Every university has an objective of improving retention and graduation rates, and history and scholarship show this can be accomplished by ensuring students have the best possible learning experience in the early and formative stages of education. The Clark School Keystone Academy of Distinguished Professors was established in 2006 with this goal in mind, and set out with the mission to “revive the infrastructure of freshmen and sophomore engineering courses with a focus on engineering design” (Calabro, Kiger, Lawson, & Zhang, 2008, p. 2). Now better known as the Keystone Program, it provides engineering students with first- and second-year experiential learning experiences which lay the foundation for their academic tenure at the University.

The Keystone Program and its tutoring center encompass the Clark School’s first- and second-year students and those foundational engineering courses required for engineering students of all majors. Each academic year, more than 3,250 students take a course taught under the Keystone Program. The program, its center, and its resources for students have been recognized by the American Society of Engineering Education as an exemplary program, and were featured in their publication, Prism (Grose, 2008).

The program has created an environment throughout the College and the University that demonstrates that excellent and effective teaching is important to students’ success.

Two decades ago, the Clark School was graduating about one in three students after five years. After analyzing the curriculum and classroom experiences in the 100- and 200-level courses, it was recognized that these courses were not always taught by the best faculty and that often resulted in students being discouraged from sticking with engineering. Since the Keystone Program’s formation, the College’s retention rates have greatly improved. The Clark School’s one-year retention rate is up from 82% in 2005 to 89% in 2010; the two-year retention rate is up from 67% to 75%, and the three-year retention rate has risen from 63% to 69%.

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The average time to graduate in engineering for entering freshmen is currently 4.1 years, compared to 4.0 years for the campus as a whole. Students find they greatly enjoy the challenging first- and second-year experiences, and this inspires many to persist in their quest to earn an engineering degree.

**What’s made the difference?**

“Our teaching and retention philosophy is ‘one student at a time,’” says Dr. William Fourney, Associate Dean and Director of the Keystone Program. “You must recognize students as individuals who have a great deal to offer humanity. And you need to engage them, as soon as they enter, with classes that have interesting formats and are led by teachers who truly want to be in the classroom with first- and second-year students.”

The Keystone Program focuses on improving the educational experience for undergraduates early in their academic careers by arranging for some of the best faculty to teach introductory engineering courses. These courses are mostly taught in small sections of less than 50 students. The program is highly selective in choosing its faculty, and, by doing so, fosters its commitment to use exemplary undergraduate teaching skills and to showcase teaching excellence in fundamental engineering courses.

A faculty member is included in the program based on their prior teaching performance and willingness to work closely with first- and second-year engineering students. Around 10% of the 200 faculty in the college are Keystone Professors. These professors are provided with the support necessary to continue making contributions to the curriculum, including renewable three-year appointments with financial incentives, and administrative and technical support (Calabro, et al., 2008). Keystone Professors also participate in the Keystone Mentoring Program, in which they are matched with first-year students to provide guidance and serve as additional campus support. These relationships can continue into the second year, depending on the student’s needs.

After the first year of the Keystone Program, it was determined the school could not improve retention rates without bringing math, physics and chemistry into curriculum planning. In 2007, Dr. Fourney met with the chairs of each of these departments, who were excited about the direction the College was taking with the Keystone Program and its courses.

Two committees were formed: one reviewed the content of math courses offered to engineering students, to determine if it was appropriate for the College’s needs; the other looked at the subject matter being covered in physics courses in which engineering students were enrolled. The department of chemistry

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also started working closely with engineering faculty to review topics covered in chemistry courses that engineering students complete for their degrees.

These departments made changes to their first- and second-year service courses in order for engineering students to be successful in their degree plans. Through these collaborative efforts, the non-engineering coursework required as part of an engineer’s graduation requirements are now taught in a way that makes the topics more relevant to engineering (Grose, 2008).

The College continues to work closely with these departments. In fact, course evaluations for math, physics and chemistry courses are provided to the Keystone Program for review and comment.

One of the Keystone Program’s proudest accomplishments has been the creation of the Keystone Center, where students in 100- and 200-level engineering courses can go to work on homework or group projects, use a computer lab or study for exams (Grose, 2008). The center is staffed by upper-level undergraduate students, hired as Teaching Fellows (TFs), who provide tutoring and other assistance several evenings a week. The TFs are students who have done well in Keystone courses and are hired to work up to 10 hours per week in specific sections of the Keystone courses. The TFs also spend a considerable amount of their time holding office hours and mentoring students in an assigned section. Each fall semester, many of the TFs enroll in a one-credit seminar class, ENES478, which covers academic topics from ENES100, teaching and learning pedagogies, and collaborative leadership skills, all taught to assist the TFs in their duties.

By improving the teaching, learning, and support services for 100- and 200-level engineering courses, the Clark School and its Keystone Program have elevated both the curriculum and student success rates. We invite our campus colleagues to visit our website at www.keystone.umd.edu, where you can learn more about our Keystone Professors, engineering design competitions, and student resources.

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**The Honor Pledge**

CTE posts this on behalf of the Student Honor Council, which encourages instructors to include the following text in course syllabi:

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The University of Maryland, College Park has a nationally recognized Code of Academic Integrity, administered by the Student Honor Council.

This Code sets standards for academic integrity at Maryland for all undergraduate and graduate students.

As a student you are responsible for upholding these standards for this course.

It is very important for you to be aware of the consequences of cheating, fabrication, facilitation and plagiarism.

For more information on the Code of Academic Integrity or the Student Honor Council, please visit http://www.shc.umd.edu.

To further exhibit your commitment to academic integrity, remember to sign the Honor Pledge on all examinations and assignments:

‘I pledge, on my honor, that I have not given or received any unauthorized assistance on this examination (assignment).’