UVA ENGINEERING

ENGINEERING TECHNOLOGIES FOR A SUSTAINABLE AND CONNECTED WORLD

Engineering a better future will require the best work of researchers collaborating along the spectrum from the tiniest building blocks of materials through the complex workings of entire societal systems. This strategic and collaborative approach is where UVA Engineering excels. We work at the micro- and nano-scale in fields like heat transfer, catalysis and 2-D materials to identify fundamental properties of matter. At the systems level, we harness these insights to create more durable, sustainable platforms in areas like energy, water use and transportation. And at the societal level, we examine those applications in the context of specific cultures and economic conditions that affect their adoption. Our goal is not simply to conduct research, but to pursue research with positive global impact.

Core Research Competencies Include:

- Device Technologies for Photonic and Wireless Communications
- Materials Science, Engineering and Integration
- Science, Technology and Society
- Systems Engineering or Model-Based Engineering of Systems
- Technologies for Energy and Environmental Applications
- Transportation Engineering and Civil Infrastructure

Application Areas Include:

- Climate Resilience
- Corrosion Prevention
- Energy Harvesting
- Next-Generation Transportation
- Public Policy
- Sustainable Energy Sources
- Wireless and Optical Communications Systems

INDUSTRY SECTORS:

MANUFACTURING | ELECTRONICS | COMMUNICATIONS | AERONAUTICS

AEROSPACE | ENERGY | TRANSPORTATION | PUBLIC POLICY

ENGINEERING.VIRGINIA.EDU/RESEARCH/ENGINEERING-TECHNOLOGIES-SUSTAINABLE-AND-CONNECTED-WORLD

AFFILIATED RESEARCH CENTERS AND INITIATIVES:

COMMONWEALTH CENTER FOR ADVANCED MANUFACTURING (CCAM)

CCAM is a public-private partnership created by the University of Virginia, Virginia Tech, Virginia State University, Canon, Chromalloy, Newport News Shipbuilding, Rolls-Royce, Sandvik Coromant, Siemens, and Sulzer Metco. The center's goal is to accelerate new technologies from initial creation through application and proof of concept and into commercial practice by bringing researchers from the universities and industry into a shared collaborative environment. CCAM is housed in a 60,000 square-foot research facility near Richmond, Va., with state-of-the-art advanced manufacturing equipment for research.

ROLLS-ROYCE UNIVERSITY TECHNOLOGY CENTER

The University of Virginia is one of only three universities in North America chosen to join the global Rolls-Royce University Technology Centers network, comprising research groups in world-class universities identified to develop long-term research and technology programs. The centers provide mutual benefits through funding of fundamental, collaborative research to advance key aerospace technologies.

MULTIFUNCTIONAL MATERIALS INTEGRATION INITIATIVE

This is an interdisciplinary initiative bringing together a team of more than 40 researchers from UVA's schools of engineering, arts and sciences and medicine. Researchers collaborate on developing advanced and complex materials and devices that – from their atoms all the way to their finished products and systems of products – have a built-in level of energy efficiency and functionality that does not exist today. New materials, and a deep understanding of how these materials work, are providing the next giant leaps in critical technologies and industries.

MULTI-FUNCTIONAL INTEGRATED SYSTEM TECHNOLOGY (MIST) CENTER

The MIST Center is a National Science Foundation Industry-University Collaborative Research Center in which researchers collaborate with industry partners on next-generation smart systems and devices – sometimes referred to as the Internet of Things. The center includes researchers from UVA and two other universities, with technical expertise in a range of technology fields from novel materials and processing technologies to devices/transducers, packaging and multi-physics modeling.

CENTER FOR ELECTROCHEMICAL SCIENCE AND ENGINEERING

This center addresses a technologically critical field across the broad area of electrochemical science and engineering, which affects the performance and reliability of most products manufactured in the world today. The center is a multi-disciplinary research effort that includes activities in UVA's departments of Materials Science and Engineering and Chemical Engineering, as well as interactions with Electrical Engineering, Computer Science, and Physics.

CENTER FOR TRANSPORTATION STUDIES

Since its establishment following the federal Surface Transportation Act of 1987, the UVA Center for Transportation Studies has become one of the foremost university sites for research dealing with information technology, highway safety, transportation planning, management and policy. The center offers a comprehensive research program, covering areas such as intelligent transportation systems, transportation planning and logistics, traffic simulation, highway safety, sustainable transportation, infrastructure management and freight and traffic operations. In the area of professional training, the center's initiatives include the UVA Transportation Training Academy and the Transportation Project Management Institute.