

ENGINEERING PHYSICS

Engineering physics, or **engineering science**, refers to the study of the combined disciplines of [physics](#), [mathematics](#), [chemistry](#), [biology](#), and [engineering](#), particularly computer, nuclear, electrical, electronic, aerospace, materials or mechanical engineering. By focusing on the [scientific method](#) as a rigorous basis, it seeks ways to apply, design, and develop new solutions in engineering.

Unlike traditional engineering disciplines, engineering science/physics is not necessarily confined to a particular branch of science, engineering or physics. Instead, engineering science/physics is meant to provide a more thorough grounding in [applied physics](#) for a selected specialty such as [optics](#), [quantum physics](#), [materials science](#), [applied mechanics](#), [electronics](#), [nanotechnology](#), [microfabrication](#), [microelectronics](#), [computing](#), [photonic s](#), [mechanical engineering](#), [electrical engineering](#), [nuclear engineering](#), [biophysics](#), [control theory](#), [aerodynamics](#), [energy](#), [solid-state physics](#), etc. It is the discipline devoted to creating and optimizing engineering solutions through enhanced understanding and integrated application of mathematical, scientific, statistical, and engineering principles. The discipline is also meant for cross-functionality and bridges the gap between theoretical science and practical engineering with emphasis in [research](#) and development, design, and analysis.

It is notable that in many languages the term for "engineering physics" would be directly translated into [English](#) as "technical physics". In some countries, both what would be translated as "engineering physics" and what would be translated as "technical physics" are disciplines leading to academic degrees, with the former specializing in nuclear power research, and the latter closer to engineering physics.^[6] In some institutions, an engineering (or applied) physics major is a discipline or specialization within the scope of engineering science, or applied science.^{[6][7][8][improper synthesis?]}

In many universities, engineering science programs may be offered at the levels of B.Tech, [B.Sc.](#), [M.Sc.](#) and [Ph.D.](#) Usually, a core of basic and advanced courses in [mathematics](#), [physics](#), [chemistry](#), and [biology](#) forms the foundation of the [curriculum](#), while typical elective areas may include [fluid dynamics](#), [quantum physics](#), [economics](#), [plasma physics](#), [relativity](#), [solid mechanics](#), [operations research](#), [quantitative finance](#), information technology and engineering, [dynamical systems](#), [bioengineering](#), [environmental engineering](#), computational engineering, engineering mathematics and [statistics](#), [solid-state devices](#), [materials science](#), [electromagnetism](#), [nanoscience](#), [nanotechnology](#), [energy](#), and [optics](#).