School of Chemical Engineering

MISSION

The School of Chemical Engineering develops human resources, professional knowledge, and infrastructure for chemical engineering to contribute to human welfare.

VISION

The School of Chemical Engineering will have a priority on excellence as evidenced by the following:

- Sustain a nationally competitive undergraduate chemical engineering program recognized for quality, fundamental-practice balance, and educational leadership;

- Attain widespread recognition for contributions to professional knowledge and tools, which are useful, widely accepted, and practiced by others;

- Sustain and create infrastructures that facilitate synergism, creativity, personal and professional growth, and productivity by students and professional personnel both within OSU and in the outside world.

Core Values

Excellence – We seek excellence in all of our endeavors, and are committed to continuous improvement.

Integrity – We will be equitable, honest, ethical, and professional.

Diversity – We respect others and value diversity of opinions, freedom of expression, and other ethnic and cultural backgrounds.

Intellectual Freedom – We believe in ethical and scholarly questioning in an environment that respects the rights of all to freely pursue knowledge.

Stewardship of Resources – We are dedicated to the efficient and effective use of resources. We accept the responsibility of the public's trust and are accountable for our actions.

Action – We are committed to causing beneficent change within human, technical, and economic systems.

Joy – We believe that individual pursuit of happiness, predicated on a sense of purpose and virtue, within a nurturing and harassment-free environment, promotes individual and corporate health and productivity.

Goals, Critical Success Factors, Objectives, and Strategies

Goal One. Sustain our Excellent Undergraduate Instructional Program while Developing the Graduate Instructional Program.

Critical Success Factors

- Acceptance rate of BS graduates into graduate/professional programs of their choice - 100%.
- Number of students receiving national scholarships or fellowships
- Alumni feedback - survey data
- ChE student organization vitality (AIChE Chapter, Omega Chi Epsilon, ChemKidz) - engages > 50% of undergraduate students.
- Compliance to schedule of activities in CQI process - number of missed items
- Employment rate and salaries of US citizen BS graduates relative to national trends - Equal or above.
- Faculty recognition - honors, and awards
- FE Exam Performance - Significantly above National average (alpha=.05)
- Feedback on Undergraduate Educational Objectives as reported by graduates about 2 to 5 years after BS - >4 (out of 5) ranking on each survey item.
- Frequency and stature of student awards at the national level. (Design, outstanding chapter, ChemE-Car, paper presentations, scholarships) - >1 per year.
- Graduate enrollment - about 5/faculty member.
- Graduate student retention - <1/10 transfer out in first year..
- Graduate student stipend - >$1,500 per month for 12 months.
- Increase undergraduate enrollment - number of students at each stage in curriculum
- Industry feedback - IAC data
- Maintain ABET accreditation
- Production of ChE graduates per FTE - >3.5BS, >0.4MS, >0.25PhD per FTE/year.
- Program productivity (manuscripts, presentations, inventions) on a per student basis - >1.5/graduate degree.
- Stabilize undergraduate enrollment - temper cycling from 5:1 amplitude ratio to 3:1 or less.
- Student and faculty complaints about OSU instruction in critical service courses - convert complaints to praise.
- Student and faculty feedback about facilities: ChE classrooms, undergraduate computer labs, software, and access - statistical reduction in complaints from normal assessment data.
- Student and faculty feedback about OSU instruction in critical service courses - statistical reduction in complaints from normal assessment data.

- Student learning and performance CQI metrics - statistically significant progress in the several Undergraduate Program metrics.
- Student learning and performance CQI metrics - statistically significant progress in the several Graduate Program metrics
- Undergraduate curriculum options - sufficiency
- Undergraduate student leadership roles (offices, intellectual, leadership, commitment to excellence) - annual addition of national stature to bragging rights
- Undergraduate student performance and recognition within OSU (Wentz Projects, Scholarships, St. Pats Awards, Alumni Association recognition, Homecoming selection) - sustained performance
- Undergraduate student performance on national contests (Design, outstanding chapter, ChemE-Car, paper presentations, scholarships) - 1 or more national recognitions annually.

Objectives:

Objective 1.1 – Maintain undergraduate accreditation

Strategies:

- Head to ensure compliance with schedule of activities in CQI processes for undergraduate programs.

Objective 1.2 – Sustain effective CQI graduate program.

Strategies:

- Comply with accreditation criteria

Objective 1.3 – Improve quality of critical service courses.

Strategies:

- Inform system of needs identified from assessment data

Objective 1.4 – Continue dedication to undergraduate program (recruiting, student coaching, instruction, student research, student activities).

Strategies:

- Maintain, affirm, and support School values and faculty perspective that the undergraduate program is the priority.
- Encourage faculty dedication to excellence through recognition.
- Encourage faculty dedication to advising of student activities through awards, accommodation, and resource allocation.

Objective 1.5 – Shape student perspectives to promote right attitudes.

Strategies:

- Integrate right values in recruiting messages
- Reinforce right values in daily messages to students.
- Publicize "Desirable Engineering Attributes"

Goal Two. Build Toward International Status in Research and Scholarly Activity Performance.

Critical Success Factors and Assessments

- Build research teams in two promising areas (perhaps bio and molecular engineering).
- Consulting frequency of faculty to local and national industry - >1 instances per year/average FTE.
- Development of sustainable research programs with multiple categories of sponsorship - Evidence of both sustainability and breadth of support.
- Faculty recognition - honors, and awards
- Former partners return to collaborate with us - instances.
- Graduate enrollment - about 5/faculty member.
- Graduate research program is vigorous, creative, collaborative, and productive - by various measures identified earlier.
- Graduate student retention - <1/10 transfer out in first year.
- Graduate student stipend - >$1,500 per month for 12 months.
- Increase faculty size - to 15 ChE faculty members.
- Level of industrial support for graduate research by faculty - >10 companies, >25% of total funding.
- Number and stature of faculty publications (in fundamental science, engineering applications, and education) >2/year/average FTE in refereed journal.
- Number of faculty in national leadership positions - 25% of faculty.
- Number of faculty with national titles, honors, recognitions - 25% of full professors are fellows.
- Number of faculty with Regents Professor titles - 25% of full professors.
- Number of national awards won by faculty - 1 per year.
- Production of ChE graduates per FTE - >3.5BS, >0.4MS, >0.25PhD per FTE/year.
- Program productivity (manuscripts, presentations, inventions) on a per student basis - >1.5/graduate degree.
- Provide new lab space for new faculty and IT staff - 5000 sqft.
- Provide new office space for new faculty, staff, and record storage - 1500 sqft.
- Research funding income - >$200k/year/average FTE.
- Technology creation and transfer - number and impact of applications of knowledge, tools, and ideas from faculty research - >1 application per year.

Objectives:

Objective 2.1 – Eliminate CEAT practices associated with AY contribution, third summer month penalty, conditions on use of chair and professorship funds, etc. CEAT faculty survey places this as the number one impediment to research.

     Strategies:

- Enlist help from OSU administration

Objective 2.2 – Provide remuneration for faculty overtime on research. It is possible through teaching, but not allowed for those working 70 hours per week to develop research programs. CEAT faculty survey places this as the number two impediment to research.

Strategies:

- Enlist help from upper administration

Objective 2.3 – Unburden faculty and staff from appointment, accounting, and purchasing activities. CEAT faculty survey placed these in third place as impediments to research.

Strategies:

- Inform OSU administration of needs

Objective 2.4 – Improve quality of graduate students

Strategies:

- Raise stipend through research funding.
- Reinforce right values in daily mentoring and messages to students

Objective 2.5 – Have about 5 graduate research assistants per faculty member

Strategies:

- Raise funding through research proposals.

Goal Three. Contribute to Outreach Activities.

Critical Success Factors and Assessments

- Student feedback on quality of instruction from electronic delivery courses.
- Growth in MS CSE program.

Objectives:

Objective 3.1 – Participate in Extension courses and programs

Strategies:

- Develop the MS CSE program
- Teach Courses in the MS CSE program

Goal Four. Recruit Outstanding Students and Provide Enrichment Activities that Prepare them for Leadership.

Critical Success Factors and Assessments

- Alumni and industrial donations to labs, class activity, and student enrichment programs (ChemE Car, ChemKidz, Wentz Projects, fieldtrips, AIChE Chapter, etc.) - >$100k/year
- Alumni and industrial participation in labs, class activity, and student enrichment programs (ChemE Car, ChemKidz, Wentz Projects, fieldtrips, AIChE Chapter, etc.) - >10 instances per year.
- ChE student organization vitality (AIChE Chapter, Omega Chi Epsilon, ChemKidz) - engages > 50% of undergraduate students.
- FE Exam Performance - Significantly above National average (alpha=.05)
- Rate of participation of students in regional and national contests – exceed peer group average
- Frequency and stature of student awards at the national level. (Design, outstanding chapter, ChemE-Car, paper presentations, scholarships) - >1 per year.
- Increase undergraduate enrollment - number of students at each stage in curriculum
- Industry feedback - IAC data
- Quality (college performance - intellectual, leadership, commitment to excellence) of undergraduates - annual addition of national stature to bragging rights
- Quality (high school credentials) of undergraduates - >50% with ACT >30, > 50% with significant leadership/service experience.
- Student learning and performance CQI metrics - statistically significant progress in the several Undergraduate Program metrics.
- Student papers originated in course work, lab work, and undergraduate research - >4 per year.
- Undergraduate curriculum options - sufficiency
- Undergraduate student and program recognition - honors, and awards
- Undergraduate student leadership roles (offices, intellectual, leadership, commitment to excellence) - annual addition of national stature to bragging rights
- Undergraduate student performance and recognition within OSU (Wentz Projects, Scholarships, St. Pats Awards, Alumni Association recognition, Homecoming selection) - sustained performance
- Undergraduate student performance on national contests (Design, outstanding chapter, ChemE-Car, paper presentations, scholarships) - 1 or more national recognitions annually.

Objectives:

Objective 4.1 – Recruit

Strategies:

- Participate in on-campus visits by individuals and groups
- Participate in off-campus Engineering and Recruiting Fairs
- Develop the Fluidized Bed Popcorn Popper for displays
- Maintain Web pages with bragging points about student achievement and national success
- Regularly update the trifold brochure
- Provide High School Excellence Scholarships

Objective 4.2 – Enrichment Activities

Strategies:

- Sustain an active AIChE Student Chapter
- Sustain an active Omega Chi Epsilon Student Chapter
- Sustain an active ChemKidz student group
- Provide undergraduate research opportunities

Goal Five. Contribute to Economic Development of the State and Beyond.

Critical Success Factors and Assessments

- Build research teams in two promising areas (perhaps bio and molecular engineering).
- Consulting frequency of faculty to local and national industry - >1 instances per year/average FTE.
- Development of sustainable research programs with multiple categories of sponsorship - Evidence of both sustainability and breadth of support.
- Employment rate of US citizen BS graduates relative to national trends - Equal or above.
- Increase faculty size - to 15 ChE faculty members.
- Multiple use of labs for research and education, both internal and external to OSU - Instances.
- Number and stature of faculty publications (in fundamental science, engineering applications, and education) >2/year/average FTE in refereed journal.
- Production of ChE graduates per FTE - >3.5BS, >0.4MS, >0.25PhD per FTE/year.
- Research funding income - >$200k/year/average FTE.
- Technology creation and transfer - number and impact of applications of knowledge, tools, and ideas from faculty research - >1 application per year.

Objective 5.1 – Increase FTE funding to fully support 15 ChE faculty members, to broaden and strengthen our ability to provide value to Oklahoma.

Strategies:

- Enlist help from upper administration

Objective 5.2 – Integrate industrial and alumni partners into program activities.

Strategies:

- Maintain an active Industrial Advisory Committee
- Seek research and develop collaboration with industry
- Market ChE faculty expertise to have industry seek us

Goal Six. Prepare Students to Work Effectively with Diverse Peoples and Environments

Critical Success Factors and Assessments

- ChE retention (graduation rate) of student members of underrepresented groups - equivalent to similarly qualified peers
- Feedback on Undergraduate Educational Objectives as reported by graduates about 2 to 5 years after BS - >4 (out of 5) ranking on each survey item.
- Industry feedback - IAC data
- Undergraduate options and graduate research diversity – number of diverse opportunities
- Number of training experiences per year - >1 per faculty body
- Lack of complaints about discrimination of lack of inclusion – 0
- Minority students feel integrated and valued by classmates – anecdotal evidence.

Objectives:

Objective 6.1 – Include personal effectiveness training in faculty and staff meetings.

Strategies:

- Invite presentations by industrial HR personnel on human factors for faculty, staff, and students.

Objective 6.2 – Shape student perspectives to promote right attitudes.

Strategies:

- Integrate right values in recruiting messages
- Reinforce right values in daily messages to students.

Objective 6.3 – Include personal effectiveness and team effectiveness training and experiences in ChE courses

Strategies:

- Introduce concepts of diversity, synergism, and team effectiveness in UOL and Design Classes.
- Have students work in teams, which include participation by professor, and which are randomly comprised to ensure diverse participants by age, sex, race, religion, accent, and city/country origin.

Goal Seven. Develop Technical and Human Skills in Self and Others.

Critical Success Factors and Assessments

- Alumni and industrial participation in labs, class activity, and student enrichment programs (ChemE Car, ChemKidz, Wentz Projects, fieldtrips, AIChE Chapter, etc.) - >10 instances per year.
- Alumni feedback - survey data
- ChE student organization vitality (AIChE Chapter, Omega Chi Epsilon, ChemKidz) - engages > 50% of undergraduate students.
- Employment rate of US citizen BS graduates relative to national trends - Equal or above.
- Faculty recognition - honors, and awards
- FE Exam Performance - Significantly above National average (alpha=.05)
- Feedback on Undergraduate Educational Objectives as reported by graduates about 2 to 5 years after BS - >4 (out of 5) ranking on each survey item.
- Former partners return to collaborate with us - instances.
- Frequency and stature of student awards at the national level. (Design, outstanding chapter, ChemE-Car, paper presentations, scholarships) - >1 per year.
- Industry feedback - IAC data
- Quality (college performance - intellectual, leadership, commitment to excellence) of undergraduates - annual addition of national stature to bragging rights
- Undergraduate student leadership roles (offices, intellectual, leadership, commitment to excellence) - annual addition of national stature to bragging rights
- Training courses attended by staff - > 1 per year per staff member (in addition to those for safety)
- Training courses attended by faculty - > 1 per year per staff member (in addition to those for safety or normal research conference attendance)

Objectives:

Objective 7.1 – Sustain effective CQI programs in graduate and undergraduate programs.

   Strategies:

- Comply with accreditation criteria

Objective 7.3 – Include personal effectiveness training in faculty and staff meetings.

   Strategies:

- Invite presentations by industrial HR personnel on human factors for faculty, staff, and students.

Goal Eight. Create an Infrastructure of Facilities, Personnel, Policy, and Procedures that Facilitates our Mission.

Critical Success Factors and Assessments

- Build research teams in two promising areas (perhaps bio and molecular engineering).
- ChE student organization vitality (AIChE Chapter, Omega Chi Epsilon, ChemKidz) - engages > 50% of undergraduate students.
- ConocoPhillips Lecture - publication relevance, quality, and dissemination - increase national leadership impact on education.
- Consulting frequency of faculty to local and national industry - >1 instances per year/average FTE.
- Development of sustainable research programs with multiple categories of sponsorship - Evidence of both sustainability and breadth of support.
- Difficulty of fixing errors or making changes to accounts for purchases and appointments - collective opinion.
- Difficulty of interpreting accounting and appointments documents - collective opinion.
- Increase faculty size - to 15 ChE faculty members.
- Increase staff to include an IT professional for School computers and electronic equipment - new staff position.
- Multiple use of labs for research and education, both internal and external to OSU - Instances.
- Number and severity of advising errors - Statistical evidence of fewer.
- Number and severity of errors in accounting and appointments - Statistical evidence of fewer.
- Number of faculty in national leadership positions - 25% of faculty.
- Provide new lab space for new faculty and IT staff - 5000 sqft.
- Provide new office space for new faculty, staff, and record storage - 1500 sqft.
- Research funding income - >$200k/year/average FTE.
- Stabilize undergraduate enrollment - temper cycling from 5:1 amplitude ratio to 3:1 or less.
- Student and faculty complaints about OSU instruction in critical service courses - convert complaints to praise.
- Student and faculty feedback about facilities: ChE classrooms, undergraduate computer labs, software, and access - statistical reduction in complaints from normal assessment data.
- Student and faculty feedback about OSU instruction in critical service courses - statistical reduction in complaints from normal assessment data.
- Undergraduate curriculum options - sufficiency
- Women-s rest rooms in EN - provide sufficient number.

Objectives:

Objective 8.1 – Improve uniformity and simplicity in advising (much has been done, process is much improved, need to assess lingering problems)

Strategies:

- Head to survey students in senior survey and exit interviews.
- Advisor to document instances discovered through advising and graduation checks.

Objective 8.2 – Provide a functional, timely, accurate, intelligible accounting and appointment process.

Strategies:

- Inform OSU administration of needs.

Objective 8.3 – Seek multiple use/benefit of activities, leverage of resources, do not settle for one outcome.

Strategies:

- Encourage and acknowledge faculty for creating synergistic situations
- Encourage and acknowledge faculty for sharing research facilities to enhance educational program
- Encourage and facilitate faculty and students to creating papers and publications from undergraduate activities
- Promote values of "add value" and "follow through to completion"

Objective 8.4 – Unburden faculty and staff from appointment, accounting, and purchasing activities. CEAT faculty survey placed these in third place as impediments to research.

Strategies:

- Inform OSU administration of needs.

Objective 8.5 – Add a staff position for IT services.

Strategies:

- Inform OSU administration of needs.

Objective 8.6 – Upgrade classroom and labs.

Strategies:

- Inform system of needs identified from assessment data
- Solicit help from industrial partners to provide functional, effective, flexible, Unit Operations Lab experiments which represent a comprehensive range of units and industrial craft and instrumentation practice

Objective 8.7 – Upgrade facilities.

Strategies:

- Inform OSU administration of office and lab space needed to accommodate additional faculty and IT technician.
- Inform OSU administration of insufficient numbers of Women's rest rooms in EN

Objective 8.8 – Provide query access to student data base to obtain statistics, and contact information

Strategies:

- Seek help from OSU administration

Goal Nine. Effectively Partner with Internal and External individuals and Organizations to Accelerate Progress

Critical Success Factors and Assessments

- Alumni and industrial donations to labs, class activity, and student enrichment programs (ChemE Car, ChemKidz, Wentz Projects, fieldtrips, AIChE Chapter, etc.) - >$100k/year
- Alumni and industrial participation in labs, class activity, and student enrichment programs (ChemE Car, ChemKidz, Wentz Projects, fieldtrips, AIChE Chapter, etc.) - >10 instances per year.
- ConocoPhillips Lecture - publication relevance, quality, and dissemination - increase national leadership impact on education.
- Consulting frequency of faculty to local and national industry - >1 instances per year/average FTE.
- Level of industrial support for graduate research by faculty - >10 companies, >25% of total funding.
- Multiple use of labs for research and education, both internal and external to OSU - Instances.
- Technology creation and transfer - number and impact of applications of knowledge, tools, and ideas from faculty research - >1 application per year.
- Participation by Industrial Advisory Committee members in annual meetings and other assignments

Objectives:

Objective 9.1 – Seek multiple use/benefit of activities, leverage of resources, do not settle for one outcome.

Strategies:

- Encourage and acknowledge faculty for creating synergistic situations
- Encourage and acknowledge faculty for sharing research facilities to enhance educational program
- Encourage and facilitate faculty and students to creating papers and publications from undergraduate activities
- Promote values of "add value" and "follow through to completion"

Objective 9.2 – Integrate industrial and alumni partners into research and education.

Strategies:

- Use industrial lecturers and fieldtrips in classes
- Maintain a strong AIChE chapter program of evening speakers and fieldtrips

- Solicit funding to support strong student activities in national contests (Design, ChemE Car, paper presentations, web page)
- Acknowledge alumni and industrial partners in marketing materials.

Goal Ten. Develop National Recognition for our Program.

Critical Success Factors and Assessments

- Hits on news and faculty sections of the School Web pages - Statistical increase.
- Acceptance rate of BS graduates into graduate/professional programs of their choice - 100%.
- ConocoPhillips Lecture - publication relevance, quality, and dissemination - increase national leadership impact on education.
- Consulting frequency of faculty to local and national industry - >1 instances per year/average FTE.
- Faculty recognition - honors, and awards
- FE Exam Performance - Significantly above National average (alpha=.05)
- Frequency and stature of student awards at the national level. (Design, outstanding chapter, ChemE-Car, paper presentations, scholarships) - >1 per year.
- Program productivity (manuscripts, presentations, inventions) on a per student basis - >1.5/graduate degree.
- Undergraduate student performance on national contests (Design, outstanding chapter, ChemE-Car, paper presentations, scholarships) - 1 or more national recognitions annually.
- Update and publish School history 1970 to present.

Objectives:

Objective 10.1 – Publicize "Desirable Engineering Attributes"

Strategies:

- Fine-tune wording with faculty and IAC members.
- Present "Desirable Engineering Attributes" in Senior Seminar.
- Publish "Desirable Engineering Attributes" on the Web.

Objective 10.2 – Promote faculty for national recognition and awards.

Strategies:

- Form a faculty committee to prepare nominations

Objective 10.3 – Maintain and improve the ChE web pages.

Strategies:

- Review and update frequently with information and appearance.

Objective 10.4 – Maintain and improve the ConocoPhillips lecture series and lecture dissemination.

Strategies:

- Maintain dissemination through pamphlet and web, and encouragement of periodical.
- Faculty and sponsor to review all aspects of lecture series and seek ways to improve quality and impact.