**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.

**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.

**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.

|  |
| --- |
| **May 2020 National Industry-Specific Occupational Employment and Wage Estimates**  **(Architectural, Engineering, and Related Services)** |
| |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | | **Occupation Code** | **Occupation** | **Estimated total employ-ment** | **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 (Retrieved April 8, 2021) |