

Expanding Horizons: Bioengineering at Ashesi University



By 2030, Africa's workforce is expected to expand more than the rest of the world's combined, and it will be home to more than a quarter of the world's total population under the age of 25. For employment, food supply and healthcare to keep pace, innovators are needed from a growing number of disciplines. **Ashesi has identified the field of bioengineering as a key area to invest in preparing a new generation of leadership by creating an interdisciplinary course that specifically trains engineers to enter the bioengineering field and support the emerging biotechnology ecosystem across Africa.**

The following programs highlight the growing list of opportunities Ashesi students and faculty are pursuing thanks to philanthropic support building a state of the art wet lab along with funds to engage in research, academic conferences and specialized equipment. The opportunities fueled by these investments are preparing Ashesi students to advance their work both in private and public organizations, including hospitals and biotech companies, after graduation. With Ashesi's embedded entrepreneurial training and curriculum, our graduates will also have the tools to build and support the biotech startups - which we know play a critical role in building a strong bioeconomy. Read on for key highlights.

Expanding Ashesi's Engineering Options

By offering mechatronics and bioengineering degree programs, Ashesi is preparing graduates with a foundation that can help foster innovations that could lead to the development of life saving technologies for Africa's healthcare industry, like vaccines, along with the production and manufacturing systems to scale distribution and access.

Bachelor of Science in Biological Engineering

Ashesi's Bachelor of Science in Biological Engineering will educate biological engineers capable of addressing issues in multiple fields including biotechnology, bioinformatics, and neuro-engineering. We will build on Ashesi's unique model of leadership education to support the bioeconomy and its service to human and environmental health.

Bachelor of Science and Masters in Mechatronics Engineering Program

As of 2024, undergraduate engineering students will be able to select Mechatronics for their degree focus. There are also 26 students currently enrolled in Ashesi's established Masters in Mechatronics Engineering Program who are being trained in automation, production, and robotics.



New Head of Engineering

Department: Dr. Elena Rosca

Dr. Elena Rosca (pictured below) was named Head of the Engineering Department at Ashesi University this past fall. Her research has focused on how to use synthetic biology principles along with engineering to design solutions for problems on the African continent.

As a bioengineer, Dr. Rosca has helped lay the groundwork for Ashesi's growing program for seven years. Most recently, under her leadership, Ashesi is partnering with the University of Pittsburg on a pilot program to introduce students to Neural Engineering with a focus on rehabilitation research.



Ashesi University received a donation from Cambridge UK through the UKRI Global Challenges Research Fund project "BioENGINE" which provided financial support, equipment, and regents for teaching and research purposes.

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◀ Global Frugal Diagnostic Network: Scaling our Impact

Ashesi is pragmatic in preparing students to solve complex problems within the parameters of what is actually available. To this end, Dr. Rosca co-founded the Global Frugal Diagnostic Network which is “building a community of policymakers, researchers and practitioners passionate about re-imagining and re-creating diagnostic ecosystems.” This work will help open doors for Ashesi students to have hands-on learning experiences while promoting healthcare equity in Africa through the identification and creation of cost-effective innovations.

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Ashesi's iGem Team: ▶ Taking Ashesi Innovation Global

Since 2017, Ashesi has participated in the international iGem competition where they've presented their bioengineered organisms and solutions alongside teams from across the globe. In 2023 the team expanded their initial scope of research from mitigating environmental and human impacts from gold mining to include those linked to lithium mining. This research has the potential to help reduce cost, prevent land degradation, and protect people's health during the precious metal mining processes that dominate a number of African economies. The hands-on learning and international exposure iGem offers Ashesi students plays a critical role in their training.



EXCITING NEWS: In November 2023, the iGem Team earned a gold medal (*pictured top right*)! They were also named a top 10 team in the biomanufacturing and entrepreneurship category alongside prestigious schools from around the world. Our thanks to the McNulty Foundation and The Hopper Dean Family Foundation for initiating the support to create the Ashesi wet lab. Their leadership paved the way for a growing number of donors to support Ashesi's continued participation in iGem and expanded research.



◀ Ashesi – New Regional Distribution for open DNA collection

Ashesi is now one of the three centres in the Global South that will hold a library of open DNA collections. In service of the larger educational community, Ashesi will make these available to local universities and researchers who can utilize these DNA constructs to create their own enzymes. This is a particularly exciting partnership, because DNA research costs are so extremely high that oftentimes the theory is taught without empirical experimentation. This will provide African faculty and students direct access to the biological software needed to conduct enzyme research and experimentation; supporting the research ecosystem at African universities. Click [here \(https://reclone.org/reagents/\)](https://reclone.org/reagents/) to learn more.



Ashesi's bioengineering program and research opportunities for Ashesi faculty and students will help foster this critical industry's establishment in Africa. Thank you for supporting Ashesi University!