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Introduction

A career takes time, effort, and commitment. It will occupy your days and in some cases, when the situation demands, your nights. It might take you to exciting places and bring you into contact with a wide variety of people. It can be life changing and life defining, so it's important to find an engineering career that you enjoy.

Our Industry Series is designed to provide an introduction to some of the most exciting industries today - aerospace, automotive, energy, healthcare, and consumer sporting goods. These are industries where engineers and their particular skill sets are in high demand. Each module highlights the impact and role of engineers in the industry, recommends strategies for pursuing a career in the field, and offers a wealth of references and resources to get you started.

Career Potential

The future for those pursuing an engineering career is a bright one. The global presence of engineers is at an all-time high. According to the American Society for Engineering Education, more than 1.2 million engineers work in the United States today. Add that to the over 3 million engineers working in the European Union, the almost 1 million graduating in China and India annually and you might think there would be plenty of supply to meet demand. But in fact, the Bureau of Labor Statistics predicts that the job market for engineers will increase faster than the overall market average through 2014. Why is the need for engineering skills and abilities so great?

Because innovations and technological advances are becoming increasingly important to success in the market place, and it is engineers that push the technological and creative boundaries that result in those innovations. They produce cleaner transport, improved medical treatments, new fuel sources, more cost-effective manufacturing plants, streamlined, safer sports equipment, and much more. Engineers helped define the 20th century - developing everything from automobiles to computers to heart valves - and it

Educational Goals:

After completion of this module, you should:

- Have a greater understanding of career choices available to engineers across industries and job functions
- Be prepared to build and utilize a network of contacts
- Learn how to enhance your value as a potential employee
- Learn how to leverage work experience in the job market
- Have a greater understanding of how to prepare for career advancement.

will be engineers that do the same in the 21st century.

Job vs. Career

There is a difference between developing a career and just getting a job. You can get an engineering position by completing an engineering degree, responding to job ads, and successfully interviewing. Developing a career - working in a field that excites you and that brings you job satisfaction - requires a more complete plan of action. This module, along with the others in the Industry Series, can help you map out that plan and offer advice both on important job-hunting tactics to get you started on the right career path and on strategies on getting ahead.

A job search is exciting, time-consuming, and unsettling all at the same time. The first thing to think about is what sort of work you envision doing. Then you need a plan to go out and get it. You always need to keep your next step in mind. Each position you have will serve as a launch pad for the next phase of your life. Our Industry Series can help you plan ahead. Having a strategy in place will make your job hunt more manageable, more enjoyable, and ultimately more rewarding.



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Choose Your Path

Overview

The first phase of any job search - for new as well as more experienced engineers - is deciding what kind of position you are looking for. Whether you are pursuing that first job on the career ladder or looking for the job that will take you career in a new direction, the first things to consider is what industry you want to work in and what type of work you want to do there. Engineers today play many important roles in industries of all kinds - so whether you've known from the start what industry you want to pursue or whether you need to do some exploration, your choices are limited only by your interest and willingness to apply.

Engineering offers such a wide range of potential career directions across so many industries that you might feel slightly daunted at the prospect. So, where to begin?



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Choose Your Path

Industry Sectors

When selecting a career path, one of the important considerations is which industry to work in. In doing so, you should examine how to make the most of your strengths and previous experiences, while also considering your extracurricular interests and fields you are passionate about.

If you've always been interested in space exploration, an engineering position at a major aerospace manufacturer may be right for you. If you are passionate about soccer, you may consider working in the sporting goods industry. While the materials and products they work with may vary from industry to industry, engineers are in demand across almost the entire spectrum of commerce, and that same combination of personal and professional interest can be achieved within many of the key engineering functions.

In the other Industry Series modules, you'll find more information on the roles that engineers play in the following fields:

- [Aerospace Industry](#)
- [Automotive Industry](#)
- [Consumer Sporting Goods](#)
- [Energy Industry](#)
- [Healthcare Industry](#)



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Choose Your Path

Job Functions

The other important factor in deciding on which position to pursue is the job function. Are you constantly thinking of improvements for existing products, or feel your creative juices flowing when you are designing a new item or component? Do you enjoy conducting experiments? Developing solutions? Making process improvements? Think about the sorts of tasks and challenges that excite you. After all, you'll be spending a considerable amount of time and effort on your job so it should be something you feel passionately about.

Focusing not on a change of industry but on a change of job function is also a good way to set your career off in a new direction. Maybe you're a sporting goods equipment design engineer who wants to move into packaging. You've got the experience with the designs and materials that the packaging is intended to protect and market. With your in-depth knowledge of the product and its attributes, you can bring a great deal of insight to the packaging and presentation of those products in the marketplace. Even if your direct experience is in a different engineering discipline, your industry experience can be leveraged to great effect to help you make that change.

Engineers play an important role across the entire spectrum of industry operations. Below are some examples to give you an idea of the types of engineering job functions available in a wide variety of fields.

Design engineers create the ideas and innovations that lead to the new and improved products and systems. They develop concepts and then generate the detailed plans and specifications used to build first the prototype, and finally the end product.

Manufacturing engineers develop the processes that ensure that the final product meets the design and consumer requirements consistently, efficiently, on time, and on budget. Manufacturing is an



enormous sector in the world economy and if you stop and think of all the things around you that require manufacturing - cars, shoes, 3-ring-binders, oil pipelines, hypodermic needles, cell phones - you'll get an idea of how in demand an engineer in this discipline is.

The manufacturing engineer will assess the feasibility, costs and logistics involved in bringing the idea to life. The manufacturing engineering will:

- Find the best sources for materials - the metals, plastics, ceramics, etc.
- Decide how and where to assemble the components and manufacture the final product.
- Establish which systems and tools - including industrial robots and factory automation - are the most appropriate. If the systems do not exist, they must design and build the tools they need.

Industrial engineers will often be found working together with manufacturing engineers but industrial engineers can be found working in many fields that have no manufacturing element at all such as healthcare, the media, banking and financial operations. Industrial engineers work to eliminate wasted time, money, labor, energy, and materials, making processes more efficient. This makes them a valuable asset to any company looking to compete effectively and profitably. Some of their tasks include:

- Analyzing, evaluating, and suggesting improvements of production methods.
- Developing recommendations for allocation of labor and resources.
- Designing plans to shorten supply chains, and streamline reporting procedures.

Quality assurance and testing engineers are responsible for ensuring that the final product meets the highest standards of safety and quality, as mandated both by the company and by industry standards. They examine everything from the raw materials to final assembly.

The potential paths for engineers just starting out or looking to change career direction are numerous. Even after you've settled on which engineering function you wish to pursue, you'll find the variety of choices as far as industry, location, and potential just as broad. Our Industry Series can tell you more about what role engineers play in some specific industries. Using the research and resources provided

here, you will discover that engineering also lies at the center of many, many more fields.



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Research

Overview

Any effective job search starts with the prep work: learning about the industry or field, locating the jobs, discovering what companies are looking for, where the next innovations are coming from and what the potential for growth is across various engineering disciplines.

Whether you are researching an industry, a job category, or a particular employer, you will be acquiring information to help you make an informed decision about the direction of your job search. The information you gain while conducting this research will help you craft a resume that stands out and reflects your knowledge of the field. It will also impress the prospective employer during interviews, communicating to them that you are knowledgeable about the industry, serious about your job search, and genuinely interested in their organization.

So, how will you find out what areas to focus on and where each company's interests and strengths lie? With research.

Industry News

If you're interested in exploring a particular industry more in depth, you need to know more about what's happening specifically with the key players in the field, as well the more general industry-wide trends. Which company has introduced a new blockbuster product? Which firm just bought out which? Which CEO has just stepped down?

- **Newspapers:** Begin by scanning your local newspaper's business section, as well as the business coverage in national and international news outlets like the [New York Times](#), the [Wall Street Journal](#), [BBC News Online](#), or [CNN](#). But don't stop at the business section. Many industries are newsmakers in and of themselves. For example, you're likely to find coverage of the pharmaceutical industry in the science section, or the



energy industry making headlines in political sections.

- **Trade Publications:** Another set of publications to review regularly are the industry trade magazines. Magazines like these report on all facets of a particular industry and can help you start researching the companies you intend to target. Information in these publications is generally the most current information available on new products and innovations. In the industry modules to follow, we provide industry-specific trade publications and other resources to help you with your research.

Corporate Profiles and History

- **In print:** Company information, profiles, and overviews can be found in print publications like Standard and Poor's Register of Corporations, Ward's Business Directory of Largest U.S. Companies, and local Chamber of Commerce and state manufacturers' directories.
- **On campus:** Your school's Office of Career Services is an excellent resource for this sort of information as well since many offer access to a library of corporate or business research materials and employer recruiting literature.
- **Online:** Online business information sites like [Hoover's Online](#) gives overviews of the companies, their top executives, and their competitors. Career information sites like [The Vault](#) or [Wet Feet](#) provide industry hiring and salary trends, reviews of companies from current and potential employees as well as job listings.

Once you've identified a few companies that you think you'd be interested in working for, visit their websites to gain more information. Most company websites include not only information on product lines but also company history. In addition to providing information about the company itself, most company websites also have links for employment opportunities.



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Research

Job Listings

For people looking for jobs online, the choice of where to start has never been greater. Every day new job portals pop up, and listings are constantly in flux. All this choice might seem a little daunting but here are some suggestions to help you find a good place to start.

You can find a wide array of jobs in many industries on the large general job-listing sites like the ones listed below. It's worth looking at them-if only to get a sense of the range of engineering positions that are available at any given time.

- [Career Builder](#)
- [Job Web](#)
- [Monster](#)
- [The Vault](#)
- [Yahoo! HotJobs](#)

If you don't see a specific listing on the general sites that catches your interest, there are many more places to search. Some companies prefer listing their available engineering positions on sites that cater specifically to engineers or which focus on a particular region or industry, such as:

- [ASME Career Center](#)
- [Career Engineer](#)
- [Dice](#) - career website for technology and engineering professionals
- [Engineer Jobs](#)
- [USA Jobs](#) - the Federal Government's official one-stop source for Federal employment

Don't limit yourself to looking at online job listings however. Other opportunities will be listed in professional publications, industry



magazines and journals or will be found through specialized employment and search agencies.

For more information on industry-specific job listings for the aerospace, pharmaceutical, automotive, energy, or consumer goods industries, please review the rest of the modules in the Industry Series.



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University Resources

We've already touched on the company research information available at many college Career Services offices. The advisors working there are also an excellent source for career development help of many other kinds. Whether you're in the early stages of developing your career plans or you're looking to take your existing career in a new direction, these departments offer assistance that both alumni and students will find invaluable such as:

- Information on local co-op and internship opportunities
- Group and one-on-one career counseling
- Recruitment programs and job fairs
- Research materials, self-assessment guides and job listings
- Workshops on resume writing, interviewing techniques and other job search planning assistance

For alumni, the Career Services office is also available - often in conjunction with the Alumni Association - to provide career strategy consultations and networking opportunities. They also bring alumni and students together through mentoring programs where alumni volunteer to provide guidance to students.



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Networking

Many people dismiss networking as simply "asking around" but it's much more than that - it can be the key to hearing about a job before other job seekers do, to standing out in a crowd of applicants and to getting ahead in your chosen field.

As Job Search Tool

It's important to use networking and job-listing research in conjunction with each other. You might be shocked to learn that over 75% of available positions are never publicly advertised and most are filled via word of mouth. With percentages like that, you can see what a vital tool networking is for getting as much information as possible and for finding the right job. Networking means that you can link yourself with someone known to the hiring manager. This type of "insider" connection means you will have an edge in your first interview over an applicant who is just one of many names on a list.

As Learning Opportunity

Hearing the first-hand experiences and impressions of someone in the industry where you want to work gives you an insider's view of a job that's hard to beat. It also gives you leads for your research and can lead you to information you wouldn't have otherwise found or known existed.

As Ongoing Practice

Networking is also a valuable tool that can help you as you move forward in your career. Two great ways to make networking part of your regular workplace experience are rotational programs, and professional and trade association memberships. Many companies - particularly larger ones - have formal rotational programs that offer new graduates an opportunity to experience more than one aspect of the firm and get a broader view of their industry as a whole. Not only will these programs expose you to different areas of the company, they'll bring you into contact with more people from different departments as well. Professional societies offer the opportunity to meet and network with industry professionals, and these activities can



be of tremendous help in making valuable contacts and staying abreast of new developments in your chosen field.

Make the Most of Networking

- Be prepared to talk about your talents, skills, and career goals with confidence. Show passion about your future so your contact feels confident about recommending you to people they know.
- Be succinct. You want to be informative but not long-winded.
- Instead of asking about specific jobs, ask for and listen to advice. People love giving advice and talking about their own achievements, so ask about their backgrounds and professional choices and try to take lessons from what you hear.
- Keep business cards with contact information with you at all times and make sure to ask politely for cards in return.
- Shortly after meeting a new contact, follow up with an email telling them how much you appreciate the time they took to speak with you and how you enjoyed your meeting.
- Keep at it. Networking as a career development tool does not stop once you get your first job. It will be a valuable way to help you move up the career ladder.

Networking can happen anywhere and at anytime. You never know who might be useful to you in your career search. It might be the person sitting next to you on an airplane, the interviewer at a job fair, or a relative you see at a family event. You should always be ready to network.



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Leveraging Your Experiences

No matter where you are on the career ladder, your work experiences and internships will help you in the increasingly competitive job market. All work experiences are a great source for networking, expanding your skill set and knowledge base, and broadening the scope of your employment history.

Leveraging Internships

Internships will give you an understanding of workplace facilities and processes related to your field of interest, and even let you "try out" industries if you aren't sure yet which you'd like to focus on. Internships can even lead directly to job offers. Many employers look to their interns first when hiring new graduates. The National Association of Colleges and Employers conducted a survey in 2006 that found that more than half of all students at companies surveyed were offered a full-time job after completing their internship.

Other Benefits of Internships:

- Searching for the right internship is good practice for the job search later on. You'll get a better sense of what's involved in researching companies and have better understanding of the industry.
- The hands-on experience will give you self-confidence. You'll be more comfortable and informed during job interviews and when discussing your career plans with potential employers as well as people you find via networking.
- The people you meet and work with during your internships can be a valuable resource throughout your career.

Our Industry Series has some resources for finding both internships and full-time positions specifically in the aerospace, healthcare, automotive, energy, and consumer goods industries. However, if your



interests lie with alternate industries, with some research you can find these types of opportunities and resources for your industry of choice.

For Careers in Transition

Previous work experiences, including internships, will help you should you decide to change career paths as the skills you develop working are often transferable between industries.

For example, an aerospace experience could potentially help you in pursuing a career in the sports equipment sector, if you can find commonalities between the two industries and the skills you have gained. With aerospace and sporting goods, that might be experience in aerodynamics. An aerospace experience that exposes you to aerodynamics testing or analysis can be of tremendous benefit when you go to apply for that job at the hottest new snowboard manufacturer.

Leveraging Non-technical Skills

And don't forget about the non-technical skills you've gained. These qualities - such as communication and collaboration skills, leadership potential, and willingness to take initiative - are often considered just as important as educational background and work history when employers are deciding on potential hires. These skills can play to your advantage when highlighted in your resume, during your interview, and when networking.

For more information on developing these valuable non-technical skills, review some of our other modules in the Management & Leadership Series and Communications Series.



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Getting Ahead

Having a career instead of just a job takes ongoing attention and is always a work in progress. If you're thinking about transitioning to a new career path, you must constantly be on the lookout for opportunities to leverage the experience you have in new ways. If you're just starting out, be aware that career planning doesn't stop once you've signed on the dotted line. Stay informed about what's happening in your field, keep up with new techniques and discoveries, and see how advances and changes in other fields will influence the work that you do.

Keep Your Resume Fresh

Even if you're not actively hunting for a new job, keep your resume current and up-to-date.

- Having your most current information in hand and ready to go means that should a great opportunity come along, you are ready to move on it immediately.
- Adding information on new skills mastered, notable accomplishments, new or expanded job duties, and recent certifications as you go also ensures that your resume is as complete as possible. It's not always easy to remember accomplishments days, months, or even years later.
- For engineers looking to shift into a new industry, a fresh resume that shifts the focus from field to function can highlight how the experience you have gained elsewhere can be applied to a new position you are seeking.

Create a Work Portfolio

Make a point of gathering job descriptions, performance appraisals and reviews so you can see how you have changed and developed from job to job, and year to year. Also collect any documents that are evidence of achievements and positive feedback. This may be letters



of referral or a recommendation from your superior, notes of praise from colleagues, mentions in trade publications or samples of your work.

- Your work portfolio will help you craft a better resume and give you context to present your work and personal development more effectively during interviews.
- Reviewing this material regularly may also illustrate to you potential career directions when and if you decide a change in direction is in order.
- Having examples of your recent achievements will help not only during a job search but during performance reviews at your current position as well.

Continuing Education

Success in the engineering field means keeping your skills sharp and your knowledge current with recent technological trends. A great way to ensure that you're up on the latest news, processes, and innovations is by looking into continuing education options like online classes, seminars, and conferences.

Keep Up With News

By virtue of the type of work they do, engineers are often working with an industry's newest discoveries and improvements so it's important to continue your news and trade publication reading. Keep abreast of what's happening, not only in your own company but with the competition as well.

Networking

We've already discussed how important networking is in all stages of your career but it's well worth mentioning again. Professional and trade association memberships, participation in mentoring programs and volunteer opportunities will enable you to build a vital and valuable series of connections that will expand your knowledge, extend your career potential and keep you informed of the latest news and innovations from your engineering colleagues.



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Summary

Our Industry Series describes only a few of the ways in which engineering has been at the heart of innovations that have changed the way we live, work, travel, communicate, and even the way we exercise and have fun. Today, when success in the global economy is tied to a willingness and ability to research, develop, and apply new technologies, there are more engineering opportunities than ever. There are positions offered all over the world, working with diverse groups of people and on a breathtaking variety of projects. This module, together with the others in the series, is designed to help you navigate through this sometimes daunting array of choices.

Even before the job search itself begins, you must ask yourself what it is that you want to do. You may already know this. Some people know from a young age exactly what they want to do. The rest of us have to explore a little. Gaining knowledge and experience in as many facets of engineering as possible is a good solid base from which to launch any career. As a start, you may want to review the following industry modules in this series:

- [Aerospace Industry](#)
- [Automotive Industry](#)
- [Consumer Sporting Goods](#)
- [Energy Industry](#)
- [Healthcare Industry](#)

Once you've selected the type of job you want, your job search begins in earnest. Job listings in industry publications and online job sites, career counseling offices, professional associations, co-workers, faculty, friends, and family are all good resources for gathering information to help you achieve your goal. Approach the whole project as carefully as you would an engineering problem. Conduct your research. Design and develop a plan. Manufacture your resumes and cover letters. Produce your final product - you - at interviews, and then follow up afterwards to see if you can make any improvements for the next time.



Whether you're on the verge of graduation or poised to take your career in a new direction, taking the time to plan an effective job search can help ensure you get the right job to start you on a new and exciting path.

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