth of knowledge in a particular area of materials science (such as energy, biomaterials or advanced manufacturing). A materials science and engineering degree allows graduates a broad range of industry careers with companies like Boeing, Michelin and General Electric. Our graduates are highly sought after by top Ph.D. programs. The average starting salary for a materials science and engineering Bachelor of Science graduate is $60,000. We have a student-to-faculty ratio of 10-to-1. All of our students do some type of undergraduate research.This degree is accredited by the Engineering Accreditation Commission of ABET. Freshmen who major in engineering at Clemson are initially admitted into our general engineering program, where you'll have a year to explore many different engineering disciplines, meet faculty from each of our engineering departments and discover which major fits your personal interests and talents. On the admissions application, you will apply as a general engineering major. When you decide to major in materials science and engineering, you'll focus on designing, developing and characterizing all types of organic and inorganic materials (polymers, ceramics and metals). You'll learn how to harness material properties for applications in fields such as bio-technology aerospace, automotive, information technology hardware, energy conversion, high-performance fibers and composites, and infrastructure. The broad scope of industrial responsibilities assumed by those who work in this field requires knowledge of mathematics, science, engineering and the social sciences; skills in problem solving, engineering analysis and design; and an aptitude in written and oral communication. Our program combines laboratory with classroom experiences to prepare students for lifelong learning and exciting career opportunities both in engineering and scientific research. The Department of Materials Science and Engineering establishes in students a broad foundation in the science and engineering of materials. Sophomores are introduced to metals and ceramics, polymer science, thermodynamics, mechanical behavior and kinetics. Juniors take classroom experiences integrated with laboratory work in the processing, fabrication, and characterization of materials. Seniors focus on a particular area of emphasis such as energy, biomaterials, advanced manufacturing, etc. Fundamentals of research are developed and carried out in a senior capstone design project. Materials Science and Engineering, B.S. Chemistry Mathematical Sciences As a materials science and engineering major, you'll have numerous outlets for gaining chances for hands-on learning, applying what you've already learned to real-world situations and networking with professionals already practicing in the field. Put your classwork knowledge to work by spending alternate semesters working at an industry and studying on campus as part of Clemson's Cooperative Education program. Learn More » Opportunities to gain real-world experience abound for our undergraduate students. Engineering research, internship and co-op positions with industry leaders and prominent research institutions are available throughout the year. We make sure our students take part in undergraduate research by requiring a senior research course and numerous in-class group projects. PEER WISEStudent Organizations Your college decision isn't really about the next four years. We get it. It's about what doors are opened by your degree and whether those opportunities are what you had envisioned for yourself. Here's a snapshot of what life after graduation looks like for some of our most recent students. KEY 41-100% 21-40% 11-20% 0-10% Cambridge, United Kingdom Process Improvement Engineer Milliken & Company R&D Technologist Sandia National Labs Product Industrialization Engineer Michelin Engineer Savannah River Nuclear Solutions Production Scheduler BorgWarner Ph.D. Nanoscience and Nanotechnology University of Cambridge Ph.D. Materials Science and Engineering Massachusetts Institute of Technology Ph.D. Materials Science and Engineering Purdue University Ph.D. Materials Science and Engineering North Carolina State University DMD Medical University of South Carolina Materials Science and Engineering Metallurgy Ceramics Plastics/Polymers/Fibers Composites Analysis and Testing Research and Development Applications Management Sales Service Consulting Manufacturing Any Engineering Discipline Production Sales and Marketing Management Consulting Research and Development Teaching Law Used with permission from the University of Tennessee. Have more questions or want more information? Fill out the form below, which goes directly to the following department contact. If you'd also like to receive general University information from Clemson's admissions office, please follow the link to the right and sign up to join our mailing list. Department Website College Website Join The University's Mailing List Department Website College Website Join The University's Mailing List

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