

## Engineering

Engineering is a highly challenging and adventurous career to pursue. The basic definition of an engineer is that this person is a professional who can solve any problem with the help of science. Engineering synonymous with innovation, invention, creativity and imagination. An engineer improvises the situation and turns disadvantages into advantages.

Engineering is suited for those who, apart from possessing creativity and an innovative approach to solving problems, also have highly developed numeracy and computer literacy; interpersonal sensitivity, persuasiveness and the ability to work as part of a team; clear written and oral communication skills.

### Some interesting facts about engineering in India:

- India produces more than 1.5 million engineers every year which is equivalent to 25% of world's Engineers. Engineering is considered the most preferred and
- promising career in India. In 2013, more than 14 lakh students appeared for the Joint Entrance Examination. This is more than the number of students who appeared for GMAT and GRE combined that too in the whole world!

In order to be an Engineer, a student has to take up a Bachelor of Technology / Bachelor of Engineering. These courses are usually 4 year-long courses in most of the countries around the world, India included. The admission to these courses is competitive as Engineering stands to be one of the most popular course options taken up by students. We will discuss about the admission process and college options later in the module.

Thanks to the technological revolution, engineering has given birth to more than 40 branches. Here; however, we will focus on the 5 main and most preferred branches along with some emerging branches as well.

### Mechanical Engineering

If you have been to an engineering college you might have seen students in a typical uniform, sweating away in a shed type workshop. While it is a specific trait of mechanical engineering students, it is also an extremely practical oriented branch that only passionate students opt for.

Mechanical engineering is a branch of engineering that applies the principles of engineering, physics, material design etc., for the design, production and operation of machinery. You must have heard names such as James Watt, Thomas Edison and Kalpana Chawla? All of them were mechanical engineers.

Mechanical engineering is a traditional discipline and with the advancement of technology and the industry it has become the forefront of all the new technologies. It has become more

interdisciplinary and is very adaptable, due to the change in the machines and new devices. Mechanical engineers provide mechanical systems that produce work, energy etc.

Degrees available under this branch are —

- Bachelor of Engineering (B.E.) Mechanical Engineering
- Bachelor of Technology (B.Tech.) Mechanical Engineering
- Bachelor of Technology (B.Tech.) Mechanical & Automation Engineering
- Bachelor of Technology (B.Tech.) Mechatronics

### **Career Prospects:**

Since mechanical engineering is the broadest of all engineering fields, the job prospects on offer for skilled mechanical engineers are plenty and unending. Mechanical engineers are required to design, test, manufacture, install, operate and maintain a wide array of machines and mechanical systems that are used in countless industries. These professionals can find employment both in the government and private sector undertakings.

Major industries that employ mechanical engineers include automobiles, space research, aeronautical, energy and utilities, air conditioning, bio-mechanical industry. Other major employers include giant manufacturing plants, and refrigeration industry, turbine manufacturing plants, oil and gas exploration and refining industries and the agricultural sector.

The expertise of a mechanical engineer is required in manufacturing industries like automobiles, aviation, etc. In the recent times, due to the advent of technology, the skills of a mechanical engineer are sought in fields such as nanotechnology, biomedical engineering, energy conservation and more. After graduation, an engineer can pursue post-graduation courses such as:

- M.Tech in Mechatronics
- Ph.D.
- Masters of Business Administration

Even within mechanical engineering, there are several streams and some of the most common functions related to mechanical engineering are:

**Product Design** - A mechanical engineer designs anything that uses mechanical motion to develop products useful to mankind.

**Research and Development** - A mechanical engineer also discovers and improves methods to human needs.

**Manufacturing** - Mechanical engineers develop machines that process materials into products.

**Industrial Design** - They design and build machines, industrial products and systems of

machines that improve the efficiency.

System Management - They also supervise and oversee the operations of large systems like power plants and more.

Mechanical engineers can be appointed as Automotive Engineers, Biomedical Engineers, HVAC Engineers, Nuclear Engineers, Robotics Engineers, and Professors etc.

## **Electronics and Communication Engineering**

Electronic communications engineering is the utilization of science and math applied to practical problems in the field of communications. Electronic Communications Engineers engage in Research, Design, Development and Testing of the electronic equipment used in various communications systems. It is due to electronics engineers that we enjoy such modern communication devices as cellular telephones, radios and television. Companies such as Airtel, Vodafone and Idea are some well-known examples of modern electronics and communications engineering enterprises. Electronics and communication engineering courses are typically offered from the bachelor's to the doctoral level.

Spread across a period of 4 years, the course involves subjects that mainly teach students about Design, Analysis & Application of Electronics & Communication Circuits. Like in other branches, Industrial training is included as a part of the curriculum where students have to work in an industry for a minimum period of 4 weeks. This gives them an exposure to the technology in practice and industrial environment which is an added advantage. This course is ideal for students who are interested in developing or managing electronic communication systems.

After completing the course, students can enter a wide arena filled with different career options.

Electronics and Communication Engineers can work in manufacturing industries and service organizations such as broadcasting, consulting, data communication, entertainment, research and development; and system support. The candidates can also work in modern multimedia service firms that are involved in real-time transfer of information through video conferencing and internet broadcasting.

They can pursue further education and can obtain master's degrees in Electronics and Communication Engineering, Communication Systems, Embedded systems and VLSI Systems, Signal Processing and Image processing, Computer Science and Engineering, Power Electronics, Electronic Design and Technology, Applied Electronics and Control Systems.

They can also work as hardware or software engineers, software analysts, technical directors, field technical engineers, network planning Engineers, customer support engineers to name a few.

## **Civil Engineering**

Have you seen some people by the road sometimes, with an instrument that resembles a camera tripod?

Most of us know that they are civil engineering students but what exactly does the course entail?

Let us take a closer look. It is a professional engineering discipline that deals with the design, construction, and maintenance of the physical and naturally built environment, including works like roads, bridges, canals, dams, and buildings.

Usually called as one of the oldest engineering disciplines, civil engineering is traditionally divided into several sub-disciplines including architectural engineering, environmental engineering, construction engineering and many more.

When we talk about civil engineering, buildings and bridges are often the first constructions that come to mind. Similarly, roads, railroads, subway systems, and airports are designed by transportation engineers, and this is another category of civil engineering. Some famous names who studied civil engineering include Benjamin Wright, M. Visvesaraya, Ratan Tata and Gustave Eiffel, who built the famous Eiffel Tower.

The old civil engineering discipline of sanitary engineering has evolved into modern environmental engineering of such significance that most academic departments have changed their names to civil and environmental engineering.

These few examples illustrate that civil engineers do a lot more than design buildings and bridges. As in all engineering courses, students should also appear and pass the entrance tests in order to gain admission in a university or college offering this course.

**Some famous streams of Civil Engineering in which students can specialize:**

Bridge Engineering	Materials Engineering
Coastal and Ocean Engineering	Municipal or Urban Engineering
Construction Engineering	Piles Engineering
Environmental Engineering	Soils and Foundation Engineering
Fire Protection Engineering	Structural Engineering
General Engineering	Surveying
Hydraulic Engineering	Timber Engineering
Irrigation Engineering	Transportation Engineering and
Water Resources Engineering	

Job opportunities include those with Municipal Corporations, Railways, Road and Airport Construction Companies, Development Companies, Water Supply Department, Defence Forces and other infrastructure related industries. They can also engage themselves in research as well as the teaching faculty in government and private services and institutes.

As there will always be the requirement of construction of new building structures so the civil engineers will always be needed to construct those and also maintain and repair existing facilities and structures. So the demand for a civil engineer is never ending.

After graduation, students can also pursue post-graduation courses in environmental engineering, civil and architectural engineering, structural engineering, project management, infrastructure management and many more.

**Electrical and Electronics Engineering**

Electrical engineering is a field of engineering that generally deals with the study and application of electricity, electronics, and electromagnetism. This field first emerged as an occupation in the latter half of the 19th century when inventions such as electric telegraph, telephone, and electric power distribution was commercialized. Some famous people who were in this field are Nikola Tesla, William Hewlett of HP and Alexander Graham Bell.

Electrical and Electronic Engineering involves the generation, storage and use of power.

Electrical and electronics engineers are involved in a wide variety of technology ranging from huge global positioning systems which can pinpoint the location of a moving vehicle to gigantic electrical power generators. These engineers are responsible for designing, developing, testing as well supervising the production of electrical and electronic equipment and machinery. This branch of engineering covers traditional areas like generation, distribution and transmission of electricity as well as new age applications in electronics ranging from telecommunications to computers and microprocessors.

If a student is fascinated by electricity, energy and electronics, and wants to design and invent things that benefit society using electricity and equipment, they may opt for an electrical and electronic engineering degree.

Electrical and Electronics engineers are responsible for designing, developing, testing as well supervising the production of electrical and electronic equipment and machinery.

An Electrical and Electronics engineer can work as a Broadcast Engineer, Control and Instrumentation Engineer, an Electrical Engineer, an electronics engineer, an IT Consultant, a Network Engineer, a Systems Analyst, a Design Engineer or a Technical Author.

After graduation, they can also pursue further studies in areas such as Robotics, Geographic Information Systems, Power Systems, Control System Engineering, Cloud Computing, Computer Science, VLSI Systems and many more.

### **Computer Science Engineering and Information Technology**

Computer Science engineering deals with design, implementation, and management of information system of both software & hardware processes.

On the other hand, Information Technology refers to the development, implementation, and maintenance of computer hardware and software systems to organize and communicate information electronically.

As you may have noticed, both are related to each other and in India, their courses overlap with each other. Therefore, for clarity, we will discuss both of them here.

A computer scientist specializes in theory of computation and design of computational systems. Computer Engineering or Computer Science Engineering integrates several disciplines such as Information Technology, Electrical and Electronics Engineering, Software Design, etc.

IT, however, is more focused and less broad than the overall computer science course.

The field of Information Technology (IT) covers the design, administration and support of computer and telecommunications systems. Some of the positions in this field include database and network administrators, computer support specialists, computer scientists, software programmers and system analysts.

The majority of career tracks in IT entail design and operational tasks related to computer hardware components, networks and software applications.

Amongst all the engineering branches, Computer Science and IT has been found to be the most popular choice of students. This branch of engineering is perceived to be popular due to its research scopes (bio, mechanics, neuro- science, etc.) and is known to be challenging while offering good career opportunities and remuneration.

Students who wish to pursue a career in computer science and engineering need a strong foundation in both mathematics and science, particularly chemistry and physics. Apart from having the ability to create and invent things, a Computer Engineer should also have good knowledge in technology and an interest in mathematics and science. He/ she should be familiar with programming and computer hardware / software. Computer engineers have good analytical skills, an eye for detail, sustained attention and the ability to solve problems. They possess good communication skills, are proficient in analyzing and evaluating data and have the skill to make decisions, to work in teams and to express their ideas both orally and in writing. They also have a detailed knowledge of the core electrical and computer engineering subjects

— including electronics, electrical systems, computers, circuits and design.

Conversely, software engineers may oversee a company's computer operation systems platform. So a program of study that offers coursework in software applications and operating systems would be more beneficial to software engineers.

### **Career prospects**

Computers are the major part in today's life. The rapid growth of information technology has made computer industry, one of the fastest growing segments. Because of it, there is a huge demand for computer engineering professionals for the development of faster hardware components, new communication systems and software. Computer Engineers with a high percentage of marks and good communication skills can be simply employed in top companies. Software and IT companies are the major employers of these graduates. Students can work in database management, IT, embedded systems, Telecommunication, software implementation & maintenance, multimedia, web designing, gaming, and almost all other industries in this sector.

It is worthwhile to note that the computer industry has witnessed such phenomenal growth in recent years that IT majors like Infosys & TCS have been the major recruiters across all other branches in engineering colleges of the country.

An interesting fact: both the founders of Flipkart, one of the biggest E- commerce retail website, Sachin Bansal and Binny Bansal are Computer Science Engineers from IIT Delhi. Similarly, Bhavish Agarwal, Co-Founder, Ola Cabs is also a graduate of Computer Science from

IIT Bombay

Professionals in the IT field work with businesses and organizations to set up and support viable computer networks that will keep systems efficient and reliable. IT encompasses all hardware and software used in the storing, creation and accessing of information. Examples of technologies that professionals work with are firewalls, databases, media storage devices, networks and the Internet. Apart from this, the can also find employment as Software Developers, Network Engineers and Administrators, Computer Scientists and many more posts.

After completing graduation, computer science engineering students can pursue a degree in masters in areas such as:

Computer Information Systems	Software Engineering
Artificial Intelligence	Robotics
Computer Graphics	Networking
Data Processing	Telecommunications Engineering
Database Systems	System Analysis
Information Science	MBA in IT
MBA in Management Systems or a General MBA	



Similarly, students who are in the IT field can pursue post-graduation degrees such as:

Master of Engineering in Information Technology
Master of Technology in Information Technology
MS in Computer Science
MS in IT and Society
MS in Embedded Systems
MS in Networking and Systems
MS in Database and Information Systems

**Chemical Engineering**

Chemical engineering is a discipline in which students are taught to conceive and design processes to produce, transform and transport materials — beginning with experimentation in the laboratory followed by implementation of the technology in full-scale production. Essentially, chemical engineers design large-scale processes that convert chemicals, raw materials, living cells, microorganisms and energy into useful forms and products.

A chemical engineer may be involved in industry or university research where they are tasked in designing and performing experiments to create new and better ways of production, controlling pollution, conserving resources and making these processes safer.

Chemical engineering is a multi-disciplinary branch of engineering that combines natural and experimental sciences (such as chemistry and physics), along with life sciences (such as biology, microbiology and biochemistry) plus mathematics and economics to design, develop, produce, transform,

transport, operate and manage the industrial processes that turn raw materials into valuable products.

**Job prospects:**

After graduation, Chemical Engineering can work in manufacturing and service industries such as food, materials, specialty chemicals, plastics, power production, biotechnology, Tyre Manufacturing, Nanotechnology, Mining Process, Mineral based Industries, Petrochemical

plants, Pharmaceuticals, Synthetic fibers, Chemical Engineering Designs, Nuclear Energy, Materials Science, development of new sources of energy and even Medicine. Some opt to work in laboratories and universities as professors.

**Chemical Engineers usually do the following:**

- They conduct research to develop new and improved manufacturing processes.
- They develop safety procedures for those working with dangerous chemicals.
- They develop processes for separating components of liquids and gases, or for generating electrical currents, by using controlled chemical processes.
- They design and plan the layout of equipment.
- They conduct tests and monitor the performance of processes throughout production.
- They troubleshoot problems with manufacturing processes.
- They also evaluate equipment and processes to ensure compliance with safety and environmental regulations and estimate production costs for management.

Those interested in government jobs have to clear Engineering Service Examinations conducted by the UPSC. The engineering graduates are employed in defense establishment, healthcare related research projects, atomic power plants, environment regulation, recycling department and power conservation projects.

They can also pursue further education and can take up courses such as:

Engineering/Bio molecular Engineering and thereafter take a Research Degree.

If they choose a Masters of Business Administration (MBA) degree as post-graduation, they can do so in Chemical Marketing Management, Energy Management, Chemical Analysis, Quality Management, and Fuel management.

**Environmental Engineering**

Environmental engineering is the branch of engineering that is concerned with protecting people from the effects of adverse environmental effects, such as pollution, as well as improving environmental quality. Environmental engineering uses the principles of engineering, social science, biology & chemistry to develop solutions to environmental problems.

Environmental engineers are involved in improving, recycling, waste disposal, public health, and water and air pollution control. They also address global issues like safe drinking water,

climate change and sustainability.

In India Environmental Engineering is offered majorly at the masters levels, where students from B.E/B.Tech or AMIE in Civil/Chemical engineering/Ceramic Engineering. Students who study Technology/Mechanical/Metallurgy/Mining/Environmental/Bio-Chemical Engineering/Bio-Technology are eligible to pursue this program.

### **Robotics and Mechatronics**

Robotics is a field of engineering that deal with design and application of robots and the use of computer for their manipulation and processing.

Robots are used in industries for speeding up the manufacturing process. They are also used in the field of nuclear science, sea-exploration, servicing of transmission electric signals, designing of bio-medical equipment etc. Most robotics engineers are employed in laboratories, space exploration, manufacturing plants, mining and organizations.

Similarly, mechatronics is a design process that includes a combination of mechanical engineering, electrical engineering, control engineering and computer engineering. The Mechatronics systems and products are in high demand in the international markets as well. This creates a lot of employment

opportunities after graduation in Mechatronics. A Mechatronics graduate can utilize his multiple skills for system designing and manufacturing the products by incorporating control, electronic and computer devices. The graduates in the relevant field can find employment with those areas which make use of Mechatronics technology.

### **Petroleum Engineering**

Petroleum engineering, is the branch of engineering that involves the development and exploitation of crude oil and natural gas fields as well as the technical analysis and forecasting of their future performance. Its origins lie in both mining engineering and geology.

The petroleum engineer, whose aim is to extract gaseous and liquid hydrocarbon products from the earth, is concerned with drilling, producing, processing, and transporting these products and handling all the related economic and regulatory considerations.

### **Mining**

Mining engineering is an engineering discipline that involves the practice, the theory, the science, the technology, and application of extracting and processing minerals from a naturally occurring environment. However, mining engineering is associated with many other sister department within like geology, mineral processing and metallurgy, geotechnical engineering, surveying. A mining engineer manages all phases of mining operations — from exploration and discovery of the mineral resource, through feasibility study, mine design, development of plans, production and operations to mine closure.

## **Nanotechnology**

Nanotechnology is the study of manipulating matter on an atomic and molecular scale. Nanotechnology is very diverse, ranging from extensions of conventional device physics to completely new approaches based upon molecular self-assembly, from developing new materials with dimensions on the nano-scale to investigating whether we can directly control matter on the atomic scale. Nanotechnology entails the application of fields of science as diverse as surface science, organic chemistry, molecular biology,

semiconductor physics, micro fabrication etc. The course is immensely valuable and getting more importance as every technology is converting into nano-size.

## **Artificial Intelligence and Machine Learning**

Lying under the purview of Computer Science, Artificial Intelligence and Machine Learning are the two areas that show promising scope for students and users alike. Since the course is considered specialized, hence it is offered more at the Masters; however, the students can still find it as one of the areas of study at the undergraduate level engineering studies in Computer Science. AI and ML is all about creating software and machines that exhibit intelligent behavior.

Among many things that AI is capable of, the technology is contributing towards cancer research and intelligent web searching. To be an AI expert you need to have good basics in Probability, Statistics, Linear Algebra, and excellent reasoning and problem-solving skills. AI is used in a diverse range of industries from gaming, robotics, media, to quantum science. Once you take up a course on it, you'll also be learning its applications like Machine Learning, Computer Vision, and Robotics. Machine Learning is the course that has brought us self-driving cars, speech recognition and effective web search.

## **Data Science**

Data Science is another emerging Computer Science field that brings with it a world full of possibilities. Data Scientists are, again, very rare in the world right now and hence the demand for a competitive data scientist is high and will continue to increase. There are huge resources of data in the world that have piled up over the decades. That information is entirely useless if you expect for it to lie around for another century to become historical relics. This is where data scientists come in. Their job is to use those large resources of data, organize it so that we can make intelligent and smart decisions for the future.

Data Scientists use the large resources of publicly available data to make predictions about public health, and diseases, predictive analysis for businesses. As we continue to head into the future, Big Data has the power to predict the kind of future we will have and ultimately avoid any catastrophes

that were previously unavoidable. Quite a few universities and institutions have shot up offering the data science studies as a bachelor or an engineering degree. You may go for that as well. Else, doing masters in data science is highly desirable.

## **Admission Process**

As we had mentioned earlier, let us now talk about the admission process the Engineering courses in the country.

All the branches and institutions of Engineering in India, will offer the students an admission basis an entrance exam. In order to pursue engineering, students should have studied Physics, Chemistry and Mathematics as main subjects in their Class 12th. There are multiple entrance exams that are organized in the country for the Engineering courses. Let us have a look at the major ones:

### **Joint Entrance Exam (JEE)**

JEE is the most popular of all entrance tests as it enables students to get into the famed Indian Institutes of Technology. JEE as a test is the most complicated among all the other engineering tests. Students usually take special coaching Classes right after their Class 10 to prepare for the JEE. JEE acts as the main entrance test for all engineering colleges in India.

For a student to be eligible, he/she needs to have studied 5 subjects during grade 11 and 12, out of which four must be English, Physics, Chemistry, and Mathematics. There is no minimum percentage that you need to score to be able to write the JEE.

Let us now get to talking about the format of the most popular Engineering entrance in India.

JEE as an exam is conducted by the National Testing Agency (NTA) and has two parts/levels to it. The first stage of the exam is called JEE Mains and is conducted twice in a year, once in January and then in April. The second stage is called JEE Advanced and that is conducted only once in a year and that is in May. A candidate is eligible to sit for the JEE Advanced only once he/she has qualified the JEE Mains at one of the turns (January or April).

The aspirants can appear for the exam only twice in consecutive years. Candidates must have appeared for their 12th Class board exam or equivalent first time with all the subjects either in that year or the year just prior to that. It means for student taking the JEE Advanced in 2019, they must have appeared in Class 12 either in 2018 or 2019. Candidates who appeared for JEE Advanced in 2018 are eligible in 2019 as well. Also, candidates whose Class XII (or equivalent) examination results for the academic year 2016-17 were declared after June 2017 are eligible to appear in JEE (Advanced) 2019. Also remember, for admission to the IITs, it is important for the candidate to secure at least 75% marks in grade 12

JEE Mains: This is the first stage exam and is conducted twice a year, once in January and then in May. A candidate can choose to take the exam at any one of the turns or at both the turns. If the candidate takes it both the times the better out of the two scores shall be considered for him/her to be eligible for JEE Advanced. JEE Mains, as mentioned, is the first stage exam for admission to the IITs across the country. Nonetheless, there are many institutions that consider the students for admission to their Engineering courses basis the JEE Mains score as well. Here is the list of the major institutions:

- National Institutes of Technology (31 campuses)
- Indian Institutes of Information Technology including the IIITM and IIITDM (23 campuses)
- Centrally/State Funded Technical Institutes
- Private Universities and Institutions such as Thapar University, Nirma University, UPES(Dehradun), Dhirubahi Ambani Institute of Information and Communication Technology, LNM Institute of Information Technology and many more.

Each year institutions keep on getting added or subtracted, please do keep a watch before suggesting the names to the students.

FORMAT: The JEE Mains is conducted as a Computer Based Test (CBT). The test consists of multiple choice questions on mathematics, physics and chemistry. The test is 180 mins long and scores a student in the range of 0 to 360.

All the information stated under the heading JEE Mains is about the JEE Mains Paper I, which is used for admission to Engineering courses.

It must be made clear that there is a JEE Mains Paper 2 also. The JEE Mains Paper 2 is used for admission to Architecture courses offered by the SPAs and the IITs across the country.

### **JEE Advanced:**

The JEE Advanced is the second level of the JEE exam and its score is used for admission to the most revered engineering institutions in the country, Indian Institutes of Technology. A candidate can write the JEE Advanced only if he/she has qualified the JEE Mains.

Only the top 2,45,000 candidates (including all categories) based on performance in JEE MAIN will qualify to appear in the JEE ADVANCED examination. Admissions to IITs will be based only on category-wise All India Rank (AIR) in JEE ADVANCED, subject to condition that such candidates are in the top 20 percentile (category wise) in their respective Boards/Qualifying Examinations.

Format: The JEE Advanced is an online test. It scores the candidate out of 180 marks. JEE Advanced has two papers – Paper 1 and Paper 2, both of which are compulsory. Both Paper

1 and Paper 2 will have three sections – Physics, Chemistry, and Mathematics. Except for the number of Papers and Subjects, JEE Advanced doesn't have a fixed exam pattern. There is always a surprise element. The number of questions varies every year. The type of questions remains more or less the same.

## **BITSAT**

The Birla Institute of Technology and Science conducts its own entrance exam for various engineering courses. The exam is called The Birla Institute of Technology and Science Aptitude Test (BITSAT). The exam serves as a mode of entrance to the three BITS campuses namely:

- BITS Pilani Campus
- KK Birla Goa
- KK Birla Hyderabad

The registrations for the BITSAT start sometime in January first week and end in last week of March. The exam date is in May. This is an online 3-hr long test. Question Paper for BITSAT has 4 sections – Part I – Physics, Part II – Chemistry, Part III – Mathematics and Part IV – English Proficiency & Logical Reasoning. As mentioned above, for students to be eligible, they must have studied Physics, Chemistry and Math in Class 11 and 12 and for admission they must have secured a minimum of 75% in the three subjects.

## **VITEEE**

The Vellore Institute of Technology conducts the VIT Engineering Entrance Exam for admission to engineering courses offered by the institution. The institute has four campuses – Vellore, Chennai, Bhopal, and Amaravati.

Candidates must have secured 60 percent marks in aggregate in Physics, Chemistry and Math / Biology (Biology, only in case of courses such as Biotechnology etc) in the qualifying exam. The registrations open in November and close in February. The exam takes place in April. VITEEE is an online exam and has questions on Physics, Chemistry and Math/Biology. The highest marks awarded are 125 and the test is 2.5 hrs long.

## **SRMJEEE**

The SRMJEEE is conducted by SRM (Sri Ramaswamy Memorial) Institute of Science and Technology or once known as SRM University. The registrations begin in October and go on till March. The exam takes place in April. This one is also a Computer Based Test and lasts for 2.5 hours. It scores the candidates out of a total of 315 marks.

# COMEDK

COMEDK-UGET (Consortium of Medical, Engineering and Dental College of Karnataka-Under Graduate Entrance Test) provides admissions in various engineering, architecture and pharmacy colleges across Karnataka. The exam is an online computer based test and marks students out of 180. The total time duration is 3 hours

## College Options

On the basis of their performance in the entrance exams, the candidates will be allotted an engineering branch which is best suited for them.

## Top Colleges to study engineering:

Being a highly reputed and most preferred career option, India has many well-known colleges and universities which offer courses in engineering.

Top on their list are the IIT's of Indian Institutes of Technology. These are 23 autonomous institutes in the various states of India which are known for their high quality education. Here is the list

Indian Institute of Technology (IIT), Gandhi Nagar	Indian Institute of Technology (IIT), Ropar
Indian Institute of Technology (IIT), Bhubaneshwar	Indian Institute of Technology (IIT), Mandi
Indian Institute of Technology (IIT), Madras	Indian Institute of Technology (IIT), Roorkee
Indian Institute of Technology (IIT), Guwahati	Indian Institute of Technology (Banaras Hindu University), Varanasi
Indian Institute of Technology (IIT), Indore	Indian Institute of Technology (IIT), Jammu
Indian Institute of Technology (IIT), Kanpur	Indian Institute of Technology (IIT), Palakkad
Indian Institute of Technology (IIT), Jodhpur	Indian Institute of Technology (IIT), Tirupati
Indian Institute of Technology (IIT), Kharagpur	Indian Institute of Technology (IIT), Goa



Indian Institute of Technology (IIT), Hyderabad	Indian Institute of Technology (IIT), Bhilai
Indian Institute of Technology (IIT), Mumbai	Indian Institute of Technology (IIT) Dharwad
Indian Institute of Technology (IIT), Patna	Indian Institute of Technology (Indian School of Mines), Dhanbad
Indian Institute of Technology (IIT), Delhi	

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The other renowned institutions are:

- Birla Institute of Technology and Science, BITS-Pilani
- Jadavpur University (Faculty of Engineering & Technology)
- Motilal Nehru National Institute of Technology
- PSG College of Technology
- Malaviya National Institute of Technology
- Thapar University
- Delhi Technological University, Delhi
- Anna Univeristy, Chennai
- Vellore Institute of Technology, Vellore
- Manipal University, Karnataka

## **KEY TAKEAWAY**

- Engineering is one of the most preferred career options in India. Engineers are people who solve problems with the help of science
- In order to pursue engineering, students should have studied Physics, Chemistry and Mathematics as main subjects in their Class 12th after which they have to appear for entrance exams, most famous among them is the IIT JEE
- Engineering has 5 traditional branches which attract most of the applicants. They are Mechanical Engineering, Electronics and Communication Engineering, Civil Engineering, Electrical and Electronics Engineering, Computer Science Engineering and IT and Chemical Engineering.
- Many new branches of engineering have also emerged in the last several years. Some of them are:
  - Environmental Engineering, ○
  - Mechatronics and Robotics, ○
  - Petroleum Engineering, Mining,
  - Nanotechnology
- IITs or the Indian Institutes of Technology are the top institutions in India which offer engineering and technical courses. There are a total of 18 IITs spread across India in different states.
- Apart from IITs, some top colleges to study engineering are Birla Institute of Technology and Science, Jadavpur University (Faculty of Engineering & Technology), Motilal Nehru National Institute of Technology, PSG College of Technology and Malaviya National Institute of Technology