The CECS STUDENT SUCCESS CENTER
at WRIGHT STATE UNIVERSITY

A National Model for Increasing the Number, Caliber and Diversity of Engineering and Computer Science Graduates

According to the President's Council on Jobs and Competitiveness, the National Academy of Engineering and industry leaders nationwide, the future of U.S. global competiveness will depend in large part on our ability to increase the number, caliber and diversity of our engineering workforce.[1] To this end, the College of Engineering and Computer Science (CECS) is seeking philanthropic support for its Student Success Center as a national model for doing just that. The center is grounded in $5.0M in NSF supported curricular innovations which have successfully uncorked the primary bottleneck to student success in engineering – namely, the freshman calculus sequence.

The Wright State model involves the introduction of EGR 101 – a hands-on, application-oriented first-year engineering math course replacing traditional math prerequisites for core sophomore engineering courses - along with a more just-in-time structuring of the required calculus sequence. The result has shifted the traditional emphasis on math prerequisite requirements to an emphasis on **engineering motivation for math**. Since its inception in Fall of 2004, the approach has had an overwhelming impact on student retention, motivation and success in engineering. The 2007 introduction of EGR 199 as a precursor to EGR 101 for initially underprepared students has further strengthened the approach, and has made the core engineering curriculum accessible to an extremely broad range of American high school graduates. Results of a recent longitudinal study have shown that the introduction of EGR 101 and associated prerequisite changes have substantially mitigated the effect of incoming math preparation on student success in engineering across the entire range of incoming ACT math scores, which has more than doubled the average graduation rate of enrolled students. Moreover, it has done so without watering down the caliber of graduates, who have actually enjoyed a slight (but statistically significant) increase in graduation GPA. Finally, the approach has been shown to have the greatest impact on members of underrepresented groups, for many of whom the traditional engineering curriculum is simply not accessible. With the help of NSF support, various aspects of the approach are now being piloted by dozens of institutions across the country (primarily university, but also at the community college and K-12 levels).

In addition to sustained support for Wright State's first-year engineering math program and associated K-12 outreach, the CECS Student Success Center supports mandatory, individualized academic advising of ALL intending engineering and computer science majors; supplemental instruction and peer tutoring in core sophomore-level engineering courses; scholarships to recruit high caliber students, encourage articulation from community colleges, support experiential learning and study abroad, and reward student success in first-year courses. Coupled with aggressive recruitment strategies now underway, the Center will seek to double the annual number of CECS graduates by 2018, and will serve as a model for engineering and computer science programs nationwide.

[1] *Road Map to Renewal: Invest in our Future, Build on Our Strengths, Play to Win, 2011 Year-End Report, President's Council on Jobs and Competitiveness, 2011.*

Impact of EGR 101 on CECS Graduation Rates

All DFHS Students Entering Fall 2000-Fall 2006 Earning CECS Degree