The reasons students give for abandoning STEM majors point to the retention strategies that are needed. For example, high-performing students frequently cite uninspiring introductory courses as a factor in their choice to switch majors. And low-performing students with a high interest and aptitude in STEM careers often have difficulty with the math required in introductory STEM courses with little help provided by their universities. Moreover, many students, and particularly members of groups underrepresented in STEM fields, cite an unwelcoming atmosphere from faculty in STEM courses as a reason for their departure.
Key UG Retention Efforts

- **Ryan Scholars Program**: Summer Bridge through Graduation
- **CU EMPower**: Structured Peer Mentoring Program
- **CUES Program**: Spatial Visualization Skill Development, Tutoring for Major Level Courses with a Focus on Gateway Courses to the Majors, and the Engineering Summer Math Institute
- **LSAMP Scholars Program**: Research and Graduate School Preparation Program
- **LSC Scholarships**: Support for Winter and Summer Courses with a goal to increase persistence to through affiliation with an engineering major and to graduation
Ryan Scholars Program

• **Purpose**
  
  – Provide Ryan Scholars with every opportunity to succeed as engineering undergraduate students and beyond

• **Number of students reached today**
  
  – 130

• **Number potentially reached each additional year**
  
  – 30 to 34 per year
Ryan Scholars Program

- **Key or scalable features:** Pre-freshman summer program
  - First math and computer science courses – placement determined by Cornell math diagnostic, AP scores, and high school math and CS curriculum
  - Course to develop spatial visualization skills, introduce work in team projects, and to engage scholars with faculty/project clients
  - Weekly SAFE (Strategic Actions for Excellence) Seminars
  - Collaborative learning groups and individual tutoring
  - Power Labs to introduce undergraduate research
  - Development of a supportive community and establishment of connections to peers, staff, and faculty
Ryan Scholars Program

• Key or scalable features
  – One-on-one proactive (aka intrusive advising)
  – Peer mentoring through CU EMPower
  – Tutoring for core and major level courses
    • Tutoring for core courses through ELI, LSC, and Math and Physics support centers
    • Tutoring for major level courses through the CUES Program
  – Priority consideration for LSC Scholarships
  – Priority consideration for the Engineering Summer Math Institute through the CUES Program
  – Financial awards to scholars in support of their access and participation in academic and professional development activities
Ryan Scholars Program

• Key tools for Evaluation
  – Pittsburgh Survey
    • Administration to all first year students in the early fall and late spring
  – APPLE Survey
    • Administration to all Ryan Scholars during PSP and to all participants in CUES Tutoring Program and Engineering Summer Math Institute
  – Focus Groups
    • Facilitated in late July during PSP with first and second year Ryan Scholars
  – CU EMPower Mid and Post Program Surveys
Ryan Scholars Program

• Key metrics of success
  – Increased Sense of Belonging
  – Persistence & Academic Performance
    • 1st and 2nd year retention, retention through major affiliation, graduation rate
    • Persistence at Cornell if a scholar decides to transfer internally
  – Post Graduate Outcomes
  – Development of meaningful connections with peers, staff, and faculty
  – Creation of a positive, supportive, and caring community among Ryan Scholars
### Ryan Scholars Program

- **Key metrics of success**

<table>
<thead>
<tr>
<th>Cohort Year</th>
<th>Original Cohort Size</th>
<th>Retention in Eng</th>
<th>Retention at CU</th>
<th>Ave. Eng GPA</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>24</td>
<td>83.33%</td>
<td>83.33%</td>
<td>2.98</td>
</tr>
<tr>
<td>2011</td>
<td>24</td>
<td>83.33%</td>
<td>91.67%</td>
<td>3.10</td>
</tr>
<tr>
<td>2012</td>
<td>27</td>
<td>96.15%</td>
<td>96.15%</td>
<td>2.90</td>
</tr>
<tr>
<td>2013</td>
<td>22</td>
<td>81.82%</td>
<td>81.82%</td>
<td>3.14</td>
</tr>
<tr>
<td>2014</td>
<td>33</td>
<td>100.00%</td>
<td>100.00%</td>
<td>3.46</td>
</tr>
</tbody>
</table>
CU LSAMP Scholars Program provides:

- Individual and Group Advising
- Strategic graduate school preparation
  - Search & admissions process
  - Identifying and applying for undergraduate research opportunities
  - Graduate fellowship applications

CU LSAMP REU (Research Experience for Undergraduates):

- 8-week summer research program with faculty research mentors
- Weekly seminars and community events
- GRE Prep
- $3400-4000 stipend with housing

Joint Alliance Activities:

- GEM GRAD Lab
- National & Regional Conferences