

Top 10 Most Difficult Engineering Courses in the World 2026



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Engineering courses are some of the toughest courses in the world. With wide applications in the real world, engineering courses help to develop the engineers of tomorrow who create solutions using the concepts of Maths and Science. Read this article to learn about the toughest engineering courses in the world.

*Engineering courses are some of the toughest courses in the world. With wide applications in the real world, engineering courses help to develop the engineers of tomorrow who create solutions for prevailing problems using the concepts of Maths and Science. Read this article to learn about the **top 10 toughest engineering courses in the world.***



Rightly said - “engineers are some of the smartest people in the world”. But what goes behind transforming a normal person into one of the smartest people? The answer is problem-solving real-world related study that helps to think and create solutions for several problems at a time. It is no surprise that the smartest engineers undergo difficult coursework to raise their aptitude to their maximum potential.



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The hardest engineering courses in the world are usually Aerospace, Nuclear, Chemical, and **Mechanical Engineering**. These programs involve complex math, deep scientific concepts, and difficult problem-solving in areas like thermodynamics and fluid dynamics. Other challenging fields include Electrical, Materials Science, Petroleum, and Computer Engineering. All of these require strong abstract thinking and knowledge that combines physics, math, and specialised topics. In this article, we will uncover the top 10 toughest engineering courses in the world and several more details associated with them.

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List of 10 Most Difficult Engineering Courses in the World 2026

The toughest engineering degrees in the world incorporate the understanding of complex theories and problems. Some engineering courses also require students to practice with hazardous chemicals, while others require them to develop challenging technical parts to withstand dynamic air pressure or the strongest chemical reactions in the world.

The good thing about some of these hardest engineering courses is that they pay off with some of the **highest paying jobs in the world** and they also develop the ability and skills to provide life-changing solutions to mankind. The 10 most difficult engineering courses in the world are given below:

Most Difficult Engineering Courses in the World	
Nuclear Engineering	Aerospace Engineering
Biomedical Engineering	Electrical Engineering
Chemical Engineering	Civil Engineering (Structural) and Architectural Engineering
Computer Engineering	Petroleum Engineering



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1. Nuclear Engineering

Nuclear engineering, one of the toughest engineering in the world, is a branch of engineering sciences that involves designing, developing, operating, and maintaining systems that utilise nuclear energy. This field deals with the applications of nuclear processes, particularly nuclear fission and fusion, for various purposes (mainly for electrical energy production through nuclear fission processes).

But this is not it, the most difficult engineering course in the world also prepares students for the following-

- **Medical Isotope Production-** Creating radioactive materials used in medical diagnosis and treatment
- **Radiation Detection-** Developing and using instruments to detect and measure radiation
- **Nuclear Waste Management-** Storing nuclear radioactive waste is a big problem. Nuclear engineering teaches students to design safe and secure methods for storing radioactive waste without polluting environment
- **Navy Nuclear Propulsion-** Designing and maintaining nuclear reactors for powering submarines and aircraft carriers

Above were some fields and applications of nuclear engineering courses, other than their conventionally presumed scope of electronic energy generation.

Pursuing this one of toughest [engineering courses abroad](#) has several benefits, such as establishing a career in government agencies, nuclear power industries, research institutions, medical Physics and other consulting firms. However, there are also some challenges associated with this course, such as the requirement of a strong foundation in Maths and a safety focus.

The main points of learning in the Nuclear Engineering course include Nuclear Reactor Physics, Heat Transfer and Fluid Dynamics, Nuclear Materials Science, Radiation Safety and Shielding, and Nuclear Fuel Cycle Management.

The other info on the toughest engineering course in the world, i.e. nuclear engineering, is



given below.

Scope	Medical Isotope Production, Small Modular Reactors (SMR), Advanced Reactor Designs, etc.
Best Countries to Pursue	US, UK, France, Canada, Germany, China and Japan
Best Universities for Nuclear Engineering	• Massachusetts Institute of Technology (MIT), • Tsinghua University, • University of California, Berkeley , • Stanford University, • University of Cambridge, • École Polytechnique, • McGill University, • University of Toronto, • University of Tokyo, • Kyoto University, • Karlsruhe Institute of Technology.



Admission Requirements	• A strong subject knowledge of Physics and Maths • Excellent academic track record in high school or in a relevant bachelor's degree. • Proof of proficiency in English/other language, whichever is required for the programme. • SOP and LOR • GRE scores, if required.
Average Starting Salary	\$70,000 to \$90,000 per year
Popular Designations	• Reactor Engineer • Nuclear Fuel Cycle Engineer • Health Physicist • Radiation Protection Engineer • Medical Physicist • Nuclear Materials Engineer

2. Aerospace Engineering

Placed at number 2 of the toughest engineering courses in the world, **Aerospace engineering** is a branch of engineering that deals with the designing, developing, testing, and operation of aircraft, spacecraft, and related systems. It is a vast field with two major overlapping sub-disciplines, i.e. aeronautical engineering and astronautical engineering. The aerospace engineers are responsible for developing large flight vessels, ensuring flight safety, and other operations, considering factors like less fuel consumption, aerodynamics, etc.

While a degree in aerospace engineering can be beneficial for students in several ways,



there may be some potential challenges in getting one, such as knowledge of core Maths topics, such as calculus, linear algebra, differential equations and multi-disciplinary topics such as Physics, aerodynamics, thermodynamics, etc.

The other info on one of the toughest engineering courses in the world, i.e. aerospace engineering, is given below.

Scope	Hypersonic Flights(faster-than-sound passenger jets), Reusable Launch Vehicles (to reduce the cost of space travel), Space Exploration
Best Countries to Pursue	US, UK, France, and Canada
Best Universities for Nuclear Engineering	• Massachusetts Institute of Technology (MIT), • California Institute of Technology (Caltech) • Purdue University • University of Michigan • Imperial College London • Ecole Nationale de l'Aviation Civile • McGill University • University of Toronto



Admission requirements	• Strong knowledge of Physics and Maths • GRE or GMAT test scores • IELTS or TOEFL test scores • A well-written SOP and LOR • A relevant bachelor's in aerospace or aeronautical engineering (if going for a master's degree), with the minimum required GPA ranging from 3.0 to 3.5. • Qualification in high school with a strong focus on Physics, Chemistry and Maths (for bachelor's degree). • An updated resume and SOP detailing your determination for the course. • LOR
Average Starting Salary	\$65,000 to \$75,000 per year
Popular Designations	• Reactor Engineer • Nuclear Fuel Cycle Engineer • Health Physicist • Radiation Protection Engineer • Medical Physicist • Nuclear Materials Engineer

Related Blogs:



- [Aerospace Engineer Salary](#)
- [Aeronautical Engineering Salary](#)

3. Biomedical Engineering

It is a branch of engineering that employs engineering principles to solve problems in Biology and medicine. Aiming to improve healthcare facilities, **biomedical engineering** acts as a bridge to fill the gap between Biology and the engineering world. Being listed among toughest engineering courses, biomedical engineering not only challenges students to take up rigorous coursework but also provides life-changing solutions to healthcare industry such as - pacemakers and artificial limbs to diagnostic tools like MRI machines and prosthetics.

Biomedical engineers also contribute to areas like tissue engineering, biomaterials development and medical robotics.

What makes biomedical engineering most difficult engineering course in the world is its requirement for one to know both Physics principles and Biological sciences.

Graduates from this field can work in following fields- medical research and development, clinical engineering, prosthetics and orthotics and biomaterials sciences.

The other info on one of the toughest engineering courses in the world, i.e. biomedical engineering, is given below.

Scope	Artificial Organs and Tissue Engineering, Bioprinting, Brain-Computer Interfaces (BCIs), Personalised medicine, etc.
Best Countries to Pursue	US, UK, Canada, Singapore, and Australia



Best Universities for Nuclear Engineering	• Harvard University • Massachusetts Institute of Technology (MIT), • University of Michigan - Ann Arbor • National University of Singapore • University of Toronto • Imperial College London • University of Melbourne • University of Sydney
Admission Requirements	• Strong proven academic knowledge in Maths and Science subjects • GRE or SAT scores • TOEFL or IELTS test scores • A relevant bachelor's degree in fields like biology, biotechnology, etc. to apply for a master's degree • Good performance in Maths, Physics and Biology during high school - needed for application to a bachelor's course • SOP, LOR, and an updated CV
Average Starting Salary	\$75,000 per year



Popular Designations	• Biomaterials Engineer • Medical Device Engineer • Clinical Engineer • Tissue Engineer • Biomechanics Engineer • Bioinformatics Engineer
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4. Chemical Engineering

Chemical engineering is a fascinating engineering branch that bridges the gap between Chemistry and engineering subjects. This too is considered the toughest engineering course in the world, owing to its rigorous curriculum & the tendency to build from raw materials or scratch chemical substances to form usable and sustainable solutions for significant problems (for example, the generation of polymers, pharmaceuticals, biofuels and personal care items).

Thus, it is safe to say that the chemical engineers are the masterminds behind:

- **Essential materials:** Plastics, polymers, fibres
- **Life-saving drugs:** Pharmaceuticals, antibiotics
- **Everyday products:** Food processing, personal care items
- **Clean energy solutions:** Biofuels and fuel cells

Due to its applications across various industries, **chemical engineering** offers strong job prospects for graduates with high pay.

The main concepts of learning include chemical reaction engineering, heat and mass transfer, process design and control and thermodynamics.

The other info on one of the toughest engineering courses in the world, i.e. aerospace engineering, is given below.

Scope	Nanotechnology, Biotechnology and Environmental Engineering
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Best Countries to Pursue	US, Europe and Asia
Best Universities for Nuclear Engineering	• Massachusetts Institute of Technology (MIT), • California Institute of Technology (Caltech) • ETH Zurich • Technical University of Munich • National University of Singapore • University of Tokyo • Nanyang Technological University • Delft University of Technology • University of Oxford
Admission Requirements	• Strong performance during high school and graduation in Maths and science subjects like Physics and Chemistry • English language proficiency by means of IELTS, TOEFL or PTE test scores • SAT, ACT, or GRE test scores • SOP, LOR, academic transcripts and an updated CV
Average Starting Salary	\$70,000 per year



Popular Designations	• Process Engineer • Research & Development Engineer • Plant Engineer • Environmental Engineer • Product Development Engineer
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Also Check: [How to get into Top Colleges for Undergraduate Courses](#)

5. Civil Engineering (Structural)

Civil engineering (structural) is a specialised field within **civil engineering** that deals with the design, analysis, and construction of the skeleton or "bones" of a structure. Structural engineers are essentially the ones who ensure our buildings, bridges, dams, and other creations can safely withstand all the forces acting upon them. The course requires strong Mathematical knowledge, relevant software knowledge, visualisation & spatial reasoning, and bonding between several mixing substances to make strong building structures.

The other details on one of the 10 most difficult engineering courses in the world are given below.

Scope	Sustainable building designs, Building Information Modelling (BIM) and smart materials and structures.
Best Countries to Pursue	US, UK, Canada, Singapore, Netherlands and Australia



Best Universities for Nuclear Engineering	• Massachusetts Institute of Technology (MIT), • University of California, Berkeley (UCB) • Delft University of Technology • National University of Singapore • ETH Zurich • Tsinghua University • Imperial College London
Admission Requirements	• Strong grades in high school in Maths and Science subjects • Proficiency in English language • A relevant bachelor's degree with good GPA, preferably in civil, is required for a master's degree • GMAT or GRE test scores
Average Starting Salary	\$65,000 per year
Popular Designations	Structural Engineer Seismic Design Engineer Bridge Engineer Building Engineer Construction Engineer

Summary: Why are these Engineering Fields Difficult?

The most difficult engineering fields listed in this article are difficult for the following



reasons:

1. **They have an interdisciplinary nature:** They merge multiple core sciences (chemistry, physics, biology) with advanced mathematics (calculus, differential equations).
2. These courses require high levels of abstract and critical thinking, such as in solid mechanics, quantum physics, or electromagnetism.
3. **Mathematical Intensity:** Heavy use of partial differential equations, Laplace transforms, and complex modelling.
4. **Practical Application:** Involve complex lab work, simulations, and designing intricate physical systems.

Check the details on the most difficult [engineering degrees in the world that also pay well](#).

Eligibility Requirements for the Toughest Engineering Courses

To get admitted for one of the toughest engineering courses in the world at a university outside India, you need to have a strong student profile. You must represent your capability of studying and finishing the course to your desired university; only then will they allow you to take on this course. Below are the basic eligibility requirements, including educational qualifications, for Indian students to study the toughest engineering courses abroad.

1. Interested students need to have completed their class 12 with core science and maths disciplines like Physics, Chemistry, Maths, etc. They should have scored >80% aggregate marks in these subjects.
2. Showcasing exceptional performance in SAT/ACT/Gre exam and the TOEFL/[IELTS](#)/PTE exam are a must
3. A strong SOP, demonstrating your interest in the story and how good you are an applicant among others for this course
4. You need to attach 2-3 reference letters from your previous professors, mentors and employers - to get the admission committee in confidence that you are capable of doing this course by mentioning your past experiences and skills.

Details on Exams Required for the Hardest Engineering Programs in the World

Getting into the hardest engineering universities is not easy. You must demonstrate your preparedness, your competitiveness, academic knowledge, co-curricular activities and results from standardised exams. The exams required for the toughest engineering courses in the



world are -

Exams Required for the Toughest Engineering Courses in the World		
Exams	UG Courses	PG Courses
Subject Exams	• SAT • ACT	• GMAT • GRE
English Language Exam (or other language's exam scores, depending on - in which language do you prefer to take your exam)	IELTS/TOEFL/PTE/Duolingo or, TOPIK for Korean language, JLPT for Japanese, HSK for Chinese and Goethe-Zertifikat for German. Check with your university - which of the above-mentioned exams will be required for your course before you pay the fees for taking any of these exams.	(same as for UG courses)

Also Read:

- [Top 10 Hardest Degrees in the World](#)
- [Most Affordable Countries to Study Abroad](#)

This was all about the top 10 hardest engineering courses in the world, their applications, future prospects, and the best universities and countries for getting an education in these fields. If you have any doubts, then drop your queries in the comments below.

Top 10 Toughest Engineering Courses in the World FAQs



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