

## **Miller Faculty Fellowship Grants Academic Year 2019-2020**

### **Flipped pre-lab discussion & structured inquiry in CHEM 331L, \$9,442**

Teresa Fernando, Joseph Awino, George Kraus, Arthur Winter and Yan Zhao, chemistry (LAS)

Redesign the largest organic chemistry lab class -- perceived by students as a huge obstacle -- by replacing pre-lab lectures with video tutorials, other materials and discussion to predict experiment results. Experiments themselves will use structured inquiry and guided inquiry approaches in which the outcome is less certain. The goal is for students to use critical thinking to learn basic concepts, understand why organic chemicals behave as they do and become better interpreters of experiment results.

### **Developing virtual lab software as a new teaching tool for biochemistry lab course, \$16,452**

Baoyu Chen and Desiree Gunning, biochemistry, biophysics and molecular biology (LAS); and Simanta Mitra, computer science (LAS)

To aid the introductory biochemistry lab course, software will provide animated visualization of biomolecules to help students simulate and understand experiments outside of actual labs. The team will track if the software helps students better execute and understand complex experiments.

### **Enhancing best practices in microbial sciences in the digital age through experiential learning, \$13,705**

Larry Halverson and Claudia Lemper, plant pathology and microbiology (CALs); and Greg Phillips, veterinary microbiology and preventive medicine (VMD)

As part of the capstone course (Micro 440) for students in microbial sciences, integrate computational and bioinformatic data into previously purchased laptops (replacing a paper notebook archive) for efficient, secure use of the data and to expand the scope of possible learning exercises.

### **Video enhanced mobile observation: Mobile-app supported peer observation and feedback pedagogy, \$13,812**

Evrin Baran and EunJin Bahng, School of Education (HSCI)

Develop a video mobile app for use in an elementary science teaching course to enhance students' peer observation and feedback and ultimately develop better teachers.

**Leadership skill awareness development through peer feedback, \$5,500**

Maartje Schouten and John Watt, management (IVYCOB)

Turn a lecture-based course into one where students are the decision-makers on topics, and peers assess each other's leadership skills. It will help ensure students' ideas are heard and leadership behavior is shown in group settings.

**Innovative learning framework for classes involving physical systems: Combining the inductive teaching and learning method and the Make To Innovate program, \$13,000**

A Ram Kim, Benjamin Ahn and Matthew Nelson, aerospace engineering (ENGR)

Use an inductive learning method (which begins with questions or challenges for students), as well as aerospace engineering's successful "Make To Innovate" program to help students in two AE courses (355 and 531) understand complex concepts in flight dynamics and aircraft performance. Inductive methods are rarely used in engineering courses, mostly due to a lack of evidence they can work in the discipline.