Teaching-Learning-Assessment Cycle
For
Chemistry

I. PROGRAM MISSION

The mission of the Department of Chemistry, Biochemistry, & Physics is for students and faculty to acquire a better and more systematic understanding of the physical world, and to disseminate new discoveries to the greater scientific community. Faculty expand the knowledge, skills, and values of all students, and help transition their learning styles from passive to active.

In support of this mission, a research-rich, challenging curriculum engages undergraduate chemistry and biochemistry majors amidst a supportive environment featuring exceptional access to faculty and facilities. Two American Chemical Society-approved curricula emphasize extensive hands-on experience with state-of-the art instrumentation and development of effective communication skills. Computational modeling is integrated throughout the curriculum as one mechanism to blend contemporary practice with traditional methods. A strong sense of community grows from personal attention and individualized mentoring from faculty and support from fellow students.

Students are therefore the central focus and an integral part of the Department, working side-by-side with faculty who are enthusiastically committed to the teacher-scholar model. Faculty strive to be nationally recognized in their areas of specialization by working in research partnership with students as colleagues. Most departmental majors complete original research projects, many of which culminate in presentation or publication at the national level. Marist Chemistry graduates are superbly prepared to be critically thinking, ethical scientist-citizens, with a balanced understanding of theory and method. Such graduates will be successful regardless of the paths they follow after leaving Marist College.

In pursuit of the philosophy of "Science without Boundaries," the Department actively seeks to collaborate with students and faculty from other disciplines. The Department cherishes its role in training students majoring in the other sciences, because the physical sciences underlie processes integral to the life sciences and health professions. The Department recognizes its responsibility to contribute to the understanding and thinking of non-science majors via its involvement in the Core/Liberal Studies program. Faculty and students also use their expertise to provide service to the College and the mid-Hudson Valley.

II. STUDENT LEARNING OUTCOMES

1. Students will be able to solve problems through the understanding and application of fundamental scientific principles of chemistry, biochemistry, and physics.
2. Students will have acceptable skills in laboratory procedure.
3. Students will have the ability to communicate effectively through written work and oral presentation.
4. Students will have an understanding for ethical values and how they may apply to their future careers.

5. a) Students will learn research methods by undertaking significant research at a level that can be presented locally, nationally, or internationally (BS MAJORS)
   b) Students will learn research methods by undertaking extensive research. (BA MAJORS)
6. Students will be trained to a high level such that they can successfully obtain competitive positions in graduate schools, professional schools, secondary education and industry.

III. LEARNING OPPORTUNITIES – see Table

IV. ASSESSMENT MEASURES – see Table

V. DATA ANALYSIS/ACTION – see Table

VI. TIMELINE - – see Table

Teaching-Learning-Assessment Cycle Department/Program: Chemistry, Biochemistry, and Physics Date: December 2007			
Student Learning Outcome	Learning Opportunities	Assessment Measures	Data Analysis/ Action
1. Students will be able to solve problems through the understanding and application of fundamental scientific principles of chemistry, biochemistry, and physics.	• Courses: CHEM 131-132, 211-212, 215-216, 355, 361-362, 365-366, 376, 420-421, 423-424, & PHYS 211-212, 213-214 • Research experiences	• Scores from ACS standardized exam in selected courses. • Major course project reports in 376 or 476 (rubric-graded). • Oral examination in 376 or 476 (rubric-graded).	• Department will review test data • Department will review rubric graded reports • Department will review rubric graded oral exam
2. Students will have acceptable skills in laboratory procedure.	• Courses: CHEM 131-132, 215-216, 355, 365-366, 376, 422-423, 475-476 • Research experiences	• Copies of laboratory notebook pages and the final projects (rubric-graded) that correspond to the notebook entries in 376 or 475. • Laboratory observation via brief written assessment in 216 and 376 or 475.	• Department will review notebook pages and rubric graded reports • Department will review written assessments of lab skills
3. Students will have the ability to communicate effectively through written work and oral presentation.	• All courses • Research experiences	• Laboratory project reports (rubric graded). • Oral presentation of research (rubric-graded).	• Department will review rubric graded reports • Department will review rubric graded oral presentation

4. Students will have an understanding for ethical values and how they may apply to their future careers.	• Capping course, CHEM 478	• Final paper. • Reviewed as part of the C/LS program assessment	• Department will review papers • Core committee will assess
5a. Students will learn research methods by undertaking significant research at a level that can be presented locally, nationally, or internationally. (BS MAJORS)	• Courses: CHEM 376, CHEM 475, 476 • Research experiences	• Copies of the laboratory notebook pages and final report (rubric-graded) in 476. • Records of the quantity and quality of student presentations.	• Department will review notebook pages and rubric graded reports • Department will review quantity and quality of external student presentations
5b. Students will learn research methods by undertaking extensive research. (BA MAJORS)	• Courses: CHEM 376 • Research experiences	• Copies of lab notebook pages and final report (rubric-graded) in 375.	• Department will review notebook pages and rubric graded reports
6. Students will be trained to a high level such that they can successfully obtain competitive positions in graduate schools, professional schools, secondary education and industry.	• Entire curriculum	• Track employment rates, placement rates to graduate school and professional schools and summer research positions. • Alumni surveys	• Department will evaluate placement of our graduating students and results of alumni surveys • Periodic review by ACS for programmatic approval

Timeline

ACS test results will be collected and assessed each year.
CHEM 376 and 476 reports and rubrics, oral exam rubrics will be assessed in alternate even years.
Lab observation reports from CHEM 216, CHEM 376 and 476, notebook pages from 376 and 476 and capping papers will be assessed in alternate odd years.
Chair will collect information on career paths of graduating seniors, external research presentations and publications each year.
Alumni surveys will be collected by Institutional Research and assessed by the department every five years.
Early in summer, department will meet to evaluate all collected material and prepare a brief report including any actions required.