

Engineering research paper

[Business](#), [Industries](#)



Thesis Statement After exploring the field of engineering, it will be determined whether mechanical or genetic is better. Outline I. Introduction A. Intro of two careers II. Mechanical Engineering A.

Description of career B. History C. The Job 1. Types of Jobs 2. Work Environment 3. Salary D.

Education III. Genetic Engineering A. Description of career B. History C. Potential risks and dangers IV. Conclusion Introduction In the modern times of today, the world revolves around technology.

With astonishing breakthroughs in science and technology every single day, the world is always changing, always adapting to the next big thing. To be more specific, the world revolves around engineering, genetic and mechanical. There are medicinal breakthroughs in genetic engineering all the time, cures for diseases, much needed vaccinations for new viruses, genetically improving plants for better produce, and overall improving different organisms so they will be better suited for life. On the other hand, in mechanical engineering, breakthroughs happen more often: better fuel efficient cars and cars that don't run on gas at all, faster processing computers, new smart phones, and so many other gadgets that make life so much easier. Both of these fields are very important to society. The world literally wouldn't be anywhere close to being the same without one or both of these fields, but which one is better? They each have equal importance in the world, but which is a better field to go into? Which field is easier to get into? Which will provide better benefits for its employees and for the world as a whole? After vigorous research the answer will be known. Mechanical

Engineering: Description of career Mechanical engineers plan and design tools, engines, machines, and other mechanical systems that produce, transmit, or use power. These designs range from gasoline engines to rockets to kitchen food mixers.

Their work varies by industry, employers, and function. They may work in design, instrumentation, testing, robotics, which is whole different field, transportation, or bioengineering (Careers in Focus, pg. 83). Mechanical engineering is the broadest of all engineering disciplines and fields; it extends across many interdependent specialties. Mechanical engineers may work in productions operations, maintenance, or technical sales and finance.

There also many engineering administrators or managers (Engineering Careers, pg. 5). There are approximately 221, 000 mechanical engineers employed in the United States (buzzle. com). Mechanical Engineering:

History The earliest people who might have been called mechanical engineers were the ones who built things, large or small, safely and efficiently. Mechanical engineering has existed for thousands of years.

Although on a simpler scale, pyramid building in ancient Egypt, for example, required extensive knowledge of engineering principles, large blocks of two and even three ton stone were transported and positioned perfectly to make the pyramids the world knows today (Mech.

Eng. New Book of Knowledge pg. 224). The Ancient Greeks and Romans were also great builders, and also very influential on western civilizations architectural style. Unlike the Egyptians, they developed and made use of elaborate mechanical devices, like water pumps and power generating

treadmills that were used for lifting and moving heavy objects. The Greeks even invented a steam engine, but back then they viewed it as a toy and not useful (Careers in Focus pg.

84). The term engineer was coined in the 14th century. It applied only to those who designed equipment for war.

Their achievements were so important that the strength of a country's military became heavily dependent on their inventions. Engineers who worked on civilian projects became simply known as civil engineers. Later, engineers who worked on machinery and generating power were called mechanical engineers (Engineering Careers pg. 98). The modern field of mechanical engineering sprouted during the Renaissance. During this time engineers focused their energies on developing more efficient ways of doing ordinary tasks like pumping water. Water wheels and windmills were common energy producers (buzzle. om).

Leonardo da Vinci was a true innovative engineer. He tried and nearly succeeded in creating a helicopter, submarine, and his famous flying machine. One of the most significant inventions of the Renaissance was the clock (Encyclopedia of Careers pg. 221). Despite these developments, it wasn't until the Industrial Revolution that modern day mechanical engineering came to life.

The steam engine was introduced in 1712 by Thomas Newcomen. Over half a century later, James Watt modified the steam engine to be power large industrial machines. In 1876 Nicolaus Otto developed the internal

combustion engine which became one of the most significant and important inventions of the century.

The American Society of Mechanical Engineers was formed by 1880 (Careers in Focus pg. 85). Mechanical engineering expanded rapidly in the 20th century. Mass production systems allowed large quantities of standardized goods to be made at a low cost, and mechanical engineers played a large role in the design of these systems. In the second half of the 20th century computers came into play heavily.

Mechanical engineers now design mechanical systems on the computer, and they are used to test, monitor, and analyze mechanical systems and factory production, a trend that is evident during modern times (Goodwin, Peter pg. 51). Mechanical Engineering: The Job On average a mechanical engineer makes anywhere from \$48, 426 to \$100, 000+, and they deserve every penny of it. The work of a mechanical engineer begins with research and development. Depending on what company you work for, you could be asked to develop a more fuel efficient car engine or many other things.

Then research is done to further knowledge in whatever you're trying to build before you actually design it (buzzle. com). Information gained from research is then taken to be analyzed and used to make a commercially useful product. The engineer would be responsible for specifying every single detail of the machine or mechanical system.

Since the late 1900's, mechanical engineers have increasingly used computers in the design process. After the product has been designed and a

prototype has been developed, the product is analyzed by engineers. Design and testing engineers continue to work together until the product meets the necessary criteria (Careers in Focus pg. 85). Once the final design is set, it is the job of the engineer to come up with most time and cost efficient way of making the product without sacrificing quality. The amount of factory floor space, the type of manufacturing equipment and machinery, and the cost of labor and materials has to be considered. Engineers select the necessary equipment and machines and oversee their arrangement and safe operation. Other engineer specialists, like chemical, electrical, and industrial engineers may help (Mech.

Engineering New Book of Knowledge pg. 226). Mechanical engineers also work in marketing, sales, and administration. In a small company an engineer may need to perform most if not all of the above tasks on their own. The working conditions of mechanical engineers vary. Most work indoors in offices, research laboratories, or production departments of factories and shops (Careers in Focus pg. 89). Depending on the job, an engineer may spend a significant amount of time on a noisy factory floor, at a construction sight, or at another field operation.

Mechanical engineers originally designed systems on drafting boards and making the traditional blueprints, but since the introductions of sophisticated software programs, design is more and more done on computers (Goodwin, Peter pg. 55). For the most part, engineering is a cooperative effort.

An engineer may have specific duties and require independent work; each project is usually the job of an entire engineering team, a team that can

include other engineers, engineering technicians, and engineering technologist (Mech. Engineering New Book of Knowledge pg. 228).

Mechanical engineers generally have a standard 40 hour workweek.

However their work hours heavily depend on the deadlines for projects.

They may work long hours to make a deadline, or show up for second and third shifts to check production at a factory or a construction project (Engineering Careers pg. 101). Mechanical engineering can be a very satisfying occupation. Engineers often get the pleasure of seeing their designs or modifications built and operating.

On the other hand it can be very frustrating when a project is stalled, full of errors, or even just abandoned. Mechanical Engineering: Education Before anyone can become a mechanical engineer, like any other career, they need an education. Starting high school, one must take courses in geometry, trigonometry, and calculus. Communication skills are important for mechanical engineers because they interact with a variety of co-workers and vendors and are often required to make and/or/ present reports, so English and speech classes are also helpful.

Also because computers are now so important to engineering, computer science courses are also recommended (educationportal. com). A bachelor's degree in mechanical engineering is usually the minimum educational requirement for entering the field. A master's degree or even a Ph. D. may be necessary for obtaining some positions, like those in research, teaching, and administration (educationportal.

com). In the United States, there are more than 200 colleges and universities where engineering programs have been approved by the Accreditation Board for Engineering and Technology. Most of these institutions offer programs in mechanical engineering. Although it varies from school to school, most require a solid background in mathematics and science (Career in Focus pg.

87). In a four year undergraduate program, students start with studying calculus, physics, and chemistry. At some schools, a five or six year program combines classroom study with practical experience working for an engineering firm. Students usually end up working for the firm after college.

A graduate degree is a prerequisite for becoming a university professor or researcher. It may also lead to a higher level job within an engineering department or firm (Encyclopedia of Careers pg. 223). Genetic Engineering: Description of Career Genetic engineering is the direct manipulation of an organism's genome, or DNA structure, using biotechnology. Genetic engineering alters the DNA of the chosen organism, by either altering the DNA directly or inserting a different DNA strand inserted that was made outside the host.

If genetic material from another species is added to the host, the resulting organism is called transgenic (Gen. Engineering New Book of Knowledge pg. 2). Genetic engineers use their research and experiments to find cures for disease, breed better animals and plants, and to one day map the human genome which would then give us the knowledge of a potential disease free human race. Genetic Engineering: History Long before the principles of genetics were known people began to domesticate wild animals and plants

and selected those that could be used for food or for doing work. This selective breeding was an early kind of genetic engineering, a deliberate effort to develop strains of organisms that would benefit human beings. There is even a bible story revolved around genetic engineering in which Jacob strategically mated his black sheep with his employer Labans white sheep, creating spotted and streaked sheep (Gen. Engineering New Book of Knowledge pg.

82). In time, many new strains of plants and animals were developed. Among these were new strains of cattle, horses, dogs, cats, wheat, rice, and corn. An example would be the different kinds of horses, a sleek fast racehorse and strong larger workhorses. Breeding animals this way became very popular and useful to the US (Encyclopedia of Careers and Vocational Guidance pg.

51). During the 1900's, genetic engineering became a much more accurate science and study. Scientist learned to breed pure strains of plants and animals. These purebred strains are genetically constant. This means that all of the offspring will be exactly like their parents for every generation. The purebred strains did not always show desirable qualities. But when different purebreds were mated with one another, some of the offspring showed more desirable qualities and unusual vigor. The offspring produced are called hybrids.

They have genes from two or more different strains (Dhillon, Sukhraj pg. 34) At first, scientist depended on natural mutations to produce the kinds of genes that could be used in developing new strains, but nature took too long. Later they learned to cause mutations by exposing organisms to

radiation such as X-rays. Offspring who actually displayed useful mutations were developed into new valuable strains. Offspring that did not display useful mutations were kept for further testing, set free, or terminated depending on the mutation (McCuen, Gary pg. 30). Millions of lives have been saved by one product of genetic engineering that was developed in this way. In 1928 a Scottish scientist discovered that penicilium molds make a bacteria fighting substance know to us as penicillin.

It was first used during World War II to treat infections in soldiers' wounds. The molds however did not produce enough penicillin to meet the demand. In a lab, some strains of penicilium were X-rayed to cause mutations. In time, high-yielding strains of the mold were developed and large amounts of penicillin were produced (The Ethics of Genetic Engineering pg. 6).

As scientist learned more about genetics, they learned how to remove, purify, and study the genes of simple organisms. Bacteria were of particular interest because of their ability to make enzymes that can cut through strands of DNA at specific places. With these enzymes, bacteria can attack viruses that invade their cells by cutting the DNA from the viruses into harmless fragments (Gen. Engineering New Book of Knowledge pg. 84).

Genetic Engineering: Potential Risks and Dangers These enzymes also have made possible a dramatic new kind of genetic engineering called gene splicing. Gene splicing is actually portrayed accurately in fiction movies. The freakish monsters can actually be created. Using this method, scientist can take a gene from one organism and splice into another organism's genetic material. Since the bases of DNA are the same for most organisms, pieces of

DNA from quite different species can be spliced together to create incredible creatures. Almost any kind of plant or animal DNA can be inserted into the DNA of bacteria, and vice versa.

Even synthetic DNA can be spliced into a cell's genetic material. This is DNA made entirely in the laboratory (Career in Focus pg. 69). Some people believe that gene splicing could be used to create new kinds of dangerous new organisms, either accidentally or on purpose. Government and private research organizations follow guidelines for gene splicing. Some kinds of experiments can be carried out only in laboratories that have special safety features.

So far, gene splicing has not caused any outbreaks of serious illnesses or environmental disasters, as critics feared. However, the possibility exists that gene splicing will not always work as planned. As a result, some people have called for stricter regulations of this technology (Levine, Harry pg. 52). Besides gene splicing, biological and biochemical warfare is the biggest threat of genetic engineering. Biological warfare is the use of biological toxins or infectious agents such as bacteria, viruses, and fungi with intent to kill or incapacitate humans, animals or plants as an act of war.

Diseases have been genetically engineered to kill its host and be completely immune to any vaccines. Although biological warfare was outlawed in 1972, the United States has biological defense and offense programs in case that level of war would ever be needed (McCuen, Gary pg. 119). Conclusion
In conclusion, mechanical and genetic engineering are both very important to society. Mechanical engineers are the backbone to society. Mechanical

engineers design, build, and test new technology to help better the lives of humans. They not only give us new toys to play with, but advances in technology keep us safe with fast reacting systems for police, unbelievably accurate weather tracking systems to warn people of severe weather, and advancements in the United States military to keep the country the land of the free. While on the other hand genetic engineering has saved the human race countless times.

The scientific engineers have developed vaccines and immunizations to all kinds of disease most people have never even heard of. Although they are both very important fields, mechanical engineering outweighs genetic engineering. As a career mechanical engineering provides better opportunities and is more enjoyable as a career. Although genetic engineering has important breakthroughs, those breakthroughs don't happen very often, every couple decades or so, while breakthroughs in mechanical engineering happen by the months. Mechanical engineers make people's lives easier.

That could mean making a car that runs on less gas and someone doesn't have to pay as much gas, making a high tech phone, or putting GPS satellite tracking in your phone so you will never lose it. Also and more importantly, mechanical engineers don't such a high risks as genetic engineers. Genetic engineers have to understand that they can contract diseases or be exposed to an experiment that could be fatal on job. Mechanical engineers have no risks like. All in all mechanical engineering is the way to go.

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