COLLEGE OF SCIENCE AND ENGINEERING
Strengths, Challenges, Opportunities and Threats

CSE Dean’s Advisory Council: Draft 10/13/14; revised 10/25/14; adopted 12/4/14

The college periodically reviews operations and practices to maintain an ongoing sense of its strengths, challenges, opportunities and threats (SCOT). This SCOT analysis is an update of the 2009-2011 analysis. The mission, vision and strategic plan for CSE are being reviewed and revised over the 2014-2015 academic year. The last strategic plan was produced in Fall 2007.

Current mission statement (CSE web-page): The mission of the College of Science and Engineering is to provide the highest quality education in science, mathematics and technology; to participate in the discovery, communication and application of knowledge; to integrate teaching, scholarly activity and service; and to maintain a diverse college community.

STRENGTHS
The strength and reputation of CSE programs is the result of a college-wide commitment to excellence in all areas of endeavor, an exceptionally strong cadre of tenured, tenure-track and non-tenure track faculty, staff and students, a commitment to faculty-mentored student research, student-centered and a progressive and innovative curriculum. Clearly identifiable strengths are:

Faculty, Staff, and Students
- Faculty excellence in classroom and research instruction.
- Quality of faculty scholarship.
- Professional and classified staff contributions.
- Student scholarship excellence.
- Achievement in post-graduate studies.
- Employer satisfaction with graduates.

Curriculum
- Interdisciplinary studies.
- Undergraduate scholarship.
- Emphasis on student-centered learning.
- Instrumentation and software instruction.
- Science and mathematics education programs.
- Innovation in the curriculum:
- Commitment to staying up-to-date.
- Commitment to effective GUR courses.
- Accredited and certified programs.

Departmental/College Structure
- Collegial departments and supportive administration.
- Staff integration in CSE programs.
- Integrated, interdependent and interdisciplinary curriculum.

Graduate Programs
- Role in curriculum.
- Support for faculty scholarship.
• Mentorship and research opportunities for undergraduates.
• Employment prospects.
• Acceptance into doctoral programs:

Facilities and Equipment
• Physical Plant.
• Equipment.
• Research lab spaces.

Commitment to Community and Region
• College and department outreach.
• Support of local enterprises.
• College Advancement Board.
• Leadership in science and mathematics education.
• Outreach to local schools.

CHALLENGES
The College faces challenges; while some are rooted in departmental and campus culture, most are due to limited resources and pressure from dramatically increasing enrollments in STEM majors. Areas where challenges exist are:

Faculty Recruitment, Retention and Development
• Diversity.
• Salaries.
• Startup packages.
• Shared instrumentation facilities.
• Time commitments.

Staff Recruitment, Retention and Development
• Salaries.
• Professional development.

Student Support
• Undergraduate support.
• Admissions.
• Graduate stipends.
• Graduate tuition waivers.
• Support for professional development.

Laboratory Space
• Enrollment limitations.
• Upgrading Physical Plant.
• Computational infrastructure.
• WWU lacks a unified policy for staffing and supporting high-end laboratory facilities, including equipment repair – whether those that are housed in departments, or those that are multi-user facilities.

Diversity
• Recruiting under-represented groups.
• Support for minority students.

Curriculum Adequacy
• Engineering program.
• Upper division and graduate courses.
• Increased depth in sub-disciplines.
• Small-course, student-centered approaches.
• Equipment/instrumentation and software.
• Less well prepared students.

Program Financial Support
• External funding.
• Reduced staff.
• High-demand programs.

OPPORTUNITIES
Because of the rapid advances in STEM areas and the high demand for graduates in these areas in the State and country, there will be exciting and numerous opportunities for CSE to be innovative. Activities for CSE to pursue are:

Curriculum
• Increased interdisciplinary programs and intercollege collaborations.
• New graduate programs.
• Adoption and integration of a formative assessment culture, including alum and employer feedback.
• Culture of globalization:
• Increased student retention.
• Consistency in teaching load assignments.
• Teaching credit for research supervision.
• Engineering program.

Resource Development
• Expand efforts in State high demand areas.
• Grow research/scholarship culture.
• Faculty participation in external funding.
• Increase indirect cost recovery and overhead.
• Naming opportunities for CSE facilities.
• Increased development.

Community Outreach
• Technology Development Center (TDC).
• Science and mathematics education programs.

Diversity Enhancement
• Programs with community colleges.
• Advising.
• Student mentoring systems.
• Other services.

THREATS
CSE faces threats that are both external and internal. State revenue shortfalls and the resulting potential reduction of funding to Western pose the most serious threats to our programs. The
current internal funding model at WWU that does not increase resource allocation to programs with increasing enrollments is an internal threat. Reduced funding decreases the quality of our educational programs and student success rates through:

- **Number of tenure track faculty positions not keeping pace with enrollments.**
- **Non-competitive faculty salaries and start-up.**
- **Obsolete and inadequate instrumentation and software.**
- **Reduced non-tenure-track faculty positions.**
  - *Teaching power reduction.*
  - *Increased time to graduation.*
  - *Reduced upper level courses.*
- **Weakened graduate program due to low graduate student stipends.**
  - *Reduced quality of introductory courses.*
  - *Reduced faculty research.*
  - *Reduced undergraduate research.*
  - *Lower recruitment of under-represented groups.*
- **Lower quality professional and technical staff**
  - *Low salaries.*
  - *Staff travel/professional development.*
  - *Increasing workloads.*
  - *Maintenance of vital/expensive equipment and computational tools.*
- **Inadequate space for growth and weakened infrastructure**
  - *Ability to recruit faculty.*
  - *Acquisition of instrumentation/equipment and software.*
  - *Reduced ability to maintain laboratory equipment.*
  - *Reduced teaching capacity.*

Other threats include the changing demographic breakdown of the state and country, and the concomitant need for CSE and WWU to adapt to a changing student body through increased diversity of the faculty, staff, curriculum and campus.