Career Resources for Students

Follow this roadmap to improve your career prospects in engineering and design.

Life is a journey, but when you're a student you're probably hoping that part of your journey ends with a good, solid job! And while hoping is nice, a proven strategy is even better. If you don't have one, then at least you're in the right place: If you follow the path below, you'll be on your way to a rewarding design/engineering career and you'll also be way ahead of your peers when it's time to land a permanent job.

We've assembled a set of useful resources and have organized them in a series of steps that'll guide you toward your dream job. Full disclosure: This is going to take some hard work on your part, but now you've got all the necessary tools to get the job done. Let's go!

❶ **Gain The Right Skills** – Let's start with your SOLIDWORKS modeling, documentation, and simulation skills. There are all sorts of abilities that you'll want to develop if you plan to be an engineer or an industrial designer, but you're on a SOLIDWORKS website so we're assuming that you're here to brush up on your SOLIDWORKS skills. Besides, since SOLIDWORKS is the world's most popular 3D design software, you probably want to be ready for what industry demands:

- Introductory SOLIDWORKS Tutorials: There are hours and hours of basic tutorials within the SOLIDWORKS product. Simply launch SOLIDWORKS, then go to Help, SOLIDWORKS Tutorials, and start working through them. Soon you'll be able to create simple parts, assemblies, and drawings, but there are also tutorials for Simulation, Surfacing, Advanced Part Design, and more.
- MySolidWorks Learning Paths: Did you know that your school's Student Premium license (a SOLIDWORKS Serial Number that begins with 9020…) gives you access to all the tutorials that are available in MySolidWorks Professional? If your school has access, you can sign up for MySolidWorks using this procedure, and you'll be able to watch over 1000 hours of training videos, with many organized into "learning paths" that guide you along to an established goal.
- SolidProfessor: Though this is a third-party training resource (at an additional cost), SolidProfessor has many videos that cover very specific functionality within SOLIDWORKS.
- If you're interested in something that's more book-like, you can begin with the Student Guide within SOLIDWORKS. It's in the Design Library (a little icon that looks like books on a shelf) on the right edge of the SOLIDWORKS window. A menu will fly out from the edge of the screen once you click on it. Also, there are more books listed in the following section.
- Many instructors/professors will tell you that being able to sketch effectively is a critical skill for collaboration. You can improve your sketching skills by drawing conceptual parts and assemblies using apps like Concepts for your tablet or iPad. Working with cardboard, LEGOs, or other building blocks can also help you conceptualize something that you'd like to eventually design accurately within SOLIDWORKS.

❷ **Expand Your Knowledge** – Now let's take those skills to the next level. There are a lot of resources to help you gain valuable knowledge about SOLIDWORKS and other important tools for your future job. From finite element analysis, to computational fluid dynamics, to animations and renderings using SOLIDWORKS Motion or SOLIDWORKS Visualize, you've got enough material for a lifetime of learning:

- Curriculum Resources: At SOLIDWORKS, we develop a fair amount of curriculum material ourselves. Look for the section entitled "Curriculum and Lessons 2019-2020." You can find introductory tutorials for fluid flow analysis in the Race Car Design Project, or finite element analysis in the Bridge Design Project.
- Classic Design & Drafting Books: These books are useful to start modeling complex mechanical parts, and some sections include mechanisms, too.
    - Visualization, Modeling, and Graphics for Engineering Design by Lieu and Sorby
    - Technical Drawing with Engineering Graphics (14th Edition) by Giesecke. This is an old text, but it has hundreds of useful modeling examples. If you can choose parts that are illustrated in this book and model them in 3D, it'll help you learn how to solve difficult modeling problems in SOLIDWORKS. It's a great way to practice reading 2D prints.
- Simulation books: There are many analysis/simulation books available through SDC Publications, and they cover finite elements analysis (FEA), thermal analysis, vibration analysis, and computation fluid dynamics (CFD).
- SOLIDWORKS Electrical: This product allows you to design the electrical components and wiring harnesses that are common in electro-mechanical systems. It's not a PCB design tool, but it's meant to help streamline the routing of cabling and wiring, and the definition of all the interconnects between electrical components in a product.
- SOLIDWORKS Visualize: This is an extremely useful product to learn if you're interested in being an industrial designer. Visualize allows you to create amazing renderings with minimal effort, and the quality of the output is really outstanding. It's a great way to build your portfolio with stunning images. Here's a learning path within MySolidWorks.
- SOLIDWORKS Motion: Motion is an incredibly powerful tool within SOLIDWORKS, and it allows you to simulate the accurate motion of mechanisms and objects with friction, impacts and other forces, gravity, etc. There's a useful SDC book that dives deep into this product.
- Archive of kinematic models and mechanical machines at Cornell University: Sometimes it doesn't make sense to reinvent the wheel (pun intended). This archive of 19th-century mechanical machines can inspire you to create similar mechanisms to solve you own design problems. The machines can also provide you with some interesting assemblies to model just for fun.
- 3DContentCentral.com: If you've ever thought "boy, I wish I didn't have to model this standard part!" it's probably because you don't really have to. 3D Content Central is an online parts library that includes all sorts of standard mechanical parts: hydraulic and pneumatic actuators, gears, electrical connectors, motors, pins, fasteners, etc. You can search through catalogs that have been provided by part suppliers across the entire world.

❸ **Show Off Your Expertise** – All that book-learning is nice, but let's prove that you're ready to tackle some real-world problems. You can start with the CSWA certification, which is often administered by schools. If you can't get certified through your academic institution, you can always purchase a Student Edition that's bundled with 2 free certification vouchers for both the CSWA and CSWP exams. Also, once you've created some cool models/assemblies of your own, you can upload them to GrabCAD or other sites that host your "portfolio" of cool designs:

- Certifications: Our industry-recognized certifications are designed to help you demonstrate your proficiency with SOLIDWORKS. The exams are rigorous and cover a lot of material, so you have to be well-prepared in order to attempt to pass them. Comprehensive information about the exams can be found here.
    o You can start with a sample CSWA exam.
    o You can buy a Student Edition with CSWA and CSWP vouchers: For students who don't have access to the SOLIDWORKS Education Edition through their school, we sell a product called the Student Edition. It's a 12-month term-of-use license that you can purchase online. Simply check out these websites to place an order.
- MySolidWorks: With MySolidWorks, you have the ability to upload and show off CAD models that you have created in SOLIDWORKS. It's like a handy virtual portfolio where you can put all your best work. You can also create and build your profile and share it with potential employers. Think of these capabilities as a mini CAD-focused LinkedIn.
- GrabCAD: GrabCAD is a repository of user-created CAD models and renderings where you can find all sorts of models from users the world over. It's also a thriving community of designers and engineers.
    o Read this blog post about creating a private portfolio of CAD designs with GrabCAD.
- Behance.net: A unique site to create your portfolio, Behance is aimed at creative professionals and students, and has sections devoted to industrial designers. It also hosts portfolios for many design schools around the world.
- Wikifactory is a relatively new tool that allows you to organize your parts and assemblies in native SOLIDWORKS format.

❹ **Add To Your Experience Level** – At this point, you've got some good skills but you're probably light on actual experience. This is one of the traps that students often find themselves in: All the good entry-level jobs ask for experience, but how do you get experience without the entry-level job??? Aha, this is the key attribute that'll set you apart from your peers! Join student design teams, local SOLIDWORKS user groups, or FIRST Robotics teams, and start making stuff. Get your hands dirty and build something real.

- Join SAE Competitions: The Society of Automotive Engineers organizes an amazing array of student competitions throughout the world. These are premier competitions for mechanical engineers, electrical engineers, and anyone interested in racing, fuel efficiency, autonomous systems, and good old fashioned teamwork.
- Mentor FIRST Robotics Teams: FIRST is a global organization dedicated to getting young students interested in STEM/STEAM via a series of competitions. You can find a FIRST team almost everywhere in the world, and it's a great way to start designing and making real robots that may eventually compete on a global level. If you're a university student, you can often find a local secondary school that could use a good mentor.
- Join your local SOLIDWORKS User Group: The SWUGN user group network is a great way to start making contacts with local industrial users of SOLIDWORKS. The SWUGN chapters welcome students, and attending meetings can get you connected to local industry. Once you're there, you can start looking for mentors who can help you with your career. Ask around to see if anyone needs help with commercial or non-commercial design projects.
- Participate in other Student Competitions:
  - RoboBoat and RoboSub
  - ASME Competitions, including the Human Powered Vehicle Challenge
  - ASCE Concrete Canoe competition
  - NASA design competitions
  - Other design competitions (Europe-focused)
  - Best Robotics
  - Skills USA or Skills Canada
- Join a local Maker Space or Fab Lab: If you need equipment to make things, a maker space or fab lab is a great place to start. You can find fab labs via the MIT Fab Foundation, which maintains a good directory of fab labs around the world. There are commercial non-profit and for-profit maker spaces all over the world as well (here's an example), which is much cheaper than buying your own laser cutter, 3D printer, mill & lathe, etc. If you look hard enough, you can even find places that can teach you to weld, blow glass, or make ceramics.

❺ **Obtain Internships, Co-Ops, & More** – And now, finally, you're set to land some coveted internships and co-ops, because (presumably) you've got some solid skills, some certifications, a nice portfolio of designs, demonstrable evidence of your collaboration with others on team projects, and (hopefully) some nice references from teachers/professors. Here are a few places to start, though there are many more:

- Your college/university career office. Visit with your school's counselors often, and way ahead of your desired timeframe for an internship. In other words, don't show up in April and say "I need a summer job in early June!" Plan ahead, and let them help you find companies that are a good fit for your career objectives.
- Assist 2 Develop: This company is seeking to bridge the gap between people who want to create products, and the people with the design and manufacturing expertise to make it happen. For students who are looking to build on their skills while working on real projects, Assist 2 Develop will help them to:
  - Participate in sponsored design challenges for cash prizes, full-time jobs, or an internship (winners)
  - Find full-time work
  - Find freelance work (can be partnered with a mentor)
  - Take live classes from one of our mentors or watch recordings
- Tethys Engineering: Tethys is a site that can help you build expertise, develop relationships with future employers, and earn an income in the process. The company allows students to take part in "virtual extended internships" with businesses of various sizes from the comfort of their dorm rooms.
- Other gig economy sites: Please note that these sites will require you to have your own commercial license of SOLIDWORKS, which is not the case for Tethys. Commercial licenses are expensive, so these particular sites may not be the best option for most students.
  - UpWork
  - Guru
  - fiverr

❻ **Now You're Really Ready!** – Yes, you are. You're head and shoulders above the crowd, so get out there and show them what you can do. And if you're not interested in a regular 9-to-5 job, here are some links to incubators for startups, our awesome Entrepreneur Program, and a few hints on how to tap your network to uncover the best jobs.

- Resume/CV building tools: Resumes are rather local, meaning that accepted standards vary from country to country. Here are a few resume/CV building tools from around the world, but be sure to pick the correct one based on what your target companies are looking for.
    - Resume-Now
    - zety
    - cvmaker
    - gravity//cv
    - Don't forget to proof your resume/CV until you're 100% sure that it's mistake-free. Lastly, update your LinkedIn profile!
- Network, network, network: Did you know that most jobs get filled without any job postings whatsoever? Why? Because, in most cases, a company that's looking for candidates has already identified a [really] short list of suitable contenders. And how did they get that list? Via people that they already know! If you're not networking, you're not on a company's radar and you're much less likely to be interviewed for a job. Luckily, if you've followed Steps 1 – 5, you've already made a lot of valuable contacts who can help you – call them, meet them for coffee, ask them to introduce you to other people in the company, and start uncovering important opportunities.
- Entrepreneur Program: If a regular job isn't your cup of tea, maybe you're interested in being an entrepreneur. The SOLIDWORKS Entrepreneur Program can help you launch your company by providing free commercial SOLIDWORKS licensing to qualified startups.
- Incubators: If you're an entrepreneur who could use a little extra help via an incubator or accelerator, then check out this list of world-class business incubators: All the incubators listed here already have SOLIDWORKS licenses, so you'll have access to your favorite design tools as long as you're part of the incubator.
- Job Boards: This is really your last resort. Networking is your best chance at finding a good job, but job boards can sometimes yield results as well. Just don't put all your eggs in this basket because it's not the preferred way of finding a job.
    - Indeed.com
    - Engineering.com
    - EngineerJobs.com
    - LinkedIn.com (at least LinkedIn has built-in networking, assuming that you've built a strong profile and network over several years)
    - Aerotek (while not a job board, it's an engineering talent search firm)

Preparation is half the battle, so look at this plan as a multi-year roadmap to prepare yourself for an extraordinarily rewarding journey. Best of luck!