Majors in Engineering and Computer Science *and their* Career Pathways

Can't decide which engineering path is right for you? Check out the major-specific information below to help you determine which engineering major is right for you: biomedical, chemical, electrical, computer (hardware), or mechanical engineering; or computer science (with tracks in software, cyber security, or data).

Biomedical Engineering (BME)

Biomedical engineers use their knowledge of science, mathematics, physics, and engineering to design and create medical equipment, devices, artificial organs, software, and medical information systems. (Source: the Vault - a free resource to VCU students)

👀**Learn more here** - AIMBE Navigate the Circuit - an excellent resource about BME careers
🧭And here - Career Cornerstone - Bioengineering

💡**Typical interests & work styles - Who are biomedical engineers?** (Source: O*NET)

- Investigative and Realistic are descriptors of people who are interested in biomedical engineering. Take the Interest Profiler on O*Net to see how you compare.
- Work styles of biomedical engineers include being innovative, adaptable, achievement focused, curious, and attentive to detail. *Does this sound like you?*

🌎**Where do Biomedical Engineers Work?**

- See the list on Career Cornerstone and read on Navigate the Circuit of the companies and areas where BMEs are found, including Abbott, Boston Scientific, GE Healthcare, Medtronic and Johnson & Johnson.
- Search the web for the most up-to-date lists of Medical Device companies.

🎒**What's offered in BME at VCU?**

Check out this page: BME at VCU

🌟**Also take advantage of:**

- Research Labs run by BME professors often welcome undergraduate research assistants.
- VIP teams specific to BME students:
    - Acute Medical Care & Systems Strengthening in Low-Resource Settings
    - Medical Device Development and Prototyping
    - Smart Health Innovation and Neonatal Engineering

- Join engineering student organizations that further build your skills and network, especially:
    - Biomedical Engineering Society (BMES)
    - Hyperlabs

Chemical & Life Science Engineering (CLSE)

Chemical Engineers apply the principles of chemistry, biology, physics, and math to solve problems that involve the production or use of chemicals, fuel, drugs, food, and many other products. They design processes and equipment for large-scale manufacturing, plan and test production methods and byproducts treatment, and direct facility operations. (Source: Career Cornerstone)

👀Learn more at Career Cornerstone - Chemical Engineering

💡**Typical interests & work styles - who are chemical engineers?** (Source: O*NET)

- Investigative, Realistic, and Conventional are descriptors of people who are interested in chemical engineering. Take the Interest Profiler on O*Net to see how you compare.
- Work styles of chemical engineers include being innovative, achievement focused, curious, cautious, having integrity, and being attentive to detail. *Does this sound like you?*

🌎**Where do Chemical Engineers Work?**

- Jobs for chemical engineers are all over the US, with a good number of employers locally in the Richmond, VA area, including: DuPont, Smurfit WestRock, Cascades, Afton Chemical, Ashland Inc., AdvanSix, Haleon, Honeywell, Evonik, Veolia Water and more.
- See Career Cornerstone for listings of industries that hire chemical engineers. Everything from paints and paper to pharmaceuticals and enzymes require chemical engineers for their production.

🎒**What's offered in Chemical Engineering at VCU? Check out this CLSE page.**

🌟**Also take advantage of:**

- Research labs run by CLSE professors often welcome undergraduate research assistants.
- VIP teams specific to Chemical Engineering students include:
    - Aerosol-Enabled Nanomaterials Synthesis, Characterization & Application
    - Smart Fabrics
    - Sustain Lab
- Join engineering student organizations that further build your skills and network

- AIChE - American Institute of Chemical Engineers

Computer Engineering (CPE)

Computer Engineers (or computer hardware engineers) research, design, develop, test, and oversee the manufacture and installation of computer hardware, including computer chips, circuit boards, computer systems, and related equipment such as keyboards, routers, and printers. This major should not be confused with computer science majors, who design and develop the software systems that control computers. (Source: Career Cornerstone)

👀**Learn more at** Career Cornerstone - Computer Engineering

💡**Typical interests & work styles - Who are computer engineers?** (Source: O*NET)

- Realistic, Investigative, and Conventional are descriptors of people who are interested in computer engineering. Take the Interest Profiler on O*Net to see how you compare.
- Work styles of computer engineers include being innovative, adaptable, achievement focused, curious, attentive to detail, and dependable.

🌎**Where do Computer Engineers Work?**

- See Career Cornerstone for industries and companies that hire computer engineers. In Virginia, students in this major often find work in the defense industry and in controls engineering roles in manufacturing environments.

🎒**What's offered in Computer Engineering at VCU? Check out** this page.

🌟**Also take advantage of:**

- Research labs run by Electrical & Computer Engineering professors often welcome undergraduate research assistants.
- VIP teams specific to Computer Engineering students include:
  - Cyber Physical Systems and Trusted Autonomy
  - HyperRAMS - Hyper Robotics, Autonomous & Mechatronics Systems
  - Intelligent Green-Powered Cities
  - Intelligent Vision Technologies
  - Smart Cities
- Join engineering student organizations that further build your skills and network
  - IEEE
  - HyperLabs

Electrical Engineering (EE)

Electrical Engineers apply their knowledge of the sciences to working with equipment that produces and distributes electricity, such as generators, transmission lines, and transformers. They also design, develop, and manufacture electric motors, electrical machinery, and ignition systems for automobiles, aircraft, and other engines. (from the Vault, a subscription-based resource offered free to VCU students)

👀**Learn more at** Career Cornerstone - Electrical Engineering

💡**Typical interests & work styles -** Who are Electrica Engineers? (Source: O*NET)

- Realistic, Investigative, and Conventional are descriptors of people who are interested in electrical engineering. Take the Interest Profiler on O*Net to see how you compare.
- Work styles of electrical engineers include being innovative, achievement focused, curious, cautious, attentive to detail, and dependable.

🌎**Where do Electrcial Engineers Work?**

- Electrical Engineers (EEs) are in high demand and work throughout the USA. In Virginia, many EEs work in the defense industry in Northern VA, in power generation for companies like Dominion Energy, in construction and data centers, and in aerospace.
- Other industries, mostly outside VA, include automotive, bioengineering, semiconductors and telecommunications like satellites.

🎒**What's offered in Electrical Engineering at VCU? Check out** this page.

🌟**Also take advantage of:**

- Research labs run by Electrical & Computer Engineering professors often welcome undergraduate research assistants.
- VIP teams specific to Electrical Engineering students:
    - Cyber Physical Systems and Trusted Autonomy
    - HyperRAMS - Hyper Robotics, Autonomous & Mechatronics Systems
    - Intelligent Green-Powered Cities
    - Intelligent Vision Technologies
    - Smart Cities
    - Collaborative UAVs
- Join engineering student organizations that further build your skills and network
    - IEEE

Mechanical Engineering (ME) *and* Mechanical with a Nuclear Concentration (MNE)

Mechanical Engineering is one of the largest, broadest, and oldest engineering disciplines. Mechanical engineers use the principles of energy, materials, and mechanics to design and manufacture machines and devices of all types. They create the processes and systems that drive technology and industry.
🔑The key characteristics of the profession are its breadth, flexibility, and individuality. The career paths of mechanical engineers are largely determined by individual choices, a decided advantage in a changing world. (Source: Career Cornerstone)

⚛️***Nuclear Engineers*** research and develop the processes, instruments, and systems used to derive benefits from nuclear energy and radiation. They design, develop, monitor, and operate nuclear plants to generate power. They may work on the nuclear fuel cycle -- the production, handling, and use of nuclear fuel and the safe disposal of waste produced -- or on the development of fusion energy.

Some specialize in the development of nuclear power sources for naval vessels or spacecraft; others find industrial and medical uses for radioactive materials -- for example, in equipment used to diagnose and treat medical problems. (Source: Career Cornerstone)

👀 **Learn more at** Career Cornerstone - Mechanical Engineering or Career Cornerstone - Nuclear Engr

💡**Typical interests & work styles - Who are mechanical engineers?** (Source: O*NET)

- Realistic, Investigative, and Conventional are descriptors of people who are interested in mechanical engineering. Take the Interest Profiler on O*Net to see how you compare.
- Work styles of mechanical engineers include being innovative, curious, cautious, attentive to detail, and dependable. *Does this sound like you?*

⚛️ **Who are Nuclear Engineers?** (Source: O*Net)

- Investigative, Realistic and Conventional are descriptors of nuclear engineers and their work styles include perseverance, stress tolerance, self-control, achievement, curiosity, caution, integrity, attention to detail, and dependability. *Does this sound like you?*

🌎**Where do Mechanical Engineers Work? How those with a Nuclear concentration?**

- Jobs for Mechanical Engineers can be found throughout the USA. In Virginia, MEs are hired into industries such as aerospace, energy, manufacturing, defense, design, and construction.
- Outside of VA, industries that hire Mechanical Engineers include automotive and bioengineering. See this list of employers on Career Cornerstone.
- Mechanical Engineering with Nuclear concentration students are often employed by Dominion Energy, Newport News Shipbuilding, BWX Technologies, and Framatome in VA. Outside VA, options include Y-12 National Security Complex, the Nuclear Regulatory Agency in DC, and more.

🎒**What's offered in Mechanical Engineering (ME) at VCU? Check out** this page for ME.
⚛️**What's offered in Mechanical with a Nuclear concentration? Check out** this page for MNE.

🌟**Also take advantage of:**

- Research labs run by Mechanical and Nuclear Professors often welcome undergrad research assistants.
- VIP teams specific to Mechanical or Nuclear Engineering students include:
  - Developing Neutron Transport Code Framework & Beyond (Nuclear)
  - Magnetocaloric Devices for Solid State Cooling & Energy Harvesting
  - 4D Printing and Beyond
  - Advanced Superhard Materials
  - Formula SAE at VCU
- Join engineering student organizations that further build your skills and network
  - ASME - American Society of Mechanical Engineers
  - ANS - American Nuclear Society
  - Ram Racing
  - Ram Rocketry
  - HyperLabs

Computer Science (CS)

Tracks in CS at VCU include: Cyber Security, Software Engineering, and Data Science

Computer Scientists are the designers, creators, and inventors of new software technology. By creating new technology, or finding alternative uses for existing resources, they solve complex business, scientific, and general computing problems. (from Career Cornerstone)

👀Learn more at Career Cornerstone - Computer Science.

💡**Typical interests & work styles** - (from O*NET)

🧑‍💻 *Who are Software Engineers?*

- Investigative, Conventional and Realistic are descriptors of people who are interested in software engineering. Take the Interest Profiler on O*Net to see how you compare.
- Work styles of software engineers include being innovative, adaptable, achievement focused, curious, attentive to detail, and dependable.

📊 *Who are Data Scientists?*

- Data Scientists are more Investigative and Conventional, with work styles that lean toward innovation, achievement, curiosity, integrity, attention to detail and dependability.

💾 *Who are Cybersecurity engineers?*

- Cybersecurity professionals tend to be Conventional and Investigative, with work styles that lean toward initiative, innovation, perseverance, adaptability, achievement, curiosity, cautiousness, integrity, attention to detail and dependability.

🌎**Where do Computer Science majors work?**

- Roles in software engineering, data and cybersecurity exist in the majority of mid to large-sized companies. Many non-tech industries have large workforces in these areas, including banking, healthcare, airlines, insurance, and government. Additionally, there are companies of all sizes that specialize in these areas, from tech giants, like Google and Facebook, to mid-sized and small start-up firms.
- See a short list of industries and companies on Career Cornerstone.
- A fun place to look at companies is on the muse, a career website with company profiles.

🎒**What's offered in Computer Science at VCU? Check out this page.**

🌟**Also take advantage of:**

- Research labs run by Computer Science professors often welcome undergraduate research assistants
- VIP teams specific to Computer Science students include:
  - Modeling and Data Analytics
  - Nanoinformatics
  - End User Programming for Cyber-Physical Systems
- Join engineering student organizations that further build your skills and network
  - RamDev- Software Development
  - LUG - Linux Users Group
  - Cybersecurity Club
  - Competitive Coding Club