### STEP Project Overview

Southern Illinois University’s Type I STEP project aims to increase the College of Engineering’s five-year graduation rate from 37% to 67% by targeting first- and second-year retention rates.

**Retention Rates:**
- Freshmen: 997-2004
- Sophomores: 100%

A holistic freshman-sophomore program was implemented effective summer 2007 that consists of (1) a new Engineering Residential College; (2) a multi-tiered mentoring program that relies on peer mentors, faculty, and practicing engineers; (3) an innovative and hands-on introduction to Engineering course that is common to all first-year students in the College; (4) common sections of cohort groups for Mathematics, English, and Speech Communications courses, many of which are offered inside the Engineering Residential College; (5) a six-week, summer math program for underprepared students; and (6) a new approach to teaching mathematics that includes supplemental instruction, tutoring and a new developmental math course designed to ready engineering students for Calculus. At the end of one year of implementation, freshmen and sophomore retention rates have increased by 7% and 9%, respectively.

### Engineering Residential College

The Residential College is the foundation of our living-learning community. Freshmen and sophomores are required to live on campus in one of three engineering-only residence halls. Trained peer mentors live alongside residents, and free tutoring and several engineering-designated sections of courses are offered in a central location.

#### Assessment Tools:
- Pre- and post-semester student attitudes survey
- Three focus group meetings per year
- Academic performance data

#### Sample Student Feedback:
- “I liked having CoE-only halls
- Confident in choice of major/school
- Improved academically
- Helped me to develop strong friendships
- Mentors aid in intellectual and academic development, but it is important to know the answer, but if they don’t, they’ll find out for you. It’s very beneficial.”

#### Challenges and Opportunities:
- Of the various project components, the Engineering Residential College impacts the largest number of students and is extremely cost-effective.
- The two-year, on-campus housing requirement has been difficult for some students to accept – seemingly justified, but we will continue to monitor attitudes and student performance.
- More than half of students surveyed would have lived in the residence halls even if it was not required.
- Structured social activities are significantly beneficial and are being expanded.
- A trend is underway; other colleges across campus have adopted a similar living-learning community model.

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### Other Activities

#### Common Sections of Courses

Creating engineering-designated sections of courses promotes peer networking and provides a comfortable and convenient, yet structured, learning environment. Post-semester surveys indicate that the majority of students were positive about the idea and recommended that the effort be continued. While most were able to get to know their engineering peers better because of the arrangement, only half liked that enrollment was limited to engineering majors. Several sections have been moved to traditional classrooms; continued assessment will help determine the impact of location, as well as cohort groupings.

#### Summer Bridge (Math) Program

This preparatory course emphasizes math and engineering science and is designed to smooth the transition to college life. Assessment tools include attitudes surveys, placement test scores, course grades, and success rates in subsequent courses. Data shows the majority of students place into a higher level math course following the program, and participants are broadly pleased and positively impacted. The number of participants needs to increase; recruitment outcomes have been disappointing, despite the fact that it is a free program.

#### Mathematics Instruction

Supplemental instruction, tutoring, and a new developmental math course taught within engineering have positively impacted pass rates and student attitudes. Yet, there still exists significant room for improvement based on overall success rates of students in these courses. Continued monitoring and targeted efforts by tutors and peer mentors will reveal more information that can be used to increase impact.

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### Engineering 101

This new interdisciplinary course emphasizes hands-on projects and application of basic math, chemistry and physics principles. The intent is to provide a preview of the different engineering disciplines so that students can make an informed choice about their academic major. It also includes guest lectures from industrial mentors and incorporates information on study skills, engineering ethics, and internship and career opportunities.

#### Assessment Tools:
- Freshmen engineering and attitudes surveys
- Qualitative exam questions
- Instructor course evaluations
- Sample Student Feedback:
  - “I liked the hands-on projects; lectures were interesting, but the projects were really exciting.”
  - “I liked that there were so many engineering freshmen in the same class; it forced us to establish help networks.”
  - “They made engineering seem right for me.”

#### Challenges and Lessons Learned:
- Instructors must understand that teaching 1st-year students is a whole new ballgame.
- Involving peer mentors in 101 fosters teamwork and study skills, and it promotes the underlying living-learning concept.
- Timing and distribution of guest lectures and projects is key.