

# STEM & Minnesota Private Colleges

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 25 percent of STEM degrees in the 2018-19 academic year.
  - Among those who earn undergraduate STEM degrees at one of our colleges, 47 percent were women.
  - Among students of color and Native American students who earn undergraduate STEM degrees, 24 percent do so at one of our colleges.
  - Among women students of color and Native American students who earn undergraduate STEM degrees, 29 percent do so at our colleges.
- Our share of undergraduate degrees is even higher for some key STEM-related areas:
  - **46 percent of all physical science degrees**
  - **34 percent of all math degrees**
  - **33 percent of all biological and biomedical science degrees**

- No matter their majors, we prepare all 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 at our member institutions

Here are examples of our member institutions' STEM contributions:

- Over the last three years, **Augsburg University** has provided National Science Foundation scholarships to 66 junior and senior STEM majors — of whom 39 percent began their college career at a community college and 36 percent 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).
- **Bethany Lutheran College's** commitment to STEM disciplines is highlighted by its bachelor of arts in engineering science degree program, which is different than traditional, structured engineering programs in that it relies on the liberal arts

foundation to produce graduates who are more than just builders, but rather they are problem solvers. Bethany's engineering program produces graduates who are critical thinkers who understand and solve complex problems for the betterment of society.

- **Bethel University** was awarded its ninth National Science Foundation (NSF) research grant for work dedicated to improve science education across middle school, high school, and collegiate settings. In addition to doubling the physics and engineering lab spaces in 2019, a three-story, 18,000-square-foot science center opened fall 2020 for the biology and chemistry departments, further strengthening the breadth and depth of STEM studies at Bethel. Since 98.6 percent of undergrad classes hold fewer than 50 students, individuals receive personalized mentoring, one-on-one support from experts in their fields, and nationally funded research opportunities. Learn more about the biology and chemistry programs at [bethel.edu/academics/science](http://bethel.edu/academics/science) and the physics and engineering programs at [bethel.edu/undergrad/academics/physics/](http://bethel.edu/undergrad/academics/physics/).

- **Carleton College** is a national leader in the number of students who go on to earn PhDs and is ranked first among baccalaureate colleges in geosciences, second in both the life and physical sciences and fifth in computer science. In specific disciplines, Carleton ranks first in chemistry, earth science and astronomy; second in biological sciences and physics; sixth in mathematics and statistics and seventh in computer science. Carleton is second among baccalaureate institutions in the number of students going on to obtain PhDs between 1966 and 2014.
- **The College of Saint Benedict and Saint John's University** provide blended STEM learning through curricular opportunities and structured co-curricular experiences that let students develop distinctive and competitive applications for graduate study. For some STEM students, those co-curricular experiences take the form of internships or clinical shadowing/observation. Many engage in powerful, practical undergraduate research opportunities alongside a faculty mentor. Some have chosen an entrepreneurial experience in the successful Entrepreneur Scholars program. Newly remodeled laboratory, classroom and student engagement spaces in many STEM areas (biology, computer science, environmental studies, mathematics, nursing, physics) support teaching, collaboration and hands-on learning.
- **The College of St. Scholastica** created the National Center for Computer Science Education, a hub of innovative computer science education projects, including the Computer Science through Concurrent Enrollment project, funded by the National Science Foundation. This three-year project supports high school teachers teaching a computer science course to their students for college credit and is building sustainable relationships to support high school computer science education and college pathways.
- **Concordia College** dedicates an academic day to Celebration of Student Scholarship, which provides an opportunity for hundreds of students, many from STEM programs, to present their undergraduate research. Other opportunities for Concordia STEM students include collaborative research, conference presentations, cadaver anatomy experience, and classes held in our state-of-the-art facility that opened in 2017.
- **Concordia University, St Paul** provides STEM students with opportunities to engage in novel collaborative projects with on-campus research opportunities encompassing medically relevant topics like tissue engineering, the human microbiome and cancer. Research students also participate in technology-driven projects including artificial intelligence, data analytics, big data and cloud computing. Students gain access to these opportunities in the context of research courses that ensure all majors get relevant research experience as part of their degree.
- **Gustavus Adolphus College** is widely recognized for its annual two-day Nobel Conference, which links a general audience with the world's foremost scholars and researchers in discussion on contemporary issues relating to the natural and social sciences. The College recently opened a \$70 million expansion and renovation of the Nobel Hall of Science, which houses biology, chemistry, biochemistry and molecular biology, geography, geology and environmental studies in 180,000 sq. ft. of state-of-the-art laboratory and classroom facilities. The building provides science, technology, engineering, arts and math (STEAM) opportunities to all students through its innovative connection to the Schaefer Fine Arts Center and the addition of the Gardner Laboratory Theatre. Gustavus also has a successful first-year research program (FYRE) that connects students with members of the Gustavus faculty to conduct research the summer after their freshman year.
- **Hamline University** has a long history of providing undergraduate STEM students with collaborative research experience as early as the summer of their first year — with the potential to continue research over multiple years. Collaborative teams of students work in a vibrant community on transformational projects ranging from nanomaterials and solar batteries to genetic adaptation of plants and the synthesis and study of bioactive compounds and proteins.
- **Macalester College** is consistently ranked among the top U.S. liberal arts colleges in the number of graduates who earn doctorates in STEM fields, according to NSF reports on Baccalaureate Origins of U.S. Doctorate Recipients. The College's

numerous undergraduate research opportunities lay the foundation, with paid summer research positions available on campus, as well as additional opportunities through partnerships with other major research universities across the country and the world. From 2015-2019, nearly half of the publications from Macalester's STEM faculty included student co-authors.

- The **Minneapolis College of Art and Design (MCAD)** offers a unique, fully online Masters in Sustainable Design (MASD) that engages a world-class community to creatively concept and lead sustainable solutions across disciplines and industries. This program seamlessly integrates theory, design projects, digital collaboration, and leadership. Courses include Systems Thinking, Biomimetic Design, and Innovation Tools and Techniques. MCAD's MASD program prepares graduates to effect purpose-driven social and environmental change.
- Newly renovated, innovative teaching facilities and labs at **Saint Mary's University of Minnesota's** Winona campus offer multiple hands-on learning experiences with cutting-edge simulated technology for science and business students. The new facility also houses Saint Mary's pre-licensure B.S. in Nursing program. The natural environment of the campus, with its bluffs, on-campus stream, and proximity to the Mississippi River, is the ultimate classroom. Through collaborations with world-class organizations, students have opportunities to connect and learn with leaders in their fields; examples

include the Mayo Scholars program and the 3+2 Physician Assistant Studies program with Mayo Clinic School of Health Sciences.

- **St. Catherine University** students have the opportunity to engage in undergraduate collaborative research projects with talented faculty and present their work at local, state and national conferences. Clare Booth Luce STEM Scholars receive scholarship support and special programs to enhance their education and career prospects. St. Kate's also offers a STEM minor and certificate for undergraduate education students as well as graduate programs in STEM and technology for licensed educators and Montessori teachers to enhance their competency 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** offers over 25 different STEM majors and received a \$1 million grant from the Howard Hughes Medical Institute to

support efforts to engage all students in science. Students planning to major in science, mathematics and/or engineering are eligible to compete for two full-tuition scholarships and two renewable \$8,000 awards. Students engage in graduate-style research alongside faculty and the Undergraduate Research Opportunities Program provides grants to undergraduates conducting research under the guidance of a faculty mentor. In the Center for Applied Mathematics, students work on research topics such as mathematical modeling of weather phenomena, mathematical biology and financial mathematics with companies including U.S. Bank, 3M and Corning. Annually, 275 students conduct student-faculty research outside of the classroom. St. Thomas also has opportunities for engineering and science students to study abroad.

### Shared STEM efforts

- Up to 11 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 their partner institutions' minority STEM graduates in the next five years.

## Member Colleges

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

Visit [mnprivatecolleges.org](https://mnprivatecolleges.org) for more information.

See the “giving” section for background on the Minnesota Private College Fund’s Galileo Scholarship, supporting students studying in the STEM disciplines.

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