

“All we know about the new economic world tells us that nations which train engineers will prevail over those which train lawyers. No nation has ever sued its way to greatness.” – *Richard Lamm, American Politician*

“It is a great profession. There is the satisfaction of watching a figment of the imagination emerge through the aid of science to a plan on paper. Then it moves to realization in stone or metal or energy. Then it brings jobs and homes to men. Then it elevates the standards of living and adds to the comforts of life. That is the engineer's high privilege.” — *Herbert Hoover, Engineer*

“As engineers, we were going to be in a position to change the world - not just study it.” - *Henry Petroski, Engineer*

As evident from the above statements by a politician and an engineer there are two professions running the world, politicians and engineers. Look around you and you will witness that even a doctor would be handicapped without all the tools the engineers have designed for their convenience. The world has become dependent on devices and gadgets, made by engineers, which control their lives. All these necessities are there to aid human being in their daily endeavours. It is needless to say that these gadgets have a major impact on the world economy and the way the world is being run today. While the scientists can theorize new ideas, it's the engineer's job to make it happen. Therefore, you will be playing in the big leagues and for you to be the best in those corridors I have a few points that I want you to remember as you tread on this path.

1. Read Books and Improve your Imagination – Reading books is ‘The’ way in your age. As you don't have much experience fill your brain with knowledge and go on a roller coaster ride with your imagination using your knowledge. The more you read, the more you will think out of the box and be more creative. Your knowledge is your biggest asset in this world. Read fiction and watch cartoons like Ironman and Transformers to fuel your imagination. Read scientific books to increase your knowledge about how things work. Books will provide you with knowledge about other people's experiences in their field, the mistakes they made and the lessons they learned. The works of Leonardo Da Vinci and Thomas Edison are worth studying as they motivate you and teach you how to think. Read non-fiction to understand the world from other people's view and to be tolerant about their perspective.

Engineering is the biggest and the broadest field of this century, hence there are hundreds of books on various engineering subjects. In future many of the other fields will combine with engineering as the need arises such as Biomedical Engineering and Engineering Management. These emerging new fields are a proof that engineering has become the need of every field. Increase your knowledge and you will not be surprised by the changes around you. The more knowledge you acquire the less confused you will be, and hence more confident. Imagination and creativity are the key to stand out from the crowd. Combine your technical knowledge and imagination to create new things.

Logic will get you from A to B. Imagination will take you everywhere ~ Albert Einstein

2. Make mistakes. Make more mistakes. Learn from them. – Making mistakes is the best way to learn. Thomas Edison made 10,000 mistakes before he was able to invent the bulb and he said "I have not **failed**. I've just found **10,000** ways that won't work.". The best experiences you can have right now which nobody would object to is making mistakes. This is the age when your mistakes will be smiled at rather than frowned at. These mistakes will be mentioned as experiences and projects on your statement of purpose to help you enter the university and the corporate world. The important thing is to experience the process of making mistakes which will become a habit and eventually develop into a 'never give up' attitude.

Keep practicing and making mistakes until you succeed. There is no alternative of practice and experience, practicing boosts your confidence and mistakes give you experience. Confidence is the key to your success in life. Engineering is mostly about trial and error, put your imagination to the test, you might just discover another penicillin during the process. Remember not to reinvent the wheel but to learn the process by which it was made. Be inquisitive and never stop asking questions.

Anyone who has never made a mistake has never tried anything new ~ Albert Einstein

3. Nature has the Best Engineering Designs – The universe has always been a mystery to the humans. We have yet to unlock the secrets of the universe and what it holds. We have learned a great deal by nature and the way it works. Observe and wonder about the systems of the natural world. The biggest commercial airplane, Airbus A380, was made possible by observing the flights of birds and the materials structure of body parts of animals. A raindrop is an inspiration for the designers of most aerodynamic vehicles. Nature explains how simply can complex systems be managed if you provide the right conditions and parameters. Nature has given us the physical constants using which we make everyday calculations and make the world tick.

Nature has all the answers if we look closely. Sometimes the only way to a solution is to seek it in the nature. Many great scientists relied on nature for answers. Be close to nature to understand the engineering the nature has developed to run its systems and learn to preserve the nature.

Look deep into nature, and then you will understand everything better ~ Albert Einstein

4. Discover Your Talent & Groom Yourself - Discover your talent and pursue it. While you're young try everything and look for the activity that interests you the most and makes you forget the time. Nurture your talent while you pursue your studies and do other chores. The talent you groom will give you confidence in what you can do and that is all that is required for a job interview. It will make you the best in your field and you will enjoy the challenges you face. The best is always required in the market irrespective of the type of field.

Right now, you may be enthralled by some particular field in science or engineering that is taking the world by storm. By the time you enter the industry in a decade, given the pace of technological advancement in the 21st century, what you may have anticipated breathlessly

may be obsolete. Times change. Keep up with the changes in the field you like, tracking new advances and keep yourself ahead of the curve. The choices we make sometimes have lasting consequences. Make the most of the time and chance that comes by your path.

If you do what you love, you'll never work a day in your life ~ Marc Anthony

5. Engineer's Skills - Skills are more important than fancy pieces of paper - The degrees of graduation from one level of academia to the next are useful mostly in climbing up the next rung of that academic ladder, and gaining your first job. Skills gained over the course of your life, however, have a lasting effect. Computer skills are vital for you as an engineer. Using internet, email and office tools is ubiquitous for engineers. More than 50% of your engineering studies will be a piece of cake if you learn how to use a search engine effectively. Learn coding as it is the need of the hour and is the best paid job as an engineer. Coding is the way you can control your everyday gadgets of the future. Improve your computer skills and hone them to perfection as it is the only way you can survive in your assignments, projects and the real world. Learn and practice CAD designing and simulation to implement your ideas flexibly without spending a penny. Once you get a good command on the features of the software, use your imagination to design various things. Management skill is another important skill for an engineer. Since you will be working in the corporate world, unless you become Tony Stark and participate in policy making, you will have to learn to manage your time and work because in the real world time is money. To be a better manager you need to be a social genius, and learn to get things done by using your contacts. Surround yourself with people who share your interest and be a good sport to be more approachable. Last but not the least presentation is your marketing tool. Learn to present your ideas and develop your convincing power which exudes your talent, knowledge and experiences.

3. The Fundamentals - Maths & Physics - Your aptitude in math and science skills may have you see yourself as a kind of prodigy in the mental arts. You may float through much of primary school and gain excellent grades without any effort exerted in study. Step up your study game or be prepared for a rude awakening in the university. Math is of utmost importance for an engineer. All engineering designs require a quantitative analysis. Number crunching is the engineer's way to reach to a solution. Study and live math every day. Math will help you in learning the computer languages and in coding. Mathematical modelling will help you solve the most complex equations and make you a practical engineer. Math is vital to every major subject in the future as the world is moving towards precision. Precision is the future and for precision math plays a major role. Though you will have the fastest calculators in the future but you can only enjoy all the features if you know mathematics. Majority of the engineering softwares require you to have a good grip on your mathematical skills.

Physics is the mother of all your disciplines as it will tell you how things work. It's imperative that you have a good command on physics. Majority of your engineering subjects will become easier for you if you have a good grip of physics. It will give you the analytical as well as the quantitative skills. It is the basis for all the modern technology. It opens doors for you to jump from engineering/IT field to life sciences field. It is diverse and encompasses the solutions to questions from every field. There isn't a project an engineer does which does not require the fundamental knowledge of physics.

Being an engineer has been a great experience though it may seem that it's a tough road but it's worth it. Like I mentioned engineer's play a major role in the development of this world. There are very few fields which engineers have not infiltrated. One gets to experience a lot of challenges over the years working in different projects. Make it your passion and you will have a story to tell to your children and your grandchildren.