LEARNERS AND LEADERS
Building education success in science and technology

EMBRACING THE CHALLENGE: ACHIEVEMENT IN MATH & SCIENCE

WHAT IT TAKES
The Campaign for MONTANA STATE UNIVERSITY
EDUCATING FOR DISCOVERY AND INNOVATION.

Competitiveness in the global marketplace demands innovation. The key ingredients for innovation are new knowledge, a skilled workforce and an environment that promotes creativity and entrepreneurship. MSU is committed to educating an increasing number of students who are prepared to enter the workforce and equipped for jobs in the fields of science, technology, engineering and mathematics, aka STEM.

LEADING THE WAY WITH LEARNING CENTERS.

Learning Centers like the Math Learning Center, the Chemistry and Physics Help Centers and the MSU Writing Center offer students a complementary learning space to their classroom environments. Many students are more comfortable working with peers or graduate students, and learning in a supportive and collaborative environment.

In addition, the peer tutors who commit to working in the learning centers gain valuable experience that serves them well into the future. Tutoring requires the ability to communicate complex ideas, a skill coveted by employers that gives peer tutors a professional advantage in the job market.

CONNECTING STUDENTS WITH THE MATH AND SCIENCE SUPPORT THEY NEED TO FULFILL THEIR DREAMS OF STEM CAREERS. PRIVATE SUPPORT FOR BES²T PROGRAMS CAN MAKE IT HAPPEN.
HANDS-ON LEARNING OPPORTUNITIES.

Preparing students for a lifetime of gaining and creating knowledge requires hands-on learning through active engagement. Private funding for the BES²T initiative will help MSU expand programs that allow students to collaborate with faculty and peers on projects that simulate real-world work environments.

These learning opportunities teach students that creativity and risk-taking are vital elements of today’s innovation-economy.

BES²T FUNDING PRIORITIES.

- Early Intervention Mentorship Program for at-risk students
- Faculty staffing for learning centers
- Seed-grants for curriculum re-design efforts and hands-on learning
- Training and support for peer tutors
- Stipends for graduate assistants and student success coordinators
- Undergraduate field and lab research opportunities
- Development of online tutoring tools

TRANSFORMING BARRIERS INTO GATEWAYS.

Montana State University aims to support faculty members who through research and teaching experience want to innovate course curriculum in order to improve student academic performance.

The BES²T fund will provide seed money for faculty with creative ideas to redesign courses like calculus, statistics and intro to general chemistry. These curriculum redesign efforts are an approach that would continually innovate to maximize value for students by focusing on courses required so that they can continue on a path towards a STEM degree. This would mean improved academic performance for thousands of students into the future.

Improving success in math and sciences courses eliminates the barriers that have historically stood in the way for many students pursuing STEM careers.

The numbers on supporting math and science

<table>
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<tr>
<th>39%</th>
<th>32,158</th>
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<td>increase in STEM majors at MSU since 2011.</td>
<td>STUDENT-HOURS OF TUTORING PROVIDED IN 2014–15 BY THE MATH LEARNING CENTER.</td>
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<tr>
<td>2,107</td>
<td>78%</td>
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<td>ALL STUDENTS OF INTRO TO GENERAL CHEMISTRY SINCE SPRING 2013 HAVE RECEIVED SUPPLEMENTAL INSTRUCTION. OUTCOME: Ds, Fs AND COURSE WITHDRAWS HAVE BEEN CUT IN HALF WHILE A GRADES HAVE DOUBLED.</td>
<td>of high school graduates nationally have not met readiness benchmarks for one or more entry-level college courses in mathematics, science and English.</td>
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Cadet Kelly Walls, a mechanical engineering major from Redmond, Washington, is required to keep up her grade point average to remain in good standing in the Airforce ROTC program. So when she did poorly on the first exam in Calculus II, she knew that she needed to get help.

At the same time, Corinne Casolara, the student success coordinator for all twenty sections of Calculus II, noted that Walls and many other students that term would need help if they were going to pass the course.

Walls received that invitation from Casolara and opted to attend the supplemental class. Though structured, Walls found the class to be more relaxed and less intimidating with fewer students—usually 10 to 15.

“It was very interactive and we would go through the suggested homework problems step by step,” Walls said. “Corinne was very patient and took extra time to explain things until you understood it. She was there for us.”

The supplementary class and additional resources made the difference for Walls and allowed her to stay on track with her degree progress. From a D grade on that first Calc II exam to a B+ final grade in the class, Walls has continued on with that strong foundation, achieving A grades in her subsequent Calc III and IV courses.

When students must retake courses, they end up paying more tuition and taking longer to graduate. Faculty and student success coordinators like Casolara are helping students to succeed before they become discouraged with the rigorous course work required of a STEM major.

Academic success for Walls has also led to research opportunities. Now a senior and a McNair Scholar, Walls works with MSU Professor Paul Gannon in his high temperature materials lab on characterizations of coatings that will advance solutions for creating less expensive solar panels.

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“Why it matters.”
STORIES OF STUDENT SUCCESS

KELLY WALLS

Cadet Kelly Walls, a mechanical engineering major from Redmond, Washington, is required to keep up her grade point average to remain in good standing in the Airforce ROTC program. So when she did poorly on the first exam in Calculus II, she knew that she needed to get help.

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In addition to teaching Calculus (Calc) II, Casolara analyzes student performance data so that as needed, MSU can provide early intervention measures to ensure students succeed in their math courses.

Every student entering Calc II with a lower prerequisite grade or who gets a poor grade on the first exam receives an invitation to join her weekly supplementary class.

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Casolara with students in the supplementary Calc II class.

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