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## Types of Engineers and Salaries Sheet

**Aerospace engineers** design, develop, and test aircraft, spacecraft, and missiles, and they supervise the manufacturing of these products. Those who work with aircraft are called aeronautical engineers, and those working specifically with spacecraft are astronautical engineers. Aerospace engineers develop new technologies for use in aviation, defense systems, and space exploration, often specializing in areas such as structural design, guidance, navigation and control, instrumentation and communication, or production methods. Aerospace engineers may specialize in a particular type of aerospace product, such as commercial aircraft, military fighter jets, helicopters, spacecraft, or missiles and rockets, becoming experts in aerodynamics, thermodynamics, celestial mechanics, propulsion, acoustics, and/or guidance and control systems.

**Biomedical engineers** develop devices and procedures that solve medical and health-related problems by combining their knowledge of biology and medicine with engineering principles and practices. Many biomedical engineers do research, along with life scientists, chemists, and medical scientists, to develop and evaluate systems and products such as artificial organs, prostheses (artificial devices that replace missing body parts), instrumentation, medical information systems, and health management and care delivery systems. Biomedical engineers may also design devices used in various medical procedures, imaging systems such as magnetic resonance imaging (MRI), and devices for automating insulin injections or controlling body functions. Most engineers in this specialty need a solid background in another engineering specialty, such as mechanical or electronics engineering, in addition to specialized biomedical training. Some specialties within biomedical engineering include biomaterials, biomechanics, medical imaging, rehabilitation engineering, and orthopedic engineering.

**Chemical engineers** apply the principles of chemistry to solve problems involving the production and/or use of chemicals and biochemicals. They design equipment and processes for large-scale chemical manufacturing, plan and test methods of manufacturing products and treating byproducts and supervise production. Chemical engineers can work in a variety of manufacturing industries other than chemical manufacturing, such as those producing energy, electronics, food, clothing, and paper. Chemical engineers also work in health care, biotechnology, and business services. These engineers apply principles of physics, mathematics, and mechanical and electrical engineering, as well as chemistry. Some may specialize in a particular chemical process, such as oxidation or polymerization. Others specialize in a particular field, such as nanomaterials, or in the development of specific products. Chemical engineers must be aware of all aspects of chemicals manufacturing and how the manufacturing process affects the environment and the safety of workers and consumers.

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**Civil engineers** design and supervise the construction of roads, buildings, airports, tunnels, dams, bridges, and water supply and sewage systems. Civil engineers must consider many factors in their design process, from the construction costs and expected lifetime of a project to government regulations and potential environmental hazards such as earthquakes and hurricanes. Civil engineering, considered one of the oldest engineering disciplines, encompasses many specialties. The major ones are structural, water resources, construction, environmental, transportation, and geotechnical engineering. Many civil engineers hold supervisory or administrative positions, from supervisor of a construction site to city engineer. Others may work in design, construction, research, and teaching.

**Computer hardware engineers** research, design, develop, test, and oversee the manufacture and installation of computer hardware. Hardware includes computer chips, circuit boards, computer systems, and related equipment such as keyboards, modems, and printers. The work of computer hardware engineers is very similar to that of electronics engineers in that they may design and test circuits and other electronic components, but computer hardware engineers do that work only as it relates to computers and computer related equipment. The rapid advances in computer technology are largely a result of the research, development, and design efforts of these engineers.

**Electrical engineers** design, develop, test, and supervise the manufacture of electrical equipment. Some of this equipment includes electric motors; machinery controls, lighting, and wiring in buildings; automobiles; aircraft; radar and navigation systems; and power generation, control, and transmission devices used by electric utilities. Although the terms electrical and electronics engineering often are used interchangeably in academia and industry, electrical engineers have traditionally focused on the generation and supply of power, whereas electronics engineers have worked on applications of electricity to control systems or signal processing. Electrical engineers specialize in areas such as power systems engineering or electrical equipment manufacturing.

**Environmental engineers** develop solutions to environmental problems using the principles of biology and chemistry. They are involved in water and air pollution control, recycling, waste disposal, and public health issues. Environmental engineers conduct hazardous waste management studies in which they evaluate the significance of the hazard, advise on treatment and containment and develop regulations to prevent mishaps. They design municipal water supply and industrial wastewater treatment systems. They conduct research on the environmental impact of proposed construction projects, analyze scientific data, and perform quality-control checks. Environmental engineers are concerned with local and worldwide environmental issues. They study and attempt to minimize the effects of acid rain, global warming, automobile emissions, and ozone depletion. They may also be involved in the protection of wildlife. Many environmental engineers work as consultants, helping their clients to comply with regulations, to prevent environmental damage, and to clean up hazardous sites.

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**Materials engineers** are involved in the development, processing, and testing of the materials used to create a range of products, from computer chips and aircraft wings to golf clubs and snow skis. They work with metals, ceramics, plastics, semiconductors, and composites to create new materials that meet certain mechanical, electrical, and chemical requirements. They also are involved in selecting materials for new applications. Materials engineers have developed the ability to create and then study materials at an atomic level, using advanced processes to replicate the characteristics of materials and their components with computers. Most materials engineers specialize in a particular material. For example, metallurgical engineers specialize in metals such as steel, and ceramic engineers develop ceramic materials and the processes for making them into useful products such as glassware or fiber optic communication lines.

**Mechanical engineers** research, design, develop, manufacture, and test tools, engines, machines, and other mechanical devices. Mechanical engineering is one of the broadest engineering disciplines. Engineers in this discipline work on power-producing machines, such as electric generators, internal combustion engines, and steam or gas turbines. They also work on power-using machines such as refrigeration and air-conditioning equipment, machine tools, material handling systems, elevators and escalators, industrial production equipment, and robots used in manufacturing. Mechanical engineers also design tools that other engineers need for their work. In addition, mechanical engineers work in manufacturing or agriculture production, maintenance, or technical sales; many become administrators or managers.

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**May 2020 National Industry-Specific Occupational Employment and Wage Estimates  
(Architectural, Engineering, and Related Services)**

Occupation Code	Occupation	Estimated total employment	Estimated Employment PRSE	% Total employment	Hourly median wage (or the 50th percentile)	Mean hourly wage	Median annual wage	Mean annual wage
17-2000	Engineers	365,470	1.4	24.32	\$44.85	\$48.46	\$93,300	\$100,800
17-2011	Aerospace Engineers	11,430	9.0	0.76	\$54.37	\$57.89	\$113,100	\$120,410
17-2021	Agricultural Engineers	200	16.7	0.01	\$39.29	\$39.49	\$81,730	\$82,140
17-2031	Bioengineers & Biomedical Engineers	820	31.1	0.05	\$44.91	\$50.47	\$93,410	\$104,980
17-2041	Chemical Engineers	2,920	8.4	0.19	\$53.11	\$57.98	\$110,460	\$120,600
17-2051	Civil Engineers	162,110	1.6	10.79	\$42.91	\$46.76	\$89,260	\$97,260
17-2061	Computer Hardware Engineers	3,150	8.6	0.21	\$50.58	\$53.38	\$105,200	\$111,040
17-2070	Electrical & Electronics Engineers	50,640	2.9	3.37	\$47.99	\$51.27	\$99,810	\$106,650
17-2071	Electrical Engineers	41,010	3.1	2.73	\$47.20	\$50.49	\$98,180	\$105,010
17-2072	Electronics Engineers, Except Computer	9,630	7.4	0.64	\$51.19	\$54.62	\$106,480	\$113,620
17-2081	Environmental Engineers	15,020	4.7	1.00	\$44.38	\$47.56	\$92,310	\$98,920
17-2110	Industrial Engineers, Including Health & Safety	22,010	14.0	1.47	\$47.58	\$49.63	\$98,970	\$103,240
17-2111	Health & Safety Engineers, Except Mining Safety Engineers & Inspectors	2,590	13.7	0.17	\$49.11	\$50.79	\$102,150	\$105,640
17-2112	Industrial Engineers	19,420	15.8	1.29	\$47.40	\$49.48	\$98,600	\$102,920
17-2121	Marine Engineers & Naval Architects	2,390	19.7	0.16	\$44.33	\$47.35	\$92,220	\$98,490
17-2131	Materials Engineers	3,520	10.9	0.23	\$45.29	\$48.44	\$94,210	\$100,760
17-2141	Mechanical Engineers	63,150	3.2	4.20	\$44.04	\$47.62	\$91,590	\$99,050
17-2151	Mining & Geological Engineers, Including Mining Safety Engineers	2,250	14.0	0.15	\$42.64	\$45.72	\$88,690	\$95,090
17-2161	Nuclear Engineers	920	18.2	0.06	\$66.28	\$67.07	\$137,870	\$139,510
17-2171	Petroleum Engineers	2,260	22.4	0.15	\$71.85	\$84.00	\$149,440	\$174,710
17-2199	Engineers, All Other	22,680	4.6	1.51	\$41.88	\$45.60	\$87,110	\$94,860
17-3000	Drafters, Engineering Technicians, & Mapping Technicians	218,860	1.2	14.57	\$26.62	\$27.71	\$55,380	\$57,640

# = Percent relative standard error (PRSE) for the employment estimate.

[https://www.bls.gov/oes/current/naics4\\_541300.htm](https://www.bls.gov/oes/current/naics4_541300.htm) (Retrieved April 8, 2021)