

STEM background

Science, technology, engineering and math (STEM) continue to have a growing impact on our lives and economy. According to the Minnesota Department of Employment and Economic Development, occupations requiring STEM knowledge are some of the fastest growing careers in the state. So building the necessary foundation through education is critical.

Private colleges' commitment

At the 17 institutions that are members of the Minnesota Private College Council, STEM education has long been a cornerstone commitment.

- Minnesota's private colleges and universities are significant contributors of bachelor's degree graduates, awarding 27% of STEM degrees.
 - Among students of color who earn undergraduate STEM degrees, 24% do so at one of our colleges.
 - Among women who earn undergraduate STEM degrees, 36% do so at one of our colleges.
- Our share of undergraduate degrees is even higher for some key STEM-related areas:
 - **46% of all physical science degrees**
 - **37% of all biological and biomedical science degrees**
 - **36% of all math degrees**
- No matter their majors, we prepare all of our graduates with critical thinking skills that are essential in our global economy — a key benefit of our focus on the liberal arts.

STEM examples

There are many examples of our colleges' STEM contributions. Here are just a few:

- Over the last four years, **Augsburg College** has provided National Science Foundation scholarships to 66 junior and senior STEM majors—of whom 39% began their college career at a community college and 36% are students of color. Each summer, about 60 students engage in on-campus undergraduate research and another 15 conduct research across the country at Research Experiences for Undergraduates (REUs).
- **Bethel University** currently has faculty researching through four NSF grants in physics and biology. A STEM minor for elementary education majors began this academic year to develop teachers who effectively integrate STEM in to their classrooms. Bethel also annually hosts area elementary, middle and high school students for STEM events such as the Minnesota State Science Olympiad Division C Tournament; GEMS: Girls in Engineering, Math and Science; and class field trips to Bethel's labs. Bethel students regularly collaborate with faculty in physics, chemistry, biology, math and neuroscience on research projects that have resulted in peer-reviewed publications, student-faculty presentations and awards at regional and national conferences. The research projects are funded by some internal grants, but primarily through external grants.
- **Carleton College** sent more students on to doctoral programs for geosciences and life sciences from 2003 to 2012, as tracked by the National Science Foundation, than any other liberal arts college. Particularly high numbers of students earn doctorate degrees in other scientific fields, as well: among liberal arts colleges, Carleton is second in students going on to earn physical science doctorates and third in students going on to earn math and computer science doctorates. Carleton

Minnesota's Private Colleges | Excellence within reach

Augsburg College
Bethany Lutheran College
Bethel University
Carleton College
College of Saint Benedict
The College of St. Scholastica

Concordia College, Moorhead
Concordia University, St. Paul
Gustavus Adolphus College
Hamline University
Macalester College
Minneapolis College of Art and Design

Saint John's University
Saint Mary's University of Minnesota
St. Catherine University
St. Olaf College
University of St. Thomas

is also a national leader among all colleges and universities nationwide in producing science PhDs — ranking sixth across all science disciplines and in the Top 10 since 1975.

- The Future Chemists Scholarships and Support (FoCuS) program is a special program for students interested studying chemistry or biochemistry at the **College of Saint Benedict** and **Saint John's University**. Students accepted into the program receive a scholarship as well as valuable mentoring in their field. They gain academic, leadership and research experiences that help prepare them for careers in chemistry or biochemistry. Incoming students are eligible for this program, which is supported by a grant from the National Science Foundation.
- **The College of St. Scholastica** offers the Clare Boothe Luce (CBL) Undergraduate Research Awards Program, which engages eight female students annually in collaborative research with faculty mentors in computer science/computer information systems, mathematics and chemistry. CBL Scholars each receive a \$5,500 research stipend, along with funds for needed research supplies, equipment, and travel to a national professional conference. St. Scholastica also leads efforts to promote computer science education at the pre-college level; a recent National Science Foundation grant of nearly \$1 million will allow St. Scholastica faculty to work with hundreds of high school teachers across the nation over the next three years. Finally, St. Scholastica works directly with K-12 youth, offering outreach and other enrichment programs.
- **Concordia College** dedicates an academic day to Celebration of Student Scholarship. It's an opportunity for hundreds of students, many from STEM programs, to present their undergraduate research. The college recently created a neuroscience major and a computer science major with data analytics and computing concentrations.
- **Concordia University, St Paul** provides STEM students with opportunities to engage in novel collaborative projects that are externally funded. Teams of our research students have participated on projects ranging in topics from developing tissue engineering materials, to detection of disease biomarkers, to providing interactive consent forms for visually disabled patients.
- **Gustavus Adolphus College** is widely recognized for its annual two-day Nobel Conference, which draws about 6,000 people to campus each year. The Conference links a general audience, including high school students and teachers, with the world's foremost scholars and researchers in discussion centered on contemporary issues relating to the natural and social sciences. Gustavus has also successfully implemented a first-year research program (FYRE) that provides opportunities for students to conduct research alongside members of the Gustavus faculty the summer after their freshman year.
- **Hamline University** has a long history of providing undergraduate STEM students with collaborative research experiences as early as the summer after their first year — with the potential to continue research over multiple years. A \$1.1 million grant from the Howard Hughes Medical Institute helped expand the summer research program to include more students and create a vibrant STEM research community.
- **Macalester College** ranks 15th among all U.S. liberal arts colleges in the percentage of its graduates who later earn science and engineering doctorates, according to the NSF Survey of Doctorates from 2004-2013. Students can start on this path with a collaborative research experience at Macalester. Within the last five years, approximately 130 students per year conducted research over the summer. Five in seven of these students worked in STEM fields.
- The **Saint Mary's University** Fellow at Gundersen, established in 2013, is a partnership between Saint Mary's and the Gundersen Medical Foundation in La Crosse through which students are immersed each year in research at the Kabara Cancer Research Institute. Students also frequently assist with research at the Fermi National Accelerator Laboratory near Chicago.

- **St. Catherine University's** majors in the sciences have grown more than 30% since 2008. Students have the opportunity to engage in undergraduate collaborative research projects with talented faculty and present at local, state and national conferences. St. Kate's Clare Booth Luce STEM Scholars receive scholarship support and special programs to enhance their education and career prospects. In addition, St. Kate's offers a STEM minor and certificate for undergraduate education students and graduate programs in STEM and technology for licensed educators and Montessori teachers to enhance their competency and confidence in teaching STEM subjects.
- **St. Olaf College** STEM faculty build upon their disciplinary strengths to promote interdisciplinary programs that include neuroscience, mathematical biology, biomolecular science, and environmental studies. Faculty members work collaboratively each summer with 50 to 60 undergraduate researchers and offer an average of 160 academic research experiences during the academic year. Thirty-seven percent of the majors awarded each May are in STEM fields. In addition, St. Olaf seeks to inspire younger students to pursue STEM majors through hosting the Science Olympiad, supporting Upward Bound, and participating in TRIO mentoring.
- The **University of St. Thomas** STEPS (Science, Technology and Engineering Preview Summer) Camp for girls has served more than 3,000 young women over the past 15 years. The weeklong overnight summer camp sponsored by the School of Engineering received the prestigious TEKNE Award from the Minnesota High Tech Association.

Shared STEM efforts

- Eleven of our colleges participate in the **Mayo Innovation Scholars Program** — a program that provides multidisciplinary teams of students the opportunity to analyze inventions and discoveries in translational medicine and technology transfer at the Mayo Clinic.
- Three of our colleges are part of the **NorthStar STEM Alliance**, which aims to double the state's minority STEM graduates in the next five years.

Visit www.mnprivatecolleges.org for more information — including on the Minnesota Private College Fund's Galileo Scholarship Fund.