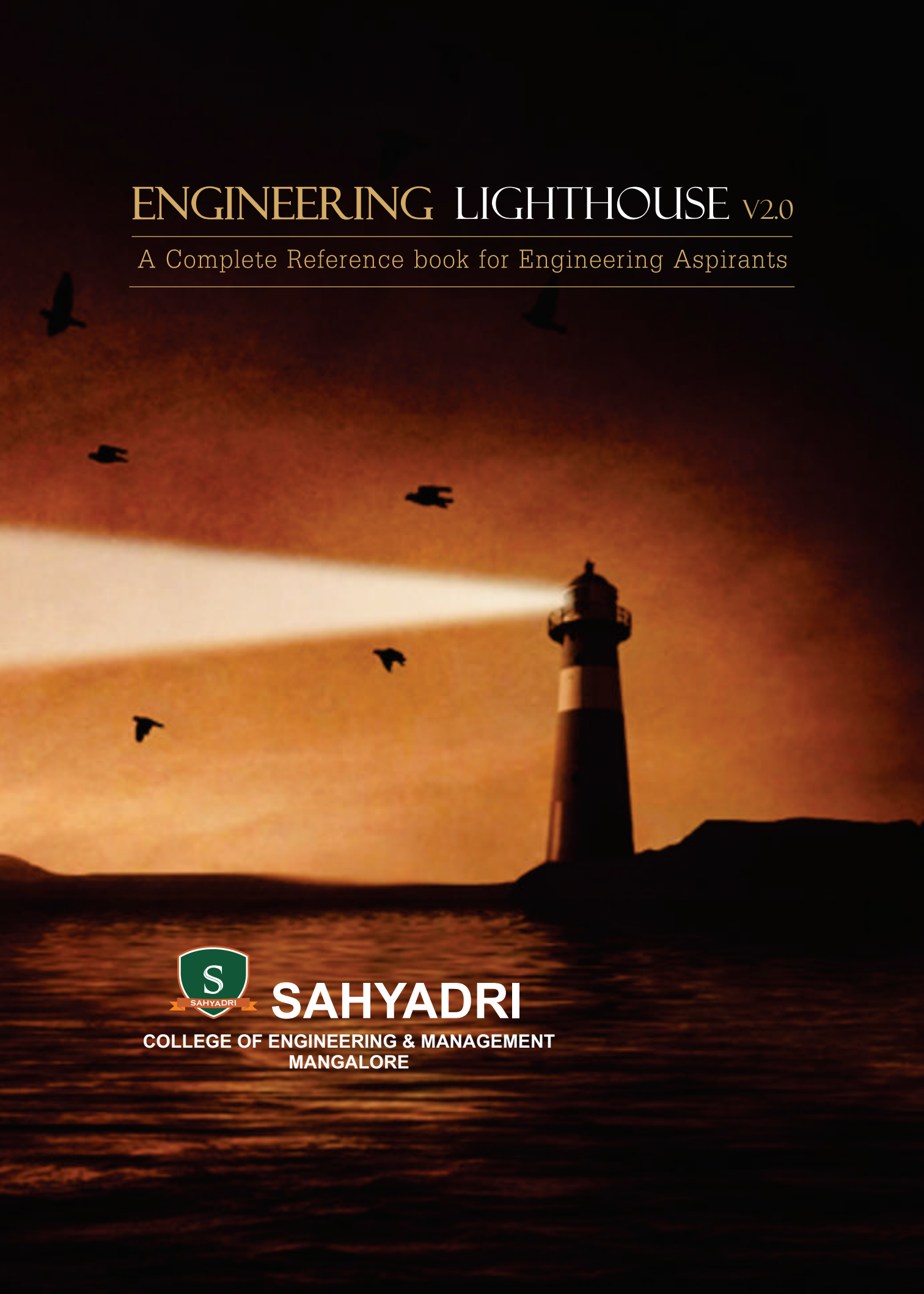
ENGINEERING LIGHTHOUSE V2.0

A Complete Reference book for Engineering Aspirants



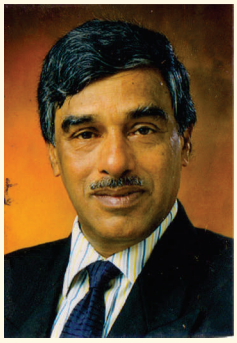
SAHYADRI

COLLEGE OF ENGINEERING & MANAGEMENT
MANGALORE


COMPUTER SCIENCE
MECHANICAL
ELECTRONICS
CIVIL

Contents

FOREWORD



In globalized world, rampant changes have been taking place in the field of professional education. The face of engineering education has drastically changed in the era of science and technology in general and information technology in particularly. Even though, we are in the age of information, the present generation is facing a lot of dilemma while selecting the branches of engineering. It is happening due to lack of guidance and confidence among students. Here I am not questioning the ability and talent of students, however they need an accurate direction to choose their engineering field with a sense of zeal and passion. To achieve this task, Sahyadri College of Engineering and Management has taken an initiative to give an ample scope and prospects of each engineering branches by publishing a book on Engineering Lighthouse.

It is my firm conviction that it becomes a truly lighthouse and shows a right path to the direction less students! I appreciate Mr. Ananth Prabhu for coming forward in writing this book and wish all the best in his endeavour.

Dr. D. L. Prabhakara
B.E, M.Tech.(IIT-M), Ph.D.(IIT-K)
Director,
Sahyadri Educational Institutions

About the book:

The book is authored by **Ananth Prabhu G** under the able guidance and mentoring by **Shri Manjunath Bhandary,** President of Bhandary Foundation with valuable inputs from the Director of Sahyadri Educational Institutions **Dr. D. L. Prabhakara** and Principal of Sahyadri College of Engineering and Management **Dr. Umesh M. Bhushi.**

According to Ananth, selecting an engineering course is a difficult choice because either your choice makes you happy for the rest of your life or after four years of engineering you try to change your field because you are not satisfied. In this book, he has tried to cover the traditional engineering branches and give a brief introduction about the allied branches, information about job prospects, industry and student trends.

According to Ananth, Selecting an engineering course is a difficult choice because either your choice makes you happy rest of your life or after four years of engineering you try to change your field. In this book, I tried to cover the traditional engineering branches and give a brief introduction and give information about job prospects, industry and student trends.

Ananth completed his B.E in Computer Science and Engineering with First Class from P.A College of Engineering, MBA in Information Science and M.Tech in Computer Science from Manipal University. He is currently pursuing his Ph.D in Computer Science and Engineering from VTU Belgaum under the able guidance of **Dr. Ganesh Aithal.**

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Introduction about Engineering

History of Engineering

In the olden days, 1325 AD to be more precise, an engineer was defined as "a constructor of military engines". Later it was divided into two categories: **Military Engineering and Civil Engineering**. The former involved the construction of fortifications and military engines, the latter concerned with non-military projects, for example bridge building. This definition is now obsolete, the term engineering has expanded with multifarious ways.

The origin of the word 'engineering' comes from the era when humans applied themselves to skillful inventions. Man, evolving further in the world, invented devices such as the pulley, the wheel and levers.

Today an engineer is described as someone who has acquired and is applying their scientific and technical knowledge to designing, analyzing and inventing useful, helpful and functional works. This would involve structures, machines and apparatus, manufacturing processes as well as forecasting their behavior in particular environmental conditions. This is all accomplished with functionality, operational economics and safety to life and property are forefront in mind.

Jobs of engineering usually entail applying physics and mathematics to problems in order to discover viable solutions or to make improvements. Where a number of different solutions are available. Engineers evaluate these options and the required outcome in order to identify the best route to follow.

The earliest recorded civil engineer was an Egyptian known as **Imhotep** was considered as the oldest civil engineer of Egypt. Who built and designed the great pyramid djoser and stepped pyramid and he was also the first person to make use of columns in architecture. The Step Pyramid was built in Egypt in about the time period 2630 - 2611 BC and can be found at Saqqara.

The history of engineering can be roughly divided into four overlapping phases, each marked by a revolution:

Pre-scientific revolution:

The prehistory of modern engineering features ancient master builders and Renaissance engineers such as Leonardo da Vinci.

Industrial revolution:

From the eighteenth through early nineteenth century, civil and mechanical engineers changed from practical artists to scientific professionals.

Second industrial revolution:

In the century before World War II, chemical, electrical, and other science-based engineering branches developed electricity, telecommunications, cars, airplanes, and mass production.

Information revolution:

As engineering science matured after the war, microelectronics, computers, and telecommunications jointly produced information technology.

The forerunners of engineers, practical artists and craftsmen, proceeded mainly by trial and error. Yet tinkering combined with imagination produced many marvelous devices. Many ancient monuments cannot fail to incite admiration.

The word "engineering" derived from the Latin word **"ingeniare"** means "to design" or "to create". Although the New Oxford Dictionary of English (1999) defines "engineering" as "the branch of science and technology concerned with the design, building, and use of engines, machines and structures" and "technology" as the "application of scientific knowledge for practical purpose, especially in industry", to-day it is no longer possible to draw any such dividing line. This perhaps has prompted the use of the nomenclatures Bachelor of Technology (B.Tech) and Master of Technology (M.Tech) along with the traditional ones, namely, Bachelor of Engineering (B.E) and Master of Engineering (M.E). The names of colleges and institutions also include such terms as "engineering" "technology" and "engineering and technology". Whatever may be the nomenclature of the awards or the names of institutions, they encompass both "engineering" and "technology".

Engineers use their imagination and analytical skills to invent, design, and build things that matter. They are team players with independent minds who ask, "How can we develop a better recycling system to protect the environment, design a school that can withstand an earthquake, or create cutting-edge special effects for the movies?" By dreaming up creative and practical solutions, engineers are changing the world all the time.

The first engineers focused on military technology, designing weapons, such as sword and catapults, and sturdy medieval castles. Later engineers designed roads, bridges, dams, electric lights, internal combustion engines, and computers -- the conveniences of our modern lives. The engineers of today are solving the problems of the 21st Century, cleaning the environment with plants and microbes, developing biofuels for cars and trucks, designing the cars and trucks that we drive to work and school, and enhancing the world in which we live.

By and large the most of the people confused while making differentiate between engineers and scientists but Albert Einstein aptly defines "Scientists investigate that which already is; engineers create that which has never been."

You can have anything you want, if you want it badly enough. You can be anything you want to be, do anything you set out to accomplish if you hold to that desire with singleness of purpose.

Abraham Lincoln

What Do Engineers Do?

The best answer to this question may be "What don't engineers do?" The engineers of today are solving tomorrows problems, but in a variety of fields and ways. Some engineers create new products like combines, computers, and food products. Others conduct scientific research, working in laboratories or outdoors, perhaps monitoring water quality or developing safer food handling techniques. Other engineers test and evaluate new systems.

In our increasingly high-tech society, the profession of engineering offers plentiful job opportunities, superior salaries and a high rate of professional satisfaction. A degree in engineering opens the door to a world of opportunity!

Why become an Engineer?

Love your work and live your life too

Engineering is an exciting profession, but one of its greatest advantages is that it will leave you time for all the other things in your life that you love!

Be creative

Engineering is a great outlet for the imagination- the perfect field for independent thinkers

Work with great people

Engineering takes teamwork and you will work with all kinds of people inside and outside the field. Whether they are designers or architects, doctors or entrepreneurs, you will be surrounded by smart, inspiring people

Solve problems, design things that matter

Come up with solutions no one else has thought of. Make your mark on the world.

Never be bored

Creative problem solving will take you into uncharted territory and the ideas of your colleagues will expose you to different ways of thinking. Be prepared to be fascinated and to have your talents stretched in ways you never expected.

Make a big salary

Engineers not only earn lots of respect, but they are also highly paid. Even the starting salary for an entry level job is impressive!

Enjoy job flexibility

An engineering degree offers you lots of freedom in finding your dream job It can be a launching pad for jobs in business, design, medicine, law and government. To employers or graduate schools, an engineering degree reflects a well-educated individual who has been taught of ways of analyzing and solving problems that can lead to success in all kinds of fields.

Travel

Field work is a big part of engineering. You may end up designing a skyscraper in London or developing safe drinking-water systems in Asia. Or you may stay closer to home, working with a nearby high-tech company or a hospital.

> Twenty years from now you will be more disappointed by the things that you didn't do than by the ones you did do. So throw off the bowlines. Sail away from the safe harbour. Catch the trade winds in your sails. Explore. Dream. Discover.
>
> *Mark Twain*

Make a difference

Everywhere you look you'll see examples of engineering having a positive effect on everyday life. Cars are safer, sound systems deliver better acoustics, medical tests are more accurate, and computers and cell phones are a lot more fun! You'll be giving back to your community.

Change the world

Imagine what life would be like without pollution controls to preserve the environment, life-saving medical equipment, or low-cost building materials for fighting global poverty. All this takes engineering. In very real and concrete ways, engineers save lives, prevent disease, reduce poverty, and protect our planet.

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10 Essential Qualities of an ENGINEER

1. Possesses a Strong Analytical Aptitude:

A great engineer has excellent analytical skills and is continually examining things and thinking of ways to help things work better. They are naturally inquisitive.

2. Shows an Attention to Detail:

A great engineer pays meticulous attention to detail. The slightest error can cause an entire structure to fail, so every detail must be reviewed thoroughly during the course of completing a project.

3. Excellent Communication Skills:

A great engineer has great communication skills. They can translate complex technical lingo into plain English and also communicate verbally with clients and other engineers working together on a project.

4. Takes Part in Continuing Education:

A great engineer stays on top of developments in the industry. Changes in technology happen rapidly, and the most successful engineers keep abreast of new research and ideas.

5. Creative:

A great engineer is creative and can think of new and innovative ways to develop new systems and make existing things work more efficiently.

6. Ability to Think Logically:

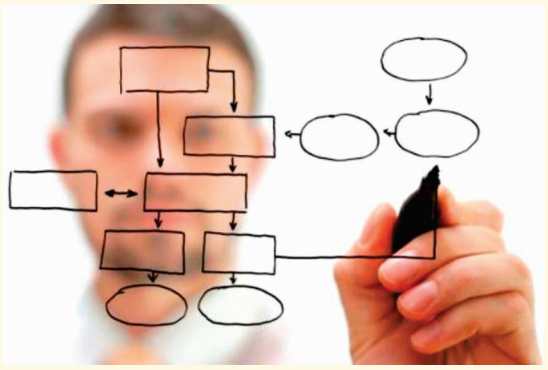
A great engineer has top-notch logical skills. They are able to make sense of complex systems and understand how things work and how problems arise.

7. Is Mathematically Inclined:

A great engineer has excellent math skills. Engineering is an intricate science that involves complex calculations of varying difficulty.

8. Problem Solving Skills:

A great engineer has sharp problem solving skills. An engineer is frequently called upon solely to address problems, and they must be able to figure out where the problem stems from and quickly develop a solution.



9. Team Player:

A great engineer understands that they are part of a larger team working together to make one project come together successfully, and therefore, must work well as part of that team.

10. Excellent Technical Knowledge:

A great engineer has a vast amount of technical knowledge. They understand a variety of computer programs and other systems that are commonly used during an engineering project.

Traditional Engineering Branches

- Aeronautical Engineering or Aerospace Engineering
- Biotechnology or BioEngineering
- Chemical Engineering
- Civil Engineering
- Computer Science and Engineering
- Electrical Engineering
- Electronics and Communication Engineering
- Materials and Metallurgical Engineering
- Mechanical Engineering
- Mining Engineering

Of all these **above branches,** which branch is the **best suited for me?**

This is the most difficult question to answer. Don't worry, It's very simple just give the answer of some question and then decide by yourself that which branch do you like most or which branch is suited to you according to your interest. We will discuss branch wise so that you can choose the branch according to your interest.

Studies show that, by far the number-one cause of unhappiness among people is job dissatisfaction. Thus, it is important to find a career that provides you with enjoyment and satisfaction. Engineers play a primary role in sustaining their nation's international competitiveness, maintaining the standard of living and protecting public safety.

As an engineer you can choose to work on projects that clearly benefit society, such as cleaning up the environment, designing prosthetic aids for disabled persons, developing clean and efficient transportation systems, finding new sources of energy, alleviating the world's hunger problems and increasing the standard of living in underdeveloped countries.

Aeronautical Engineering/Aerospace Engineering

This is a specialized and improved branch of mechanical engineering that involve learning about design and construction of airplanes, aircraft and spacecrafts. This course needs a good understanding of basic mathematics and physics because lot of fundamental principles from physics and mathematics are extensively applied in flight technology. Speaking more practically, don't have an expectation that you will visit all top Aerospace lab in the world and exposed to all space settles in B.Tech (bachelor degree in engineering) or M.Tech (master degree in engineering) course. This course will teach your basic principles of flight engineering with few individual experiments. For example, you may have a lab to experiment vibration, propulsion and thermodynamics. You will test all of them individually not in aircraft.

Aerospace engineering is the branch of engineering behind the design, construction and science of aircraft and spacecraft. Aerospace engineering has broken into two major branches: aeronautical engineering and astronautical engineering. The former deals with craft that stay within Earth's atmosphere, and the latter deals with craft that operate outside of Earth's atmosphere. While "aeronautical" was the original term, the broader "aerospace" has superseded it in usage, as flight technology advanced to include craft operating in outer space. Aerospace engineering is often informally called rocket science.

Frankly speaking big job opportunities are rare in the field of engineering. Usually students either move to software companies to got master of engineering in Aerospace Engineering. If you are aim is to work for NASA and you are from and in India then you need to be exceptionally talented, lucky, patient and persistent

Core Companies: Indian Space Research Organisation (ISRO), Defense Research and Development Organisation (DRDO), Hindustan Aeronautics Limited, there are few private companies like Boeing, GE who offer job for aerospace engineering. Finding a job is core aerospace engineering is not easy.

BioTechnology Engineering

Biotechnology in general is using technology in biological research or studies. Bioengineering and Bioinformatics are specialized domains of biotechnology. At B.Tech (bachelor degree in engineering) and M.Tech (master degree in engineering) student learns about basic principle of biology and engineering. They learn about using technology especially modern devices to create specific conditions for biological experiments. Most of the devices are related to experiments on cells and proteins, therefore biological courses related to cell and proteins are taught extensively.

Biotech is basically use of technology for improving the speed of biological research not developing devices. This course provides manpower that is aware of the use of latest devices for biological research to pharmaceutical industry.

> It has become appallingly obvious that our technology has exceeded our humanity.
>
> *Albert Einstein*

Most of the Biotech students go for higher studies abroad, as there is huge funding these days, they get good opportunities work in well established labs. Also they have opportunities to work for domestic and international Pharmaceutical industry, though these are rare.

Core Companies: Ranbaxy, Dr. Reddy labs, Cipla and GlaxoSmithKlineg are few to name apart from many Government funded research organizations and CSIR labs. There are good research opportunities abroad, usually PhD and Post Doctoral students.

Chemical Engineering

Chemical engineering studies involve all common engineering subjects in first year. Fromsecond year the specialized courses will begin that include fluid mechanics, chemical thermodynamics, chemical kinetics, surface science, catalysis and reaction engineering. Till final year students will read about chemical process and properties and topics like chemical reactors, chemical thermodynamics and experimenting with latest technology and devices.

By the end of final year students will be exposed to chemicals, polymers, petroleum, pharmaceuticals along with computer and information technology for the development of chemical engineering processes. There are good amount of opportunities for chemical engineering students, they are hired mostly by pharmaceutical, polymer and petroleum companies. There are good amount of higher studies opportunities too but need to compete with a larger pool of MSc chemistry, Biology and Pharmacy students.

Though it is not considered as a very hot branch of engineering have lot of potential for growth because of its applicability. It value and importance have risen in recent days because of the environmental issues. Jobs in petroleum companies like Schlumberger, Shell, Aramco and other Middle Eastern companies make it a prosperous choice of engineering.

Core Companies: ONGC, Reliance Industries Ltd., Essar Oil Limited, Gujarat Gas Company Limited, Indo Gulf Fertilizers Ltd, Coromandel Fertilizers Limited.

Tips for a better life

- Get organized and manage your time.
- Think confident. Always remember "What does not kill me only makes me stronger"
- Think about your goals and eliminate obstacles that do not help you getting there, such as drugs, people who bring you down, laziness, etc.
- Think of something you always wanted to do that was a little out there
- Give yourself a gift.

Computer Science and Engineering

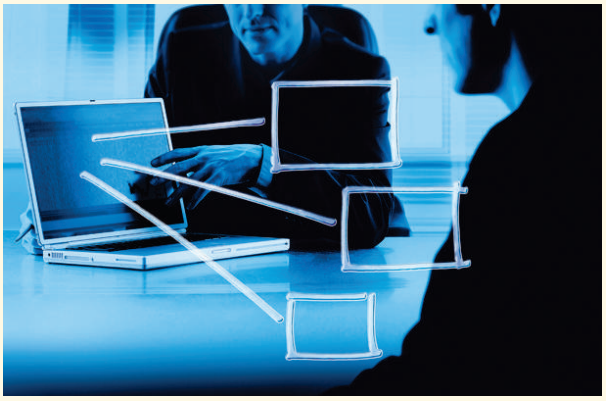
- Do you like computers? (We are not talking about computer games and Internet)
- Do you want to do something new in computers?
- Do you always experiment with your computer and surprise others?
- Are you strong enough in mathematics and logic making skills?
- Do you like puzzles?
- Are you having a good IQ?

If you answer most of the question in yes then this is the branch for you and you are made for this branch. This branch requires good logical skills and good aptitude, innovation and hard work. If you are having all these things in you then go for this branch.

This has been one of the most lucrative and competitive course to study since its inception in Indian engineering schools, colleges and universities. When India's computer industry created mark in world of business and gained super trust and revenue for the nation, it also created large amount of well-paid jobs for Computer Engineering students.

Computer science and engineering students will learn about basic engineering techniques, as other engineering students, during first year course. These techniques include Engineering Mathematics, Physics and Chemistry, and Engineering drawing. From second year they are exposed to core computer science subjects like programming, data structures, Digital logic, Theoretical computer science, Algorithms, Computer networks, Operating systems, Web technologies, Databases and Computer Architecture are few to mention.

This is really an excellent field to have opportunities both in software companies and higher studies. As computing is extensively applied to almost every walk of life it created massive jobs for Computer Engineering students. On the same time more demand and application has kept it research funding alive attracting many students to opt for higher studies.



Domains:

- Software Engineering
- Hardware Engineering
- Network Engineering
- Embedded Systems
- Artificial Intelligence
- Data Storage

Career Options:

- Programmers
- Web Developers
- E-commerce specialists
- Network administrators
- Database administrators
- Security specialists
- Software Testers
- Wireless Networks Administrators
- Cryptography Experts

Projects:

- Create software that detects brain tumors earlier
- Design a feather-light laptop
- Develop user-friendly blogging software
- Oversee the computer network for a telecommunications company
- Predict the strength of earthquakes through computer simulation

Core companies offering jobs to Computer science Engineers:

Government organizations like DRDL, ISRO, ECIL and BEL offer jobs to computer science students. There are thousands of multinational and national software companies offer jobs to computer engineers. To name few famous, Microsoft, Google, Yahoo, Amazon, IBM, Facebook, Oracle, Cisco, Infosys, TCS, and Wipro.

Information Technology and Engineering

Today, the term information technology has ballooned to encompass many aspects of computing and technology, and the term has become very recognizable. The information technology is a co branch of computer science which has a great scope and students prefer this branch of Engineering. Some key points are

- Most interesting branch.
- Better prospectus
- Easy and interesting course.

Now some guidelines for you after reading you can get your answers of your question that it suited to you or not.

- If you like computer networking, Website development, Computer languages this is the right option for you.
- If you want to know how computer software's are developed you can choose it.

Domains:

- Software Engineering
- Data Storage
- Network Engineering
- Artificial Intelligence

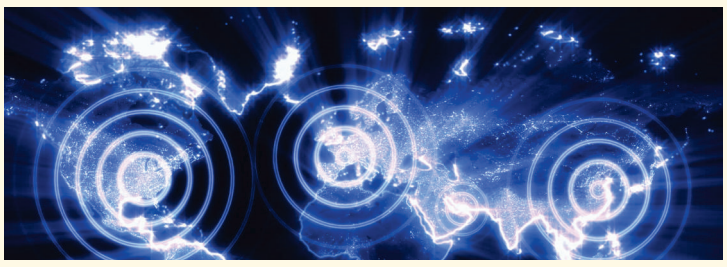
Career Options:

- Programmers
- Web Developers
- E-commerce specialists
- Network administrators
- Database administrators
- Security specialists
- Software Testers
- Wireless Networks Administrators
- Cryptography Experts

Note: The Job Opportunities for Information Science Engineer is similar to that of a Computer Science Engineer in the current scenario.

I challenge you to make your life a masterpiece. I challenge you to join the ranks of those people who live what they teach, who walk their talk.

Anthony Robbins



Differences between
Computer Science and Information Science Engineering

Information Technology

This sometimes also goes by the names "Information Systems", "Systems Administration", or "Business Systems Information/Administration". This is a practical engineering field, concerned primarily with taking existing hardware and software components and designing a larger system to solve a particular business function. Here one can learn about some basic information theory, applied mathematics theory, and things like network topology/design, database design etc. IT concerns itself with taking building blocks such as servers, operating systems, network switches, and software applications and creating a whole system to solve a problem (such as creating a sales order handling systems).

Computer Science

This is a theoretical field, with emphasis on the mathematical basis which underlies modern programming. That is, computer science is primarily software-oriented, as it concerns itself with developing new algorithmic ways to solve a problem. Such algorithms are then actually implemented in software. Here you will learn about the fundamentals of programming languages, a large variety of information theory and algorithm theory (plus, linear and discrete mathematics), how to design a software program, and how to run a successful software development team. CS can also encompass items such as compiler and Operating system design and implementation. Apart from software, you will also learn about Hardware. This field teaches the design of hardware components, and also the assembly of those components into a larger hardware system. It encompasses information theory, electrical engineering, VLSI design, and digital logic. Here you will be involved with designing CPUs and other Integrated Chips to perform specific tasks and will also learn about very low-level programming (usually, the type of programming use to create firmware). In essence, CS involves the creation of hardware devices intended to perform a very specific function (e.g. a modem, a CPU, a DRAM chip, etc.)

Civil Engineering

When engineering first emerged as a modern profession, "civil" broadly meant civilian, as distinct from military. As engineers with various expertise separately developed their systematic knowledge and professional organizations, the scope of "civil engineering" narrowed to construction, which was the first to develop scientific principles. For instance, the principle of cantilever was first investigated by Galileo Galilei. The applicability of the general principle to bridges, bigger buildings, and many other constructions exemplifies the scientific nature of engineering.

- Are you interested in constructions?
- Are you ready to rock the world by your talents of building things?
- Have you ever thought on how this can be done after seeing a building?

If yes then this is the branch for you. There is a misconception that in this branch's job opportunity is less as compared to other branches. It is not so, if you are hard worker and talented then there are a lot of opportunities in this sector.

Civil engineering is one of the most traditional engineering studies in India. British started very good schools for civil engineering studies and successfully completed some of public projects like Ganga canal and India's Railway network to name few.

In the first year of study students will learn about the basic engineering techniques along with mathematics and engineering design. From second year students will be more focused towards core subject studies. Few of the subjects taught in these four years are Fluid Mechanics, Soil Mechanics, Design of Structures, and Structural Mechanics and water recourse engineering. Students are also partly exposed to subjects like Transportation Engineering, Geotechnical Engineering, Water Resources Engineering, Remote Sensing, Transportation Systems Engineering..etc.

A bachelor degree in civil engineering will give good opportunities in industry as India is moving fast forward for infrastructure developments and one the same time leave a good space for higher studies at home and abroad like MS in civil engineering. Almost all top universities offer MS in civil engineering and there are good opportunities for Ph.D's and research too.

The most satisfied and enlightened people realize that successful and dynamic living starts from within. Before you can care for others, you must care for yourself.

Robin Sharma

Projects

- Ensure safe drinking water by managing a community's water reservoir
- Develop an art museum that provides state-of-the-art protection for paintings
- Cut down on airport delays by designing a better runway system
- Design the structure of one of the world's tallest skyscrapers
- Build cheap, sturdy shelters for victims of hurricanes and flooding

Job Prospects:

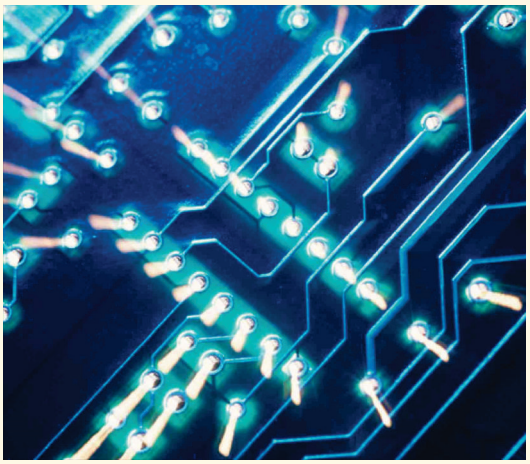
Government jobs in PWD, highways, CPWD, all Public sectors, Private construction companies like L&T ECC, Abroad chances more in Arab countries and in Singapore Malaysia.

Core Companies for Civil Engineers:

Associated Engineering Consultants, Larsen & Toubro Ltd., Railways, Engineers India Ltd., DRDO, ISRO, SERC and Jaypee Group are to name few companies and organizations that offer jobs to civil engineering students.

Electronics and Communication Engineering

This branch has good reputation in engineering. It is a top rated branch of engineering and most of the students preferred branch. EC has wider scope in industries it has some great features which makes it the branch with most demand.



- Top rated branch of engineering.
- Good scope in industries&research.
- Easy course not so tough.
- It has scope in computer and IT also.

Now to analyze whether it is suitable for you or not, I have provided some guidelines and after reading these guidelines you would get the answer of your questions.

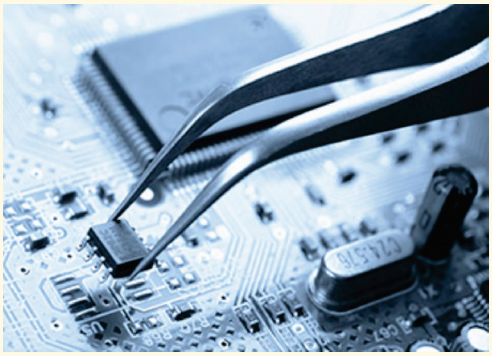
- If you have interest in physics like transistor, diodes, Communication etc. You can choose this branch.
- If you have interest in telecommunication.
- If you feel easy with analytical circuits it is the better branch for you. There is another branch called Telecommunications and Engineering as well. If you want to know about robotics you can choose it.

> Desire is the starting point of all achievement, not a hope, not a wish, but a keen pulsating desire, which transcends everything.
> *Napoleon Hill*

A guy working in a chip manufacturing plant comes to picture when we usually think about Electronics and Communication engineering course. Ultimately every student wants to go there and work, but one needs to go through a continuous study of core electronics subjects, their understanding and master their application.

First year of electronics and engineering course is dedicated to teach students about basic engineering techniques such as engineering mathematics, physics, chemistry and engineering drawing to name few. From second year of studies, students start to learn about core Electronics and Communication engineering subjects like digital electronics and logic design, fundamentals of communication engineering, electronic circuits, signals and systems, power electronics, applied electromagnetic theory, integrated circuits, VLSI, control systems and computer architecture are just few to mention.

Electronics and Communication engineering course gives enormous job opportunities in electronics and software companies. All electronic devices need software interface to run and come with one other or other device controlling programs architected and developed by Electronics and Communication engineering. It also gives great opportunities for research and development, as everyday consumer need new devices to support them in daily life.



Domains:

- Electronics
- Embedded
- Communication
- Networking
- Telecommunication
- Nanotechnology
- Control Systems

Job Opportunities:

They are absorbed into the entertainment, consumer electronics, consumer durables, transmission industry, research establishments, and specialized defense products like signaling equipment's, radar control equipment's.

Also biggest employment opportunities for EC Engineer are in the new computer related fields related to hardware & components and Networking and in the Telecom Sector. There are high end opportunities as well as middle segment opportunities.

Electronics has a major role in improving productivity in industries like oil, energy, agriculture and so many other important sectors of economy. In steel, petroleum and chemical industries it is the electronic devices that direct, control and test production processes. Health care industry depends on electronic instruments to perform chemical tests and to check body functions. The safety in transportation, factories and mines and in homes relies heavily on electronics. Depending upon your interest you can go in the above sectors.

Core companies offering jobs to Electronics and Communication Engineers:

Bharat Electronics Limited (BEL), Electronics Corporation of India Limited (ECIL), Intel, Samsung Electronics, Sony, Toshiba, Philips Semiconductors, Texas Instruments, LG Electronics, Nokia, AMD, CISCO, Nvdia, HP and IBM are just few to mention.

Electrical Engineering

This branch deals with the study and application of electricity and electronics. It isalso considered ascore or mother branch of engineering. It deals with electricity generation and distribution. It has good scope in industries. Some key points are

- Mother branch of engineering.
- Job Opportunities in government sector.
- Little tougher compared to other branches.

Now some guidelines for you after reading you can get your answers of your question that it suited to you or not.

- Do you have interest in physics and mathematics? if so, choose it.
- If you feel easy with complex circuits you can choose it.
- If you want to know how electrical equipment's work, then this is the right option for you.

During first year of engineering electrical engineering students learn about Common engineering courses like Engineering mathematics, Physics, Engineering Drawing and fundamentals of computing. From second year they will start learning about Thermodynamics, introductory electronics, signal

processing and instrumentation, signals, systems and electric networks, microelectronics, control systems, communication systems, power systems, electromagnetic systems, electrical machines, and power generation techniques. By the end of final year students can be well equipped with the understanding of working and application of electric systems and engineering.

There are equally good opportunities for jobs in electrical engineering industry and higher education. There is lot of multidisciplinary research for developing electric vehicles with great funding and scope all over there world

Projects (Electrical and Electronics)

- Invent better MRI scanners, allowing doctors to see even more clearly inside a patient's body
- Create special effects for the movies
- Design cell phones that work more reliably and have more features
- Develop artificial retinas for the blind
- Work on satellite communications systems that connect people around the world

Core companies offer electrical engineering jobs:

ABB, Bajaj International Private Ltd., Bharat Heavy Electricals Limited (BHEL), Centre for Electronics Design and Technology, Crompton Greaves Limited (CGL), Siemens Ltd., Reliance power Ltd., and Wipro Lightin etc.

Mechanical and Production Engineering

- Are you interested in bike and cars design?
- Do you take interest in functioning of daily routine things?
- Do you ask basic questions to your teachers (i.e. how this works? how that works?)
- Do you like physics?
- Do you like to make some new mechanism?
- Do you like to use your engineering skills for a common man's life?

If yes then you are at right place and this is the branch for you. This branch requires real hard work. In most of the colleges mechanical and production are different branches but their syllabus content is more or less similar. There is a misconception that in this branch job opportunities are less as compared to computer science and electronics. Again it depends upon the individual .This is called as evergreen branch ,now a days there are lots of job opportunities and money in this sector if you have talent and ready to work hard.

Domains:

- Applied Mechanics
- Manufacturing
- Energy Conservation
- Material Engineering
- Automobile Engineering
- Design Engineering
- Fluid Mechanics
- Heat Transfer
- Biomechanics
- Tribology (Reducing Wear & Tear)
- Robotics

Mechanical engineering is one of the oldest branch of engineering and this course is available in almost all engineering colleges across India. Mechanical engineering is really a broad field of engineering because of its application. It has application right from manufacturing plants, vehicles, ships, robots, heating and cooling systems, aircrafts, even in medical devices.

During the first year of Mechanical Engineering Degree students learn common engineering methods, mathematics, physics, chemistry and engineering design. From second they are exposed to specialized subjects like mechanics, kinematics, thermodynamics, fluid mechanics, heat transfer, materials science, energy...etc. Mechanical Engineering students after graduation will have the knowledge of these engineering concepts and will be ready to use them for industry.

Mechanical Engineering has good prospects in industry as well as higher studies. Mechanical Engineering jobs don't mean to work in a workshop like a labor. There are plenty of office work and because of vast application of computers in mechanical engineering. All designing and manufacturing process is automated and computerized. Therefore the job profile for mechanical engineering is almost similar to a computer engineer.

Every top university offering engineering courses have mechanical engineering and there is a lot of research going on in every specialized fields of Mechanical Engineering. You can see a good amount of requirement for PhD and research students abroad.

Projects:

- Design "smart" toys for kids
- Develop cars that are more fuel efficient
- Produce hypoallergenic air conditioning for hospital operating rooms
- Create prosthetic hands that allow a person to type and write
- Build aerospace vehicles to trek across planets and moons, collecting samples

Core Companies offering Mechanical Engineering Jobs: ISRO, DRDO, Indian Railway, ABB, TATA Motors, General Motors, Fiat, Reliance Industries, Reliance Power Ltd, Asoka Leyland, Mahindra and Mahindra, Bosch etc.

Materials and Metallurgical Engineering

In this course of engineering students will learn about the physical and chemical properties of different metal, their mixtures and applications. Students will learn about preparing metal that satisfy industry demands, like aircraft, high temperature ovens, ..etc.

During the first year of study, students learn the basic engineering methods thought mathematics, physics and chemistry. Later in second year till final year of study student will learn about he principles of metal extraction and refining, materials characterization, structure- property relationship, and processing of metals and other materials.

There are lots of companies in India doing metallurgy business for example all steal companies offer jobs Material science and Metallurgical Engineering students. There are plenty of higher studies opportunities both in home and abroad.

Core Companies offering jobs: Steel Authority of India Limited, Tata Steel, Jindal Steel & Power Limited, Ispat Industries Ltd, John Deere, Pune, Reliance Industries Ltd. Government organization include ISRO, DRDO, and Railway.

5 One Minute Productivity Tactics

- Have the courage to get great at saying "No Thanks" to any activities that don't advance your priorities.
- Take 60 seconds every morning to do a written game plan for a productive day. "The things that get scheduled are the things that get done." from the book -The Greatness Guide.
- Take a few seconds each day to turn off all your technology and work deeply on a key project with zero distraction.
- Take 60 seconds to breathe deeply and focus on your progress. This will re-energize and refuel you.
- Take 60 seconds to un-clutter your work area so you create space for your creativity to flow.

Mining Engineering

The year of mining engineering studies are common to other engineering course, where students learn about basic engineering studies, mathematics, engineering drawing. .etc. From second year of mining engineering course students learn about Rock Mechanics, Underground and Surface Environment, Geomatics, Mine Safety, and Reliability, and relevant computer applications.

A passing out student of mining engineering will be aware of theory and practices and application of extracting and processing minerals from environment. They will be exposed to subjects like mineral exploration techniques, processing of minerals, and safety in mining engineering. Studies of mining on global warming have become an important field of study and research in mining engineering.

This field of engineering offers opportunities for both higher education and industry. Only big universities and government funded universities offer this course of engineering therefore it gives ample opportunities for growth and progress.

Core Companies: Steel Authority of India, Oil and Natural Gas Corporation, Reliance Industries Limited, Tecnimont ICB Pvt. Ltd and TATA Power are few of the leading companies that offer jobs for Mining engineers. There are a good number of public sector companies the also consider mining engineers like Coal India Limited, Bharat Aluminium Limited, Hindalco Industries, Indian Oil Corporation, National Aluminium Corporation, Bharat Gold Mines Ltd.

Career Opportunities

Though there is a glut off graduates in some branches of engineering and technology leading to unemployment, the field continues to offer reasonable rewarding career opportunities to the brighter ones. What should, however be noted is that, the standard and reputation of institutions in which the candidates study have a great bearing of their success in the employment market. Products of colleges and institutions which survive on the basis of year-to-year recognition because of their inability to conform to the norms specified by the AICTE in respect of workshops, laboratories, libraries, equipment and qualified teachers, are certainly at a disadvantage in the highly competitive job market.

But choosing the right institution and branch of study having good career potentials are often, beyond the control of individuals. Both the Central and State governments continue to be the major employers of engineers particularly in such branches as Civil, Mechanical, Electrical, and Electronics Engineering. As regards the Central Government, the Union Public Service Commission conducts an annual Engineering Services Examination for recruitment to the Group A Services and posts in various technical departments and establishments. The Services fall into four categories, viz., Civil Engineering, Mechanical Engineering, Electrical Engineering, and Electronics and Telecommunication Engineering.

The eligibility requirement is a degree in engineering or Associate Memberships of professional institutions which are recognized by the UPSC as equivalent to engineering degree. The near demise of public sector industries, which at one point of time used to absorb a large number of engineering graduates, has considerably shrunken the scope of employment in this sector. Though the corresponding growth in the private sector is not very encouraging, it is still the best bet for engineers seeking lucrative careers.

Since it is the age of specialization, acquisition of a postgraduate degree (M.E/M.Tech) preferably in newly emerging areas would go a long way in ensuring a satisfying career..

Teaching and research careers are no less rewarding. With the proliferation of engineering colleges and technological institutions, postgraduates and doctoral degree holders can join the teaching profession. The profession also provides learning opportunities to enrich one's knowledge base. The major scientific establishments, other than the DAE, such as the Council of Scientific and Industrial Research, Indian Space Research Organization, Defense Research and Development Organization with their vast network of research establishments offer research careers in many front line areas of engineering and technology.

Branches offered by colleges under VTU

The respective branches are grouped according to boards.

CIVIL BOARD
- Ceramics & Cement Technology
- Civil Engineering
- Environmental Engineering

ME BOARD
- Aeronautical Engineering
- Mechanical Engineering
- Mining Engineering
- Electrical & Electronics Engineering

EC BOARD
- Electronics & Communication Engineering
- Telecommunication Engineering

CSE BOARD
- Computer Science & Engineering
- Information Science & Engineering

IP BOARD
- Industrial & Production Engineering
- Industrial Engineering & Management
- Manufacturing Science & Engineering

IT BOARD
- Biomedical Engineering
- Instrumentation Technology
- Medical Electronics

BT BOARD
- Bio-technology

CHE BOARD
- Chemical Engineering
- Polymer Science & Technology
- Silk Technology
- Textile Technology

AU BOARD
- Automobile Engineering

Major Areas of Engineering

Acoustic Engineering:

Designing of buildings and rooms to make them quiet, improving conditions for listening to speech and music in auditoriums and halls and developing techniques and sound absorbing materials to reduce noise pollution.

Website:http://en.wikipedia.org/wiki/Acoustical_engineering

Agricultural Engineering

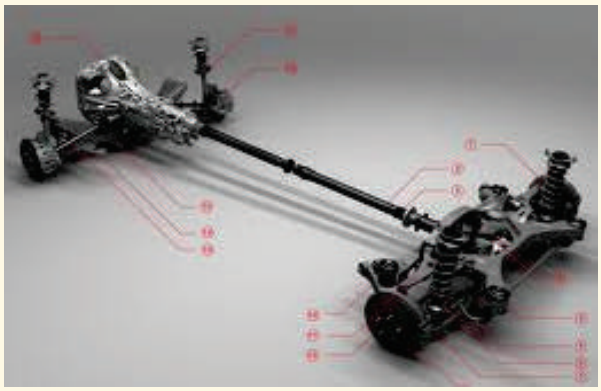
Designing agricultural equipment, erosion control and irrigation and land conservation projects, and processing, transporting and storing of agricultural products.

Website:http://en.wikipedia.org/wiki/Agricultural_engineering

Automobiles Engineering

Developing various technologies relating to automobiles and other motor vehicles and their design and management of production.

Automobile engineering is one of the most challenging careers now days. Due to demand and passion on vehicles automobile engineers has lot of opportunities in India as well in abroad.. It is the study of engineering that deals with designing the vehicle, Manufacturing new products/ new vehicle, Repairing, servicing vehicles. Automobile engineer should be innovative and dedicated to their work. Engineering has many sub section like systems and soon. It involves studying motor systems, design, technology and many more. Automobile engineer includes product design engineer, development engineer and manufacturing engineer. Manufacturing engineer they design the layout, manufacturing the safety products whereas product designer will design and test the systems of auto mobiles. Development engineers concern about the delivery of the vehicles and also about the customer satisfaction. Then it comes when having from the engineer of the automobile to improve the vehicle in response to the regeneration of clients. The future engineers



of the automobile can specialize in the alternative areas such as aerodynamic, fuels, the chassis, the electronics, the emissions, the ergonomic one, the manufacture, the materials, the creation of a fast prototype, the security or the management etc. The responsibility of the engineer of the automobile always consists of maintaining the greater level of the vehicle by the use of traditional methods and of the technology outpost. Recently, due to the fast growth of the industries of automobile in the country, the demand for the expert professionals also has been increased considerably.

Website: http://en.wikipedia.org/wiki/Automotive_engineering

Biomedical Engineering

Applying engineering techniques to health related problems. Where would modern medicine be without the contributions of biomedical engineering? Imagine hospitals operating without X-rays, ultrasound, ECGs, and the thousands of high-tech procedures and devices that diagnose conditions, sustain health, and fight disease. As a biomedical engineer, you'll make a real difference in the lives of others. You might develop artificial lenses that restore sight to the blindness, radiation treatments that fight cancer, or incubators that keep premature babies alive. And outside the world of medicine, you could contribute to the health of our planet by developing better technology in the fields of agriculture and environmental science.

Projects

- Create a prosthetic leg designed especially for children
- Grow tissues that help repair damage from heart attacks
- Protect the environment by producing organic fertilizers
- Grow vegetables that contain more nutrients
- Develop cancer treatments that don't cause debilitating side effects

Website: http://en.wikipedia.org/wiki/Biomedical_engineering

What Makes The Perfect Human? And what does it take to create a life that's so excellent it's unbelievable?

"To have the results only 5% have, you need to do the things that only 5% are willing to do." - Robin Sharma

To start seeing explosive gains in your achievement levels, I invite you to make the commitment to using every single day of the rest of your long life as a platform for improvement and a vehicle for daily optimization. Remember: as you live this day, so you craft your life (the best way to predict the future is to create it in the present). Leave everything you touch 1% better. Never stop improving your mindset. Never stop improving your communication. Never stop improving your fitness. Never stop improving your productivity. Never stop improving your knowledge base.

Remember,

- The Perfect Human Wants to Be Better
- The Perfect Human Cares
- The Perfect Human is Brave
- The Perfect Human Loves Fit
- The Perfect Human Values Honor
- The Perfect Human Needs Little
- The Perfect Human Respects Work
- The Perfect Human Craves Achievement
- The Perfect Human Adores Family
- The Perfect Human Savors Life

Environmental Engineering:

Overall efforts to prevent and control air, water, soil and noise pollution using various engineering techniques.

Most of us care deeply about stopping pollution and protecting our natural resources. Imagine yourself having more than just a passion for saving our environment, but also possessing the actual know-how to do something about these alarming problems! As an environmental engineer, you'll make a real difference in the survival of our planet by finding ways of cleaning up our oceans, rivers, and drinking water, developing air pollution equipment, designing more effective recycling systems, or discovering safe ways to dispose of toxic waste.

Projects

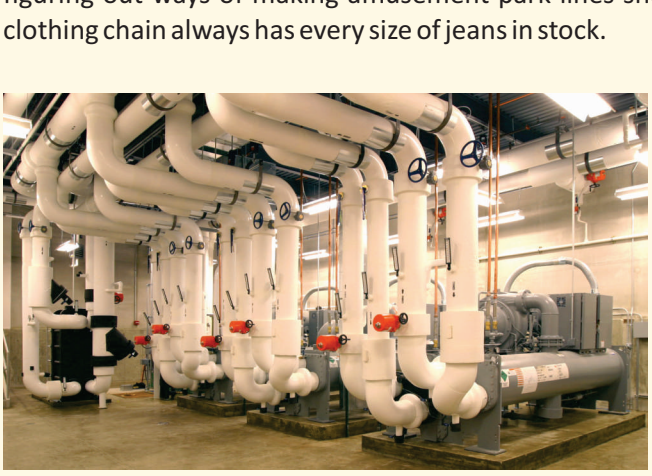
- Develop ways of tracking endangered species
- Design methods of accurately measuring acid rain, car emissions, and ozone depletion
- Work with large industries to reduce their air pollution emissions to acceptable levels
- Invent better ways of recycling paper, plastic, and glass
- Remove bacteria and poisons commonly found in the well water of the developing countries

Website: http://en.wikipedia.org/wiki/Environmental_engineering

Industrial Engineering:

Applying engineering analysis and techniques to the production of goods and techniques more particularly mathematical models developed on computer to simulate flow of work through the organization and to evaluate the effects of any proposed changes.

Do you think of yourself as super organized? Do you think you're good at understanding the big picture and figuring out how things could work better? If so, you might make a great industrial or manufacturing engineer. Your job would involve organizing people, places, equipment, and information, ensuring that complex and large-scale systems operate safely and efficiently. You might keep a hospital operating room running like clockwork. You might make sure an assembly line runs smoothly both for people and machines. Or you might be involved in adding a little extra fun and convenience to people's lives by figuring out ways of making amusement park lines shorter, for instance, or by seeing to it that a big clothing chain always has every size of jeans in stock.



In life, when one door closes another opens. But we often look so long and so regretfully upon the closed door that we fail to see the one that has opened for us.

Robin Sharma

Projects

- Prevent stress and injury in workers by designing effective workspaces
- Organize, for a computer company, a customer service center that actually helps customers
- Determine what work functions are best performed by people and which one should be automated
- Design ergonomic office space
- Make sure that an international hotel chain offers the same services and conveniences no matter where it's located

It is an engineering stream related to management of Industrial process. The name Industrial engineering often confuses students and parents and lead to an imagination of a manufacturing industry. This is engineering stream is related to understanding, development and implementation of systems involving human being and other resources. In this course of study student will learn about the methods to manage and optimum utilization of resources available by applying mathematical and engineering tools.

During first year student will learn about basic engineering subjects like mathematics, physics chemistry and other engineering subjects. In later years who study about Product Design and Development, work systems, logistics, production planning and inventory control, Operation research, Quality Control and recently Intellectual property system.

Usually these courses are most effective at master of engineering (M.Tech) level. Industrial engineers are suitable for any industry, right from manufacturing to planning, consultancy to software, logistics to supply chain management. There is big opportunity for higher education in Industrial engineering in the field of supply chain management, Operation research, Inventory management and Intellectual properties rights.

Core Companies:

All manufacturing and engineering companies offer jobs to Industrial engineers. TATA (all sectors, Motors, Steel, Communications..etc), Reliance Industries ltd., Maruti Udyog, and thousands of other companies in India including TCS, Infosys, Wipro Including Government originations like Railway, BSNL, ONGC, ISRO and DRDO to name few.

Website:http://en.wikipedia.org/wiki/Industrial_engineering

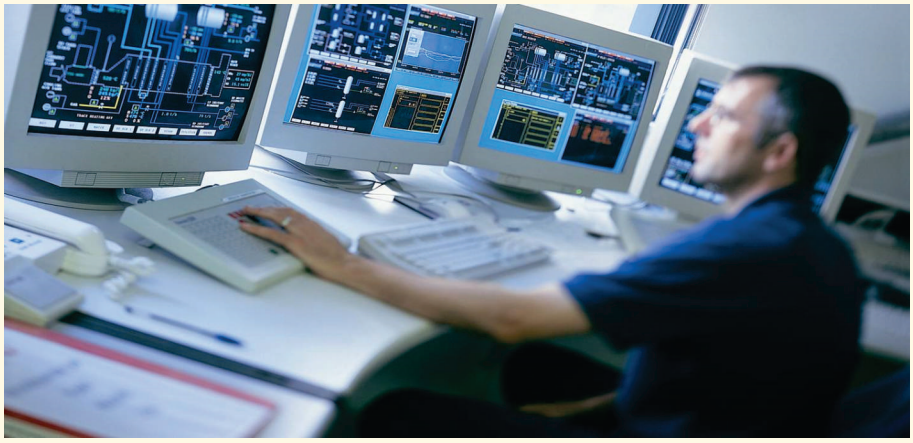
5 Secrets to Excel

- Have a clear vision of your outcome.
- Create positive pressure to keep you inspired.
- Never set a goal without attaching a timeline to it.
- Follow the magic rule of 21: The Magic rule of 21 is “For a new behavior to crystallize into a habit, one has to perform the new activity for 21 days in a row”.
- Enjoy the Process. Make sure that you have fun while you are advancing along the path of your goals and purpose.

Instrumentation and Control Engineering:

Designing and using scientific instruments for purpose, such as, communication, control, computation, direction, or measurement.

Instrumentation engineering is specialized branch of electrical and electronic engineering, which focuses on the principle, and operation of measuring instruments, which are used in design and configuration of automated systems. These engineers work for industries with automated processes, such as chemical or manufacturing plants, with the goal of improving system productivity, reliability, safety, optimization and stability. Instrumentation Engineers help in the designing, construction and maintenance of instruments and entire instrumentation systems of an industrial undertaking. An instrumentation engineer decides the type of instruments needed for ensuring better quality and efficiency of the end product.



Job Prospects:

Instrumentation engineers can be placed in R&D units of public and private sector companies. They are also required by the Heavy industries such as Thermal Power Stations, Steel Plants, Refineries, and Cement and Fertilizer Plants. They have a multidisciplinary role to play. One may choose to move sideways into other career areas either within or outside their industry. This might include areas such as purchasing, sales, marketing, finance, HR, IT or general management.

These engineers can pursue consultancy-based work. Those who have an aptitude use their expertise they have gained in industry and engage in academic research in universities or acquire a tutoring/coaching role as a lecturer or trainer of instrumentation engineers. Senior level positions are occupied with a Master's Degree and they carry the highest level of responsibility and may include planning and managing activities, as well as leading on new developments. Senior engineers in production and operation functions can often be representatives at board level.

5 tips to how to wake up early

- Allow yourself to sleep earlier. Get enough sleep of 6-7 hours.
- Do not eat heavy dinner. Have dinner at least an hour before you go to sleep.
- Put your alarm clock far from your bed. Scrap out snooze from the alarm.
- Once you get up, drink a glass of water and hydrate the body. Breathe in fresh air.
- Define the tasks to be done soon after getting up. Plan the day.

Nature of Work:

A Control and instrumentation engineer is essentially responsible for designing, developing, installing, managing and/or maintaining equipment which is used to monitor and control engineering systems, machinery and processes. Tasks and responsibilities, which are common to instrumentation engineers, may include:

- Designing and developing new control systems
- Maintaining and modifying existing systems
- Managing operations
- Working collaboratively with design engineers, operation engineers, purchasers & other internal staff
- Contacting clients, suppliers, contractors and relevant authorities
- Project management within cost and time constrained environments
- Troubleshooting and problem-solving
- Understanding and ensuring compliance with the health and safety regulations and quality standards
- Providing advice and consultancy support
- Purchasing equipment
- Writing computer software

Domains:

Though instrumentation engineering itself is a specialized subject yet those who want to pursue further studies can do PhD in the following areas:

- Digital Signal processing
- Monitor Control
- Speech Processing
- Sensor Network
- Intelligent Controls

Website: http://en.wikipedia.org/wiki/Instrumentation

Marine Engineering:

A marine engineer is a professional who is responsible for the operation, maintenance and repair of all major mechanical and engineered equipment on board a ship.

Ships these days use the most modern technology and equipment that can be understood, maintained and handled only by marine engineers. This job requires a high degree of discipline and responsibility since the chief marine engineer is in charge of a ship and its cargo which cost millions of dollars.

They manage the enormous power of the ship and all its complicated machinery and help it cross the ocean. Marine engineers may have to work on cargo ships, container ships or oil and gas tankers.

Website: http://en.wikipedia.org/wiki/Marine_engineering

Naval Architecture:

The design and construction of ships and other vehicles.

Website: http://en.wikipedia.org/wiki/Naval_architecture

Nuclear Engineering:

The handling, control and application of nuclear materials and reactors for generating useful energy.

Website: http://en.wikipedia.org/wiki/Nuclear_engineering

Ocean Engineering:

The design and installation of all kinds of equipment used in Oceans.

Website: http://en.wikipedia.org/wiki/Ocean_engineering

Petroleum Engineering:

The production, storage and transporting petroleum and natural gas.

Petroleum engineering degrees are not very popular in India because of fewer universities offering admissions to petroleum engineering and less awareness in parents. During the first year of study in petroleum engineering students usually learn about basic engineering methods and techniques and from second year very specialized courses in petroleum engineering are offered that include Reservoir Studies, Gas Hydrates, Environmental Impact of Petroleum Fluid Operation, Characterization of Crude oil, Development of Computer Software, Polymer Synthesis and Characterization, Profile Modification, Development of Novel Fracturing Fluid, Characterization and Separation of Oil-Water Emulsion Etc.

In this course student will learn subsurface activities related to the production of hydrocarbons, which can be either crude oil or natural gas. The two key area of learning will be oil exploration and processing of crude oils. Oil refining and distribution are also thought in this course of engineering.

Petroleum engineering course offer wonderful job opportunities at global and domestic levels. Opportunities in oil and gas sector are ample in Middle East with very high annual income packages. Higher education opportunities are good all over America and Europe too.

Core Companies:

The organizations in which the graduates are absorbed are Reliance Industries Ltd., ONGC, Schlumberger, Shell, OIL, Gas Authority of India Ltd., British Gas, Halliburton Services, Essar Oil, GSPC, Cairn Energy, IOCL, Baker Hughes, Reliance Energy, NIKO Resources, GEOENPRO, MECOM Ltd., etc.

Website: http://en.wikipedia.org/wiki/Petroleum_engineering

The major difference between a thing that might go wrong and a thing that cannot possibly go wrong is that when a thing that cannot possibly go wrong goes wrong, it usually turns out to be impossible to get at and repair.

- Douglas Adams

Production Engineering:

The design and operation of productive processes and facilities (refer: Industrial Engineering – Different Names for the same branch).

Textile Engineering:

Concerns machinery and processes used to produce both natural and synthetic fibers and fabrics.

The textile industry is in a period of rapid and revolutionary modernization and automation in India. The engineers graduated in Textile Engineering are equipped with the knowledge of the behavior of textile materials and the functions of machinery in textile and clothing technologies.

Textile Engineering deals with the application of scientific and engineering principles to the design and control of all aspects of fiber, textile, and apparel processes, products, and machinery. These include natural and man-made materials, interaction of materials with machines, safety and health, energy conservation, and waste and pollution control.

Job Prospects:

They are employed in departments of textile plants and companies varying from small to big scale, i.e., production, planning, quality control, sales or marketing or in agencies of domestic or foreign companies for textile products and textile machinery, concentrated in different regions of the country.

In India, there are two major textile sectors- handloom sector (the unorganized one) and the mechanized sector (organized sector). These both have full growth potential. There are thousands of textiles mills all over the country.

Graduates with textile chemistry find careers in dyeing and finishing, technical services, research and development, quality control, product development, polymer science and environmental control. Most graduates of the with textile management program initially enter management trainee programs which can ultimately lead to plant or corporate management. Other career options include technical sales, industrial engineering, product development, marketing, customer relations, human resources, and cost and inventory control. So one who has a degree in Textile Engineering can work as

- Process engineer
- Quality control supervisor
- Technical Services/Sales Manager
- Operations Trainee
- Process Improvement Engineer
- Medical Textiles Engineer

To be yourself in a world that is constantly trying to make you something else is the greatest accomplishment.

Ralph Waldo Emerson

Textile engineering courses deal with the application of scientific and engineering principles to the design and control of all aspects of fiber, textile, and apparel processes, products, and machinery. These include natural and man-made materials, interaction of materials with machines, safety and health, energy conservation, and waste and pollution control. Additionally, students are given experience in plant design and layout, machine and wet process design and improvement, and designing and creating textile products. Throughout the Textile Engineering curriculum, students take classes from other engineering and disciplines including: Mechanical, Chemical, Materials and Industrial Engineering Departments. There are four concentrations in the Textile Engineering Program

- Information Systems Design
- Machine Design
- Textile Product Engineering
- Chemical Processing

Courses in accounting, economics, management, marketing and computers are coordinated with textile courses related to managing people and processes in the fiber, textile, carpet and apparel industries. Optional courses allow a student to concentrate on specific aspects of the business such as marketing or apparel manufacturing.

Domains:

• Textile chemical technology

It deals with the innovative solutions to today and tomorrow's textile wet processing opportunities.

• Fiber science technology

Deals with fiber and polymer research, helps to develops new fibers, and tries to increase the productive capacity

• Technical textile

Technical textiles are the term given to textile products manufactured for non-aesthetic purposes, where function is the primary criterion. These include textile structures for automotive applications, medical textiles (e.g. implants), geotextiles (reinforcement of embankments), agro textiles (textiles for crop protection), protective clothing (e.g. against heat and radiation for fire fighter clothing, against molten metals for welders, stab protection and bulletproof vests),spacesuits(astronauts) manufactured for non-aesthetic purposes, where function is the primary criterion.

• Computer application in textile

This study helps the engineers to design various products with the help of computers.

Website:http://en.wikipedia.org/wiki/Textile_manufacturing

• Transportation Engineering:

The efforts to make transportation safer, more economical and efficient.

Website: http://en.wikipedia.org/wiki/Transport_engineering

Preference of **Engineering Branches** according by students in the last academic year.

The students in state universities preferred Electronics Engineering over Computer science and other trends remain almost the same as IITs and NITs. The reason for making this list to give students an idea about the preference trends in last years.

I personally consider all the engineering course, streams and trends are same. It all depends on interest and dedication one puts on to it.

The preference list is as follows:

1. Computer Science & Engineering
2. Electronics & Communication Engineering
3. Electrical & Electronics Engineering
4. Mechanical Engineering
5. Information Technology
6. Instrumentation & Control Engineering
7. Chemical Engineering
8. Civil Engineering
9. Industrial and Production Engineering
10. Biotechnology
11. Metallurgy and Materials Engineering

A. Piccard, E. Henriot, P. Ehrenfest, E. Herzen, Th. De Donder, E. Schrödinger, J.E. Verschaffelt, W. Pauli, W. Heisenberg, R.H. Fowler, L. Brillouin;
P. Debye, M. Knudsen, W.L. Bragg, H.A. Kramers, P.A.M. Dirac, A.H. Compton, L. de Broglie, M. Born, N. Bohr;
I. Langmuir, M. Planck, M. Curie, H.A. Lorentz, A. Einstein, P. Langevin, Ch. E. Guye, C.T.R. Wilson, O.W. Richardson

Frequently asked Questions

Who is an engineer?

Engineers are professional problem-solvers. They use math and science along with skills in communications, critical thinking, and management to find practical solutions that will benefit people or society. They DO things: design, create, build, improve, invent -- everything from heart valves and microchips to skyscrapers and space vehicles.

How much money do engineers make?

Salaries for engineers depend on what type of engineer they are, what kind of company they work for, how many years of experience they have. Many engineers with bachelor'sdegrees start out making over Rs 3,00,000 a year. Some engineers just starting out earn more than Rs 7,00,000 a year!

How long is the Engineering Course?

You can start working as an engineer with a 4-year college degree. Many engineers go on to earn masters degrees (usually in another 2 to 3 years), and some get a Ph.D. (4 to 6 years beyond the bachelor's degree).

Where do engineers work?

Engineers work in lots of different places. Some work in large corporations, while others own their own small firms. Engineers are employed at manufacturing plants, hospitals, research labs, construction sites, and "regular" business offices. Some engineers work for government agencies and while others work in foreign countries.

What do engineers wear?

Engineers who work in offices may wear business suits every day, others may dress more casually - even blue jeans occasionally! Engineers who work in manufacturing plants or on construction sites may wear hard hats and steel-toed boots. Some engineers wear special clothes to protect them from dirt or hazardous chemicals.

How long is an engineers work day?

An engineer can work a regular 9-to-5 hours or much longer depending on what kind of company they work for and what kind of project they are involved with at the time.

Can they still have a family, friends, a life?

Engineers are people, too! They work hard, but have families and friends just like everyone else. Look at the engineers profiled in the gallery: Many of these successful women have families as well as hobbies ranging from music and gardening to sports etc.

What if someday I decide I want to do something else?

An engineering degree is good preparation for many different careers - especially ones that require problem-solving skills. There are several engineers who have chosen to become doctors, lawyers, or business managers as well as traditional engineers.

Can I pursue my PhD after BE/BTech?

As many IITs are calling for PhD after B.Tech and students who appeared for GATE and could not make it to M.Tech in IITs usually called for PhD exam and interview. A letter from IIT can make you or anyone think about that program. Here in this post I would like to tell all the pros and cons of this.

The biggest advantage of doing PhD right after of B.Tech is you get to see IITs with not very high score and have a chance to study with highly competitive students. You can also prove to be better than them with hard work and determination.

If you have long term plan for research then this could be a wonderful opportunity. Most of the students are worried about PhD pressure and research aptitude right after B.Tech or BE, I think this will not be an issue. The reason for this is that, one needs to take up a bunch of subjects(coursework) before they start the actual research. These subjects are usually recommend by ones guide and useful in research and also help you to build a solid base to start working. The number of subjects, usually, are same as M.Tech and sometimes professor may ask you to take additional class too.

If you looking for an industry job right after your studies, I think you need to think again about PhD program. A doctorate degree may help you to secure a position in some research lab but finding an industry job is not easy

The time duration for PhD is also not well defined and may differ from lab to lab or research area. Usually it is something around 4~5 years. During this time one need to be self motivated and stay focused. Always try to have at least one research paper in top most journal of your area of interest.

Most of the PhD students would go abroad for post doctoral research or join as faculty in some college, university or institute based on their quality of research. Few take up the challenges and luck support them to join industry and they choose their career from there. Getting an industry position especially in research is not easy as there are limited laboratories and requirements are too low, as the people who are working as researchers usually don't move frequently.

To summarize, if you are patient, have really long term plans, self motivated and willing to work for future then you should knock the doors of IITs for PhD. If you are not very patient with books, long reading hours, and would like to complete studies as soon as possible then I would recommend you to try hard to get into to M.Tech in good universities to based on your scores.

How important is the foundation of P,C,M for Engineering?

The first year of Engineering comprises of Basic Science courses which includes Engineering Physics, Engineering Chemistry and Engineering Mathematics etc. The necessary foundation is stressed upon in these 2 semesters. Students who are good in these subjects have an added advantage because Engineering is more of applications of Physics and Mathematics to solve real life problems.

When do the campus placements happen?

The campus placements are conducted usually in the Final year. i.e. 7th semester or the 8th semester in which students who meet the eligibility criteria can attend these interviews and get placed in the companies.

How important is it to get an MTech Degree?

The first and foremost advantage of doing MTech is that you get time to think where things are going and how you can control them. Where do you want to go and what is your ultimate destination. You know the mistakes you made in B.Tech. Thus u can avoid them and improve to recover from them.

The second advantage of doing MTech is that you add a value to education and will definitely have benefit in the long run. As we are moving ahead in life our educational qualifications are becoming more and more important. At some point where all other competitors have same technical skills you will be given preference over others because of qualification.

The third advantage is that you will get more insight into the subjects as this time you are mature enough to understand the subjectsand you are more exposed to applications.

The fourth advantage is you will have good friends who are similar to you and trying hard to move ahead in life. If your institute is good you will see all of them in high positions in future, their contacts may be good enough for you to start new projects and help many.

There are lots of other advantages of doing a higher degree. But there may be many social constraints and difficulties that may prevent you from doing master degree. Everyone knows their situation better than others and can make best decisions based on that. You can push your plans of having a master degree little later and gain few years of experience before.

Improving Memory Retention

A person's memory is what is stored, or retained information that is seen, heard, learnd, or otherwise experienced. The ability to recall and use that information is also courtesy of one's memory. There are different types of memory that retain information in different ways. The two main types of an individual person’s memory are short term and long term memory. Information that a person must recall for a test is courtesy of his or her long-term memory, but this process starts with the short-term memory. There are times when students may feel that they are having more difficulty retaining information. This can be the result of any number of factors, and just as previously mentioned memory is influenced by many things. Fortunately there are learning habits that can be developed to improve memory, such as using mnemonic devices, repetition and practice tests. Improving overall brain function can also make a big impact on memory.Some physical factors that can be adjusted are nutrition, exercise and sleep habits.

There are numerous strategies that can be used to improve a student's memory retention. Giving oneself plenty of time to study is one important method of improving memory retention. Students who cram at the last minute are less likely to retain what they are attempting to learn because they are overloading their short-term memory and not actually learning the information. Another way to improve memory in a particular subject is overlearning. Overlearning involves studying beyond the point where the student believes that he or she has simply memorized the subject being studied.

Which is the best engineering course?

Engineering is a basically a combination of theory and practical's. Keeping this in view and thinking about the course will help you to make decision about your choice. Let me start with Civil engineering, this is a wonderful course and almost every colleges have good infrastructure for this, both in terms of faculty and laboratories. On the other hand this is really a tough job and most of them going to the sites and taking care of construction management stuff. You cannot make good money in this field working for someone and starting own company needs good investment and contacts, which is difficult for a common Indian family. Mechanical Engineering comes with similar issues.

Electronics and Electrical Engineering are very good and highly job oriented courses. No doubts and questions about that. But when it comes to faculty and practical experiments most of the colleges does not have sufficient infrastructure. Moreover after finishing most of these engineers work in software companies as there no sufficient companies who work in core areas of Electronics and Electrical Engineering.

At last we are left with Computer engineering and IT. The infrastructure required for these courses is very easy to provide and if teaching is not good at college finding a tutor outside even in a small town is not a problem. More importantly when Google, Microsoft and other top companies come for campus interviews they don't allow any other stream than CS and IT.

Even after electrical or electronics engineering one goes to software jobs, more over top software companies do not allow them to appear for test and interview. Therefore, I don't see any logic in going for these courses if Computer Science or IT is available. We have more software companies than any other companies. These companies pay good salaries and also give a chance for foreign assignments that will further enhance your personal and professional skills.

Once I am done with admission in any course, I will concentrate and work hard to be best in that course. Best in any field is always rare and respected. So I suggest all of you to work hard and live to the dreams of your parents and make them proud.

What to do after B.E if I do not get Campus Selected?

Another common question usually struck in an engineering student is what after Engineering. Here, I tried to figure out what are best possible options you can choose and are not exceptions. In other words well known and common options that you can choose after B.Tech.

Hunting a Job:

If one feel that t has been too heavy to study for four years and want to start earning money, then start early hunt for job. Make a profile in all job sites and social job networking sites like LinkedIn. Give it a big try and attend all walk-ins and apply all the places where you find suitable. Be prepared to travel a lot in the search from Bangalore to Pune, Pune to Delhi, Delhi to Noida anywhere. Don't miss any advertisement for fresher and don't give up..

Be faithful in small things because it is in them that your strength lies.
Mother Teresa

MTech or MS:

If you think you need to improve or need a higher degree to feel secure or gain higher positions at right time, you should look at all possible ways to crack GATE and think about MTech. If you are interested in having a foreign exposure and think your family can help and support you, then start preparing for GRE, TOFEL and start looking for universities that are suitable for that.

MBA- Lets change the domain:

We study Engineering for four years and at the end we are almost clear about our decision of joining some engineering stream and our career in that. By the end we know whether we can stay in the same domain, stream, or field of engineering and improve or it is kind of wasting our time if we remain in the same engineering field and you decide to change your area of study. MBA is a very good alternative, but make sure you are going to a right place for MBA.

Research:

If you think you have patience and motivation for studying for several years ahead and work for a cool and successful career you should consider doing PhD after B.Tech, many IITs take admissions to PhD even right after B.Tech. This may take on the average 4 to 6 years to complete but will definitely make you a strong player in real life and make you confident.

What if I don't get any of these?

This is really an important question to be answered. I feel the alternatives are join some value added courses and in some good institutes like CDAC and others that offer great value and job opportunities, as these require a good amount of money.The exceptions can be to Start a company, be an entrepreneur and explore your world.

Which is the best Engineering Course for girls?

The following courses are recommended for girls according to the priority.

- Computer Science and IT
- Electronics and Communication Engineering
- Biotech or Bioengineering
- Electrical Engineering
- Chemical Engineering

All the above courses have both teaching, lab experiments and jobs which are within the building and you don't need to go out for educational reasons. Whereas other engineering course like Civil, Mechanical, Petroleum Engineering, even if you get an in-house job, for you course work one needs to work outside without thinking about weather and environment.

For the above said courses you get ample and well paid opportunities in teaching as well as research and Industry, which usually girls prefer.

This was just to give an idea about the courses available and their opportunities.

What is AICTE recognition and NBA Accreditation?

First let me start with the abbreviation of these terms AICTE and NBA. AICTE stands for All India Council for Technical Education and NBA stands for National Board of Accreditation. NBA was established by AICTE for periodic evaluations of technical institutions & programmes basis according to specified norms and standards as recommended by AICTE council.

AICTE was established on 1945 to plan and control technical education in India. As the time passed the council grown big spanning over different department, such as UG Studies in Engg. & Tech., PG and Research in Eng. and Tech., Management Studies, Vocational Education, Technical Education, Pharmaceutical Education, Architecture, Hotel Management and Catering Technology, Information Technology, Town and Country Planning. To organize, plan and functioning of these departments AICTE developed nine bureaus. Over all its shows that the organization grown very big spanning over several departments and offices all over the nation.

The simple and most important thing for a common student to know about AICTE is that it is the only organization that approves an engineering college all over the nation. If a college is not approved by AICTE, their engineering degrees are not valid at least in India.

AICTE recognition means, before an engineering college starts taking approval from state govt. and state technical university, they should fulfill basic requirements for starting an engineering college. AICTE checks those minimum conditions at the beginning and gives its approval. Once a college gets an approval from AICTE they can associate themselves with the state technological university to start taking students for Engineering studies.

As AICTE has grown big in years, it became highly difficult to have a constant check on the quality of education in approved colleges and on the same time assess the new application for starting engineering colleges. To deal with AICTE, an established autonomous body known as NBA was set up to have periodic evaluations of Engineering Colleges & courses according to specified norms and standards as recommended by AICTE. It has the full authority to recognize or derecognize institutions and programmes under them.

In 2009 AICTE and UGC official were raided by CBI under corruption charges after that Union Minister of Education formally communicated his intentions of closing down AICTE and related body, the University Grants Commission due to corruption and inefficiency. The Minister also announced that National Board of Accreditation (NBA) would be set up as an independent body and would take over the AICTE's responsibilities.

What are Autonomous Colleges?

In 2007, the University granted academic and administrative autonomy to 14 colleges in the state. Autonomy implies that the college has the freedom to set its own syllabus, evaluation system and grading system, but the degree awarded at the end of the course will be by the university. This degree differs from the degree awarded by non-autonomous colleges, with the difference being that the college name is boldly marked as 'Autonomous'.

Grading system

All the affiliated colleges (except the autonomous colleges) grade the students by a mark system. An aggregate score is calculated out of 100 as a percentage. All the subjects get equal weightage. The final score is not calculated as a GPA.

All the autonomous colleges follow a grading system, the system being absolute grading or relative grading. The final score is calculated as a GPA.

HARD TRUTH ABOUT ENGINEERING

1) It is the course that matters and not the college.

2) Any college having basic infrastructure and good faculties is sufficient for a determined student to excel and achieve his/her goal. It is very essential for the college to have a good campus comprising of good ambience, open space with greenery, good ventilation, playground etc.

3) IIT's and NIT's are similar to any college established in the state. The only difference that sets them apart in the research grants they receive and the global exposure the students gets, which attracts big MNC's to participate for campus recruitments. Because of these reasons, the good students try for these elite colleges.

4) Even the best of the college cannot place a student in any company if he/she does not qualify for the minimum cut off percentage i.e. 65% aggregate in B.E.

5) Apart from core technical skills the student should be well behaved and possess the right attitude to be successful. He/she should dress appropriately in formals and should be well groomed. Personal hygiene is very essential. There are many students who lost their jobs in campus interviews because of their arrogant attitude and informal sense of dressing.

6) Soft skills, Aptitude, Inter-personal skills have to be improvised and mastered by the students to get placed. This must start right from the first year of Engineering.

7) The aim of the student should be to gain knowledge and not study only to clear the examinations.

8) The student must be able to apply the knowledge to solve problems. That is real engineering education - Solving real life problems scientifically.

9) Students should be up to date with the latest trends in the industry. This is possible only when the student visits the library during free time to enrich their knowledge.

10) Students must participate in extracurricular activities and should take care that it does not affect their studies.

11) A healthy mind needs a healthy body. Students should regularly exercise; play out door games to be fit and energetic. This helps them to channelize their energies in the right dimension.

12) Students must participate in College/ State/ National / International level paper presentations and workshops regularly. This will boost their confidence and give them the head start to excel.

13) Students should respect the teachers and the institution. They should have faith in the system, which will automatically guide them to success.

14) Parents should visit their children at least once in a month if they are staying in the hostel.

15) Companies offer the same salary package to the student, irrespective of which college he/she studies in, therefore it is wise to choose the college which is having good faculties, infrastructure, good campus and should be at proximity distance from your residence.

16) Second PU marks is not the thumb rule that governs a student's performance in engineering. There are many instances where low marks scoring students of 2nd PU have performed exceptionally well in engineering as well as high marks scoring students have failed miserably. Therefore it is all about the effort that counts.

17) First and Second semesters are very crucial in sculpting the future of the students because unless the student gets his basics right, the path ahead becomes very gruesome.

18) A strong background of Math's and Physics is very essential to become a successful engineer.

19) Students should not miss classes under any circumstances unless for unavoidable reasons. Because it becomes very difficult to cope up thereafter once they do not attend a specific class. Engineering study is like a race. The one who runs the fastest, wins. So if a break is taken by not attending classes, the student tends to lag behind while the others perform well.

20) Students are recommended to use prescribed text books for Engineering and not senior's notes/other text books.

Courses Offered

Under Graduate Courses

Bachelor of Engineering - BE)

- Computer Science & Engineering
- Information Science & Engineering
- Electronics & Communication Engineering
- Mechanical Engineering
- Civil Engineering

Post Graduate Courses

Masters of Technology Programs - M.Tech.)

- Machine Design (Mechanical Engineering)
- Computer Aided Design of Structure (Civil Engineering)
- Computer Science & Engineering (CS&E)
- Structural Engineering (Civil Engineering)
- VLSI Design & Embedded Systems Design(E&C)

Master of Computer Application - MCA)

MCA (Regular-3 years)

MCA (Lateral-2 years) for B.Sc (Computer)/BCA

Master of Business Administration - MBA

Programs by VTU and approved by AICTE

- Finance
- Marketing
- Human Resource Management
- Banking & Finance

Research

M.Sc. Engineering by Research & Ph.D

- Computer Science & Engineering
- Electronics & Communication Engineering
- Mechanical Engineering
- Civil Engineering
- Business Administration

M.Tech (Part - Time QIP) 2013-14

- M.Tech. (Part - Time QIP) in Computer Integrated Manufacturing
- M.Tech. (Part - Time QIP) in Transportation Engineering
- M.Tech. (Part - Time QIP) in Computer Science & Engineering
- M.Tech. (Part - Time QIP) in Digital Electronics

Approved By:

- Government of Karnataka: vide letter No. Ed 80 TEC 2007(1), Dt. 20-07-2007
- AICTE, New Delhi: vide letter No. F.No.06/06/KAR/ENGG/2007/10, Dt. 29-08-2007

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