Undergraduate Program in
AEROSPACE ENGINEERING

Curriculum Overview

[FRESHMAN-SOPHOMORE]

The first two years build the basic science and mathematical skills that you’ll need for the practice of aerospace engineering: chemistry; two semesters of physics; math through differential equations; mechanics and dynamics of rigid bodies, and mechanics of deformable bodies. Aerospace engineering courses start in the sophomore year.

[JUNIOR]

The third year develops the engineering sciences and provides basic knowledge in the areas of fluid mechanics and heat transfer, computers and instrumentation, materials, gas dynamics, systems analysis, and computer-aided design (CAD). Hands-on laboratories build practical skills from the classroom instruction.

[ SENIOR ]

With the background acquired in the junior year, students are equipped to study design theory and methods and to engage in a capstone design experience. The material learned in the first three years comes together synergistically to emphasize aeronautical and astronautical topic areas.

Applications Big and Small

Aerospace engineering includes aeronautics and astronautics applications (subsonic and supersonic aircraft, satellites, space vehicles, space station, etc.), as well as aerospace-related component development (design of structures, devices and instruments), and vehicle and propulsion system design.

Aerospace Engineers Make Firsts

As an aerospace engineer, you could be part of a team that is the first to:

• Launch a rocket putting astronauts on Mars
• Design a permanent habitat in space
• Develop a shape-changing ultra-high strength material
• Build a super-mileage solar-powered aircraft

Employers

UB AE graduates have joined top employers worldwide, in both industry and government laboratories, including: NASA, Air Force Research Laboratories, National Transportation Safety Board, Boeing Company, Calspan Corporation, Honeywell Satellite Systems Operation, Lockheed-Martin Corporation, Moog Aircraft Group, Orbital Sciences Corporation, and United Airlines.

Aerospace Engineers Explore Frontiers

Throughout history, aerospace engineers have broken technological frontiers, building and creating the previously unimaginable. One hundred years after the first flight, aerospace engineers have pushed the boundaries of exploration and pursue exciting opportunities in cutting-edge fields beyond traditional aerospace applications in airplanes, spacecraft, and rocket science.

Did You Know?

You can get paid to go to graduate school. Several of our graduates go on to pursue advanced degrees. Some choose to continue their studies here, while others attend other elite graduate programs including MIT, Stanford, Cornell, and Texas A&M. Top UB graduate students receive full tuition scholarships, and a modest stipend to support their study.

Employment Outlook

Aerospace engineers are expected to have 10 percent growth in employment over the decade.

(Source: http://www.bls.gov/oes/current/oes172011.html)

Facts About AE@UB

• Full-time faculty: 35
• The average starting salary for AE BS positions is $67,000. The mean annual wage for AE’s is $105,450
• Degrees offered: BS, MS, and PhD
• Double major in Aerospace and Mechanical Engineering in 4½ years

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**Student Excellence**

**Bradley Cheetham** received the Barry M. Goldwater Scholarship, awarded to sophomores and juniors who plan to pursue advanced degrees in science and engineering. Bradley also completed the prestigious NASA Academy at Goddard Space Flight Center and was awarded a SUNY Chancellor’s Award. He was the founder of UB SEDS (Students for the Exploration and Development of Space), and is now studying for his PhD with fellowships from the National Science Foundation (NSF) and the National Defense Science and Engineering (NDSEG).

“The faculty members at UB have been great. They are always willing to listen to student ideas and I have thoroughly enjoyed working with many professors on projects. Looking to the future, my experience at UB has made anything possible.”

**Research Opportunities**

Undergraduates have the opportunity to work with faculty on research addressing important societal needs, such as improving health care systems, making public transportation accessible to people with disabilities, and making our nations’ transportation systems more energy efficient.

**Work Opportunities for Students**

Students can gain industrial knowledge experience during their undergraduate studies, through engineering-related summer employment or through 3-credit internships. Many graduates claim that these experiences gave them a leg up on the job search and let them hit the ground running when they started working.

**Undergraduate Research**

In addition to being a terrific undergraduate university, UB is also a great research institution. Research opportunities abound in AE, and our faculty are at the frontiers of knowledge in diverse areas, including dynamics, control and mechatronics, design and optimization, fluid and thermal sciences, and computational and applied mechanics.

As an example, a team of UB engineering students is currently competing in the University Nanosat Program, an Air Force sponsored competition among 10 universities, in which students design and build a small satellite. Students are involved with and responsible for every aspect of the program, including design and fabrication, and complete a series of engineering reviews to compete for a launch into orbit.

**Student Clubs and Activities**

Every year, UB’s chapter of the American Institute of Aeronautics and Astronautics competes in national competitions in design and construction. Students always learn new methods in composite development and application. If you want to get experience in a design team, build team, and/or a leadership position, this group is for you.

“AIAA has two main projects, Design-Build-Fly and Microgravity research. We do many other things, like Learn-to-Fly using RC aircraft, Bot Wars, and other campus activities. We are very open to new ideas; please bring yours. We have many alumni from AIAA who are now working in many of the top aerospace companies such as Moog, Inc. and Lockheed Martin, no doubt from their experiences with the club.”

—John Sisti, AIAA President, 2008–2009

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