

2018

Career Readiness for Engineering Students:

What you should know about being an engineering professional and finding a job in today's economy

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Introduction

Career readiness is a top concern for educational professionals. At the same time, it can be difficult to determine what tools and resources students need to successfully transition into the workplace. This is particularly true for the rapidly evolving world of engineering.

In this whitepaper, we discuss some of the most important things for engineering students to know as they begin building their careers. From the state of the industry to necessary interview skills, this whitepaper provides a foundational overview to the many facets of career readiness for engineering students.

What is career readiness?

According to the National Association of Colleges and Employers (NACE), career readiness is “the attainment and demonstration of requisite competencies that broadly prepare college graduates for a successful transition into the workplace.”¹

¹ Definition from NACE website,
<http://www.nacweb.org/career-readiness/competencies/career-readiness-defined/>

Understanding the industry

A crucial element of being prepared to enter the workforce is understanding what's going on in the industry as a whole – a difficult topic for even the most seasoned professional. The engineering industry, in particular, is experiencing major changes that will have far reaching impacts for years to come.

Two important things for students preparing to enter the engineering workforce to understand are the implications of rapid technological advancement and the growing skills gap. Understanding the challenges these factors present, as well as the impacts they may have on the industry, helps students determine the path that is right for them now and adapt as time passes.

Engineering the Fourth Industrial Revolution

Rapidly evolving technology and cyber-physical systems (CPS), such as the internet of things (IoT), machine learning (ML), and artificial intelligence (AI), are the driving forces behind the Fourth Industrial Revolution. As CPSs are used more prominently to automate a variety of day-to-day tasks, many fear the loss of engineering jobs to automation.

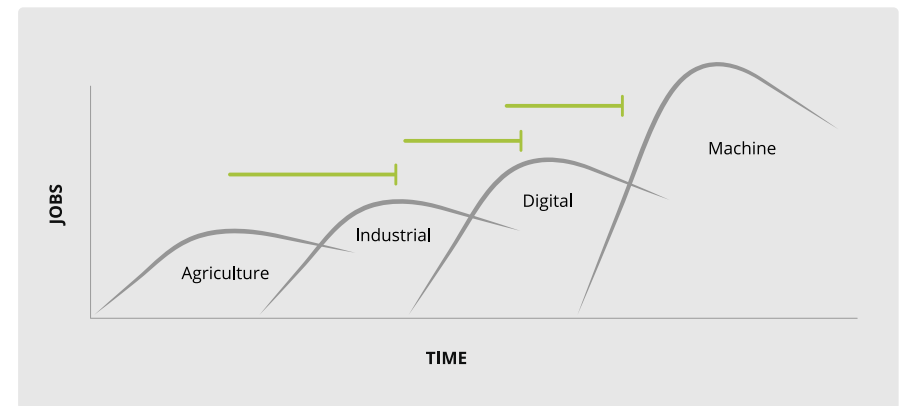
What are cyber-physical systems?

Cyber-physical systems (CPS) are engineered systems that are built from, and depend upon, the seamless integration of computational algorithms and physical components.¹

According to a recent study from McKinsey Global Institute, about a third of tasks in 60% of occupations could be automated using existing technology. This same report indicated that, while millions of workers will need to learn new skills for different occupations, there should be enough work to maintain full employment until 2030.²

As we head into the Fourth Industrial Revolution and consider what it means for the workforce moving forward, it's important to realize the previous three revolutions brought about many of the same concerns. From the effects of mechanical and mass production on craftsmen, to the use of computer systems to process information, each revolution has grappled with the impacts of automation.

Previously, the transition between these periods was long enough that the workforce was able to evolve slowly over time. The greatest difference today is that the workplace is evolving so rapidly, the workforce is having difficulty keeping up with the changes, causing a gap between the skills companies are seeking and the capabilities of the available workforce.



¹ Definition from National Science Foundation website, https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=503286

² Jobs lost, jobs gained: Workforce transitions in a time of automation, December 2017, McKinsey Global Institute

Primary contributors to the skills gap

Due to the accelerated speed of technological advancements, employers are looking for workers with entirely new skill sets. In fact, by 2020, more than one third of fundamental responsibilities for the majority of jobs will be made up of skills that weren't considered essential as little as two years ago. ²

Another contributor to the growing skills gap is the aging engineering workforce. As workers retire, they take their years of experience along with them, leaving gaps that companies struggle to fill. According to Deloitte, the number one reason cited by engineering executives for the current and future talent gap is retirement, with about 89% of executives listing retirement as having a moderate to significant impact on the gap. ³

What is the skills gap?

The Association for Talent Development defines a skills gap as “a significant gap between an organization’s current capabilities and the skills it needs to achieve its goals and meet customer demand.” ¹ For engineering and manufacturing, the skills gap extends beyond individual organizations and effects the entire industry.

Overcoming these challenges

Ultimately, keeping up with the rapid changes in technology and shrinking the skills gap comes down to a commitment to lifelong learning. When asked what solutions would help their companies stay competitive and thrive in today's market, engineering executives agreed that training and development programs could make the biggest impact, whether as internal programs or pursued by individual workers. ⁵

Top three ways to close the gap, according to executives ⁶

1. Internal employee training & development programs
2. External training & certification programs
3. Use of internship programs

Understanding the state of the industry is crucial to engineering and manufacturing students as it will prepare them for the changes to come. As students begin their careers, they can equip themselves with the tools they need and lay the foundation for long term success.

¹ Bridging the Skills Gap: Workforce development is everyone's business, 2015, Association for Talent Development.

² Employment, Skills and Workforce Strategy for the Fourth Industrial Revolution, January 2016, World Economic Forum

³⁻⁶ The skills gap in US manufacturing: 2015 and beyond, 2015, The Manufacturing Institute and Deloitte Consulting LLP

The most in-demand jobs

As the industry evolves, demand for different types of workers fluctuates in determining what career to pursue, take into consideration anticipated stability and availability of openings.

Despite the impacts of automation on the job market, engineering jobs are expected to see notable growth in the coming years. By 2024, the number of engineering jobs in the US is projected to grow by 4% compared to 2014 - accounting for about 65,000 new engineering jobs.¹

Projected job growth by occupation, between 2014 and 2024

Occupation	Projected change	Projected number of jobs in 2024
Biomedical engineers	23.1%	27,200
Environmental engineers	12.4%	62,000
Petroleum engineers	9.8%	38,500
Marine engineers and naval architects	8.9%	9,000
Civil engineers	8.4%	305,000
Mining & geological engineers	6.4%	8,800
Health & safety engineers, except mining	6.2%	26,800
Mechanical engineers	5.3%	292,100
Agricultural engineers	4.4%	3,000
Computer hardware engineers	3.1%	80,100
Chemical engineers	1.8%	34,900
Materials engineers	1.3%	25,600
Electrical engineers	1.0%	180,200
Industrial engineers	0.9%	243,200

¹ Employment outlook for engineering occupations to 2024, October 6, 2016, Bureau of Labor Statistics, United States Department of Labor

The skills employers are looking for

Whether completing a LinkedIn profile or preparing for an interview, it's important to understand the skills and qualities employers are looking for. While the engineering industry is seeing a shift in the types of technical knowledge and experience required for a position, there are a number of non-technical or soft skills employers are seeking when hiring recent graduates.

What are non-technical skills?

Non-technical skills are social, cognitive, and personal skills that aid in work, often improving performance of technical skills. Examples of non-technical skills include: communication skills, creativity, leadership skills, and time management.

Why non-technical skills are important

From a foundational level, non-technical skills are important to employers because employees need to interact with each other, clients, management, other departments, and more. By hiring workers who demonstrate competency in non-technical skills, such as interpersonal and communication skills, companies help to ensure their workforce and their clients have an enjoyable experience with the company.

From a practical perspective, an experienced manager or mentor can teach most recent graduates new technical skills quickly and easily. This is largely due to exposure to and experience with technology from such a young age. With two-thirds of Millennials considering themselves to be either cutting edge or in the upper tier of technology usage¹, it's no surprise that recent college graduates would be able to easily pick up new technical skills.

Non-technical skills, however, take more time and, therefore, resources to develop in new employees. As time is often of the essence and in short supply, workers who demonstrate non-technical capabilities fair better in the workforce.

The gap between essentials and proficiencies

In a recent survey conducted by the National Association of Colleges and Employers (NACE), hiring managers were asked to rate the essential need for a variety of career readiness skills, as well as the proficiency of recent graduates in those areas. The results of the survey showed a significant discrepancy between the skills sought after and the skills possessed by recent graduates.

Competencies	Considered essential*	Rated Proficient**
Teamwork/Collaboration	97.5%	77.0%
Critical thinking/Problem solving	99.2%	55.8%
Professionalism/Work ethic	100%	42.5%
Oral/Written communications	95.9%	41.6%
Leadership	68.6%	33.0%
Global/Multi-cultural fluency	31.1%	20.7%
Career management	47.1%	17.3%

*Percentage of companies considering a skill to be essential

**Percentage of recent college graduates considered to be proficient by those employers.”²

The survey found the most significant gaps between desired skills and graduates' proficiencies were in non-technical skills – most notably in professionalism/work ethic and oral/written communications.

¹ The millennial majority is transforming your culture. 2017. Deloitte University Leadership Center for Inclusion.

² Job Outlook 2018. December 2018. National Association of Colleges and Universities

Developing non-technical skills

Students preparing to graduate are in the perfect position to begin developing their soft skills. The first step in developing these skills is identifying where an individual needs to focus. Some students may not need to pay as much attention to leadership skills as communication skills. Others may have an incredible work ethic, but struggle with non-verbal communication.

In an article on Engineering.com, recruitment experts shared the skills they look for in recent graduates, as well as their advice for developing these skills. This article divided desirable non-technical skills into four categories: communication, interpersonal, problem solving and critical thinking, and enthusiasm, commitment, and motivation.¹

Communication skills

Building good communication is skills tops the list of non-technical, career readiness skills employers are looking for. This is also one of the areas recent graduates struggle with most. Encompassing written, verbal, and non-verbal forms of communication, there are many ways students can improve their skills in these areas.

One of the most important things to master across all forms of communication is communicating clearly, especially as an engineer. The ability to effectively explain ideas, problems, and solutions to non-technical stakeholders makes engineers more impactful in their jobs and opens up more opportunities for career advancement.

Ash Norton, an engineering leadership consultant and coach, says that the best way to develop good, clear communication skills is to simply practice. "Whether it is writing a technical report, presenting your work to senior management, taking a class, or simply reading a book aloud to a child, practice is the only way to get better at communicating."²

¹ 5 Skills Hiring Managers Look for in Engineering Grads, Megan Brown, February 2016, Engineering.com, <https://www.engineering.com/JobArticles/ArticleID/13894/5-Skills-Hiring-Managers-Look-for-in-Engineering-Grads.aspx>

² 6 Soft Skills Technical Employees Need to Thrive, Laurence Bradford, August 2017, Forbes. <https://www.forbes.com/sites/laurencebradford/2017/08/26/6-soft-skills-technical-employees-need-to-thrive/2/#4a481cc06c86>

“We survey recruiters and hiring managers twice a year and ask them to tell us about the most important skills a job or internship applicant should possess. Year after year, communication skills are consistently reported as the number one skill employers are looking for.”

Angela Froistad

Assistant Director of the College of Science and Engineering Career Center at the University of Minnesota, Twin Cities

Interpersonal skills

Interpersonal skills are closely related to communication skills and help in interactions with coworkers, management, clients, and others. Cheryl Monachino, former Director of Industrial Outreach at Binghamton University's School of Engineering and Applied Science, highlights the importance of interpersonal skills for engineers in the team environment:

“Engineering professionals are almost always part of a multi-discipline team and they need to exhibit a positive attitude, cooperate in the workplace, interact with people in a friendly manner and be accountable for their assignments.”¹

Allison Kay, Co-Founder of BeMyCareerCoach.com, listed four strategies for developing interpersonal skills in an article for Training Magazine.²

- 1. Practice active listening** by paying attention to what someone is saying. Repeating back what you heard helps ensure you understood while also demonstrating that you were paying attention.
- 2. Express your appreciation** to your coworkers for their hard work. This fosters good relationships and keeps others motivated.
- 3. Use positive body language.** This is where practicing non-verbal communication skills is particularly helpful.
- 4. Stay positive and interact with coworkers.** Investing time in and building good rapport with coworkers reduces stress, helps with productivity, and promotes creativity.

Problem solving and critical thinking

Problem solving and critical thinking skills demonstrate an individual's ability to look at an issue, objectively consider the facts, and come up with a solution or plan of action. This ability is crucial to the success of engineering professionals, and is as much about being able to organize one's thoughts as it is about creativity.

A study published by the Global Journal of Engineering Education found that one of the most effective ways to help students cultivate critical thinking skills is to adopt a reflective learning model. Students who participated in the study saw about a 16.5% improvement on critical thinking tests in just eight weeks.³

With the significant impact reflective learning can have on students' problem solving skills, instructors can better help their students prepare for their careers by implementing the five basic tenants of reflective learning in their classrooms:

- 1. Reporting:** Describing the problem or situation.
- 2. Responding:** Determining feelings and reactions to the problem or situation.
- 3. Relating:** Connecting the problem or situation to existing knowledge or experience.
- 4. Reasoning:** Applying existing knowledge to explain the problem or situation and its possible solutions.
- 5. Reconstructing:** Determining a plan of action to solve for the problem or situation.

¹ 6 Soft Skills Technical Employees Need to Thrive, Laurence Bradford, August 2017, Forbes. <https://www.forbes.com/sites/laurencebradford/2017/08/26/6-soft-skills-technical-employees-need-to-thrive/2/#4a481cc06c86>

² How to Improve Interpersonal Skills, Allison Kay, December 2014, Training Magazine. <https://trainingmag.com/how-improve-interpersonal-skills>

³ Reflective learning model in improving students critical thinking skills. Farida Aryani, Muhammad Rais, Hillman Wirawan. November 2017. Global Journal of Engineering Education.

Enthusiasm, commitment, and motivation

While enthusiasm, commitment, and motivation are generally thought of more as attributes than skills, knowing how to demonstrate these attributes can make quite the difference for job seekers. This is also one of the easiest skills to learn.

There are many ways students can demonstrate these qualities to potential employers, such as:

1. Taking the time to customize cover letters.
2. Researching a company, their history, and their mission before going into an interview.
3. Inquiring about mentorship programs.
4. Asking about potential for growth.

All these things demonstrate an individual's genuine interest in a position and showcase an applicant's commitment to their work.

Industry certifications: Why, what, and how

With hundreds of different certifications available to engineering professionals, it can be difficult to determine which certifications will be most helpful in beginning a career. From earning software certifications to becoming a licensed Professional Engineer (PE), determining the right certification path is an important aspect of career readiness.

Professional Engineer (PE)

Becoming a licensed PE is a significant achievement, requiring applicants to complete a four-year engineering degree from an accredited university, pass the Fundamentals of Engineering (FE) exam, complete four years of engineering work under a PE, and pass the Principles and Practice of Engineering (PE) exam. Individual states then have different requirements for maintaining licensure.

While obtaining a PE license is not a necessary step in building an engineering career, there are benefits to becoming a PE.

1. Sign and seal plans and drawings. Only licensed PEs can prepare, sign and seal, and submit plans and drawings to public authorities. For those who intend to own a firm in the private sector or work independently as a consultant, becoming a licensed PE is a requirement.

2. Career differentiator. Because of the commitment and work it takes to become a PE, companies often look favorably on PEs and those working towards PE certification, called Engineers in Training (EIT).

3. Higher salary. A study done by the National Society of Professional Engineers showed the median salary for an unlicensed engineer is \$94,000. For licensed PEs, the average salary goes up about 5% to \$99,000.¹

4. Career flexibility. From options in the private sector to transferring your license to a different state, PEs have more opportunities and flexibility in what they do with their career. For those who are unsure about their long-term goals, putting in the time early on to become a licensed PE can be beneficial when making decisions later.

Software certifications

Software certifications are another way for graduating students to set themselves apart in the job market. In general, these certifications prove to potential employers an individual's capabilities using specific software packages.

There is some debate within the industry over the usefulness of these certifications as compared to hands-on experience. Though there is no replacement for hands-on experience, software certifications do require extensive practice using the software and indicate that an applicant can likely be onboarded much more quickly – giving recent graduates with these certifications an advantage in their job hunt.

While many engineering software packages provide users the opportunity to earn certifications, the various certifications offered from SOLIDWORKS and Autodesk are among the most useful and widely acknowledged in the industry.

¹ Engineering Salaries Continue to Rise Despite Concerns Over Shortages. August 2016. National Society of Professional Engineers.

SOLIDWORKS certifications

SOLIDWORKS is probably the most widely used and recognized 3D CAD and rendering software package on the market. It comes as no surprise then that SOLIDWORKS certifications are some of the most sought after by employers.

There are three basic levels of SOLIDWORKS certification: Certified SOLIDWORKS Associate, Certified SOLIDWORKS Professional, and Certified SOLIDWORKS Expert. Each progressive level signifies different levels of expertise in the software. Once each level of certification has been attained, there is no need to renew the certification. Investing time and energy in these certifications early on can be extremely beneficial for long-term career success.

Below are details for testing for each of the primary SOLIDWORKS certification exams.

Certified SOLIDWORKS Associate (CSWA) ¹

Exam length: 3 hours

Minimum passing grade: 70%

Re-test policy: There is a 30 day waiting period between every attempt of the CSWA exam. A new exam credit is required for each attempt.

Students can prepare for the CSWA exam using [SolidProfessor's CSWA Prep course](#).

Certified SOLIDWORKS Professional (CSWP) ²

Exam length: 3 hours 30 minutes (Issued in 3 segments)

Minimum passing grade: 75% in each segment

Re-test policy: There is a 14 day waiting period between every attempt of the CSWP exam. A new exam credit is required for each attempt.

Students can prepare for the CSWP exam using [SolidProfessor's CSWP-CSWE Prep course](#).

SOLIDWORKS also offers more specialized certifications in a variety of advanced topics. Other SOLIDWORKS certifications include:

- Certified PDM Professional Administrator (CPPA)
- Certified SOLIDWORKS Professional Model Based Design (CSWP-MPD)
- Certified SOLIDWORKS Associate – Electrical (CSWA-E)
- Certified SOLIDWORKS Associate – Sustainability (CSWA-Sustainability)
- Certified SOLIDWORKS Associate – Simulation (CSWA-Simulation)
- Certified SOLIDWORKS Professional – Simulation (CSWP-Simulation)
- Certified SOLIDWORKS Professional Advanced Sheet Metal (CSWPA-SM)
- Certified SOLIDWORKS Professional Advanced Weldments (CSWPA-WD)
- Certified SOLIDWORKS Professional Advanced Surfacing (CSWPA-SU)
- Certified SOLIDWORKS Professional Advanced Mold Tools (CSWPA-MT)
- Certified SOLIDWORKS Professional Drawing Tools (CSWPA-DT)

Certified SOLIDWORKS Expert (CSWE) ³

Prerequisites: Must have successfully passed the CSWP exam and at least four CSWP advanced topics exams

Exam length: 4 hours

Minimum passing grade: 80%

Students can prepare for the CSWE exam using [SolidProfessor's CSWP-CSWE Prep course](#).

¹ Testing information taken from <http://www.solidworks.com/sw/support/mcad-certification-programs.htm>

² Testing information taken from http://www.solidworks.com/sw/support/797_ENU_HTML.htm

³ Testing information taken from <http://www.solidworks.com/sw/support/CSWE.htm>

Autodesk certifications

Autodesk is another leader in 3D design and engineering software. Like SOLIDWORKS, Autodesk offers users the option of becoming either a Certified User or Certified Professional for most of their software offerings.

The primary difference between the Certified User and Certified Professional exam is the amount of experience needed to pass each exam. For example, the Autodesk Certified User (ACU) exam requires about 40 hours of hands-on experience and takes 75 minutes to complete. The Autodesk Certified Professional (ACP) exam requires upwards of 400 hours of practice and takes two hours to complete.

Taking this into consideration, the Certified User exams are generally the best suited to the needs of students and recent graduates. These exams require the depth of knowledge students easily accumulate during their studies, while also attesting to their skills using the software.

To the right is a breakdown of the various exams offered by Autodesk.¹



Autodesk Certified User (ACU) & Autodesk Certified Professional (ACP)

These exams look at skills and knowledge key to using any of Autodesk's products. The ACU was designed specifically for students and instructors looking to demonstrate their proficiency with Autodesk's suite of products.

AutoCAD Certified User and AutoCAD Certified Professional

Obtaining AutoCAD certification attests to an individual's design skills and proficiency with the AutoCAD software.

Students can prepare for the AutoCAD Certified User exam using [SolidProfessor's AutoCAD User Certification Prep course](#).

Inventor Certified User and Inventor Certified Professional

Inventor certifications help individuals demonstrate their skills in mechanical design.

Students can prepare for the Inventor Certified User exam using [SolidProfessor's Inventor User Certification Exam Prep course](#).

Revit Architecture Certified User and Revit Certified Professional

Revit Architecture certifications show that an individual has demonstrated essential building design and construction skills using Revit Architecture.

Students can prepare for the Revit Architecture Certified User exam using [SolidProfessor's Revit Certification Test Prep course](#).

Fusion 360 Certified User

With no Certified Professional exam available, becoming a Fusion 360 Certified User validates a user's skills in creating and manipulating designs in Fusion 360's integrated concept-to-production interface.

¹ Testing information taken from <https://academy.autodesk.com/about-us/certification>

Niche certifications

Becoming a licensed PE and earning software certifications gives recent graduates an edge as they build their careers. However, they can require significant time and financial commitments. For students who want to demonstrate their skills and ability quickly and easily, there are other options available.

SolidProfessor offers members the opportunity to earn SolidProfessor Technical Certificates, which can be printed or shared on LinkedIn and attest to an individual's abilities. Technical Certificates are earned after a member completes every lesson in a course and scores above an 80% on the course review test.

Online certificate programs such as this provide individuals with a unique opportunity to demonstrate their skills in niche topics. What's more, as each Technical Certificate includes the date it was completed along with the version of the software it was completed for, they show potential employers how up-to-date a worker's skills actually are.

Getting a job: General tips and advice

After students understand the industry, the jobs available, and the skills they need to land their dream job, they're ready to begin their job search.

Preparing to apply

Before applying to any positions, students should first create their resume, a LinkedIn profile, and a portfolio.

Resume

As resumes are required for most job applications, this is where most people need to start with their job search. For graduates with little to no real-world experience, it's especially important to present applicable training and experience in a clear, organized manner.

A hiring manager should be able to easily identify each section of a resume and scan its contents quickly to determine if an applicant might be a good fit. With that in mind, Stephen Harris of TheEngineer.co.uk advises that resumes should have the information most pertinent to the position (qualifications and training) at the beginning, followed by skills, experience, and references.¹

In an article using advice from subject matter experts, Kim Isaacs from Monster.com, lists a number of tips to keep in mind while writing an engineering resume.²

1. Keep it professional. Proofread and look for errors before submitting a resume to a potential employer. Daniel Mullin, VP at Carroll Engineering, says that not fixing errors is the most common resume problem among engineers.³

"It's imperative that you have a well-prepared, professional resume with no spelling or grammatical errors," he says. "Triple-check it and have other people go over it as well to make sure it's perfect."

2. Include a summary instead of an objective. Traditional resumes often

¹ How to write the perfect graduate engineering CV, Stephen Harris, September 2017. <https://www.theengineer.co.uk/issues/the-student-engineer/how-to-write-the-perfect-graduate-engineering-cv/>

^{2,3} Resume tips for engineers, Kim Isaacs. <https://www.monster.com/career-advice/article/engineering-resume-tips>

include an objective section at the top, which states the type of job being sought along with any applicable skills and experience. Objectives are often skipped over by hiring managers and don't provide much information.

By including a summary of notable qualifications instead of an objective, it's easier to pique the interest of a hiring manager. A summary should be only a sentence or two in length and state any certifications, experience, and other qualifications. For a recent graduate, a summary may look something like this:

Recent graduate of UCSD Jacobs School of Engineering with two years of internship experience, pursuing Professional Engineer (PE). Qualifications include Certified SOLIDWORKS Associate and passed FE exam.

3. Tailor your resume to fit the job description. Different positions and companies look for different qualifications in candidates. When applying to jobs, it's important to tailor each resume that's sent out to be reflective of the skills and qualifications being sought after in the job description.

Not only does this tailoring demonstrate to potential employers that a candidate is serious about their application, but it's also easy to do. Instead of writing a new resume for every job description, students can create one long resume that can be edited down to highlight specific skills for different positions.

LinkedIn

LinkedIn is one of the most commonly used and powerful tools for job hunting and networking. Having a well put together and complete LinkedIn profile makes it easy to apply to the more than 20,000 entry level engineering jobs on the site.

Setting up a LinkedIn profile is straight forward, with prompts for what to include and a setup that mimics a resume. As students work on their profile, there are a few important things to keep in mind.

1. Fill out your profile completely. LinkedIn is a popular resource for hiring managers and recruiters to seek out job candidates. By simply having all sections filled out, a profile is far more likely to be seen.

2. Customize your public URL. An easily overlooked feature, custom LinkedIn URLs make it easy to share your profile on your resume, in your email signature, and other places you may be communicating professionally.

3. Get recommendations from professors and supervisors. LinkedIn has an entire section for connections to leave recommendations and praise for people's work. Having this public testament to someone's skills is a great way to demonstrate drive and skills to employers. Professors, coaches, advisors, and any work supervisors are great resources to ask for recommendations.

4. Tell recruiters you're looking. Students can signal to recruiters and companies that they are looking for job opportunities by editing their Career Interests under the Jobs tab on the site. Here, they can also edit the type of employment, locations, and industries they are most interested in.

Portfolio

According to the Thayer School of Engineering at Dartmouth, anyone looking for a "job or internship in product design/development, architecture, (and) mechanical engineering" should have a portfolio.¹ Highlighting skills and work, portfolios are generally either dedicated websites or PowerPoints converted into PDFs.

Having a portfolio to share with potential employers is a great way for recent graduates to stand out from other candidates and provide proof of their capabilities. A good portfolio should be clean and neat, much like a resume, and include sketches, engineering projects, diagrams, and a condensed resume.

There are many tools available for students looking to build an online portfolio. Wix, Squarespace, and WordPress are all popular website platforms with easy to use interfaces and free options for building portfolios.

Looking for positions

Thanks to the internet, finding job listings is easier than ever before. At the same time, there are now so many listings readily available, it can be difficult to know where to start. Two of the most popular search methods are company websites and online job boards.

¹ Creating Your Portfolio, Thayer School of Engineering. <https://engineering.dartmouth.edu/careers/students/creating-your-portfolio>

- **Company websites.** For graduates who have a clear idea of what they want to do or have specific companies in mind, company websites are a great resource for job listings.

- **Online job boards.** An update to traditional classifieds, online job boards provide candidates with a method of searching for positions across the globe. Using these boards is a great option for graduates who aren't certain what they'd like to do in the long run, while also providing advanced filtering options for those with a clearer vision for their future. Some popular boards for engineering jobs include:

1. **EngineerJobs.com:** "The most visited engineering job site" with 300,000 engineering jobs in the US and Canada

2. **Engineering.com/jobs:** Search thousands of engineering jobs across the US and Canada by discipline, state or city, and filter by experience level.

3. **USAJOBS:** The federal government's official job board has dedicated pages for [mechanical engineering positions](#) and [civil engineering positions](#).

4. **LinkedIn, Monster, Indeed, CareerBuilder, etc.:** These job boards allow candidates to search for a wide range of positions, upload their resumes, and communicate with recruiters.

TIP: As graduates begin applying for jobs, it's important to keep a running list of applications submitted, the submission date, and any relevant contact information for easy follow up.

Start networking

Another important job-finding resource that often gets overlooked is networking. Whether in professional associations, software user groups, or other local meetups, meeting and speaking with other professionals can help graduates learn about job openings, while also often providing a foot in the door.

Up to **85%** of job openings are filled through networking¹

According to a recent survey, it's projected that as much as 85% of open job openings are filled through networking. This is because about 70%-80% of job openings go unlisted and rely on internal employee referrals. Even for jobs that are listed publicly, about 40% of new hires to those positions come through employee referrals.¹

Forming personal connections with local engineering professionals opens an entirely new realm of possibilities in the job market and can be extremely helpful in the job hunt.

Honing interview skills

The final thing students need to work on as they prepare to enter the workforce is interview skills. Monster breaks their interview advice into four main categories: preparation, appearance, questions, and following up.²

Preparation: Preparing for an interview is not the same as preparing to apply for jobs. In preparing for an interview, graduates should focus on researching the company and gathering any materials they will need to bring along with them.

Job candidates should go into a interview knowing what the company they are interviewing at does, what products they make, and what problems the company is trying to resolve. This helps to demonstrate genuine interest in the company and goes back to the non-technical skills of enthusiasm, commitment, and motivation discussed earlier. The more thorough the research and knowledge of an applicant, the more they'll stand out from other applicants.

¹ How many jobs are found through networking, really? Gina Belli, April 2017. <https://www.payscale.com/career-news/2017/04/many-jobs-found-networking>

² Information taken from https://www.monster.com/career-advice/job-interview?intcid=skr_navigation_CA_job-interview

Additionally, there are certain things candidates should prepare and bring with them to their interviews. Resumes printed on nice paper in a professional folder of folio, a notepad and pen for taking notes, and a list of references are all generally necessary items to have on hand in an interview.

Appearance: It's always advised to dress professionally for an interview. While this doesn't necessarily mean candidates need to wear a suit and tie, it does mean that clothes should be clean and ironed, and hair should be tidy. Candidates should always make sure they show up to interview well groomed and not wearing any perfume or cologne that's overpowering.

TIP: For those who are unsure how formal to dress, it never hurts to ask the person scheduling the interview. Simply asking, "How formal is the office dress?" helps put into perspective what's expected.

Questions: As students prepare for their first interviews, it can be extremely helpful to review the types of questions they may encounter during the process. A simple Google search for "engineering interview questions" yields million of results, including [this helpful article from Engineer Jobs](#).

It's also important to note that interviewers shouldn't be the only people asking questions in an interview. As candidates research the company during preparation, they should also create a list of their own questions about the company and the position to which they are applying. These questions should be written down in the notebook brought to the interview.

Following up: After an interview is completed, candidates should send a follow up email to the interviewer, thanking them for their time and inquiring about next steps. This simple gesture can make a significant impression on hiring managers and only needs to be a sentence or two in length.

Conclusion

While we have only just touched the surface of career readiness for engineering graduates, they should be well on their way to finding their first job out of school. The last piece of advice they should take into their careers is to never stop learning and improving.

As we discussed in the first section of this whitepaper, rapid technological advances cause major changes in the industry, the engineering workforce needs to be able to evolve as well. Staying ahead of the latest innovations requires a lifelong commitment to continuous learning. When engineers commit to continuous learning, they set themselves up for long-term career success.

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Karcher Morris
UC San Diego