ADVANCED ENGINEERING DESIGN LAB
THE ADVANCED ENGINEERING DESIGN LAB (AEDL) IS A NEW FACILITY THAT CONSISTS OF 6,500 SQUARE FEET OF SPACE. STUDENTS FROM ALL MAJORS CAN PARTICIPATE IN SEVEN COMPETITION TEAMS.

Professor Todd Lowe with AOE next to the Pratt-Whitney PW6000 jet engine housed at the AEDL.
AEDL focuses on aerospace inspired engineering projects in the areas of rocketry, air flight, drone and wind turbine technologies.

The Advanced Engineering Design Lab is a joint venture between Virginia Tech’s College of Engineering and the Aerospace and Ocean Engineering department. The facility houses up to 7 undergraduate design teams in the areas of rocketry, drone technology, aircraft technology, and turbine energy. AEDL teams travel to many parts of the United States to compete in world class engineering design competitions. AEDL is managed under the Ware Lab, which facilitates similar projects in the mechanical, civil, electrical, and aerospace disciplines.

The Kevin T. Crofton Department of Aerospace and Ocean Engineering has been instrumental in spearheading the initiative that has made the AEDL a reality. The AOE department provides funding for space rental expenses and equipment procurement. All college and university majors, in addition to AOE students, are encouraged to participate in the team activities taking place at the facility.
3D PRINTED AIRCRAFT TEAM

Competition: 3D PAC National, Arlington Texas.
Goal: Design and build an aircraft (fixed wing or rotary wing) in which all airframe components are printed using 3D printing technology.
Website: aoe.vt.edu/undergraduate/design-projects/design-teams

NASA STUDENT LAUNCH INITIATIVE

Competition: NASA Student Launch.
Goal: To provide relevant, cost-effective rocket propulsion systems.
Website: hslvt.org
**ORBITAL LAUNCH VEHICLE TEAM**

**Goal:** Initially to fly a rocket past the Karman Line (100 km altitude) and then to place a satellite into low Earth orbit.

**Website:** oltvt.org

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**ROCKETRY@VT**

**Competition:** Intercollegiate Rocket Engineering Competition and Spaceport America Cup, New Mexico.

**Goal:** To launch a 10 lb payload to 10,000 feet altitude.

**Website:** rocketryatvirginiatech.org
ROCKSAT-X@VT

Goal: To launch a modular payload aboard a sounding rocket to advance cost-effective access to space for university student design teams.

Website: rocksatx.aoe.vt.edu

MARS SUB-SURFACE ANALYSIS TEAM

Competition: Moon to Mars Ice & Prospecting Challenge

Goal: Design and build prototype hardware that can extract water from simulated lunar and Martian subsurface ice.

Website: instagram.com/mdsat_vt
WIND TURBINE TEAM

Competition: Collegiate Wind Competition
Goal: To build, market, and select a mock implementation location for a viable wind turbine.
Website: eng.vt.edu/student-teams/windturbine

KENTLAND FARM

AEDL rocketry teams have access to Virginia Tech’s Kentland Farm launch facility. This remote site allows teams to perform rocket testing prior to competition events.
The Advanced Engineering Design Lab wishes to thank our many corporate and government sponsors. Without this support AEDL teams would not have the resources to design and fabricate award-winning projects. AEDL seeks additional sponsorship for the purchase of equipment for our new machine shop/3D printing lab. Specifically, we are looking to purchase drill presses, band saws, sanders, a water jet router, 3D printers, and a 4-axis carbon fiber winder. We’d like to thank the following sponsors:

- Siemens
- Collins Aerospace
- Leidos
- Northrop Grumman
- Boeing
- BNSF Logistics
- Maxon Motors
- US Department of Energy
- Virginia Tech Student Engineer Council (SEC)

LEADERSHIP

Ella Atkins is the Department Head for the Kevin T. Crofton Department of Aerospace and Ocean Engineering at Virginia Tech. Under Ella’s leadership the AEDL continues to have support through AOE, which provides resources necessary for the success of engineering design teams.

Dewey Spangler has been manager of the Ware Lab since 2003 and the AEDL since 2020. He is responsible for daily operation of both facilities, working with student project teams, communicating with corporate and individual sponsors and promoting Virginia Tech to prospective students. Dewey is also responsible for safety compliance in the Ware Lab and AEDL facilities.

Email: spangler@vt.edu

Bob Schoner is the AEDL Assistant Manager, and is responsible for the daily operation of the lab, purchasing necessary equipment and materials, and enforcement of lab policy and safety rules. The Assistant Manager also works directly with student team members with project fabrication, design reviews, and testing.

Email: bschoner56@vt.edu
FACULTY ADVISORS

PAT ARTIS
Aerospace and Ocean Engineering
E: hartis@vt.edu
Teams
- NASA STUDENT LAUNCH INITIATIVE
- ORBITAL LAUNCH VEHICLE TEAM

ARTHUR BALL
Electrical and Computer Engineering
E: aball@vt.edu
Teams
- WIND TURBINE TEAM

NANYAPORN INTARATEP
Aerospace and Ocean Engineering
E: nintarat@vt.edu
Teams
- WIND TURBINE TEAM

KEVIN SHINPAUGH
Aerospace and Ocean Engineering
E: kashin@vt.edu
Teams
- ORBITAL LAUNCH VEHICLE TEAM
- ROCKETRY@VT
- ROCKSAT-X@VT
- MARS SUB-SURFACE ANALYSIS TEAM

CRAIG WOOLSEY
Aerospace and Ocean Engineering
E: cwoolsey@vt.edu
Teams
- 3D PRINTED AIRCRAFT TEAM
AEDL WELCOMES VISITORS FROM K-12, UNIVERSITIES, INDUSTRY, HOME-SCHOOLS, PARENTS AND ANY ONE ENGAGED IN STEM RELATED ACTIVITIES. TOURS CAN BE ARRANGED BY CONTACTING THE AEDL MANAGER AT SPANGLER@VT.EDU.