
INNOVATE.
EXPLORE. EMPOWER.
TRANSFORM.
ENERGY
THE UNIVERSITY OF
TENNESSEE
KNOXVILLE

ARCHITECTURE + DESIGN

WE DON'T TOSS AROUND WORDS LIKE INNOVATE AND EXPLORE ON A WHIM.

For us, they express two deeply held values. And with a mission to prepare students to transform the world through design, we embed these values into everything we do—everywhere we teach.

HUB + HIVE

Our facilities are far more than four walls and a door. They are incubators of design innovation. They are alive with creative energy and design thinking, and they are outfitted with advanced technology. The Art + Architecture Building is our main hub on UT's dynamic campus, and the Fab Lab maker space is our exploration hive in downtown Knoxville.

INNOVATION + EXPLORATION = FUTURE

Students have full access to an incredible array of resources. From analog equipment in our two woodshops to maker technology in the Fab Lab, our facilities help students acquire skills they can't learn anywhere else.

When students explore in two of the most forward-thinking design facilities in the country, they become empowered to transform the world.

Contributing to downtown Knoxville's urban renewal is a 20,000-square-foot maker space in a renovated historic building—but there's nothing old about the Fab Lab.

All students in the college, from first-years to graduate students, can access the two floors of advanced technology, including an industry-grade water-jet cutter, x-axis mill, vacuum former, and CNC routers. They can explore with robotics, 3-D printers, and a laser cutter, not to mention a metal shop and woodshop.

"**The Fab Lab offers an enormous opportunity for students to gain fabrication skills and enter the modern workforce with immediate hands-on knowledge.** It is also a privilege for students, providing a wide range of resources and tools not available in most design programs, to explore their ideas and produce some truly mind-blowing projects. No other university is going to have these types of opportunities. It is one of the main reasons I'm here at the University of Tennessee."

—Michaela Stanfill
Second-year architecture student

"Digital fabrication techniques are no longer just fringe specialized practices; they are important, even crucial tools for 21st-century design practices worldwide. For me, teaching students at the Fab Lab is a vital part of their development as contemporary designers. **This facility is one of the best of its kind that I have been in, and it provides students with a rich experimental laboratory for actualizing design thinking in capacities that are otherwise impossible.**"

—Mark Stanley
Lecturer, School of Architecture

The Fab Lab is an exploration hive.

Through rapid prototyping, students' designs move from flat computer screens to models in their hands, not over days but in mere hours. Students work with many substrates, from foam to plastics and from titanium to aluminum. It's experience they couldn't get anywhere else, and it quickly catches the eyes of employers.

FAB LAB
Transforming through Innovation

IN 2015–16

330 HOURS ON CNC ROUTER

300+ STUDENT PROJECTS
created on CNC router and water-jet cutter

129,921 FEET
of filament used in 3-D printers

Two full-time Fab Lab supervisors and a dozen trained student workers are on hand to teach students how to **use the technology correctly** and **safely**.

Students in a **Governor's Chair Studio in the Fab Lab** contributed to a design for AMIE (additive manufacturing and integrated energy), which took **200 hours to 3-D print at Oak Ridge National Laboratory** and used **10,000 pounds** of carbon-fiber reinforced polymer. The same digital file that printed AMIE now prints model prototypes at the Fab Lab.

The Fab Lab offers **19 industrial- and consumer-grade 3-D printers**, including an SLA printer that uses a photopolymer resin, UV light, and mirrors to create 3-D models.

The **fourth rotational axis** on one of the CNC routers transforms the router into a CNC lathe and allows accurate rotation of an object in fractions of degrees.

Students learn to use **multiple software programs** to operate the technology in the Fab Lab, including Rhino and RhinoCAM, Makerbot, Preform, and Catalyst.

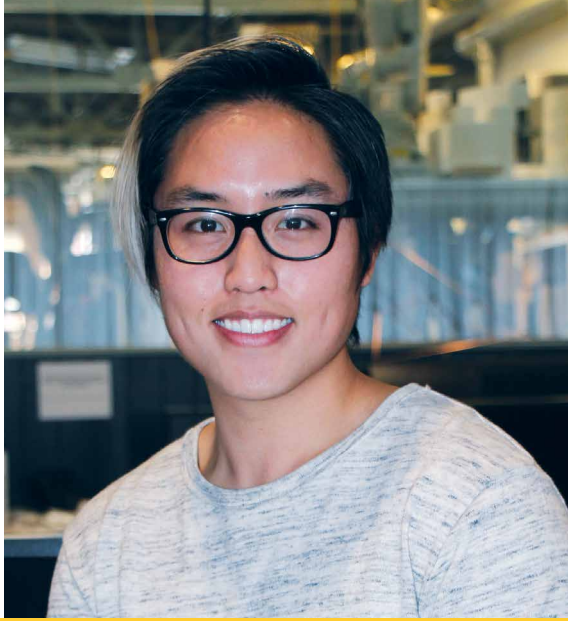
The total value of equipment in the Fab Lab is close to $650,000.

The college is **raising $1.4 million to purchase the Fab Lab building**. Once we own the building, the current $90,000 lease will apply to student scholarships.

To support the Fab Lab, contact Dean Scott Poole, 865-974-5267, scott.poole@utk.edu. Watch a Fab Lab video at **archdesign.utk.edu/fablab**.

…although who wouldn't think…

Innovation and exploration are among the habits we foster as we educate students for bright futures. We don't do it for fun—**although who wouldn't think cutting through a piece of 4-inch-thick titanium with a 55,000-PSI stream of water and garnet-laced grit moving at 700 miles an hour is fun?**—but to empower them to transform the world.



"As a 1995 graduate, I have enjoyed the college's willingness to evolve, with greater and greater commitment to hands-on education and technical capacity. **The college's Fab Lab is an embodiment of this evolution. The Fab Lab places the College of Architecture and Design amongst the most progressive in the nation in terms of digital fabrication and its impact on the practice of architecture.** As an owner of a critical design practice with integrated fabrication services, I look to the University of Tennessee to cultivate the next generation of designers and makers."

— Josh Shelton
Principal, el dorado inc., Kansas City, Missouri

"The Fab Lab is equipped with many tools that allow us to **fabricate our ideas through analog methods or materialize them from the digital realm.** Being able to use and understand the capabilities of these tools has opened many design opportunities that I'm able to translate into projects and bring into my career."

— Brian Lam
Fifth-year architecture student

Two studios meet in the Fab Lab's renovated anteroom—

both part of the Governor's Chair for High Performance Energy Practices in Urban Environments, a unique $2.5 million collaboration of the College of Architecture and Design, Oak Ridge National Laboratory, and world-renowned firm Skidmore, Owings & Merrill. Work coming from architecture and landscape architecture students in the Governor's Chair Studios has led to one of the world's first 3-D-printed buildings, solutions for repurposing downtown structures, and investigations into the 21st-century challenges of the Tennessee River.

ART + ARCHITECTURE BUILDING: INNOVATION IN EDUCATION

A stone's throw from Neyland Stadium on UT's campus is the **college's main innovation hub, the Art + Architecture Building**. The four-level, 161,650-square-foot A+A includes studio spaces, an auditorium, an atrium, lecture spaces, two galleries, and several review spaces. It contains a 3,600-square-foot woodshop fabrication studio equipped with a European horizontal lathe, helix planer, CNC router, and more, **available to all students**.

Students construct full-sized experimental building prototypes inside the A+A, where they also have access to a **virtual computer lab**, **digital print center**, and **3-D printers**.

Working in collaboration with nearby partners including Oak Ridge National Laboratory, Great Smoky Mountains National Park, and the Tennessee Valley Authority, the college employs an **innovative curriculum that combines design thinking with digital fabrication** in a design/build and urban planning environment. Each year, the college offers about 60 studio sections for its 400+ students.

Following a recent $1.5 million building upgrade, **every student in the college has a studio work space**, ergonomic chair, and dedicated computer monitor—resources offered by only the top schools in the nation.

For more information, visit **archdesign.utk.edu.**