

Annual Report Executive Summary, 2008-09

Department of Chemistry

Learning: Undergraduate

The Department of Chemistry is committed to the highest level of undergraduate education that it can deliver and applies that commitment to the thousands of students in our "service" courses as well as our own majors.

A. Service Courses

We define service courses as those courses, typically at the freshman and sophomore levels, offered to a variety of majors across the university to satisfy their own major requirements. The bulk of our service offerings is found in four courses: General Chemistry (1035, 1036), General Chemistry Lab (1045, 1046), Organic Chemistry (2535, 2536) and Organic Chemistry Lab (2545, 2546). Enrollment numbers for these 4 courses were:

Fall 2008: Chem 1035 – 2918; Chem 1045 – 2208; Chem 2535 – 933; Chem 2545 – 785.

Spring 2009: Chem 1036 ; Chem 1046 ; Chem 2536 - ; Chem 2546

B. Majors and Upper Division Courses

While the majority of our 3000 and 4000 level courses are for chemistry majors, there are quite a few students who are minoring in chemistry who also need these courses. An overall increase in majors along with these students have stressed our upper level offerings greatly. Number of chemistry majors:

Fall 2008: 268

Spring 2008: 257

The department graduated 51 B.S./B.A. majors in 2008-2009.

C. Undergraduate Research

An incredibly important component of the undergraduate education experience is undergraduate research. A research university has much to offer to students that will enrich their learning far beyond the capabilities of a classroom.

Fall 2008: 23 undergraduates participated in undergraduate research. This is the number who have officially signed in for credit with a number of others participating informally.

Spring 2009: 23

Those students who have signed up for 3 credits or more are required to present their work at an undergraduate research symposium the department holds at the end of each semester.

D. Evaluation

One-on-one exit interviews with graduating seniors underscored the high level of satisfaction that chemistry majors have with their experience in the department. Teaching evaluations of

E. Notable Achievements.

Sandra Hobson was one of seven students chosen to represent VT at the 2009 ACC Meeting of the Minds conference in Raleigh NC. The selection was based on the quality of her research (in quantum chemistry) with Prof. Edward Valeev, which has already resulted in an article in *Molecular Physics*

Discovery

The Department of Chemistry is one of the most research active departments on campus in terms of total awards and research expenditures. When placed on a per faculty basis, the Department is arguably the top research department on campus. The Department ranked 54 in the FY 2007 list of chemistry department research expenditures tabulated by the National Science Foundation. Again, when placed on a per faculty basis, the VT Chemistry Department would consistently rank in the top 10 since most departments ahead of VT have 40-60 faculty compared with 30 for Virginia Tech.

For FY 09, the Chemistry Department has obtained \$9.7 million in new awards continuing a high level of awards first seen in FY 08. The FY 09 figure is fully 40% of the College of Science total for new awards. Among those awards are individual awards of note:

Lou Madsen received a NSF Career Award.

Edward Valeev received a NSF Career Award.

These two Career Awards continuing an impressive string of Career Award winners in the Chemistry Department. Among the active faculty, seven faculty have received the NSF Career Award. This number represents about 80% of the eligible faculty hired over the last 15 years – a tribute to the care that the Chemistry Department takes in recruiting new faculty

Theresa Reineke received a Sloan Fellowship.

Edward Valeev received a Sloan Fellowship

Sloan Fellowships are among the most competitive and receiving this award is recognition of their accomplishments and their potential for the future.

5/27/09

Other awards and honors of note:

David Kingston: Prof. David Kingston was honored with a special issue of the *Journal of Natural Products*, in recognition of his contributions to the chemistry of the anticancer drug paclitaxel (Taxol), and to the conservation of biodiversity through the isolation of possible drug compounds in rain forest botanicals.

Harold McNair: Prof. Emeritus Harold M. McNair has received the prestigious LCGC Award for Lifetime Achievement in Chromatography, for contributions over more than four decades.

Edward Valeev: Prof. Edward Valeev has been selected as one of four winners of the ACS Division of Computers in Chemistry Outstanding Junior Faculty Award sponsored by Hewlett-Packard.

Robert Moore: Prof. Robert B. Moore was elected 2010 Vice-Chair (and 2010 Chair) of the American Chemical Society Polymer Division.

Richard Turner: Prof. Richard Turner has received the 2008 American Chemical Society Industrial Polymer Scientist Award. This award, which recognizes Turner's achievements during his tenure at Eastman Chemical Company.\

Jessica Lu, a graduate student who studies with Prof. John Morris, has received a Fulbright Scholarship to spend a full academic year at the Weizmann Institute in Israel. The scholarship provides a stipend and living expenses, enabling Ms. Lu to concentrate all of her efforts in Israel on her research, which focuses on the scattering dynamics and reactions of gas molecules at solid and liquid surfaces.

The department is also proud to note that one of its alumni received the 2009 VT Graduate Alumni Award – Professor Joseph DeSimone, University of North Carolina at Chapel Hill.

Engagement

The Department of Chemistry is highly engaged especially with respect to economic development activities but also with K-12 education and professional service. Examples of activities:

1. Nearly every member of the faculty visits local schools to put on chemical demonstrations to develop an interest in science in the students.
2. Members of the polymer group in the department are very active in presenting short courses (under the auspices of

- the American Chemical Society) on various aspects of polymer chemistry
3. Over 40% of the department's research funding comes from industry.
 4. Each Career Awardee has put in place a plan for "broader impacts" which includes educational outreach among other activities.
 5. The department makes available (for a fee) its vast analytical capabilities that are of particular service to the companies in the Corporate Research Center.
 6. Dr. Paul Deck and Ms. Angie Miller revamped the Department of Chemistry website and it is now a greatly improved and highly functional portal to the department.

Diversity

Achieving diversity across the board in the Chemistry Department is a major goal. The department wishes to achieve diversity in the undergraduate population, the graduate population and faculty and staff. Multiple members of the department are very active with ADVANCE-VT.

John Morris has assumed the role of graduate recruiter and is very active in the MAOP program and recruiting a diverse graduate population is a major thrust of those programs.

Joseph S. Merola served on the VA/NC Alliance for Minority Participation Advisory Board.

Judy Riffle spearheaded the establishment of a Virginia Tech/Nebraska Alliance for Minority Participation.

Theresa Reineke, was added to the department faculty bringing the number of female professors to 4. Recruitment of faculty for gender and ethnic equity will play a large part of chemistry's activities.

Claudia P. Brodtkin, manager of the undergraduate chemistry labs at Virginia Tech, was recently awarded the College of Science Diversity Award for 2008.

Goals for 2009-10

Goals for 2009-2010.

1. Continue the excellent research activity for which the department is known. Work to expand those activities via strategic partnerships and alliances.

5/27/09

2. Design and construction of Davidson Hall project will require a large effort in 2009-2010 as well as finding and occupying interim space while the Davidson construction takes place.
3. Recruit a faculty member who will add to our energy thrust and also add to the faculty diversity.
4. Expand the number of students engaged in undergraduate research.
5. Expand undergraduate and graduate student recruiting efforts with a special eye toward improving diversity.
6. Develop a more robust assessment program at all levels: faculty, staff, graduate student, undergraduate student.
7. Develop a new Department of Chemistry strategic plan ensuring that it aligns with the College of Science and University Plans.