

2016 Faculty Awards Convocation

Romeo L. Moruzzi Young Faculty Award for Innovation in Undergraduate Education

We are delighted to present the Romeo Moruzzi Young Faculty Award for 2016 to Professor Dirk Albrecht of the Biomedical Engineering Department, for his innovative efforts to enhance student engagement through hands-on learning in a large enrollment bioinstrumentation course.

The bioinstrumentation course redesigned by Professor Albrecht epitomizes WPI's motto of "theory *and practice*" in a particularly challenging context: a course with more than 100 students, most of them sophomores, and no scheduled laboratory. Handed a course that students seemed to dread, he refocused learning around a relevant and tangible goal: for each student to build their own electrocardiograph (ECG) instrument, from scratch, to measure their own heart signals. His primary innovation was the development of a series of "at-home" labs using inexpensive Arduino kits. In a series of four progressive modules, students apply the principles, theory, and equations presented in class to assemble their own ECG instruments and, ultimately, to test them by measuring their own heart signals. Professor Albrecht created instructional materials for each lab so that students could build their instruments in a self-directed and self-paced manner.

Professor Albrecht's ambitious and bold course redesign demonstrates that significant hands-on learning experiences *are* feasible in large undergraduate classes and have substantial benefits for students. Colleagues have noticed lasting impact as students use their hardware and skills in subsequent courses and projects. One student observed: "I learned applications and skills I use every day as a researcher. The electronics skills I have learned have had a major impact on my success at WPI." Another commented that "my MQP team is using concepts we learned from [Professor Albrecht's course] to apply to our project ... which is something we would not have been comfortable diving into if not for his teaching approach." Perhaps the highest praise comes from a student who noted that Professor Albrecht has "greatly contributed in teaching students the skills needed to become innovators themselves."

For his effective integration of theory and practice to motivate learning in a challenging course, and for his commitment to helping students develop practical engineering skills, we are proud to present the 2016 Romeo L. Moruzzi Young Faculty Award for Innovation in Undergraduate Education to Professor Dirk Albrecht.

