UNIVERSITY OF NORTH DAKOTA

DEPARTMENTAL PLAN FOR ASSESSMENT OF STUDENT LEARNING 2005-2006 ACADEMIC YEAR

Department: Chemistry

Programs: B.S. in Chemistry; B.S. with Major in Chemistry; Minor in Chemistry

Mission Statement

Chemistry is the central science, and so the Department plays a pivotal role in advancing the mission of the University of North Dakota. Our Department occupies a unique niche as one of the smaller Ph.D.-granting programs in the country. As such, this enables us to accomplish nationally and internationally significant research and yet allows us to give individualized graduate education in the context of vibrant, externally-supported research. We also provide outstanding chemical education for a large fraction of the UND student body through service courses and for chemistry majors with a variety of emphases. The active participation of most of our faculty members in research facilitates the transfer of cutting-edge knowledge to the classroom, and the strong commitment of our faculty to teaching produces a solid foundation of learning for both majors and non-majors alike. Experiential learning through active participation in research by both undergraduate and graduate students will continue to be a hallmark of our Department. We impact the economic development of the state and region as a direct consequence of grant activity, with our service and community work, and by educating and training students to become successful alumni who assume leadership positions in regional industries. We respect and value the individuality of faculty members with regard to research, teaching, and service contributions while accomplishing the overall mission of the Department.

Student Learning Goals

Student Learning Goal 1: Attain a factual knowledge of concepts of chemistry.

Objective 1.1: To gain an understanding the relationships among different facts
Objective 1.2: To learn the use of multiple sources of information, including the literature

Student Learning Goal 2: Understand and learn to use the scientific method to think critically about modern chemistry concepts.

Objective 2.1: To design and interpret results of chemical experiments.
Objective 2.2: To communicate the results of experiments in oral and written forms

Student Learning Goal 3: Applying learning to problem solving.

Objective 3.1: To make connections between ideas or events in the sciences and society

Programs: B.S. in Chemistry(A); B.S. with Major in Chemistry(B); Minor in Chemistry(C)

Most chemistry courses can be used towards either the B.S. in Chemistry(A) or the B.S. with Major in Chemistry(B). "Other" designates service courses that can only serve as prerequisites for majors other than chemistry.

Student Learning Goals & Objectives	**Educational Experiences**	**Assessment Methods**	**Timeline**	**Responsibilities**	**Use of Results and Process for Documentation & Decision-Making**
Goal 1 Attain a factual knowledge of concepts of chemistry **Objective 1.1** To gain an understanding the relationships among different facts	(A) 221, 222, 341, 342, 464, 465, 461, 454, 455 (B) Chem 121, 122, 333, 341, 342, 466 (C) 121,122, 341, 342, 333, 240 **Other:** Chem 110, 115, 116, 240	Instructor developed exams Graded homework assignments American Chemical Society (ACS) exams, where applicable Class averages on ACS exams are expected to be at or above national norms. Averages on instructor developed exams and on ACS exams will be compared to exams given in previous years	All classes have final exams, and one or more exams are given during each course. ACS exams are given a) once at the end of first year chemistry (121 & 122 or 221 & 222) b) at the end of the course (115 & 116), or c) once at the end of second year chemistry (341 & 342), d) in upper division courses when applicable.	Instructors of individual courses are responsible for administering exams and creating homework. Instructors forward results to the department chair.	Trends in exam scores are used to adjust (a) material presented in courses, (b) text book selections, and (c) teaching methods. Overall results of ACS exams are included by the department chair in department annual reports. Results are used in evaluation of individual instructors.
Objective 1.2 To learn the use of multiple sources of information, including the literature	(A) Chem 461L, 462, 488 (B) Chem 467	Bibliography in written reports is evaluated for accuracy and appropriateness.	One or more reports per course.	Instructors of individual courses are responsible for grading reports.	Student results are used to modify experiments to enhance student learning.

Student Learning Goals & Objectives	**Educational Experiences**	**Assessment Methods**	**Timeline**	**Responsibilities**	**Use of Results and Process for Documentation & Decision-Making**
Goal 2 Understand and learn to use the scientific method to think critically about modern chemistry concepts **Objective 2.1** To design and interpret results of chemical experiments **Objective 2.2** To communicate the results of experiments in oral and written forms	(A) Chem 221L, 222L, 341L, 342L, 429, 461L, 462, 463, 488, 492 (B) Chem 121L, 122L, 341L, 342L, 333L, 467 (C) Chem 121L, 122L, 341L, 342L, 333L, 240L Other**:** Chem 110, 115L, 116L, 240L	Lab reports and prelabs are graded for content and interpretation. Lab reports and prelabs are graded for communication. Oral presentations are given in Chem 488.	Lab notebooks are graded on a weekly or biweekly basis. Lab notebooks are graded on a weekly or biweekly basis Oral presentations are given at the conclusion of the course.	Instructors of individual courses are responsible for evaluating lab notebooks. Instructors of individual courses are responsible for evaluating lab notebooks. Department seminar committee evaluates oral presentations in Chem 488.	Student results are used to modify material and pedagogy to enhance the learning experience. Changes will be discussed with the chair for financial and safety considerations. Student results will be used to modify instructions to enhance clarity of presentation.
Goal 3 Apply learning to problem solving **Objective 3.1** To make connections between ideas or events in the sciences and society	All courses	Varies. In lecture courses, exams will have questions that require synthesis of information. In lab courses, written reports must demonstrate analysis and discussion of results.	Varies with timing of exams or reports	Instructors of individual courses are responsible for administering exams and/or grading reports.	Results on key questions/reports that emphasize critical thinking are tracked annually. Adjustments to content are made to enhance student learning.