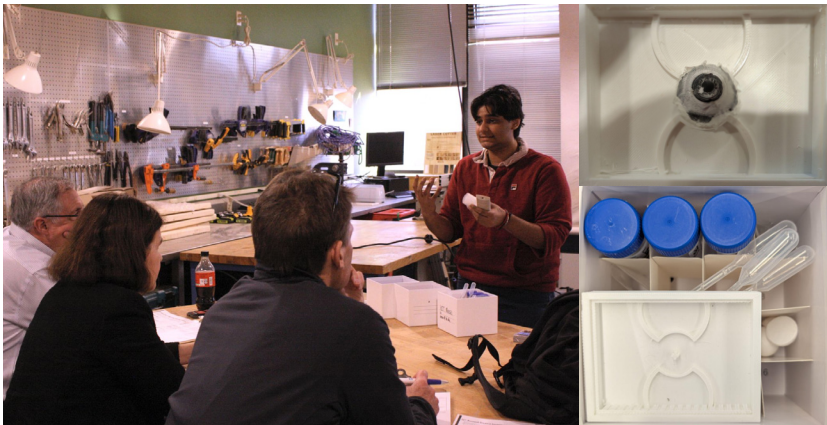




Boston University College of Engineering

BTEC PROJECT HIGHLIGHT

A Novel Method of Simulating Penetrating Keratoplasties



Anum Kotecha (BME '28)

The rising cost and limited availability of surgical training models for ophthalmology have restricted access to critical education in corneal transplantation techniques. Traditional training relies on cadaveric tissue, animal eyes, or commercial kits, all of which present ethical, logistical, and financial barriers. Using the BIO X 3D Bioprinter in BTEC, Anum Kotecha worked to develop a novel, affordable, and globally accessible 3D bioprinted corneal model designed to simulate penetrating keratoplasties. Using modified bio-inks composed of sodium alginate and pectin, trials of differing bio-ink ratios demonstrated functional corneal phantoms suitable for surgical training. Using 3D-printed molds with the bio-inks, Anum developed a kit costing approximately \$11 per unit. This innovation provides a scalable path toward democratizing ophthalmic surgical education while potentially improving patient outcomes in regions with high burdens of corneal disease. **This project is funded by the Engineering Student Innovation Fund.**

BTEC Advisory Board Members:



upcoming events

BTEC x BMES Design
Competition Kickoff
Sept 25 at 6:30, BTEC 201



Cell Culture Workshop
Sept 27 at 1, BTEC

Dean's Imagineering
Competition Kickoff
Oct 17 at 4, SILab

Catapult Competition
Nov 22 at 12, Nickerson



BTEC
ENTREPRENEURSHIP
SEMINARS



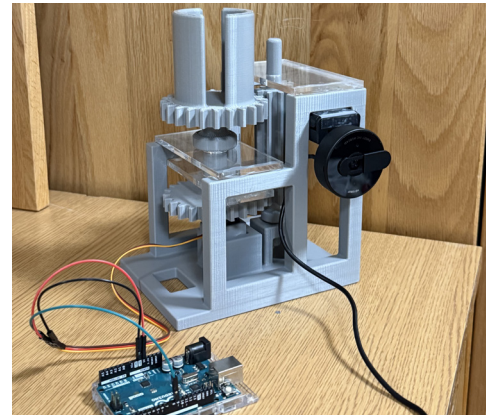
Anh Hoang, PhD
CEO
Jana Care

Dec 3 at 3:30, Kilachand CILSE 101

SILAB PROJECT HIGHLIGHT

Motion-Tracking Phone Stand by Doris Siu (Mech E '27)

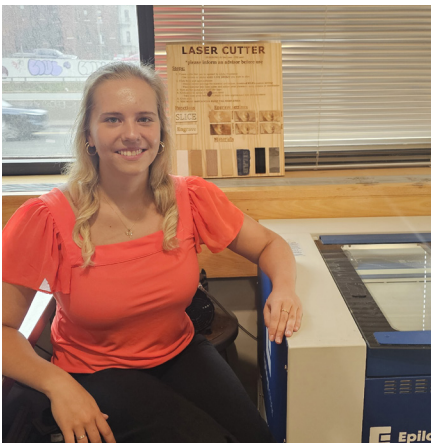
To allow ballroom dancers to film themselves, Doris designed a motion-tracking phone stand that automatically follows a moving subject. The device features a phone mount at the top and a webcam for real-time motion detection. Designed in SolidWorks, its housing combines 3D printed and laser cut components. The device's rotation is driven by a servo motor controlled by an Arduino Uno.



BTEC TECHNOLOGY HIGHLIGHT

AirClean® 600 Workstation

The AirClean® 600 Workstation is a vertical laminar flow fume hood. With a constant positive pressure maintained using ISO 5 air with HEPA filtration in the chamber, sash opening, and a UV lamp for sterilization, this hood provides a clean environment that prevents contamination. BTEC utilizes the new hood as a designated space for microbiology work, where users can perform bacterial culture, mold culture, and cloning without risking contamination from airborne particulates. Ultimately, this workstation enables innovation in the areas of synthetic biology and molecular engineering.



SILAB ADVISOR HIGHLIGHT

Anna Tretiakova (Mech E '26)

Anna Tretiakova started working at SILab in the summer of 2023. In addition to several woodworking projects, as a former athlete, Anna values the importance of medals in competition. She created medals out of glitter and glow-in-the-dark acrylic for the Catapult, Lutron, and the Dean's Imagineering Competitions to make the victories even sweeter. In the summer of 2025, Anna developed and ran a laser cutter workshop where students used Adobe Illustrator to transform a small picture into a BU terrier desk standee by engraving and cutting acrylic pieces and joining them together. Anna is always eager to talk to students about their projects and share her excitement about SILab!

ENGINEERING STUDENT INNOVATION FUND

Do you have a project that you are working on in BTEC/SILab that could benefit from funding for supplies?

For information on how to apply for funding scan the QR code to the right.

For inspiration from past projects, check out the BTEC-SILab ESIF Video at <https://shorturl.at/WKPhA>



PAST EVENT HIGHLIGHTS

BTEC x BMES Design Competition

The 3rd annual design competition—focused on improving health outcomes by increasing access to healthcare technologies and designing for a wide range of needs—concluded at the end of April. The winning projects included a cornea surgery training kit, a skin tone colorimeter for imaging, a cellulose-based antibacterial coating, and a wearable alert system to help the deaf.



Engineering Materials in 3D Workshop

In July, BTEC and SIlab held a workshop on utilizing SolidWorks 3D modeling, 3D printing, and 3D bioprinting for engineering materials. Raymond Lu, Andrew Tantrakoon (MechE '27), and Michelle Yang (BME '27) took first prize at the mini design challenge with their mechanical spider that visualizes and clears clogs deep in pipes!

SILab Laser Cutter Workshop

In August, at a SIlab workshop students used the Laser Cutter and Adobe Illustrator to create a 3D desk-o-ration of their own design, and gained the skills needed to create future laser cut prototypes.



Summer Outreach for High School Students

The **First Inspiration in Research in Engineering (FIRE)** took place in BTEC, introducing 35 students to hands-on biomedical engineering skills during a “Wet Lab Olympics”. Students competed in groups on precision pipetting, liquid measurements, and loading of DNA samples into agarose gels. Two **Upward Bound** rising seniors interned at SIlab over the summer.



Orientation Events

New orientation events were held in BTEC and SIlab to introduce incoming students to hands-on learning with technologies from gene editing, biosensors, and digital medicine to 3D printing, laser cutting, and milling.

Diane Joseph-McCarthy, Executive Director BTEC
Kavon Karrobi, BTEC Manager
Katie Kelso, SIlab Manager
For more information, email: btec@bu.edu