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Commentary

Avionics Engineering and Electronics Systems in Aerospace Technology

Lianxi Zheng*

Department of Physics, United States Naval Academy, Annapolis, Maryland, USA

DESCRIPTION

Aerospace engineering is a field of engineering that deals with the design, development, and production of aircraft and spacecraft. It is a branch of engineering that applies scientific principles to the creation of machines, structures, vehicles, and buildings. The field is composed of a range of specialized engineering fields that each focus on specific areas of applied mathematics, applied science, and application types. The use of jargon is common in engineering, and it is important to be familiar with these terms when working in the field.

Aircraft are vehicles that use air support to fly, while spacecraft are machines or vehicles designed to travel through space. Spacecraft use static lift, dynamic lift from an airfoil, or the downward thrust from jet engines to counteract gravity. They are used for a wide range of applications, including communications, earth observation, meteorology, navigation, space colonization, planetary exploration, and transportation of individuals and cargo. All spacecraft, except for vehicles with a single stage to orbit, require a launch vehicle to enter space.

Aerospace engineering is divided into two main branches: engineering for space and space travel. Avionics engineering, which is similar to aerospace engineering, focuses on electronics, which is at the heart of aircraft electronic systems. The practice of launching spacecraft from Earth's atmosphere is known as astronautics, and it is one of the primary applications of space travel. Space science is another primary field in the study of astronautics.

Avionics systems include many systems that aircraft are outfitted with to perform various tasks, such as communications, navigation, display and management of multiple systems.

Electronics engineering, a subfield of electrical engineering that emerged in the early 20th century, is responsible for the addition of active components like semiconductor devices to amplify and regulate the flow of electric current. Electrical engineering, on the other hand, has traditionally utilized passive components like mechanical switches, resistors, inductors, and capacitors. Electronics engineering encompasses areas like embedded systems, digital electronics, analog electronics, power electronics, and consumer electronics. It is involved in related fields like solid-state physics, radio engineering, telecommunications, control systems, signal processing, systems engineering, computer engineering, instrumentation engineering, electric power control, and robotics.

Aeronautical engineering was the original name of the field, but it has since been replaced by the more general term "aerospace engineering," which encompasses both aircraft and spacecraft. In casual conversation, aerospace engineering is often referred to as "rocket science," particularly in reference to astronautics.

Outer space refers to the region of space that lies beyond earth's atmosphere and between celestial bodies. Although there are human beings in space, the environment is challenging for human exploration due to the risks posed by radiation, vacuum, and microgravity, which can cause muscle atrophy and bone loss. The financial cost of sending things into space, including humans, is extremely high.

Aerospace engineering has numerous commercial, industrial, and military applications. The boundary between space and air is thought to be 100 kilometers (62 miles) above the ground, based on the physical explanation that the air pressure is too low for a lifting body to generate a meaningful lift force without exceeding orbital velocity.

Correspondence to: Lianxi Zheng, Department of Physics, United States Naval Academy, Annapolis, Maryland 21402, USA, E-mail: Zhenglianxi01@gmail.com

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