Aerospace Engineering

Aerospace engineering is concerned with the science and technology of flight, and the design of air, land and sea vehicles for transportation and exploration. This exciting field has led people to the moon and continues to lead in the expansion of frontiers deeper into space and into the ocean's depths. Because of their unique backgrounds in aerodynamics and lightweight structures, aerospace engineers are becoming increasingly involved in solving some of society's most pressing and complex problems, such as high-speed ground transportation and pollution of the environment. The BS degree program in aerospace engineering is accredited by the Engineering Accreditation Commission of ABET (http://www.abet.org) under the criteria for aerospace and similarly named engineering programs.

Program Educational Objectives

Program educational objectives are statements that describe the expected accomplishments and professional status of aerospace engineering graduates three to five years beyond the baccalaureate degree. The School of Mechanical and Aerospace Engineering at Oklahoma State University is dedicated to graduating aerospace engineers who:

1. *Our graduates will be recognized leaders with exemplary careers to the greater benefit of society.*

2. *Our graduates will strive to acquire new skills and knowledge throughout their careers and will earn a reputation as responsible and ethical professionals.*

3. *Our graduates will be collaborative innovators who adapt to changing professional and societal norms with wisdom and integrity.*

Student Outcomes

The student outcomes for students graduating from the aerospace engineering BS program are:

1. an ability to identify, formulate and solve complex engineering problems by applying principles of engineering, science and mathematics;

2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety and welfare, as well as global, cultural, social, environmental and economic factors;

3. an ability to communicate effectively with a range of audiences;

4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental and societal contexts;

5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks and meet objectives;

6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions;

7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies;

Each junior and senior level course builds upon the preceding engineering, mathematics and fundamental science courses to develop in the student the ability to identify and solve meaningful aerospace engineering problems. Aerospace design is strongly emphasized in the junior and senior years. The coursework is specifically sequenced and interrelated to provide design experience at each level, leading to progressively more complex, open-ended problems. The coursework includes sensitizing students to socially-related technical problems and their responsibilities as engineering professionals to behave ethically and protect occupational and public safety. The program culminates in a senior-year design course in which students integrate analysis, synthesis and other abilities they have developed throughout the earlier portions of their study into a capstone aerospace design experience. The design experiences include the fundamental elements and features of design with realistic constraints such as economics, safety, reliability, social and environmental impact, and other factors. At this point, students are able to design aerospace components and systems that meet specific requirements, including such pertinent societal considerations as ethics, safety, environmental impact and aesthetics. Students develop and display the ability to design and conduct experiments essential to specific studies and to analyze experimental results to draw meaningful conclusions.

An integral part of this educational continuum, from basic science through comprehensive engineering design, are learning experiences that facilitate the students' abilities to function effectively in both individual and team environments. The program also provides every graduate with adequate learning experiences to develop effective written and oral communication skills. State-of-the-art computational tools are introduced and used as a part of their problem-solving experiences. Finally, the students' experience in solving ever-more-

challenging problems gives them the ability to continue to learn independently throughout their professional careers.

The broad background and problem-solving ability of aerospace engineers are well-suited for research, development, design, production, operation, management, technical sales and private consulting. A bachelor's degree in aerospace engineering is also an excellent background for entering other professional schools such as medicine, dentistry, law or business (MBA).