

## DEPARTMENT OF CHEMISTRY

### Mission

The Department of Chemistry at Oklahoma State University: promotes the advancement and dissemination of knowledge that is central to many science reliant degree programs both within A&S and across College lines; nurtures the growth of future scientists through undergraduate and graduate research; supports creative endeavors in innovative instruction paradigms and scientific research by faculty and staff; enriches civilization by contributing to education and new technological developments.

### Vision

That the many innovative scientific and technological accomplishments of the faculty and of graduates from our degree programs, will have been prepared to make an international impact on the chemical science and science in general through instruction and Research and Development, and will bring honor to these individuals, to the Department, to the institution, and to the State of Oklahoma as a whole.

### Core Values

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

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

**Integrity** – We are committed to the principles of truth and honesty, and we will be equitable, ethical, and professional.

**Service** – We believe that serving others is a noble and worthy endeavor.

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

**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.

In each and every one of its educational endeavors, the Department of Chemistry is committed and dedicated to honoring the ancient tenets of higher education learning, namely: requiring **excellence** in the organization and dissemination of knowledge; ensuring the **academic freedom** of speech and the **freedom to pursue new knowledge** without challenge or recourse; embracing **diversity** and dealing equally with all peoples in all stations in life; and showing **integrity** in all of our intellectual and sociological pursuits.

These core values are stated once and only once. Be it understood that they apply without question to every **Goal**, every **Critical Success Factor**, and every **Objective** that is prescribed in this Strategic Plan for the Department of **CHEMISTRY**.

## **Goals, Critical Success Factors, Objectives, and Strategies**

**Goal 1: Academic Excellence and Human Resources: Recruitment, promotion, retention, reward of outstanding and productive faculty.**

### **Critical Success Factors:**

- Outstanding faculty are convinced to complete their careers at OSU.
- Faculty salaries at all ranks are competitive with those in regional peer comprehensive research institutions.
- Salary adjustments are based solely on merit, unless otherwise dictated.
- Outstanding faculty are personally and publicly recognized and rewarded for their excellence and contributions to science.
- A larger proportion of tenure and promotion decisions are positive.

### **Objectives:**

**Objective 1.1:** Restore the full complement of 19 faculty lines as expeditiously as possible to reduce current workload woes.

#### Strategies:

- Make strong justifications to persuade the OSU Cabinet to provide competitive startup packages for new faculty.
- Apply a fraction of the Department's share in indirect costs from ongoing grants to add to the startup package for new faculty.
- Redirect our current first priority for faculty recruitment away from fulfilling an instructional need towards a research priority.
- Focus on interdisciplinary research and development across our modus operandi for the immediate and long term future.
- Be more aggressive advertising in print and web media that provide assistance in recruiting for under represented minority candidates.

**Objective 1.2:** Select faculty from only the top 5 choices of the applicant pool.

#### Strategies:

- Advertise positions as interdisciplinary in nature to generate as large a pool of applicants as possible.
- Solicit and use informative input from potential research collaborators from outside the Department.
- Separate the pool of applicants into academically related sub group according to disciplines.
- Reduce the number to a short list of no more than 5% of the total applicant pool.

- Select no more than the top 5 candidates from the short list for campus interviews.

**Objective 1.3:** Ensure selected faculty have a strong commitment to teaching.

Strategies:

- Make proficiency in communicating in the English language at any and all levels a high priority.
- Ensure as far as humanly possible that they possess the personal traits that will sustain only positive interactions.
- Focus on candidates that have a relaxed presence when in front of a large audience.
- Expect that they will be agreeable to accepting assignments outside their immediate personal realm of responsibilities.
- Take the necessary corrective steps to assist professional development as they are needed and not rely only on annual appraisal and development exercises.

**Objective 1.4:** Provide meaningful mentoring programs to new and established faculty.

Strategies:

- Make counseling of new faculty a Departmental responsibility and not an individual commitment assigned to a senior faculty member.
- Share instructional materials prepared and used by senior faculty with new faculty to make them aware of the standards that are used in preparing their initial assignments.
- Have the Unit Administrator offer verbal counsel every semester and prepare a fully critical written annual appraisal statement.
- Have the Unit Administrator and senior faculty, prepare an early and detailed plan of correction where necessary.
- Have the Unit Administrator follow up on the plan of correction ensure compliance.

**Objective 1.5:** Revise the Promotion/Tenure document without jeopardizing the standards set by the Department and the College.

Strategies:

- Carefully monitor the evolution of the newly prepared Departmental Promotion and Tenure document.
- Provide counsel to young faculty on the interpretation of the Promotion and Tenure document.
- Acquaint young faculty of what is the charge of A&S Dean's PDT committee.
- Reassure young faculty that perceived unfair or contentious decisions on tenure and promotion are not indicative of what will happen in their case.

- Become alert to early indications of impending disquiet in collegial relationships at all level within the Department.
- Prepare a comprehensive Department policy and procedure for dealing with these differences as expeditiously and as amicably as possible.

**Objective 1.6:** Give greater consideration to early promotion for at-risk faculty.

Strategies:

- Make the A&S Dean aware when the first signs of an impending problem concerning faculty retention arises.
- Provide a written appraisal of how grave the loss to the Department will be from the continuing Department faculty's perspective.
- Be prepared to seek tangible rewards for faculty at risk of leaving, especially those who have solid support from the continuing faculty.
- Be ready to initiate a request for consideration of early promotion when the individual's performance merits it.
- Use College and Department IDC dollars either as salary adjustment or as research support inducements.
- Find ways to assuage any anxieties in the minds of the continuing faculty that the loss will be compensated for quickly to combat any thoughts that others may have of leaving.

**Goal 2: Academic Excellence, Human Resources, and Leverage Resources: Enhanced support for research, scholarship, and creative activity.**

**Critical Success Factors:**

- Outstanding staff are successfully retained by the Department.
- Salaries and employee benefits are at a par with total compensations across campus and at regional peer institutions.
- Salary adjustments are based solely on merit, unless otherwise dictated.
- Working conditions are pleasant and staff-faculty relations are mutually respectful.
- Staff development and growth are continued through training.

**Objectives:**

**Objective 2.1:** Develop a successful mentoring program for new and continuing staff.

Strategies:

- Immediately involve senior staff in hands-on counseling to shorten the learning curve for all new staff additions.
- Make arrangements for new and continuing staff to become better acquainted with staff employees at the College and higher administrative levels with whom they will be directly involved.
- Acquaint new and continuing staff with department policy statements that delineate the proficiencies in job performance that will be expected when decisions for job advancement are considered.

**Objective 2.2:** Develop a mentoring program to focus on job cross-training.

Strategies:

- Write policy statements that will delineate the differences in job advancement policies for classified (i.e. secretarial, business) staff versus A&P technical staff (i.e. managers of undergraduate laboratories and supervisors of major research instrumentation facilities).
- Prepare an organized chart for a continuing cross-training program scheduled for each staff member in the classified and technical management areas.
- Hold common regular monthly meetings involving all staff personnel and the Unit Administrator.
- Have a committee of tenured faculty serve as an advisory body for technical staff to maximize the operations of the teaching and instrumentation laboratories.

**Objective 2.3:** Annually review Position Questionnaires for efficiency evaluations.

Strategies:

- Have the Unit Administrator review staff Position Questionnaires annually to ensure that work assignments correlate accurately with the job description, and if not to modify it.
- Have staff prepare a written statement that from their perspective the correlation is accurate, and if not to work with the Unit Administrator to modify it.
- Solicit input from staff, either privately or in common staff meetings, on how the unit may operate more efficiently.
- Encourage staff to immediately advise the Unit Administrator of any kind of personal harassment in the workplace.

**Objective 2.4:** Require staff to attend seminars related to their job descriptions.

Strategies:

- Require staff to attend on-campus seminars, workshops, etc., that are directly related to their job responsibilities and where necessary have the department underwrite the enrollment costs.
- Permit staff release time to enroll in OSU classes for continued education credit and where possible to obtain tangible progress towards completing a bachelor's or master's degree.

**Objective 2.5:** Nominate outstanding staff for competitive awards for excellence.

Strategies:

- Elect a standing faculty advisory committee with the charge of aggressively nominating outstanding senior level staff for prestigious on-campus, local, and regional awards.

**Goal 3: Student Development: Increased quality and diversity of under-graduate students.**

**Critical Success Factors/Assessments:**

- Measurable progress in both quality and in numbers of majors entering chemistry from high schools.
- Measurable progress in both quality and in numbers of majors entering chemistry as majors or as joint major/minor from other majors or pre-professional degree programs.

**Objectives:**

**Objective 3.1:** Ensure ALL classroom instructors have the PhD degree.

Strategies:

- Restrict all classroom teaching assignments to only tenured or tenure track faculty that have a PhD degree in chemistry.
- Refuse to accept all inquiries or job applications from adjunct chemistry faculty, from chemists with Masters degrees, and from senior level graduate students.

**Objective 3.2:** Increase the momentum for personally contacting prospective students.

Strategies:

- Be pro-active in working with the Offices of High School Relations and the College of Arts and Sciences Student Services to assist us in identifying the best of the juniors and seniors in high schools in the immediate four state area.
- Make arrangements for faculty to visit these students in their home schools.
- Reach seniors in schools outside Oklahoma via the interactive Department web page.
- Focus more vigorously on seeking diversity in selective recruitment by accessing the appropriate web pages, newspapers and journals that are specific to ethnic groups.
- Invite the best of all of the students contacted to reciprocate by inviting them to the Department.

**Objective 3.3:** Exploit all conceivable aspects of advertising our degree programs.

Strategies:

- Openly discuss the competitive nature and the number of Departmental scholarships available to students on their first enrollment.



- Describe the opportunities and advantages of enrolling in joint interdisciplinary degree programs and how they fit in with OSU's research initiative and the future direction of US science and engineering in general.
- Describe the challenges and advantages derived from being involved in meaningful undergraduate research beginning as early as the first summer term after their enrollment.
- Take a pro-active role in working with Offices of High School and College Relations, A&S Student Services, and OSU Foundation in obtaining scholarship dollars.
- Exploit our nationally recognized expertise in instructional innovations for early science recognition and recruitment purposes.

**Objective 3.4:** Introduce chemistry (and other science and pre-professional) majors to undergraduate (sponsored) research with faculty.

Strategies:

- Make contact with this group of non-chemistry majors during their involvement in low enrollment upper division classes.
- Invite qualified students to be inducted into the Phi Lambda Upsilon Chemistry Honor Society.
- Encourage these same quality students to become involved in federally sponsored research with Chemistry faculty.

**Objective 3.5:** To answer current market demands, initiate a 5 year BS/MS degree.

Strategies:

- Study and evaluate BS/MS degree programs from other institutions across the US as guidelines for developing an OSU Chemistry program.
- Consult with other OSU departments and colleges on how our 5 year program might also enhance their specific science requirements.
- Emphasize the technology side of the degree plan by arranging for internships with industry.
- Develop a hands-on curriculum that would provide not only the know how to operate scientific instruments but also to learn the theoretical bases upon which they function.
- Focus on teaching the technology of computer/instrument interfacing and how to apply statistical analyses methods to large databases.

**Goal 4: Academic Excellence, Student Development: Enhanced Retention of undergraduate students.**

**Critical Success Factors/Assessments:**

- Measurable increase in graduation percentages for all degree plans that involve Chemistry as a major or as a service component.

**Objectives:**

**Objective 4.1:** Assign only the most patient instructors to service level courses.

Strategies:

- Assign Professors to non-chemistry major courses who are recognized as being personable in dealing with students.
- Make the level of rigor in a course correlate with what the major degree plan needs.
- Enforce the prerequisites and eliminate the “permission of instructor” option from OSU catalog Chemistry course descriptions.

**Objective 4.2:** Reduce the outrageous student to faculty ratios (e.g. 280 to 1).

Strategies:

- Restore the Chemistry faculty to the full complement of 20 members that it had in 2000 as expeditiously as possible.
- Raise the entering ACT, SAT, and high school GPA requirements (in process).
- Enforce all written course prerequisites.
- Ensure students who enroll on-line follow course pre-requisites exactly.
- Take the necessary steps to correct self-advised student enrollment errors before the first drop date.

**Objective 4.3:** Maintain the American Chemical Society accredited degree plan.

Strategies:

- Retain the ACS accredited BS degree option to remain competitive with other institutions in recruiting the most promising students.
- Meet all of the stated objectives and requirements of the ACS accredited degree plan without any suggestion of a compromise.
- Employ the necessary personnel to teach the required advanced laboratories.
- Apply for funding from Federal, private and/or public sources to underwrite the costs of fitting and maintaining advanced level laboratories.

**Objective 4.4:** Reformat other degree plans and modernize course offerings.

Strategies:

- Use the impetus of the OSU multidisciplinary research initiative as good reason to propose changing current course contents.
- Use the impetus of the OSU multidisciplinary research initiative to convince faculty in other Departments that their services courses are overdue for upgrading.
- Make strong pitches to the faculty of these Departments to expect more than just the minimum from their undergraduate majors.

**Objective 4.5:** Provide “free” tutoring service.

Strategies:

- Provide “free” tutoring service to students at all undergraduate levels by adding tutoring to the work responsibilities of Graduate TA’s at a proposed commitment of one hour contact time per lab section.
- Have available a list of paid tutors comprised of the most able TA’s and RA’s. A TA will be forbidden to accept recompense from any student enrolled in any laboratory section of the course he/she has been assigned to teach.

**Objective 4.6:** Interview students who choose to change to a Chemistry major.

Strategies:

- Have the Chemistry advisor and the Unit Administrator interview students who are contemplating changing majors to assist them in solidifying their decision.
- Have the student interview with the faculty member(s) who they consider provided the inspiration to change.
- Have the student meet socially with advanced level chemistry majors or the officers of the PLU Honorary Society.
- Share with the prospective chemistry major the pro and con comments gathered from exit interviews held between the Unit Administrator and graduating seniors.

**Objective 4.7:** Department Support of Creative Instruction and the Center for Science Literacy.

Strategies:

- Provide continuing support to Chemistry faculty whose primary creative activity is a commitment towards teaching innovations that encompass new instruction paradigms, innovative computer and web-based instruction, and the development of real and computer based laboratory exercises.

- Have the Department provide matching money in the search for extramural funding.
- Contribute computer and travel support where needed.
- Provide release time for collaborative involvements of campus.

**Objective 4.8:** Broaden the Department participation in the Honors College.

Strategies:

- Continue further developments of the CHEM 1314, CHEM 1414, and CHEM 1515 Honors courses as its contribution to the Honors College.
- Have the faculty consider an advanced laboratory Honors course but limited to students in the Physical and Biological Sciences only.
- Have the faculty investigate the legality and the reality of developing an Honors degree in Chemistry either separate from the Honors College or as a new direction for the Honors College to consider.

**Goal 5: Academic Excellence, Student Development: Recruitment and retention of graduate students in Chemistry and in joint majors.**

**Critical Success Factors/Assessments:**

- A measurable progress in both the quality and numbers of graduate students.
- A measurable progress in both the quality and numbers of domestic graduate students.
- Graduate assistant stipends that are competitive with those in regional peer comprehensive research institutions.
- Share information with associated science and engineering departments.

**Objectives:**

**Objective 5.1:** Expend more personal and fiscal resources to recruit domestic students. (to counter problems associated with the Patriot Act).

Strategies:

- Work closely with the new administration of the Graduate College to increase the operating efficiency of that office.
- Work closely with the new administration of the Graduate College to develop procedures to assist Departments in identifying potential students.
- Communicate with these students using the Department's interactive web site.
- Formalize an on-campus visitation program for students from the four state geographical region that parallels the faculty recruitment program.
- Give Departments the autonomy to complete student applications in order to expedite decisions and extend offers as early as possible.
- Have Departments share the completed files with the College office.

**Objective 5.2:** Make pre-matriculation summer scholarship money available.

Strategies:

- Invest Departmental discretionary money and IDC from sponsored research grants to underwrite a summer matriculation program as incentives for the best prospects.
- Apply for Federal support to fund summer research programs for upper division undergraduate students.
- Seek to make partnerships with local small companies to sponsor summer support to new students by way of internships.

**Objective 5.3:** Lobby for 11-month stipends.

Strategies:

- Provide tangible evidence that Chemistry is not competitive in recruitment because of 9-month stipends and high tuition and fees.
- Provide tangible evidence that Chemistry research faculty are nationally competitive in pure and applied research, signaling an excellent graduate program.
- Add Department support to the OSU Cabinet's lobby for 11-month graduate stipends and lower tuition costs and fees.
- Convince the OSU Office of Scholar Development and Recognition that it has an obligation to promote graduate students as well as undergraduate students for competitive Scholarships, Fellowships, Honors, etc.

**Objective 5.4:** Initiate a degree plan that encompasses a combined 5-year BS/MS degree.

Strategies:

- see under **Objective 3.5.**

**Goal 6: Academic Excellence: Enhanced Environment for Research, Scholarship, and Creative activities.**

**Critical Success Factors/Assessments:**

- Success in hiring research faculty who will contribute directly to the identified priority areas of the OSU Strategic Research Plan.
- Obtain necessary startup and seed money for each new tenure track faculty hire.
- Obtain additional continued external support for research.
- Enter into a more broader seminar exchange agreement with outside speakers from academia and industry.

**Objectives:**

**Objective 6.1:** Recruitment of Research Faculty.

Strategies:

- Enhance the research environment by obtaining the commitment of resources from the VP for Research and Technology Transfer (VPRTT) and the Provost to fill the open faculty positions as expeditiously as possible.
- Focus all faculty searches in the immediate future on the experimental and applied sciences only.
- Propose that new faculty be hired in small pods (2 to 3) in order provide the needed mutual peer support and to stimulate research collaborations.

**Objective 6.2:** Research Support Infrastructure.

Strategies:

- Continue to make the science research electronic and print literature as broad and as easily accessible as possible.
- Assure that all solicitations that deal with on-campus competitive grant announcements are *immediately* put in the hands of all faculty.
- Encourage on and off campus (academic and industrial) connections through seminar exchange programs that might stimulate more enduring collaborations.
- Have the Department encourage and underwrite attendance at professional scientific meetings and visits with program managers at Federal funding agencies.
- Revitalize the dormant sabbatical leave program.
- Explore the feasibility of introducing and developing the departmentally conceived **I-PSALMS** (or **I**ntegrated **P**rogram for **S**tructural Analysis of **L**arge **M**olecules and **S**urfaces) as a platform for stimulating inter-disciplinary research initiatives.
- Develop a specialty in the operation and use of major research instrumentation and in multivariate statistical analysis supported through a progressive series of undergraduate and graduate special topics courses.

**Goal 7: Academic Excellence: Expansion and renovation of physical facilities.**

**Critical Success Factors/Assessments:**

- Classrooms and laboratories offer personal comfort for better learning.
- All classrooms are equipped with state-of-the-art capabilities.
- All laboratories meet modern safety standards.
- All laboratories are supplied with appropriate modern instrumentation.
- Facilities are upgraded for better access to students with disabilities.
- Physical Plant Services brings some sanity to its budgeting practices.

**Objectives:**

**Objective 7.1:** Ease the uncomfortable crowding in large classrooms.

Strategies:

- Have the OSU administration approve the immediate renovation of middle size classrooms (100-200 seating capacity), such as PS 101 and 103, to improve upon the comfort and acoustics as an inducement to better learning.
- Replace all of the original hardwood seating.
- Re-design podiums to accommodate technology driven teaching styles.
- Remove the long demonstration benches which are passé and physical barriers towards making closer teacher-student connections.

**Objective 7.2:** Improve and increase personal safety in chemical teaching laboratories.

Strategies:

- Have the OSU administration approve the immediate upgrade of all current undergraduate teaching laboratories by adding showers, eyewash stations, first-aid kits, and fire blankets, etc., and providing access and easy egress for disabled students.
- Verify that safety checks on fire alarms, fire extinguishers, fume hoods, etc., are conducted according to pre-determined schedules.

**Objective 7.3:** Improve research facilities to accommodate quality programs.

Strategies:

- Give our full support to the OSU Cabinet executives' efforts to obtain funding for a new on-campus research-only building.
- When the OSU Cabinet decides to launch a funding drive to raise a new research-only building, offer the expertise and initiatives of the research faculty expertise in providing knowledge and personal resources in the search for matching dollars from proposals to Foundations and Federal agencies.



- Constantly remind the OSU Cabinet executives that quality research laboratory space is a high priority item when recruiting new faculty and that all renovations need to be taken care of before the professor arrives.
- Constantly remind the OSU Cabinet executives that excessive renovation costs detract from the size of the startup packages that can be offered to new faculty and sorely reduces our competitive capability.
- Constantly remind the OSU Cabinet executives that the University should reach the rational decision to allow external bidding practices for renovation work in order to combat the monopoly allowed to, and the outrageous bids made by Physical Plant Services.