



TEXAS TECH UNIVERSITY

Department of Chemistry & Biochemistry

STRATEGIC PLAN

(Revised, May 2007)

MISSION STATEMENT

The Department of Chemistry and Biochemistry is committed to providing high quality education in the chemical and biochemical sciences for undergraduate and graduate students, producing research contributions that are recognized nationally and internationally, and making service contributions at all levels.

VISION STATEMENT

The Department of Chemistry and Biochemistry aspires to advance our reputation to top 50 national status, noted for excellence in teaching, research, and service.

Department of Chemistry and Biochemistry Core Values

Excellence in the advancement of chemical knowledge by

- Communicating effectively with undergraduate and graduate students;
 - Presenting quality service courses;
 - Delivering quality courses for undergraduate majors and graduate students;
 - Educating undergraduate and graduate students through research experience;
 - Conducting fundamental and applied research;
 - Publishing research results in peer-reviewed journals, book chapters, and monographs;
 - Contributing to science education of EC-12 students.
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GOALS, CRITICAL SUCCESS FACTORS, and OBJECTIVES

(including Strategies and Assessments)

Goal 1. Access and Diversity: Recruit, retain, and graduate a larger number of undergraduate and graduate students with greater diversity.

Critical Success Factors

- Increase number, quality, and diversity of undergraduate chemistry and biochemistry majors.
- Increase number, quality, and diversity of graduate students in chemistry and biochemistry.
- Improve student retention rates in service courses.
- Enhance student performance in non-service courses.

Objectives

Objective 1.1: Enhance recruitment of chemistry and biochemistry majors.

Strategies:

- Provide attractive, informative, and easy-to-access web site descriptions of undergraduate degree programs and departmental information.
- Improve contact with New Student Relations.
- Participate in TTU recruiting events and programs.
- Distribute departmental brochures to regional high schools and TTU Recruitment Centers.
- Contact applicants who express interest in chemistry, biochemistry, or pre-health profession courses of study.
- Increase interactions with chemistry teachers in area high schools.
- Invite chemistry classes from regional high schools to visit.
- Cultivate relationships with chemistry teachers in area junior colleges.
- Utilize our best teachers in general and organic chemistry courses.
- Improve mentoring and advising of undergraduate majors.
- Solicit funds to expand the number of departmental undergraduate scholarships.
- Explore possibility of combined 5-year BS/MS degree programs in chemistry and biochemistry.

Assessments:

- Number of chemistry and biochemistry majors.
- Number of departmental undergraduate scholarships.

Objective 1.2: Enhance recruitment of graduate students.

Strategies:

- Provide attractive, informative, and easy-to-access web site descriptions of graduate degree programs and departmental information.
- Increase recruiting activities and recruitment budget.
- Participate in TTU recruiting events and programs, and coordinate recruiting efforts with the Graduate School.
- Enhance contacts with applicants.
- Increase number of graduate teaching assistantships with more competitive stipends and reduced teaching loads.
- Utilize Chancellor's Fellowships to attract outstanding applicants.
- Continue departmental Graduate Student Recruitment Weekend and seminar visits by faculty members to smaller colleges and universities in Texas.
- Explore possibility of combined BS/MS degree programs in chemistry and biochemistry.

Assessments:

- Number of successful applicants for Chancellor's Fellowships.
- Graduate student enrollment.
- Participation in recruitment events.

Objective 1.3: Enhance undergraduate and graduate student diversity.

Strategies:

- Increase number of faculty members and staff from under-represented groups to promote student diversity.
- Strengthen mentoring programs for students, providing specific programs for under-represented groups.

Assessment:

- Proportion of undergraduate and graduate students from under-represented groups.

Objective 1.4: Increase undergraduate retention and performance.

Strategies:

- Continue use of Chemistry Placement Examination (CPE) to assess mastery of high school-level chemistry concepts by entering students.
- Initiate strategies to identify and help at-risk students in service courses.
- Institute recitation or tutorial sessions for general chemistry courses to augment assistance offered by the Supplemental Instruction (SI) Program and the PASS Center.
- Provide reward incentives for faculty to improve student performance.

- Initiate departmental curriculum review and reform.
- Increase social activities that promote student-faculty contact.
- Involve more undergraduates in research projects.
- Conduct exit interviews with graduating seniors.

Assessments:

- Percentages of students passing the upper-track general chemistry lecture courses with grades of C or better.
- American Chemical Society examinations in courses following the general chemistry sequence.
- Graduation survey.

Goal 2. Excellence: Achieve excellence in all facets of the mission of the Department of Chemistry and Biochemistry.

Critical Success Factors

- Continue improvement of student retention in service courses.
- Increase number of undergraduate chemistry and biochemistry majors.
- Enhance quality of educational experience for majors.
- Maintain accreditation.
- Increase number and quality of graduate students.
- Enhance external funding for research.
- Increase number and quality of research publications.
- Increase presentations of research results at regional, national, and international meetings.
- Continue improvement of departmental shops and instrumentation to support research and teaching activities.
- Nominate qualified faculty for awards and membership in prestigious organizations.
- Continue service to professional organizations and funding agencies.
- Increase intramural and extramural contributions to science education.

Objectives

Objective 2.1: Provide high-quality instruction in service courses.

Strategies:

- Utilize our best teachers in general and organic chemistry courses.
- Institute recitation or tutorial sessions for general chemistry courses to augment assistance offered by the Supplemental Instruction (SI) Program and the PASS Center.
- Initiate strategies to identify and help at-risk students.
- Add faculty to decrease the size of "monster" service courses.
- Reward faculty for outstanding performance in teaching of service courses.
- Use information technology to enhance the educational process.
- Continue required participation of graduate teaching assistants in university and departmental training activities.

Assessments:

- Student retention and performance in general and organic chemistry courses.
- Amount of use of departmental web site for instructional purposes.
- Number of tenured and tenure-track faculty.
- Recognition and reward of faculty members who are outstanding teachers.

Objective 2.2: Enhance the educational experience for undergraduate majors.

Strategies:

- Initiate departmental curriculum review and reform.
- Improve mentoring and advising of undergraduate majors.
- Continue modernization of instructional laboratories.
- Increase use of information technology for lecture and laboratory courses.
- Involve larger percentage of chemistry and biochemistry majors in research.
- Support student organizations for chemistry and biochemistry majors.
- Explore possibility of teaching experience for chemistry and biochemistry majors.

Assessments:

- Number of chemistry and biochemistry majors.
- Number of proposals per year for instructional laboratory development to external agencies.
- Percentage of chemistry and biochemistry majors engaged in research.
- Number of research publications with undergraduate co-authors.
- Amount of use of departmental web site for instructional purposes.
- Activities of Student Affiliates chapter of the American Chemical Society.

Objective 2.3: Maintain accreditation by the American Chemical Society.

Strategies:

- Initiate curriculum development to respond to changes in requirements for accreditation by the Committee on Professional Training of the American Chemical Society.
- Report information about undergraduate degree programs to the American Chemical Society.

Assessments:

- Annual and five-year reports to the American Chemical Society.
- Accreditation by the American Chemical Society.

Objective 2.4: Expansion of graduate program.

Strategies:

- Enhance recruitment of graduate students.
- Increase number of graduate teaching assistantships with more competitive stipends

and reduced teaching loads.

- Increase number of graduate students supported as research assistants on external grants.
- Explore possibility of combined BS/MS degree programs in chemistry and biochemistry.
- Develop interdisciplinary research programs.
- Improve departmental research instrumentation.
- Continue recognition of outstanding dissertation submitted in a calendar year by the Song Award.

Assessments:

- Graduate student enrollment.
- Number of proposals to external agencies for research instrumentation.

Objective 2.5: Enhance research productivity.

Strategies:

- Increase number of faculty to that commensurate with a university the size of Texas Tech University.
- Hire top-quality new faculty with proven research capabilities.
- Improve departmental infrastructure (shops, instrumentation) to support research efforts.
- Increase level of external research support.
- Expand research collaborations within Texas Tech University and with the Texas Tech University Health Sciences Center and the Reese Technology Center.
- Expand research collaborations with industry and national laboratories.
- Enhance level of research publication in peer-reviewed journals, monograph chapters, and books.
- Increase number of research presentations by faculty and their coworkers at regional, national, and international professional meetings.
- Nominate qualified faculty for membership in prestigious organizations and awards.
- Reward research productivity.
- Encourage faculty to apply for development leaves.

Assessments:

- Number of tenured and tenure-track faculty.
- Number of proposals to external agencies for research instrumentation.
- Capabilities of departmental shops.
- Level of external research support.
- Number of collaborative research projects.
- Number of research publications by faculty members.
- Number of research presentations by faculty and their coworkers at professional meetings.
- Number of faculty on development leaves.
- Number of nominations of qualified faculty for awards.

Objective 2.6. Continuation and expansion of departmental service activities.

Strategies:

- Continue faculty service in individual peer review of grant proposals and manuscript submissions.
- Continue faculty service as officers in regional and national professional agencies.
- Continue student service in local, regional, and national organizations.
- Expand science education activities for EC-12 students.
- Expand collaboration in science education activities at Texas Tech University.

Assessments:

- Number of service activities by faculty and students.
- Number of service activities by the Student Affiliates chapter of the American Chemical Society.
- Level of interaction with the science education community.

Goal 3. Engagement: Provide programs and services that disseminate knowledge and skills to enhance the quality of life at the university, local community, region, state, and nation.

Critical Success Factors

- Develop local, regional, and national leadership roles in chemical education.
- Increase faculty involvement in service.
- Enhance student involvement in service.

Objectives

Objective 3.1: Provide chemistry and biochemistry courses in support of other departments within the College of Arts and Sciences and of other colleges at Texas Tech University.

Strategies:

- Provide dedicated lecture and special laboratory courses in general chemistry and dedicated lecture courses in organic chemistry for students in the Honors College.
- Provide courses necessary for teacher certification through the College of Education.
- Provide two special chemistry courses for the Master of Science with Major in Multidisciplinary Science degree program for EC-12 teachers of science.

Assessment:

- Number of dedicated sections of general chemistry lectures and laboratories and dedicated sections of organic chemistry lectures for students in the Honors College.
- One special chemistry course per year to students in the Master of Science with Major in Multidisciplinary Science degree program.

Objective 3.2. Development of leadership roles in science education at the local, regional, and national levels.

Strategies:

- Provide chemistry contributions to science education research and development activities at Texas Tech University.
- Encourage development and submission of research proposals on science education to external agencies.
- Support faculty participation in chemistry education activities sponsored by professional organizations.
- Encourage faculty participation in local EC-12 science education activities.
- Utilize undergraduate students in chemistry education activities.
- Reward faculty for success in science education activities.

Assessments:

- Level of collaboration in joint science education research and development proposals with faculty from other departments at Texas Tech University.
- Amount of faculty and student participation in EC-12 science education.
- Level of faculty and student activities in science education.

Goal 4. Information Technology: Maximize effective use of information technology to enhance teaching, research, and service.

Critical Success Factors

- Develop alternative methods for information delivery.
- Obtain additional on-line access to journals and Chemical Abstracts searching from the Chemistry Building.
- Modernize the instructional laboratories.
- Increase utilization of computers in coursework.

Objectives

Objective 4.1: Increase effective use of technology in teaching and learning.

Strategies:

- Develop teleconference facility and classroom to offer specialized classes at remote sites (e.g., graduate-level biochemistry courses at the Texas Tech University School of Pharmacy in Amarillo).
- Obtain resources to allow on-line access to all chemistry and biochemistry journals from the Chemistry Building.
- Evaluate alternative methods for information delivery.
- Evaluate possibility of offering one or more courses in general chemistry with televised lectures.
- Increase use of departmental web site for instructional purposes.
- Modernize upper-level undergraduate laboratories with computer-interfaced instrumentation.

- Increase software available for student education.

Assessments:

- Amount of utilization of departmental computer laboratory by students in chemistry and biochemistry lectures and laboratories.
- Level of use of departmental web site for instructional purposes.
- External proposals for undergraduate laboratory development with computer-interfaced instrumentation.
- On-line journal access and searching from the Chemistry Building.

Objective 4.2: Increase effective use of information technology in research.

Strategies:

- Enhance use of computers for data acquisition and evaluation.
- Obtain resources to allow on-line access to journals searching from the Chemistry Building.
- Increase use of computer-interfaced instrumentation in research.

Assessments:

- Amount of utilization of departmental computer laboratory by graduate students, postdoctoral associates, and faculty.
- Use of computers as research tools.
- Number of proposals to external agencies for computer-interfaced instrumentation for research.
- On-line journal access and searching in the Chemistry Building.

Objective 4.2: Increase effective use of information technology in service.

Strategy:

- Expand departmental web site to provide links to other locations for chemical information on the web.

Assessment:

- Expanded departmental web site.

Goal 5. Partnership: Collaborate in strategic alliances with other academic, government, community, corporate, and private entities.

Critical Success Factors

- Enhance collaborations with other researchers at Texas Tech University.
- Expand research collaborations with Texas Tech University Health Sciences Center and Reese Technology Center.
- Enhance research partnerships with industry.
- Increase research partnerships with national laboratories.

- Establish partnerships in science education with area primary, secondary, and high schools.

Objectives

Objective 5.1: Enhance research and development collaborations within Texas Tech University.

Strategies:

- Encourage departmental faculty to initiate and expand research collaborations internally, with researchers in other departments and colleges, as well as through centers and institutes.
- Invite faculty interested in possible collaboration with departmental faculty to present seminars on their research.

Assessment:

- Level of external funding for collaborative research projects within Texas Tech University.

Objective 5.2: Facilitate alliances with EC-12 science education providers.

Strategies:

- Encourage and support cooperative initiatives dealing with EC-12/university partnerships in science education within TTU and between TTU and other entities.
- Enhance summer involvement of high school science teachers on projects supported by the Texas Higher Education Coordinating Board Advanced Research Program and Advanced Technology Program.
- Strengthen faculty involvement in academic University Interscholastic League competitions and activities.
- Recognize faculty efforts in seeking grants to support EC-12 collaborations and partnerships in science education.
- Facilitate math and science education at area junior high schools and high schools.

Assessments:

- Number of science education proposals to external agencies.
- Level of funding for science education proposals from external agencies.
- Number of high school teachers engaged in THECB ARP/ATP projects.
- Donations of surplus laboratory equipment and computers to area junior high schools and high schools.

Objective 5.3: Enhance research and development collaborations with Texas Tech University Health Science Center and the Reese Technology Center.

Strategies:

- Encourage departmental faculty to initiate and expand interactions with researchers

at the Texas Tech University Health Sciences Center and the Reese Technology Center.

- Invite researchers interested in possible collaboration with departmental faculty to present seminars.

Assessments:

- Faculty participation in collaborations with researchers at the Texas Tech University Health Sciences Center and the Reese Technology Center.
- Number of collaborative research proposals to external agencies.
- Level of funding for collaborative research projects from external agencies.

Objective 5.4: Enhance research and development collaborations with industry and national laboratories.

Strategies:

- Encourage departmental faculty to initiate and expand collaborative projects with industry and national laboratories.
- Invite scientists and engineers from industry and national laboratories to visit and present seminars.

Assessments:

- Level of support for research and development projects by industry.
- Number of interactions with researchers at national laboratories.

Goal 6. Human Resources: Maintain and enhance the quality of the faculty and staff in the Department of Chemistry and Biochemistry and enhance the quality of the work environment within the Department.

Critical Success Factors

- Increase number of tenured and tenure-track faculty substantially.
- Increase number of technical support staff.
- Enhance faculty and staff diversity.
- Continue efforts to retain quality faculty at all levels.
- Increase recognition of superior faculty members.
- Increase recognition of superior staff members.
- Enhance safety in teaching and research laboratories.
- Obtain resources for room renovations in the Chemistry Building.

Objectives

Objective 6.1: Hire excellent and diverse faculty.

Strategies:

- Increase number of tenured and tenure-track faculty to that commensurate with a university the size of Texas Tech University.
- Actively recruit excellent and diverse faculty.
- Provide salary and start-up packages comparable to those offered by peer institutions.
- Facilitate spouse/partner accommodations whenever possible and mutually beneficial.

Assessment:

- Number of tenured and tenure-track faculty.

Objective 6.2: Retain quality faculty members.

Strategies:

- Recognize and reward faculty excellence in research, teaching, and service.
- Provide appropriate office and laboratory space.
- Enhance departmental infrastructure for support of research and instructional activities.
- Provide atmosphere of collegiality and cooperation within the Department.
- Identify and respond to faculty problems/complaints.
- Make competitive counteroffers when offers are made to departmental faculty by other universities.
- Nominate quality faculty members for college and university awards, as well as those of professional organizations, foundations, etc.

Assessments:

- Retention of quality faculty members.
- Nominations of qualified faculty for awards.

Objective 6.3: Retain quality staff members.

Strategies:

- Reward superior staff performance.
- Nominate staff members for college and university awards.
- Provide an atmosphere of collegiality, cooperation, and support within the Department.
- Identify and respond to staff problems/complaints.
- Continue upgrading of equipment and facilities for staff members.

Assessment:

- Turnover of quality departmental staff.

Objective 6.4: Enhance work environment.

Strategies:

- Encourage enhanced safety awareness in teaching and research laboratories.
- Obtain resources to complete renovation of Room 10 in the Chemistry Building. (Cost estimate is \$500,000.)

Assessments:

- Number of accidents in the teaching and research laboratories.
- Renovation of Room 10 in the Chemistry Building.

Goal 7. Tradition and Pride: Project a strong positive image for the Department of Chemistry and Biochemistry locally, regionally, nationally, and internationally.

Critical Success Factors

- Increase visibility of departmental achievements and those of individual faculty members and students.
- Enhance interactions with graduates.
- Enhance reputation and image of Texas Tech University.
- Develop Chair's Council Advisory Committee.

Objectives

Objective 7.1: Enhanced recognition of the faculty and student achievements.

Strategy:

- Increase recognition of faculty and student accomplishments by nomination for Texas Tech University awards, as well as those by professional organizations, foundations, etc.

Assessments:

- Number of faculty nominations for awards.
- Number of students recognized by awards.

Objective 7.2: Improve reporting of achievements.

Strategies:

- Continue to encourage faculty to report their achievements in research, teaching,

- and service to the Publicity Committee.
- Encourage students to report their achievements to the Publicity Committee.

Assessments:

- Number of articles published about faculty, student, and departmental accomplishments.
- Enhanced reputation and image of Texas Tech University by more publicity for faculty, student, and departmental accomplishments.

Objective 7.3: Enhance communication with graduates.

Strategies:

- Maintain database with contact information for graduates and postdoctoral associates.
- Continue annual publication of departmental newsletter, the *TestTube*.
- Expand the *TestTube* to include a feature article about a famous graduate in each issue.
- Encourage faculty to provide more information about their previous research coworkers for publication in the *TestTube*.
- Develop Chair's Council Advisory Committee

Assessments:

- Database with contact information for graduates and postdoctoral associates.
- Expanded and improved *TestTube*, the annual departmental newsletter.
- Activity of Chair's Council.

Goal 8. Institutional Advancement and Accountability: Increase the fiscal stability of the Department of Chemistry and Biochemistry.

Critical Success Factors

- Increase profitability from formula funding annually.
- Enhance level of external funding by 25% over 5 years.
- Engage in fundraising.
- Develop Chair's Council Advisory Committee

Objectives

Objective 8.1: Enhance fiscal stability by increased profitability with respect to formula funding.

Strategies:

- Increase undergraduate course enrollments to enhance profitability.
- Expand graduate program to increase profitability.

Assessment:

- Profitability from formula funding.

Objective 8.2: Enhance fiscal stability by increased external funding.

Strategies:

- Encourage faculty to submit more proposals for external research support.
- Recognize and reward faculty success in attracting external funding.

Assessments:

- Amount of external research support.

Objective 8.3: Enhance donations from private donors, companies, and foundations.

Strategies:

- Apply to The Welch Foundation for endowment of a Welch Chair in Biochemistry.
- Cultivate private donors and companies as sources of additional support.
- Secure a departmental endowment fund.
- Continue annual publication of departmental newsletter, the *TestTube*, and solicitation of donations from graduates.
- Coordinate with the Development Office and the College of Arts and Sciences in development efforts.

Assessments:

- Match for increase by The Welch Foundation of endowment for Welch Chair in Chemistry.
- Initial donation and requisite matching funds to endow a Welch Chair in Biochemistry.
- Donations to endow more undergraduate scholarships.
- Level of donations from graduates in response to solicitations in the *TestTube*.
- Donations to endowment funds.