Advanced Devices & Sustainable Energy Laboratory
Wanted to show-case semiconductors research happening at Virginia Tech.

Aerospace Structures and Materials Lab
Testing of structures and materials, including advanced composites and smart materials. Also used for educational purposes.

An inside look into our Biotechnology labs in Biological Systems Engineering: From Cell Engineering to Living Materials
Our state of the art Biotechnology research facility is the home of 9 research groups within BSE. Here, we are exploring basic questions and pushing boundaries at the intersection of biology and engineering. During the tour, you’ll get a glimpse into the research topics of our faculty and students, from employing a futuristic integrative approach of Biologically Programmed Living Materials to developing drug delivery mechanisms using cell engineering. Every semester and summer, many of our undergraduates have opportunities to contribute to ongoing research that connects their classroom experience with scientific discovery and advancement. In this lab tour, you’ll have an opportunity to see some of our “tools of the trade” and meet some of our faculty, graduate, and undergraduate students.

Center for Autonomous Mining
Learn about sensors and data for mining robots. Design and build lab-scale autonomous mining equipment.

Chemical Engineering Unit Operations Lab
The Unit Operations Lab, or UO Lab, is the capstone laboratory course for chemical engineering students. Students work in groups to operate bench and pilot scale equipment including distillation columns, heat exchangers, carbon capture devices, membrane units, fuel cells, and reactors. The lab is also the home of the award-winning ChemE Car and ChemE Cube student design teams.

Collaborative Robotics Lab
Welcome to the Collaborative Robotics Lab (Collab) at Virginia Tech! We create learning and control algorithms for robots that collaborate with people. Our goal is to develop intelligent robots that understand — and are understood by — their human partners. These robots personalize their behavior: continually adapting to what the human wants and proactively helping them to achieve their goals. Overall, our research explores the intersection of human-robot interaction, machine learning, and control theory, with applications in personal, interactive, and assistive robots.

Construction Education Labs
The Myers-Lawson School of Construction is very hands-on & relevant, putting a high priority on application of skills. Our various "construction education labs" in Bishop Favrao & Hitt Hall include the Build (tools/experimentation) Lab, Innovation (creativity) Lab,
ARCADE (robotics) Lab, SMART (smart construction) Lab, BEST (building systems) Lab & our Trimble (technology) Lab is a collaborative lab space with Architecture.

**Dreams Lab**
Dreams lab stands for Design, Research, and Education for Additive Manufacturing Systems. Our lab focuses on the research and science in the field of additive manufacturing, also called 3D printing. A simple question that we are trying to answer is that how to design and fabricate a part so we could solve the challenges that conventional manufactures are facing.

**Ecological Engineering in Biological Systems Engineering: Nature Based Solutions & Restoration**
Our research focuses on improving our understanding and management of our land and freshwater environments through the use of systems engineering methodologies, nature-based solutions, and sustainable water management practices. We combine field studies, lab work, and computational models to help ensure a clean and reliable water supply now and in the future. In this lab tour, you’ll have an opportunity to see some of our “tools of the trade” and meet some of our faculty, graduate, and undergraduate students.

**Extreme Materials Lab**
Extreme Materials Lab, in Materials Science and Engineering Department at Virginia Tech is an interdisciplinary research group at the interface of materials science, tribology, and corrosion. We explore the processing-structure-property relationships in structural metals and materials using experiments, analytical theory, and computer simulations. Our current research focuses on understanding the deformation and corrosion of materials under extreme conditions. These conditions include, but are not limited to, high strain rates, irradiation, corrosive environment, high surface friction, cyclic loading, high temperatures, etc.

**Frith Lab**
The Frith First-Year Makerspace is designed to support the retention and development of engineers through hands-on learning, peer mentoring, and authentic problem-solving. Part collaboration and innovation space, part fabrication and prototyping space, and part learning laboratory, Frith is integrated into the first-year foundations of engineering courses and enables General Engineering students to learn by dissecting, designing, making, and analyzing engineering products. All students enrolled in General Engineering courses have free access to tools and materials for personal and course projects.

**inVenTs Studio**
First-year makerspace in a residential building. Students in Hypatia and Galileo have access to this space and it’s equipment, including power tools, laser cutters, 3D printers, and more!
ISE Learning Factory
The ISE Learning Factory is a demonstration lab of Industry 4.0 technology including 3D printing, robots, autonomous vehicles, networked machining centers, digital twin & virtual factory, and solar power.

Kroehling Advanced Materials Foundry
Metal casting education and research facility

Learning Factory (Industrial and Systems Engineering)
The mission of the Learning Factory is "to provide a safe and effective learning environment where hands-on undergraduate education of Industry 4.0 concepts and technologies can be experienced," and is an educational platform that includes traditional machining and assembly operations found in most manufacturing environments.

MSE Instructional Labs
The Materials Science and Engineering (MSE) Instructional Labs serve as a centralized facility for processing, preparing, and testing a wide range of experimental engineered materials - including metals, ceramics, polymers, composites, and electronic materials. The ≈10,000 sq. ft. lab space is used for undergraduate instruction, capstone projects, and graduate research.

Pruden Lab - Civil and Environmental Engineering
Chemical and Microbial Analysis of Engineered Systems within the Water Environment. Focuses on water chemistry, application of advanced molecular tools, environmental microbiology, and environmental engineering.

Roberts Glyco-Diversity Lab
The Roberts Glyco-Diversity Lab examines cell-surface sugar expression in diseases, such as cancer and central nervous system disorders.

Sanghani Center
The Sanghani Center for Artificial Intelligence and Data Analytics brings together computer scientists, engineers, and statisticians to meet the research and workforce needs of today’s data-driven society. We offer deeply technical undergraduate and graduate programs in analytics and our faculty conduct leading-edge research in visual and text-based data analytics, machine learning, and artificial intelligence. We study not just the algorithmic aspects of converting data to knowledge and of automated decision-making, but also human-AI collaboration and teaming, and the ethical and social aspects of AI.

VT Helmet Lab
Injury Biomechanics Lab
**Ware Advanced Engineering Design Lab**

Ware Lab is home to 10 top tier undergraduate teams that compete across North America. Teams include Formula SAE, Baja SAE, Steel Bridge, Human Powered Sub, and SailBOT, among others. Students from any major and academic level may participate with upper class men and women in an exciting and challenging design, build, test, and compete cycle.