

Mechanical engineering

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The branch of engineering that deals with the generation, transmission, and utilization of heat and mechanical power, and with the production of tools and machines. This distinction begins in college where, after 1 year of common engineering studies, a person can be identified as a student of mechanical engineering. After college, mechanical engineers may enter many industries. Common areas of industrial employment for mechanical engineers are private electric power and machinery manufacturing.

To grasp the meaning of mechanical engineering, it is desirable to take a close look at what engineering really is. The Engineers' Council for Professional Development has defined engineering as the profession in which a knowledge of the mathematical and physical sciences gained by study, experience, and practice is applied with judgment to develop ways to utilize economically the materials and forces of nature for the progressive well-being of humankind. Here is a picture of a profession in which study in mathematics and science is blended with experience and judgment for the production of useful things.

Formal training of a mechanical engineer includes mastery of mathematics through the level of differential equations. Training in physical science embraces chemistry, physics, mechanics of materials, fluid mechanics, thermodynamics, statics, and dynamics. Enhancing these subjects are courses in the humanities: literature, economics, philosophy, and history.

Experience, for the mechanical engineer, is not gained solely by the passage of time. For experience to be added, the time spent in engineering must be meaningful. Projects must become more difficult and the consequences of error greater.

Judgment is the hallmark of any competent engineer in whatever specialized branch of engineering is pursued. The exercise of judgment requires the ability to assess and decide between alternate courses of action. In the application of judgment there is constant testing of the engineer's decisions against his or her knowledge of the laws of nature, his or her sense of right and wrong, and economics.

A further essential of an engineer is that efforts be devoted to matters which improve the well-being of humankind. This purpose is kindred to that of all learned professions and is closely allied to the professions of medicine and law.

In relation to other professions the mechanical engineer differs in one large measure. Whereas most doctors and many lawyers are self-employed, almost all engineers are employed by corporations, colleges, or government. This distinction exists for several reasons. Generally the doctor or lawyer is far more concerned with people and their actions than is the engineer. Also, an engineer dealing with machines requires larger sums of money to finance the equipment and facilities used than does the doctor or lawyer.

From the foregoing, a young person thinking of becoming a mechanical engineer should recognize that there is a long period of preparation necessary. Starting in high school, a full, rigorous academic program should be pursued. Then careful self-examination of results in high school are in order. If high interest and success in mathematics, English, and science are demonstrated, there is room to consider the matter further. Finally, there must be evidence of willingness to work and patience to gain the experience and judgment required in any learned profession. *See also:* ENGINEERING; MACHINE DESIGN; MACHINERY; TECHNOLOGY.

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