

**From:** [C Ramey](#)  
**To:** [Faculty Senate](#)  
**Cc:** [Nanette Boyle](#)  
**Subject:** Expression of Interest for RFP Student Signature Experience  
**Date:** Monday, November 2, 2020 7:11:12 PM  
**Attachments:** [Innovation Funds Proposal Goal-paragraph.docx](#)

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Hello,

Nanette Boyle and I would like to submit a proposal to support the International Genetic Engineered Machine iGEM team at Mines. Attached please find our expression of interest.

Warm regards,  
Josh

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Innovation Funds Proposal Goal: To provide increased access to biology-related research projects and provide students with a signature experience in designing, building and characterizing genetically modified organisms to solve problems they are passionate about.

Background: The International Genetically Engineered Machine (iGEM) competition was founded in 2004 as a way to provide students a way to explore the exciting interface of engineering and biology while trying to solve a problem [1,2]. This competition has grown to include more than 340 teams from 45 countries in 2019. iGEM is a student-driven endeavor that promotes teamwork, entrepreneurship, and the application of knowledge at the interface of biology and engineering.

The Mines iGEM team was founded in 2016 and has participated in the international competition (the Jamboree) in 2018 and 2019. During this period, approximately 90 Mines students have participated in some facet of the team and 8 have travelled to Boston to participate in the Jamboree. The team consists of passionate undergraduate students from diverse departments coming together to identify a problem and use synthetic biology to propose a solution. A typical competition year starts in January when students gather to identify the problem they want to solve in the upcoming year. The students then lead the effort to research potential ways to approach the problem using the latest advances in synthetic biology. During the semester they attend seminars from faculty who pursue research in these areas, attend lab training 'boot camps' supervised by iGEM faculty advisors and try to engage stakeholders. Over the summer, students work independently to design and build a novel biological system, and in the fall, they prepare a website describing their work and present it formally at the Jamboree. Over the last 4 years, we have seen an increase in interest from students wanting to pursue careers at the interface of biology and engineering. To meet the needs of this growing student population, we propose to expand our reach by developing a new synthetic biology course and securing funds for continued support of iGEM to ensure student access. This will provide students with a signature experience, skills that are attractive to potential employers both in and outside of synthetic biology, and name recognition to Mines as a leader in synthetic biology.

Specific aims:

- Develop a new synthetic biology course offered starting Spring 2022 that teaches students principles of engineering design and modeling as well as stakeholder and community engagement in the context of synthetic biology.
- Develop the entrepreneurial and research discovery spirit of students by allowing them to participate in the Design Build Test cycle to solve a novel problem.
- Design and implement community outreach programs to teach K-12 students about synthetic biology by partnering with the Trefny Center and DECtech.
- Help students develop confidence in their soft skills and knowledge of synthetic biology by providing multiple opportunities to present their scientific work to diverse audiences.
- Provide students an overview of the types of careers available to them at the interface of engineering and biology.