ASSESSMENT PLAN
DEPARTMENT OF CHEMISTRY
OAKLAND UNIVERSITY

1. Goals from Oakland University's Mission Statement

The Department of Chemistry Assessment Plan is based on the following goals contained in the Oakland University Role and Mission statement:

I. Oakland University provides rigorous educational programs. … A variety of majors and specialized curricula prepare students for post-baccalaureate education, professional schools or careers directly after graduation.

II. Oakland University assumes an obligation to advance knowledge through the research and scholarship of its faculty and students. … Students are involved in research projects, and the results of research and scholarship are integrated into related courses of instruction.

2. Department of Chemistry Goals

Department goals associated with University goal I.

I.A. Graduates are prepared with the conceptual and technical skills to gain admission and Succeed in quality graduate chemistry programs or professional schools.

I.B. Graduates are prepared with conceptual and technical skills for appropriate positions in chemical and related careers in industry and government laboratories.

Department goals associated with University goal II.

II.A. Graduates have a quality research experience working individually with a faculty member.

II.B. Results of faculty and student research are utilized to maintain up-to-date relevant courses of instruction supported by current technology and pedagogy.

3. Student Learning Objectives

Student learning objectives associated with Department Goals I.A. and I.B.

1. Students will use general principles of chemistry to solve problems in all areas of the disciple.
2. Students will draw appropriate conclusions from observations resulting from experiments designed for a specific purpose.
3. Students will be able to obtain information from the chemical literature and obtain and assess information from the Internet.
4. Students will demonstrate the ability to communicate, both in written and oral reports, the results of experimental studies in way appropriate to the subject and audience.
5. Students will gain admission to graduate or professional school programs or a position in industry or government laboratories.
6. Students will succeed in quality graduate chemistry programs or professional schools.
7. Student will be prepared for work in industry of government laboratories immediately after graduation.

Student learning objectives associated with Department Goals II.A. and II.B.

8. Students will conduct a through literature review and provide a properly referenced written report.
9. Students will demonstrate the ability to conduct laboratory or computational experiments whose results are unknown.
10. Students will be able to analyze the results of laboratory or computational research experiments.
11. Students will present the results of their capstone project using appropriate software packages for data analysis and presentation.
12. Students will utilize appropriate macroscopic, microscopic, and symbolic representations in problem solving as modeled by faculty in classrooms and research laboratories.
13. Students will learn results of current research by OU faculty and others in fields related to their courses of instruction.
14. Students will experience up-to-date and relevant courses supported by current technology and pedagogy.

4. Assessment methods for measuring progress toward achievement of student learning objectives.

Direct methods of assessment

a. Final exams for selected courses. (Student Learning Objective 1)
   Whenever possible and appropriate an American Chemical Society (ACS) standardized exam with national norms will be used for the final exam or as part of the final exam. These exams are all presented in a multiple choice format. Average class scores on such exams will be converted to a percentile score for comparison with national norms. The

exam answer sheets will be submitted to the Curriculum Committee for more detailed item analyses to have objective reviewers look for gaps in student knowledge that might be addressed by modifications in the course content or methods of instruction.

Instructor written exams will be reviewed by another faculty member qualified to teach the course to verify the appropriateness of the exam questions. Copies of such exams with a list of exam scores will be provided the Curriculum Committee. Instructors using self-constructed exams with 50% or more points from subjective questions, such as essay questions, will have their scoring of a representative sample of exams reviewed by another faculty member.

Final examinations for each course will be submitted to the Curriculum Committee every third year on a rotating basis to allow review of one third of courses each year. If such reviews suggest the need for modifications in the content or method of instruction, exams will be submitted after the modification are implemented regardless of the normal review cycle for that course.

b. Laboratory reports for CHM 348. (Student Learning Objectives 2 and 12)
CHM 348 is the course used as the writing intensive course for general education. It requires the most extensive laboratory reports. The CHM 348 instructor every three years will submit copies of grading keys to the Curriculum Committee which the committee will use to verify support for these learning objectives. Grading keys should show the expected conclusions and format for data presentations and analyses. If extensive changes are made in assignments and/or grading keys, the revisions will be provided to the Curriculum Committee even if outside of the normal three year cycle.

c. Capstone course projects. (Student Learning Objectives 3, 4, 8, 9, 10, 11, 12 and 13)
Majors are strongly encouraged to take the research courses that require formal written reports as their capstone course. The organization of these reports will cover all eight of these learning objectives. Each report will be read by a committee of three faculty including the director of the student's research project. Any deficiency in achievement of all eight learning objectives noted by any committee member must be corrected prior to acceptance of the project report for fulfillment of the capstone requirement. Each reader will be asked to initial a checklist of these eight learning objectives as demonstrated by the capstone project

d. Online surveys of graduating seniors (Student Learning Objectives 5, 13 and 14)
A draft copy of the survey for graduating seniors is attached as the electronic file: ExitInterviews2.doc. We expect to have this survey in final form for use starting in Fall 2006. Every senior during their final term will be asked to complete this survey. It will be online for at least six weeks at the end of each term. All students who have filed for graduation will be notified by email when the survey goes online. After two weeks any student who has not completed the survey will be sent a second email. After four weeks any student who has not completed the survey will receive another email and be asked by one of their instructors to complete the survey. One member of the Curriculum Committee will be designated to review the survey results at the start of each new

academic year and present a report to the committee with suggestions for changes to the curriculum, courses, instructional methods, or anything else that might improve our programs.

e. Online survey of graduates two and five years after graduation. (Student Learning Objectives 6 and 7)
Another survey for graduates will be designed by the Curriculum Committee in Fall 2006. This survey will be specifically designed to address student learning objectives 6, 7 and 14. It is our belief that graduates with a few years experience have a much better basis for identifying the strengths and weaknesses of our instructional programs than do current students. We plan to email all graduates two years and five years after their respective graduation dates and ask them to complete this survey. As with the survey of graduating seniors one Curriculum Committee member will analyze these survey results each year and make recommendations to the committee.

f. Online survey of graduate research advisors or employee supervisors. (Student Learning Objectives 6 and 7)
An online survey will be constructed by the Curriculum Committee during 2006-2007 to solicit information on the quality of our graduates from graduate research advisors and supervisors for those with chemical related jobs. As part of the email message to graduates after two and five years we shall ask them to send us the email address for their graduate advisor or supervisor. Upon receipt of these addresses we shall send email messages with the URL for the online survey and ask the graduate advisor or supervisor to complete the survey. Another member of the Curriculum Committee will be designated to coordinate this effort and to compile the results with an annual report to the committee.

g. CHM 400 seminar reports. (Student Learning Objective 13)
All majors are required to register and receive a S grade for CHM 400. To receive a S grade they must attend a weekly research seminar and submit a one paragraph summary for each seminar. The faculty assigning grades for CHM 400 will report to the Curriculum Committee each term on the quality of student seminar reports.

h. Online course appraisal survey. (Student Learning Objectives 13 and 14)
Attached is an electronic copy (chemevalform3.html) of the online survey to be completed in every chemistry section during last three weeks of each term. The focus of this survey will be students self appraisal of their learning. The survey will identify course components that students utilize and find most helpful for their learning as well as any components that could be strengthened. One Curriculum Committee member will be designated to perform an annual analysis of survey results and make a report to the committee.

5. Individuals responsible for each activity

The Department Curriculum Committee has responsibility for implementing the Assessment Plan. The individuals listed below are those with these responsibilities as of April 2006. As committee membership changes responsibilities will be reassigned.

a. ACS examinations and instructor designed examination – monitoring use, tabulating results, annual report with recommendations: J. Russell

b. Laboratory reports – collecting grading keys, annual report: C. Taylor

c. Capstone project reports – assigning committees, collecting reports, verifying learning objective checklist: D. Cronn

d. Online survey of graduating seniors – analysis of survey and report: J. Seeley

e. Online survey of graduates – analysis of survey and report: X. Zeng

f. Online survey of graduate advisors & supervisors – analysis and report: J. Gendell

g. CHM 400 seminar reports: J. Seeley

h. Online survey for course appraisal – analysis of survey and report: J. Russell

6. Procedures for translating assessment results into program changes.

During the fall term each academic year members of the Curriculum Committee will provide the committee with written reports for the assessment tasks for which each member is responsible. At the start of the winter term each academic year the Curriculum Committee will determine if the assessment results from the previous year warrant any program changes. If the committee believes program changes are warranted, it will propose such changes to the department. Any proposal for program changes will include a statement specifying how the impact of the changes will be evaluated and who will be responsible for this evaluation. In one or more department meetings proposals for program changes and their evaluation methods will be discussed. If the department approves the proposal or any part of the proposal for program changes, the Curriculum Committee will notify all other academic units that might be impacted by the proposed changes and obtain their comments. If such comments warrant a reconsideration of any part of the proposed changes, those sections will be submitted to the department for reconsideration. The Curriculum Committee will then complete any required forms to initiate the proposed program changes at times consistent with the next scheduled submission of catalog copy. Program changes that do not require external approvals or catalog changes will be implemented at the earliest appropriate time.