

# MSU College of Engineering Strategic Plan 2014-2019

## MSU COE Mission

The College of Engineering at Montana State University will serve the state of Montana and the nation by

- Fostering lifelong learning
- Integrating learning and discovery
- Developing and sharing technical expertise
- Empowering students to be tomorrow's leaders

## MSU COE Vision

The College of Engineering at Montana State University will be an outstanding collaborative community that achieves excellence in learning, innovation, discovery, and knowledge transfer. To realize this vision, the college will

- Leverage shared interests and talents among faculty and students in order to create knowledge across disciplinary lines.
- Effectively and efficiently balance breadth with depth in undergraduate education in order to prepare students for the global workforce.
- Be a leader in innovation and discovery in our identified focus areas.
- Successfully integrate research and innovation into the learning experience of both undergraduate and graduate students.
- Be recognized for the level of knowledge transfer to industry, governments, and citizens in the state of Montana.

## MSU COE Core Values

Members of the MSU College of Engineering community approach all of their work with the following deeply held core values:

- *Life-long learning.* The college is a community that believes in and fosters life-long learning in all of its members—undergraduate students, graduate students, faculty, and staff. Life-long learning also extends beyond the college community to state and national constituencies.
- *Knowledge Discovery.* At the heart of the college community's activities are knowledge discovery and dissemination and the creativity that accompanies these activities. We believe that knowledge discovery informs and enriches the life-long learning of the entire college community.
- *Collaboration.* We believe that collaboration and collegiality both inside and outside of our college community enrich all college activities.
- *Inclusiveness.* The college is a community that welcomes and encourages diverse points of view and backgrounds, believing that this inclusiveness enriches our creative learning environment.
- *Professionalism.* The College of Engineering community approaches all activities with a high degree of professionalism, working with integrity, honesty, and commitment to excellence.
- *Self Actualization.* The College of Engineering embraces self-actualization for all members of the community and strives to provide the resources and the environment in which community members can reach personal goals.

## Implementation

The bold goals and objectives in this plan are not resource neutral, and in order to maintain the quality of the students' experience, progress toward the goals and objectives will depend on an environment that is conducive to growth.

### Presuppositions

Many of the Goals and Objectives articulated in the COE Strategic Plan presuppose the following:

- That student to faculty ratios are maintained at the level proportionate to the level from 2008, prior to the MSU enrollment growth; thus, the FTE of faculty (both tenure-track and tenured faculty, as well as non-tenure-track instructional faculty) will increase from 71 to 118 by 2019. (In 2008, the college had about 2,000 students and 65 faculty, for a student to faculty ratio of about 31. If the college has 3,700 students in 2019, a similar ratio would be maintained with 118 faculty.) The proportion of non-tenure-track FTE faculty will remain below 20%.
- That student success is inextricably linked to the level of staff support; thus, the number of staff supporting academic units will need to increase by at least 30%.
- That, by 2019, as stated in the MSU Strategic Plan, average MSU faculty and administrative salaries will increase to at least 80 percent of the representative peer market average, as listed in the Oklahoma State University Faculty Salary Survey. Average staff salaries will increase to the representative peer market average.
- That COE space will increase to accommodate additional students, faculty, and staff.
- That Graduate Teaching Assistantship support will increase commensurate with the increase in graduate enrollment.

### Control

At the end of each academic year, beginning May of 2015, the COE Strategic Planning Committee will collect data related to the goals and objectives in the plan. In addition, the committee will determine if parallel progress is being made in regard to the presuppositions. If faculty, staff, GTA, and space resources are not growing at an appropriate rate, the college will need to determine if growth metrics are realistic and implement control strategies where appropriate.

## LEARNING

**Goal: We prepare students to graduate equipped for careers and further education.**

**MSU Objective L.1: Assess, and improve where needed, student learning of critical knowledge and skills.**

Metric L.1.1: By 2019, MSU will achieve targets for mastery of disciplinary knowledge as developed in departmental learning assessment plans.

COE Strategy: Continue ABET assessment process.

COE Objective: Update program assessment plans and report

**MSU Objective L.2: Increase graduation rates at MSU.**

Metric L.2.1: By 2019, the bachelor's graduation rate will increase from 51% to 65% as measured by the 6-year graduation rate.

COE Objective: Increase COE 6-year graduation rate.

COE Metric: By 2019, increase COE 6-year graduation rate from 57% to 65%.

Metric L.2.2: By 2019, the number of graduate degrees awarded will increase from 548 to 625 per year. The number of doctoral degrees awarded will increase from 56 to 80 per year.

COE Objective: Increase COE graduate degree production.

COE Metric: By 2019, increase COE M.S. degrees from a 3-year average of 52 (2012) to a 3-year average of 65 and Ph.D. degrees (3-year average) from 7 (2012) to 15. (See Objective D.3 for related graduate enrollment information.) These increases are based on the presuppositions of increased faculty, staff, and GTA support resources.

Metric L.2.4: By 2019, the first time, full time freshmen fall-to-fall retention will increase from 74% to 82%.

COE Objective: Increase first time, full-time freshman fall-to-fall retention rate.

COE Metric: By 2019, increase fall-to-fall retention rate from 77% to 82%.

## DISCOVERY

**Goal:** Raise the national and international prominence of MSU in research, creativity, innovation, and scholarly achievement and thereby fortify the university's standing as one of the nation's leading public research universities.

### **Objective D.1: Elevate the research excellence and recognition of our faculty.**

Metric D.1.2.: By 2019, national and international recognition of MSU faculty will improve as measured through accomplishments such as national awards, peer-reviewed publications, invited presentations, journal citations, fellowships, editorial positions, technology transfer activities, visiting appointments, scholars visiting MSU, occurrence of scholarly conferences on the MSU campus, membership on governmental policy committees, review panels, museum-level exhibitions, creative work that engages audiences at leading venues, and placement of doctoral students.

COE Objective: Increase in measures of scholarly work: peer-reviewed publications, awards.

COE Metric: By 2019, COE scholarly work, measured by peer-reviewed publications and awards, will increase by 50% over the 2012 baseline (measured by FAD). This increase is based on the presupposition of an increased number of faculty as well as progress in faculty salaries.

Metric D.1.3: By 2019, MSU will improve its rank among Carnegie Classified Research Universities – Very high Research Activity (RU/VH) RU/VH institutions on four measures: STEM R&D expenditures (current rank 94); Non-STEM R&D expenditures (rank 92); Number of S&E research staff (rank 96); and Doctoral conferrals (rank 106).

COE Objective: Increase research expenditures

COE Metric: By 2019, COE research expenditures will have increased by 50% over the 2012 baseline: from about \$16,000,000 to about \$24,000,000. This increase is based on the presupposition of an increased number of faculty as well as progress in faculty salaries.

### **Objective D.3: Expand the scale, breadth, and quality of doctoral education.**

Metric D.3.2: The graduate population will increase 20% to approximately 2,350 by 2019, with an emphasis on increasing doctoral student enrollment.

COE Strategy: Recruit more graduate students and higher quality graduate students.

COE Objective: Expand graduate education.

COE metric: By 2019, COE graduate enrollments (3-year average) will increase 20%, from 171 (2012) to 205.

Metric D.3.3: By 2019, graduate degrees awarded annually will increase to 625; Science, technology, engineering, and mathematics (STEM) masters and doctoral degrees will increase to 325; all doctoral degrees will increase to 80.

COE Objective: Expand graduate education.

COE metric: By 2019, COE graduate degrees awarded annually (3-year average) will increase to a total of 80, with 65 M.S. degrees and 15 Ph.D. degrees.

## ENGAGEMENT

**Goal:** Members of the Montana State University community will be leaders, scholars and engaged citizens of their campus, local, state, national and global communities, working along-side community partners through the mutually beneficial exchange and application of knowledge and resources to improve the human prospect.

### **Objective E.1: Strategically increase service, outreach and engagement at MSU.**

Metric E.1.2: By 2019, the number of students, faculty and staff involved in outreach activities will increase, with particular attention to underserved areas and minority populations.

COE Objective: Increase outreach activities (need to establish baseline metric and data collection)

Metric E.1.3: By 2019, the number of students, faculty, and staff involved in service activities will increase.

COE Objective: Increase service activities (need to establish baseline metric and data collection)

Metric E.1.4: By 2019, all MSU students and faculty will have an engagement experience during their time at MSU.

COE Objective: Need a better understanding of MSU metric.

Metric E.1.6: By 2019, MSU will have increased the percentage of students actively participating in student organizations.

COE Objective: Increase student participation in student organizations.

COE Metric: By 2019, the proportion of students participating in student organizations will increase by 10%.

### **Objective E.2: MSU graduates will have global and multi-cultural understanding and experiences.**

Metric E.2.1: By 2019, the percentage of MSU students participating in cross-cultural study, work or service experiences, incorporating both academic preparation and post-experience reflection, will double.

COE Objective: Enhance COE student global experience.

COE Metric: By 2019, the proportion of COE students obtaining an International Engineering Certificate will increase from .28% (7 out of 2536 2012-2013) to .5% (19 out of 3700).

## INTEGRATION

**Goal:** By integrating learning, discovery and engagement, and by working across disciplines, the MSU community will improve the world.

**Objective I.1: Increase the integration of learning, discovery and engagement.**

Metric I.1.1: By 2019, all graduating students will have had a substantial curricular experience that integrates learning, discovery and engagement.

COE Strategy: Need to better understand MSU metric.

Metric I.1.4: By 2019, faculty scholarly products with undergraduate and graduate students will increase 50%.

COE Objective: Increase involvement in research by undergraduate and graduate students.

COE Metric: By 2019, faculty scholarly products with undergraduate and graduate students will increase 20%. This increase is based on the presupposition of an increased number of faculty as well as progress in faculty salaries.

**Objective I.2: Increase work across disciplines.**

Metric I.2.1: By 2019, the number of students completing interdisciplinary programs will increase 30%.

COE Objective: Increase student participation in interdisciplinary experiences.

COE Metric: By 2019, students pursuing minors, double majors, and certificates will increase by 10%.

## ACCESS

**Goal:** Montana State University is committed to widening access to higher education and ensuring equality of opportunity for all.

**Objective A.1: Educate more students while maintaining the quality of our programs.**

Metric A.1.3 By 2019, the number of students enrolled in graduate programs will increase 20% to approximately 2,350.

COE Strategy: Recruit more graduate students and higher quality graduate students.

COE Objective: Expand graduate education.

COE metric: By 2019, COE graduate enrollments (3-year average) will increase 20%, from 171 (2010, 2011, 2012) to 205.

Metric A.1.7: By 2019, the total student population will increase 15% to 16,000.

COE Objective: Increase undergraduate enrollment.

COE Metric: By 2019, COE undergraduate enrollment will increase 20%: from 3100 (Fall 2013) to 3700.

**Objective A.2: Diversify the student body**

Metric A.2.1: By 2019, the number of Native American students enrolled will increase to 800 (a 45% increase).

COE Objective: Increase Native American enrollment in the COE.

COE Metric: By 2019, Native American enrollment in the COE will increase 30% (from 9 to 12).

Metric A.2.2: By 2019, the number of other under-represented minority students enrolled will increase to 950 (a 40% increase).

COE Objective: Increase under-represented minority enrollment in the COE.

COE Metric: By 2019, the undergraduate, under-represented minority (other than Native American) enrollment in the COE will increase from 3% in 2012 (80 out of 2536) to 8% (296 out of 3700).

COE Objective: Increase the number of women undergraduate students in the COE.

COE Metric: By 2019, the entering first-time freshman cohort will increase from 14% women (fall 2013) to 20% women.

COE Objective: Increase the proportion of women tenure-track faculty in the COE.

COE Metric: By 2019, the proportion of women tenure-track faculty in the COE will be 25%.