

**UMD Swenson College of Science & Engineering
STRATEGIC PLAN
September 2016**

Note: This plan is considered a living document and will be updated annually with progress reports on key metrics and any modifications of goals and metrics following periodic review by the faculty, leadership and External Advisory Board (EAB) of the College. The current plan has been endorsed by the faculty, leadership, EAB, and Executive Vice Chancellor for Academic Affairs.

A. Vision

We strive to be a national leader in comprehensive, integrated STEM education, research and outreach programs that directly address regional needs while having national and global applicability and impact.

B. Mission

UMD is a comprehensive public land- and sea-grant research university as part of the University of Minnesota system. The Swenson College of Science & Engineering within UMD encompasses all the principal fields of science, technology, engineering and mathematics (STEM) at UMD. The college has three interlinked missions of STEM education, research and outreach:

- Our educational programs are based on a strong commitment to professor-taught, student-centric, outcomes-based training in an active learning environment that includes classroom and laboratory education, independent student research projects, professional development, and career-based internships with our regional partners.
- Our research programs are focused on interdisciplinary, team-based projects that address real-world challenges and opportunities that are of greatest importance to our region but are also of national and international significance, and that provide innovative but practical science-based solutions that scale from regional to global impact.
- Our outreach programs are focused on applying our knowledge and resources to better engage K-12 students and teachers, as well as individuals, community groups, local and regional government organizations, and non-profit and for-profit private organizations, and to serve as a trusted, objective, science-based resource for the State of Minnesota and all its stakeholders.

C. Core Strategic Areas

1. Education

- **Foundations**
 - Outstanding faculty with strong teaching tradition
 - All courses are taught by faculty
 - Student-focused teaching
 - Outcomes-oriented, linking our programs to career opportunities
 - Disciplinary excellence within a liberal education background
 - Regional focus but global perspective
 - Strong Masters programs and nascent PhD umbrella programs
 - Excellent graduation and placement rates
- **Goals**
 - Active learning across the curriculum
 - Horizontal and vertical integration of curriculum
 - Fully incorporate training of other professional skills (communication, analytical, team and other soft skills)
 - Provide experiential training for all graduates (coops, internships, student research projects, etc.)
 - Develop additional umbrella PhD programs that incorporate all disciplines
- **Grand Challenges (5-10 years)**
 - Transform entire College curriculum to active learning
 - Create horizontally and vertically integrated curriculum
 - More explicit linkage of liberal education curriculum to disciplinary curriculum (e.g., communication skills)
 - Expand experiential learning to include all students
 - Establish PhD programs that expand coverage to all disciplines

2. Research

- **Foundations**
 - Strong individual and departmental research programs
 - Large Lakes Observatory and Natural Resources Research Institute
 - Strong infrastructure and instrumentation support
 - National and international reputation in some areas
 - Consistently attract and retain excellent research faculty
 - Integration of undergraduates and graduate students in research programs
- **Goals**
 - Develop interdisciplinary and team-based projects and programs
 - Address real-world challenges and opportunities with real-world solutions that directly address regional issues but that also translate and scale to related national and global issues

- Identify and develop 3 to 5 “big idea” areas of distinction and critical focus – centers of excellence with national reputation
- **Grand Challenges (5-10 years)**
 - Double external funding over next five years (\$15 million)
 - Double again over next five years (\$30 million)
 - Develop stable outside funding for 3-5 big idea programs leading to creation of Centers of Excellence
 - Develop international reputation in big idea areas (e.g., Water=UMD, UMD=Water) – nascent areas are: materials science, water, sustainable energy, mining innovation

3. Outreach

- **Foundations**
 - Numerous small but effective K-12 outreach programs
 - Strong brand within region
 - Trust of stakeholders and desire to partner
 - Developing communications footprint
 - Developing new web site, social media sites
 - Planetarium, Blue Heron, other emblematic programs
- **Goals**
 - Coalesce current programs into larger, more comprehensive and focused programs, especially K-12 and Native American
 - Focus on K-12 STEM and public science education
 - Focus on recruiting and retaining girls, Native Americans and other under-represented groups into the STEMs
 - Partnerships and leveraging of educational and research strengths
 - Regional focus (boots on the ground) but state-wide reach
- **Grand Challenges (5-10 years)**
 - Develop comprehensive and impactful K-12 program
 - Develop portfolio of outside funding for sustainable continuation and support of programs, develop new innovative programs
 - Develop comprehensive public science communication program
 - Develop a Native American K-12 and general outreach program

4. Structural

- **Foundations**
 - Strong faculty and staff
 - Strong sense of community and common purpose
 - Strong student body and high success rate
 - Reasonably stable steady-state budget
- **Goals**
 - ***4a. Demographics and Faculty Development***

- Increase and maintain diversity of faculty, with focus on increasing female faculty and other under-represented groups
- Develop strong mentoring and professional development network
- Improve professional and leadership development
- **4.b. Infrastructure**
 - Develop sustainable, consistent and transparent model for all SCSE shared resources
 - Maintain continuous acquisition and improvement of shared instrumentation
 - Match location, amount and quality of space to program needs
- **4.c. Shared Governance**
 - Develop stronger and more transparent shared governance model
 - Revise faculty policies for more consistency and transparency across College
- **4.d. Budget and Financials**
 - Develop transparent, distributed budget model
 - Develop and implement tools for better local management of financials
 - Develop and maintain more sustainable budget for College
 - Develop reserves for College for strategic implementation
 - Budget recruitment and startup packages as UMD budget line item
 - Develop stronger and more sustainable development model
- **4.e. Professional Staff**
 - Right-size the staff to adequate support levels
 - Develop better staff support and professional development
 - Develop a shared governance model for staff
- **4.f. Space and Capital Projects**
 - Develop comprehensive space plan for College
 - Complete CAMS Building and move Chemistry
 - Complete Research Greenhouse
 - Repurpose Old Chemistry Building – active classrooms?
 - Move Math – Education or Old Chemistry Building?
 - Plan, approve, complete a new Engineering Building
 - Renovate Voss-Kovach and Engineering
 - Move EE and CS to engineering complex
 - Plan approve, complete new Large Lakes Observatory Building
 - Develop harborside facility for support of LLO vessels
 - Move EES out of Heller Hall, relinquish building
 - Work with Pharm and Med to develop new Rural AHC Building
 - Migrate programs into Old Med, recover current Pharm space in Life Sci
- **Grand Challenges (5-10 years)**
 - Achieve gender equity within faculty
 - Develop and implement comprehensive shared resource plan
 - Complete comprehensive shared governance model for faculty and staff and implement

- Develop new budget model
- Establish hard-line support for existing staff and increase staff to appropriate levels
- Repurpose Old Chemistry Building – active classrooms? 2018-2020
- Move Math – Education or Old Chemistry Building? 2018-2020
- Plan, approve, complete a new Engineering Building by 2025
- Renovate Voss-Kovach and Engineering by 2025
- Move EE and CS to engineering complex 2025-2027
- Plan approve, complete new Large Lakes Observatory Building by 2025
- Develop harborside facility for support of LLO vessels by 2020
- Move EES out of Heller Hall, relinquish building 2025-2027
- Work with Pharm and Med to develop new Rural AHC Building by 2020
- Migrate programs into Old Med, recover current Pharm space in LSci 2020-25

D. Top Ten Strategic Goals and Alignment with UMD Strategic Plan

- SCSE Goal 1 – transform the entire SCSE undergraduate curriculum to active learning within the decade (UMD Goal 1)
- SCSE Goal 2 – implement the T-squared model of horizontal and vertical curricular integration across the college within the decade (UMD Goal 1)
- SCSE Goal 3 – achieve gender equity across the SCSE faculty within the decade, and significant increases in other measures of diversity (UMD Goal 2)
- SCSE Goal 4 – achieve gender equity across the SCSE student body within the decade and significant increases in other measures of diversity (UMD Goal 2)
- SCSE Goal 5 – double enrollment in SCSE graduate programs over the next decade, and add one or two new umbrella PhD programs to provide coverage for non-IBS and non-WRS programs (UMD Goal 3)
- SCSE Goal 6 – establish 4 to 5 centers of excellence in interdisciplinary, regionally responsive research within the decade (UMD Goal 4)
- SCSE Goal 7 – double the level of SCSE external research funding within five years, double again within the next five years (goal \$30 million) (UMD Goal 4)
- SCSE Goal 8 – develop a comprehensive K-12 focused outreach program with the region and state, creating a sustainable pipeline of diverse high school students applying to SCSE (UMD Goals 1 & 2 & 5)
- SCSE Goal 9 – increase SCSE physical footprint by 30% - with a combination of new and renovated / repurposed space (UMD Goal 6)
- SCSE Goal 10 – develop and implement a sustainable, cost pool-based budget model for SCSE (UMD Goal 6)