Aerospace and Ocean Engineering Challenges and Opportunities | Ella Atkins
This presentation will describe the Aerospace and Ocean Engineering disciplines. Contemporary challenges in Advanced Air Mobility, Space Exploration, and Undersea Exploration will be presented. Opportunities in Virginia Tech student teams and research labs will be summarized along with the exciting career paths students have taken after graduation.

AI-ML based cattle behavior analysis | Sook Ha
Cattle movement and posture can be significant indicators of the animal’s health. Machine learning algorithms paired with computer vision can identify, classify, and link them to the symptoms of the particular problem, automatically issuing an alert.

Autonomous Drones for 3D Mapping of Underground Mines | Richard Bishop
The presentation highlights the cutting edge research in the Mining Engineering department developing UAVs for autonomous 3D mapping of underground mines. The slides contain many photos and videos of large underground mines that students and parents alike will find otherworldly and interesting.

Biological Systems Engineering | Priscilla Baker & BSE Student Ambassadors
BSE connects biology and engineering to solve complex, critical problems in sustainability, environmental protection, and human health. Our graduates develop engineering solutions that safeguard land and water resources, detect and prevent human diseases, and produce food, pharmaceuticals, and polymers.

CEED Pre-College Programs | Kim Lester
The Center for the Enhancement of Engineering Diversity offers a wide range of pre-college programs from middle to high school including both academic year and summer programs.

Chemical Engineering at Virginia Tech | Jeremy Wilson
The presentation provides a brief summary of what chemical engineering is, what sorts of jobs a chemical engineering degree prepares you for, and how the program is structured at Virginia Tech. Additional emphasis is placed on extracurricular opportunities for chemical engineering students.

Civil & Environmental Engineering | Dr. Scott Case, Kara Lattimer
How do we build sustainably for our future? Come find out about Civil & Environmental Engineering at Virginia Tech, where we focus on infrastructure solutions for our changing world!

Computer Science | CS Student Ambassadors
Learn all about CS at Virginia Tech is this overview of the Department of Computer Science that gives students and their loved ones an opportunity to receive information from a student perspective.
Constructing Success: A Glimpse into the World of Building Construction | George Reichard and Renee Ryan
During our experiential session, we'll dive into the dynamic world of construction management. Through an engaging activity and simulation, we'll unravel the complexities of construction projects and offer a glimpse into the innovative tools and technologies shaping the industry. Join us as we lay the foundation for your future success in the rewarding field of construction management!

Construction Engineering & Management--Building The Future | Sharon Williams & CEM Ambassadors
CEM students learn the intricate nuances of the design & construction industry. Foremost, they are problem-solvers, team players & visionaries who don't rely only on the way things have been done before. They try to make the world better by using 'green' sustainability practices, innovative technology & strong people skills on a daily basis. They work hard to turn "built environment" challenges into opportunities.

Controlling Light(Field) Matter Interaction Using Metamaterials | Jordan Budhu
When light interacts with the atoms in natural matter, different processes such as scattering and absorption cause the object to appear as it does to the observer. Imagine being able to 'play the almighty' and design matter atom by atom as if by tweezer in order to engineer a specific response to incident light. In metamaterials and metasurfaces, matter is assembled meta-atom by meta-atom to engineer a specific response to incident electromagnetic radiation. Since the wavelength of the incident radiation is long compared to the dimensions of the meta-atoms, the individual atoms cannot be resolved, and therefore the response of the metamaterial or metasurface is an aggregate or averaged one just as how light interacts with ordinary natural matter (remember that atoms have a breadth on the order of an angstrom whereas visible light has a wavelength of approximately 600nm or 6000 times longer than the atom). Hence, the meta-atoms can be designed individually and when placed into an array with subwavelength spacing, produce the macroscopic effect of complete field and wavefront control. Being able to completely control light-matter interaction allows for the creation of electromagnetic or optical illusions where a solid object, with its surface patterned in a particular way, will appear to an observer as a completely different object. Hence, you could go to pick up the object and would fumble, as it looks like a sphere but in reality, is a small cube for example. Or, in another example, a beam can be seen to completely disappear from one location in space and reappear in another spatially dislocated place as if it had teleported. In this talk, progress toward technologies that make these kinds of phenomena possible at microwave frequencies will be presented.

Electrical and Computer Engineering | Jaime De La Ree, Scott Dunning, and Virgilio Centeno
The presentation will provide an overview of the ECE Department and discuss the 12 unique majors offered by the department.
Electronic and Photonic Materials and Devices | Mantu Hudait

Shrinking feature sizes of silicon (Si) transistor has enabled increase in transistor densities and this rising number of transistors increases the power consumption in microprocessor. Currently, Apple iPhone 15 pro max has 19 billion and Apple watch ultra 2 has about 9 billion transistors. With the explosion of data transfer for the ever-growing demand in computing driven by high-performance cloud services, AI, Big Data, and internet-of-things (IoT), Cu (copper)-based electrical interconnects are rapidly becoming inefficient in meeting bandwidth requirements. Optical interconnects are highly desired for both inter- and intra-chip communications, where large volumes of data can be transferred at high speeds. Photons are excellent at carrying information at high speeds, while electrons are excellent at information processing. The question remains; can we integrate monolithically electronics with photonics? In this talk, I will present the recent development on the research work from our group that has the capacity for ultra-low power transistors and photonic devices on a single platform soon. There are many challenges one needs to overcome to achieve this long-standing dream.

Galileo and Hypatia Living-Learning Communities | Dr. DeAnna Katey

This will be an information session for anyone interested in joining the Galileo and Hypatia Living-Learning Communities.

Industrial and Systems Engineering (ISE): where people and engineering intersect. | Natalie Cherbaka & ISE Academic Advisors

Learn about the Industrial and Systems Engineering at Virginia Tech! Hear what you will do in the #3 ISE program in the United States and how it will provide you with a career in engineering, like no other.

Intelligent Equipment and Mine Blast Design | Erik Westman

Machine learning has been used with data from a smart drill rig to better map the differences in rock hardness. With this information, blast engineers can design blasts that break the rock evenly.

Interdisciplinary Projects and Capstones | Dr. Lisa McNair

Interdisciplinary projects are available to engineering students in both capstone courses and in first-year, sophomore, and junior levels. Project teams include engineering and students in other departments, as needed for achieving project goals. A wide range of current and future topics will be described.

Intro to the General Engineering Program | David Gray and James Newcomer

All COE students are enrolled in the General Engineering program their first year at VT. Here we will discuss the program, including course work, lab space, advising, resources, etc. that students need to know to prepare for their first year in the College.
iPhones, Electric Vehicles, and Renewable Energy – The Critical Role of Mining Engineering in Modern Society | Aaron Noble
Modern society is facing increased demand for small electronic devices, light weight metals, and high-performance batteries. All of these essential devices require extremely specialized raw materials that are difficult and expensive to mine and extract. The Mining and Minerals Engineering Department at Virginia Tech is world renowned for its teaching and research in critical materials production and separations. This presentation will describe some of this cutting-edge research and explain how new undergraduates can get involved through undergraduate research and internships.

Materials Design via Informatics: What Is It and Why Do We Need It? | Pinar Acar
This presentation will provide an overview of the importance of materials design for building next-generation engineering structures. I will briefly introduce some computational techniques, including AI/ML, that we use to perform computational design of materials for various applications.

Materials Science & Engineering Demo | MSE Student Ambassadors
Following the information sessions, MSE Student Ambassadors will give several demonstrations of various materials from electronics, metals, polymers and ceramics.

Materials Science & Engineering; everything is material. | Michelle Czamanske
Materials Science & Engineering (MSE) is the center of developing the next generation of materials and improving current materials. MSE is the center of all engineering; everything is made of materials.

Measuring the winds at the edge of space | Scott England
At the boundary between Earth’s atmosphere and the space around it, there is still a tenuous gas. Its motion - the winds - can be very strong and highly complex. Measuring the winds in this region requires satellite observations. This talk will share how these were made, and VT’s part in the design of the spacecraft and analysis of the data.

Mechanical Engineering | Sarah Deisher
Brief overview of ME department and majors/minors within. Hear from students about their experiences both on campus and in the work force.

Metal Casting Education and Research | Alan Druschitz
Metal casting classes and research are conducted at the Kroehling Advanced Materials Foundry at Virginia Tech. The classes are hands-on and students learn how to make molds, melt various metal alloys (aluminum, copper, iron), and pour their own castings. Mold filling and solidification analysis classes are also available. Students are encouraged to join the American Foundry Society and participate in society conferences and activities.

Nature has already solved many of the challenges that humankind face today. In this presentation, we show how nature-inspired fog harvesters, synthetic trees, and advanced materials can harvest energy and water in effective ways.

**Ocean Engineering: Undergraduate Program & Job Opportunities | Stefano Brizzolara**
Virginia Tech Ocean Engineering program is ranked at the top of the nation accredited programs and it prepares future ship designers and researchers for the US Navy, research labs and shipbuilding/shipping industry. Ocean Engineering is listed in the top five engineering degrees for job opportunities right after the UG degree. The presentations gives details about the hands on learning experience that the Aerospace and Ocean engineering department implements in the undergraduate and graduate programs and an overview of the specialization tracks that prepare OE graduate for the profession.

**Office of Undergraduate Admissions | Admissions Representative**
Admissions Overview

**Robotics and Machine Learning at VT | Dylan Losey**
Robots are changing the future of our society. Self-driving cars, assistive prostheses, and surgical robots are already here --- what will be next? This presentation highlights some of the robotics and machine learning research going on at Virginia Tech, and explains how students can get involved in these topics.

**Safety, Convenience, Equity – Automotive Research at Virginia Tech | Miguel Perez**
Think about how you have traveled around Virginia Tech today. Were you in a car or bus? Did you walk? Research underway at Virginia Tech intends to make these journeys safer, quicker, more efficient, and more equitable. Come find out how!

**Study Abroad Opportunities for First Year Engineering Students | Mariah Henderson**
This presentation will explore the study abroad opportunities for first year engineering students including the award-winning Rising Sophomore Abroad Program.

**Study Abroad Options for Engineers | Nicole Sanderlin**
COE's GEER office will present options for engineering students to gain a global experience. Students are able to study abroad (short-term or a full-semester), have a research experience abroad or participate in international service work. Planning ahead is key for engineers to have a global experience that enhances their degree program and keeps them on track for graduation.

**Subsurface Imaging, Infrastructure, and the Environment | Joseph Vantassel**
At present most engineering characterization of the earth’s near-surface (upper 100 ft) is accomplished by drilling vertical holes into the ground and visually inspecting the recovered earth material (soil and rock). However, on-going advances, make “seeing” into the earth non-invasively more feasible for engineering purposes. The presentation will
discuss recent advances in subsurface imaging at Virginia Tech and their implications for monitoring and restoring infrastructure and the environment.

VT Cyber Security Is a Team Sport | Rudy Falana
I will be giving a presentation about the College of Engineering's commitment to Cybersecurity. This will be a high-level presentation that will have a few visuals.

VT Green Engineering Program Overview | Sean McGinnis
The VT Green Engineering Program focuses on teaching concepts and skills to understand, analyze, and design solutions for the environmental impacts of engineering practices across disciplines. This presentation will review the academic, research, and outreach opportunities for Green Engineering as well as describe the benefits for students.

What is Biomedical Engineering? | Sara Arena
This presentation will give an overview of biomedical engineering, the curriculum at Virginia Tech, and opportunities for BME students. Student Ambassadors will also be available for a Q&A at the end of the session.