many hours of solitary work, also requires a person to have strong communication skills as they will be frequently in contact with others and need to convey their complex ideas effectively.

A Day in the Life—Duties and Responsibilities

Aerospace engineers may develop new technologies for use in aviation, defense systems, and spacecraft. They often specialize in areas such as aerodynamic fluid flow; structural design; guidance, navigation, and control; instrumentation and communication; robotics; and propulsion and combustion.

Profile

Working Conditions: Inside
Physical Strength: Light to Heavy Work (Varies)
Education Needs: Bachelor's Degree
Licensure/Certification: Optional
Opportunities for Experience: Cooperative Programs; Internships
Interest Score: IR

Duties and Responsibilities

- Directing and coordinating the design, manufacture, and testing of aircraft and aerospace products
- Assessing proposals for projects to determine if they are technically and financially feasible
- Determining if proposed projects will result in safe operations that meet the defined goals
- Evaluating designs to see that the products meet engineering principles, customer requirements, and environmental regulations
- Developing acceptance criteria for design methods, quality standards, sustainment after delivery, and completion dates
- Ensuring that projects meet quality standards
- Inspect malfunctioning or damaged products to identify sources of problems and possible solutions

Aerospace engineers can specialize in designing different types of aerospace products, such as commercial and military airplanes and helicopters; remotely piloted aircraft and rotorcraft; spacecraft, including launch vehicles and satellites; and military missiles and rockets.

Aerospace engineers often become experts in one or more related fields: aerodynamics, thermodynamics, materials, celestial mechanics, flight mechanics, propulsion, acoustics, and guidance and control systems.

Aerospace engineers typically specialize in one of two types of engineering: aeronautical or astronautical.

OCCUPATION SPECIALTIES

Aeronautical Engineer
Aeronautical engineers work with aircraft. They are involved primarily in designing aircraft and propulsion systems and in studying the aerodynamic performance of aircraft and construction materials. They work with the theory, technology, and practice of flight within the Earth's atmosphere.

Conversation With...

ANDREW ZYDNEY

Distinguished Professor, Chemical Engineering
Pennsylvania State University
Chemical Engineer, 35 years

What was your individual career path in terms of education/training, entry-level job, or other significant opportunity?

I received my B.S. in Chemical Engineering from Yale University, then went to M.I.T. for my Ph.D. in Chemical Engineering. I had always been interested in-and good at-science and math, and thought engineering might be a good fit. I didn't know much about the field, but took an "Introduction to Chemical Engineering" course as a sophomore, and did so well that the instructor offered me a position as a research assistant in his lab. I loved doing research, and I became hooked on the discipline as a career path. I've never regretted that. I enjoy applying the principles of chemistry to solve problems, as well as the combination of mathematics with chemistry.

In graduate school, I was involved in a research project looking at the use of membrane filtration to remove toxic plasma proteins from blood, which was being considered as a treatment for diseases ranging from cancer to rheumatoid arthritis to lupus. I really enjoyed learning the fundamentals of membrane separations and was excited about the impact the work could have on human health. I have continued to do research in both membranes and health-related technology. I'm currently working on projects ranging from the purification of polysaccharide-based vaccines, to the use of novel membranes for the purification of plasmid DNA for gene therapy, to the analysis of virus removal filtration processes used to ensure the safety of a wide range of therapeutics.

What are the most important skills and/or qualities for someone in your profession?

My roles as chemical engineer and professor each have a somewhat different, although overlapping, skill set. Chemical engineers need a solid foundation in chemistry, physics, and the life sciences, as well as a strong background in math. They need to be good problem solvers who see the big picture.

As a professor, I have significant responsibilities in research and teaching. Both require strong communication skills, although the nature of the communications is very different. Research requires creativity and insight, including the ability to draw connections between ideas. As a researcher, I spend a tremendous amount of time writing manuscripts, funding proposals, and progress reports.

ining worksites, they also spend time in an office reviewing blueprints, writing reports, and scheduling inspections. Some inspectors climb ladders or crawl in tight spaces as part of their work. Inspectors typically work alone. However, inspectors may work as part of a team on large, complex projects, particularly if they specialize in one area of construction.

Profile

Working Conditions: Both Inside and Outside
Physical Strength: Light Work
Education Needs: High School Degree; On-the-Job Training; Apprenticeship
Licensure/Certification: Required, Varies Between States
Opportunities for Experience: Internship, Apprenticeship, Part-Time Work
Interest Score: RCI

Occupation Interest

The field of building inspection often attracts those with backgrounds in engineering, physical science, architecture, and civic planning. Many inspectors arrive at the position after several years in the private construction industry, either as skilled laborers or as engineering consultants, project managers, or architects.

Construction is a multifaceted discipline that requires knowledge of an array of logistics and systematic infrastructure, including architecture, HVACR, plumbing, electrical circuitry, weatherproofing, load-bearing metrics, and aerodynamics. Inspectors must also be well-versed in local, state, and national building regulations.

Duties and Responsibilities

- Reviewing building plans and approving those that meet requirements
- Monitoring construction sites periodically to ensure overall compliance
- Using equipment and testing devices, such as moisture meters to check for plumbing leaks or flooding damage and electrical testers to ensure that electrical components are functional
- Inspecting plumbing, electrical, and other systems to ensure that they meet code
- Issuing violation notices and stop-work orders if building is not compliant
- Keeping daily logs, which may include digital images from inspectors
- Documenting findings in writing

A Day in the Life—Duties and Responsibilities

Much of the day-to-day responsibilities of building inspectors involve traveling to and inspecting construction sites. The scale, location, and breadth of site surveys will depend on the specialty of the inspector.

Civic building inspectors survey all new construction sites and renovation projects within their particular jurisdictions to ensure that the projects fall within the parameters of regional, state, and federal building codes.

Conversation With...

JAN VERTEFEUILLE

Senior Director
World Wildlife Fund
Advocacy, 15 years

What was your individual career path in terms of education/training, entry-level job, or other significant opportunity?

I transitioned into international advocacy for conservation after working at newspapers and loving it. But after a decade, I started thinking about what else I could do with my strongest skills: researching, writing, delivering work on deadline and drawing stories and information out of people.

I went to work for a nonprofit in D.C. called Environmental Media Services, which was run by a bunch of former reporters who educated journalists about environmental issues and worked to generate media coverage of issues like environmental health and genetically engineered food. I worked there for four years before learning of a communications job at World Wildlife Fund. Since my passion was wildlife, it seemed a great fit.

My job focuses on figuring out advocacy strategies to achieve a specific wildlife conservation goal, like trying to reduce illegal ivory sales in a particular country to reduce elephant poaching. We might launch a campaign that includes policy advocacy (i.e. lobbying), media outreach to raise public awareness, and direct public engagement, like asking citizens to pledge not to buy ivory or sign a petition to their government. Then we look at who might be influential with the decision-makers in that country. Would diplomatic pressure help? Would a celebrity or influential business leader take up the cause?

What are the most important skills and/or qualities for someone in your profession, particularly someone who decides to work overseas?

People think of advocacy as lobbying legislators and government officials to get a law passed, and that's part of it. But to be successful, you need to really understand the players you're trying to influence and what tactics will be successful and what ones might actually hurt your efforts.

Professional training and a degree is less important than innate skills, which can be cultivated and improved through practice: creativity, curiosity, strategic thinking, flexibility, persuasion and the ability to work with a cross-cultural team. And by that last one I mean the ability to really

Marine Engineer/ Naval Architect

Snapshot

Career Cluster(s): Architecture & Construction; Science, Technology, Engineering & Mathematics; Transportation, Distribution & Logistics

Interests: Design; Mathematics; Problem-solving; Analyzing Data; Decision-making

Earnings (Yearly Average): $95,440

Employment & Outlook: Slower Than Average Growth Expected

OVERVIEW

Sphere of Work

Marine engineers and naval architects design, build, and maintain ships, from aircraft carriers to submarines and from sailboats to tankers. Marine engineers are also known as marine design engineers or marine mechanical engineers and are responsible for the internal systems of a ship, such as the propulsion, electrical, refrigeration, and steering systems. Naval architects are responsible for the ship design, including the form, structure, and stability of hulls.

Photo via iStock/shaunl. [Used under license.]

Work Environment

Marine engineers and naval architects typically work in offices, where they have access to computer software and other tools necessary for analyzing projects and designing solutions.

- Mining & Mineral Engineering
- Naval Architecture & Marine Engineering
- Nuclear Engineering
- Robotics Engineering

Adult Job Seekers

People interested in pursuing a career in mechanical engineering should seek out a university or community college that offers courses or a degree in mechanical engineering; otherwise, it is unlikely to attain an entry-level position as bachelor's degrees are necessary. Additionally, internships or apprenticeships also help and individual gain experience with the various technologies and work environment of a professional mechanical engineer.

Professional Certification and Licensure

Licensure is not required for entry-level positions as a mechanical engineer. A Professional Engineering (PE) license, which allows for higher levels of leadership and independence, can be acquired later in one's career. Licensed engineers are called professional engineers (PEs). A PE can oversee the work of other engineers, sign off on projects, and provide services directly to the public. State licensure varies from state to state so be sure to check the requirements of where one may work or live.

Additional Requirements

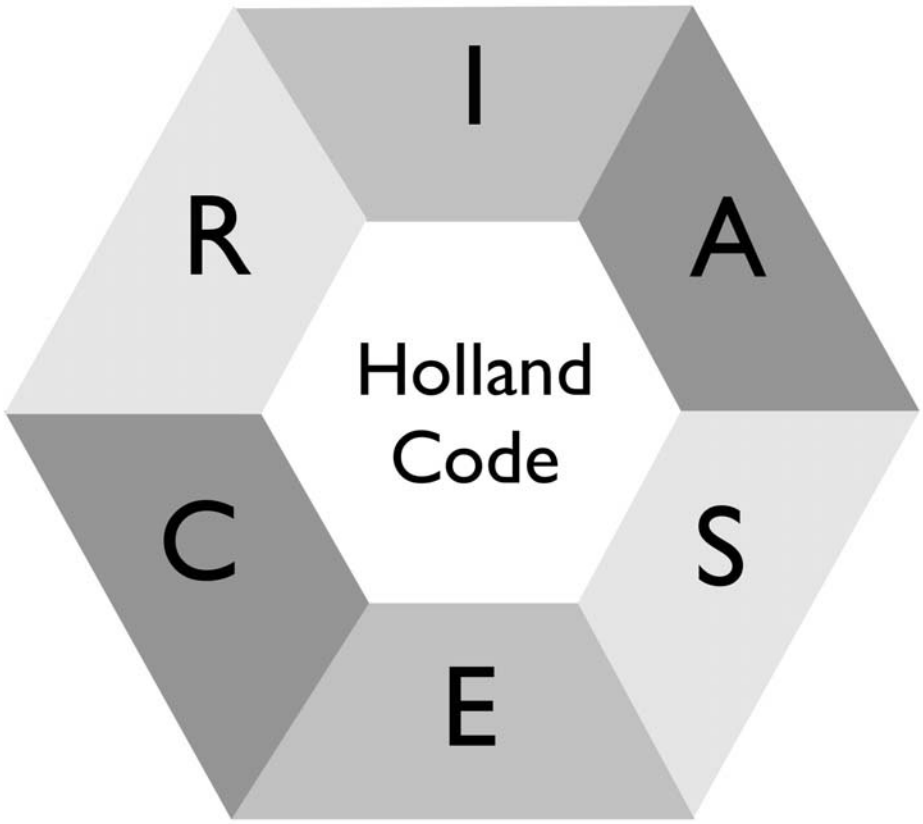
Several states require engineers to take continuing education to renew their licenses every year. Most states recognize licensure from other states, as long as the other state's licensing requirements meet or exceed their own licensing requirements. Several professional organizations offer a variety of certification programs for engineers to demonstrate competency in specific fields of mechanical engineering.

EARNINGS AND ADVANCEMENT

Median annual earnings of mechanical engineers were $90,160 in 2020. The lowest 10 percent earned less than $58,410, and the highest 10 percent earned more than $141,060.

Generally, the pay of mechanical engineering has many variables that can impact the earnings of an individual. From the location of an employer to the size and type of business, an individual's education level, skill set, and job responsibilities

What Are Your Career Interests?



This is based on Dr. John Holland's theory that people and work environments can be loosely classified into six different groups. Each of the letters above corresponds to one of the six groups described in the following pages.

Different people's personalities may find different environments more to their liking. While you may have some interests in and similarities to several of the six groups, you may be attracted primarily to two or three of the areas. These two or three letters are your "Holland Code." For example, with a code of "RES" you would most resemble the Realistic type, somewhat less resemble the Enterprising type, and resemble the Social type even less. The types that are not in your code are the types you resemble least of all.

Most people, and most jobs, are best represented by some combination of two or three of the Holland interest areas. In addition, most people are most satisfied if there is some degree of fit between their personality and their work environment.

The rest of the pages in this booklet further explain each type and provide some examples of career possibilities, areas of study at MU, and co-curricular activities for each code. To take a more in-depth look at your Holland Code, take a self-assessment such as the SDS, Discover, or a card sort at the MU Career Center with a Career Specialist.