

# UB DEPARTMENT OF MECHANICAL AND AEROSPACE ENGINEERING (MAE)

## BS in Aerospace Engineering (AE)

### Facts About AE@UB

- Full-time faculty: 30
- 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

### Aerospace Engineering: Applications Big and Small

Aerospace engineering includes aeronautics and astronautics applications (subsonic and supersonic aircraft, satellites, space shuttle, 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.

### Curriculum Overview

#### Freshman-Sophomore

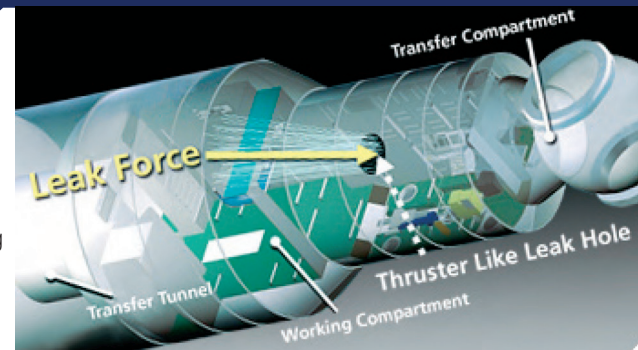
The first two years build the basic science and mathematical skills that you'll need for the practice of aerospace engineering: chemistry; two semesters of physics; math through differential equations; mechanics and dynamics of rigid bodies, and mechanics of deformable bodies. Aerospace engineering courses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



### Employment Outlook

Aerospace engineers are expected to have 10 percent growth in employment over the decade. (Source: <http://www.bls.gov/oes/current/oes172011.htm>)

### 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.



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Study of non-premixed flame-wall interaction using vortex ring configuration is done for the first time at the Computational Fluid Dynamics Laboratory.

## 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

*"University at Buffalo Students for the Exploration and Development of Space (UB SEDS) is a completely student-run organization promoting space and its related activities. The organization is continually growing and adding new projects. Current projects include rocketry, propulsion, educational outreach, and astronomy. Students also attend conferences, discuss current space activities, host speakers, and much more. If you are interested in a club that is open to your ideas and allows you to dream big, then come join us."*  
—**Bradley Cheetham**, SEDS Team Leader

## Successful Alumni



**Dr. Lesley Weitz** (BS '02) is a lead simulation and modeling engineer for the MITRE Corporation's Center for Advanced Aviation System Development, a federally funded research and development center that supports the mission of the Federal Aviation Administration. Weitz is a technical lead in the development of an international avionics standard to create more precise spacing, or intervals, between aircraft that will increase efficiency of air traffic operations in the U.S. and Europe.

## Award-Winning Faculty

In recent years, our faculty members have earned many prestigious awards:

- 1 NSF Presidential Faculty Fellows Award
- 7 NSF Career Awards
- 1 NSF Accomplishment-based Creativity Award
- 2 NIH Quantitative Research Development Awards
- 1 Office of Naval Research Young Investigator Award
- 2 SUNY Distinguished Teaching Professors
- 6 Chancellor's Award for Excellence in Teaching
- 6 Society of Automotive Engineers Teeter Educational Awards
- 1 National Geospatial Intelligence Agency New Investigator Award

To apply, please visit [admissions.buffalo.edu](http://admissions.buffalo.edu)

## CONTACT INFORMATION

**Matthew Ringuette**, Associate Professor and Director of Undergraduate Education  
(716) 645-1461  
[ringum@buffalo.edu](mailto:ringum@buffalo.edu)

**Brittany Smetanka**, Undergraduate Academic Coordinator  
(716) 645-1796  
[bsmetank@buffalo.edu](mailto:bsmetank@buffalo.edu)

**Department of Mechanical and Aerospace Engineering**  
University at Buffalo, The State University of New York  
318 Jarvis Hall  
Buffalo, NY 14260-4400

[WWW.MAE.BUFFALO.EDU](http://WWW.MAE.BUFFALO.EDU)

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