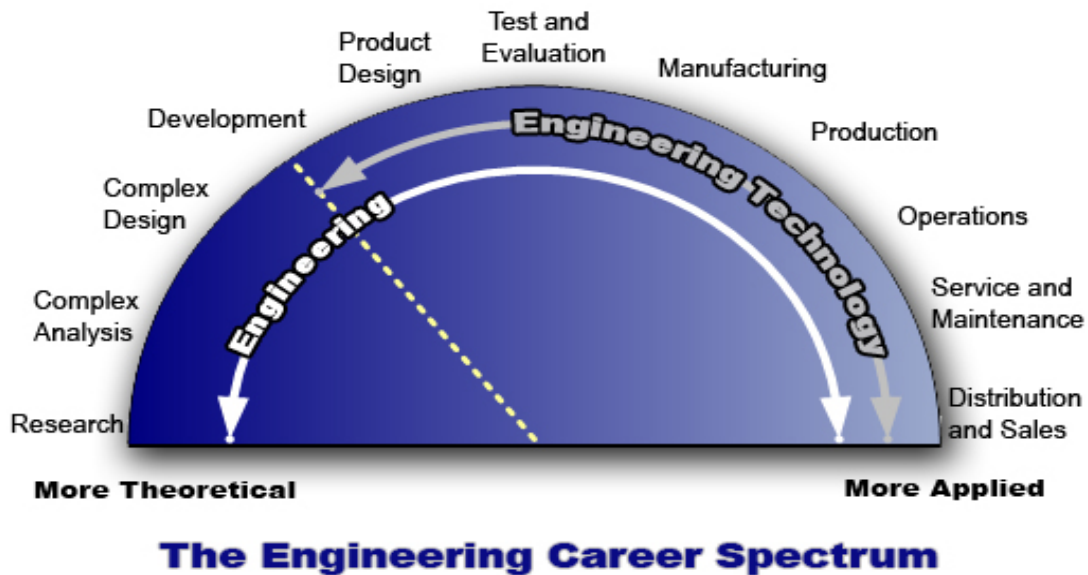


Engineering Career Pathways

When deciding on which engineering jobs fit you, consider three things: **function, industry, & location.**



Start with Job Function:

Engineering Functions

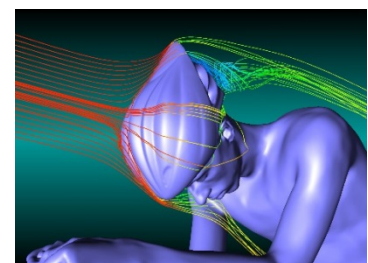
Research

- Research engineers are knowledgeable in principles of chemistry, biology, physics, and mathematics.
- Masters Degree is almost always required, and a Ph. D is often strongly recommended.



Analysis

- Analysis engineers use computational tools and mathematical models to enrich the work of design and research engineers.
- Analysis engineers typically have a mastery of: heat transfer, fluid flow, vibrations, dynamics, acoustics, and many other system characteristics.



Design

- The design aspect is where the largest number of engineers are employed.
- Design engineers work on components of a product, providing all the necessary specifics needed to successfully manufacture the product.
- Design engineers regularly use computer design software and computer aided drafting software in their jobs.



- Design engineers must verify that the part meets reliability and safety standards required for the product, as well as the cost effectiveness.

Development

- Development engineers bridge the gap between the laboratory and the production facility. They also identify problems in a potential product by building prototypes.
- A example is the development of concept cars for companies like Ford and GM.



Testing

- Testing engineers are responsible for testing the durability and reliability of a product and making sure that it performs how it is supposed to. Testing engineers simulate instances and environments in which a product would be used.
- Crash testing of a vehicle to observe effects of an air bag and crumple zone are examples of a testing engineer's duties.



Systems

- Responsible on a larger scale for bringing together components of parts from design engineers to make a complete product.
- Responsible for making sure all components of a product work together as was intended by the design engineers.

Manufacturing & Construction

- Work individually or in teams and are responsible for transforming raw materials into finished product.
- Keep records of processes and equipment and help with design process to keep costs low.



Operations & Maintenance

- Responsible for setting up and maintaining the production line.
- Must have technical know-how to deal with problems.
- Responsible for inspecting the facility and equipment. Must be certified in various inspection methods.



Technical Support

- Works between sales, customers and producers.
- Typically will have knowledge of the technical aspects of product and must have good interpersonal skills.



Sales

- Sales engineers have technical background, but are also able to communicate effectively with customers.
- The job market for sales engineers is growing, due to the fact that products are becoming more and more technically complex.



Consulting

- Consultants are either self-employed, or work for a firm that does not directly manufacture products.
- Consulting engineers might be involved in design, installation, and upkeep of a product.
- Sometimes required to be registered professional engineer in the state where he/she works.
- Consultants are typically required to have expertise within the areas where they are consulting.



Note: At smaller companies, a single engineer will tend to do most of these functions. At larger companies, especially if working on large scale projects, an engineer will tend to work mostly within one functional area.

Source: Central Conn State Univ –Engineering Functions, Dec 2010

Consider the **Industry** that might interest you:

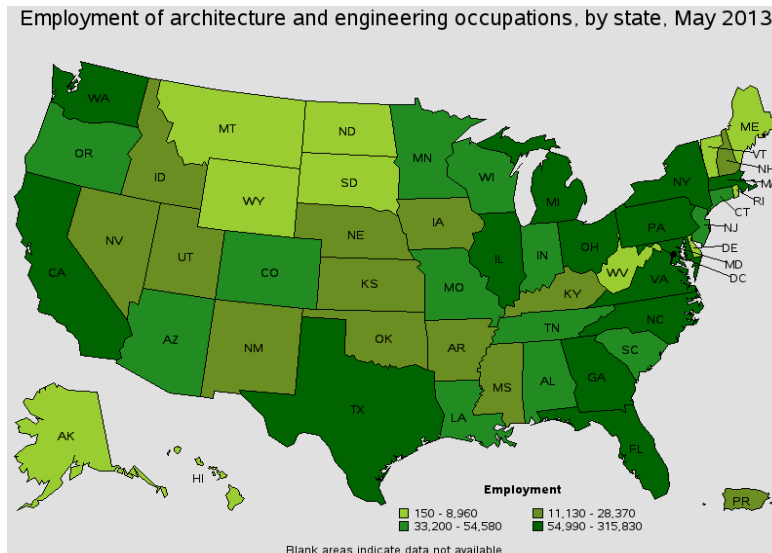
Industry

- | | |
|-----------------------------|-----------------------------|
| ■ Food Manufacturing | ■ Energy |
| ■ Chemical Manufacturing | ■ Automotive |
| ■ Biotechnology | ■ Oil & Gas |
| ■ Consumer Products | ■ Transportation |
| ■ Electric Power Generation | ■ Information |
| ■ HVAC | ■ Education |
| ■ Pharmaceutical | ■ Healthcare |
| ■ Telecommunications | ■ Government |
| ■ Water & Sewer Utilities | ■ Defense |
| ■ Semiconductor | ■ Professional & Scientific |

This is just a short list to get you thinking. To look at more industries or to explore companies within industries, go to <http://guides.library.vcu.edu/company> or contact our careers librarian, Bettina Peacemaker at bjpeacemaker@vcu.edu

Location

Consider where the industry and the chosen function take place. Some jobs are very location-specific (like the oil & petroleum industry being centered in Texas), while others are done in many geographic locations (like construction).



Source: Bureau of Labor Statistics, US Dept of Labor, http://www.bls.gov/oes/current/map_changer.htm, Aug 2014

The map above is from the Bureau of Labor Statistics. On that page, you can change the type of work to specific engineering concentrations and you can search by major metropolitan area (MSA).

Go to: http://www.bls.gov/oes/current/map_changer.htm

Resources to help:

Other useful sources of information on career options and descriptions of careers:

Career Cornerstone www.careercornerstone.org

MyPlan.com <http://www.myplan.com/careers/browse-by-major/engineering-28.html>

Also, the websites for Professional Engineering Associations can offer much information. Just do a search for the organizations below by title and explore their pages:

- ASME (Mechanical Engineers)
- ANS (Nuclear Engineers)
- IEEE (Electrical & Computer Engineers)
- ACM (Computer Science)
- AIChE (Chemical Engineers)
- BMES (Biomedical Engineers)

Want some help? Contact the Engineering Career Center in Snead Hall B1102! Call 804-827-1801

Visit the blog: wp.vcu.edu/egrcareerservices/

Come to Walk-in Hours:

Tuesdays & Wednesdays 10:00 am – 12:00 noon

Thursdays 1:30 pm – 3:30 pm

Make an appointment with your career advisor: go to HireVCURams and click on “Make Appointment”