Mission Statement

The Department of Chemistry and Food Science at Framingham State University is committed to providing our graduates with an excellent, comprehensive undergraduate education in chemistry and/or food science coupled with a strong general education component. We strive to engage and challenge students in their journey with a strong foundation in chemistry and/or food science thus producing scientifically literate graduates. Within our courses and laboratories, we promote active participation, foster critical understanding, and introduce safety and ethical issues. The Department of Chemistry and Food Science is unique in that it offers strong majors in both Chemistry and Food Science. The programs complement each other, producing Food Science majors with an exceptionally strong background in chemistry and providing Chemistry majors with the opportunity to take electives in more applied areas such as food chemistry, food engineering, and food analysis. Undergraduate research opportunities are also enhanced by the combination of these program areas. One of the three chemistry concentrations is approved by the American Chemical Society (ACS); the other chemistry concentrations may be taken along with a minor. The strength of these programs is clearly indicated by the excellent graduate school placement and achievement records and by the employment opportunities enjoyed by Department graduates.

Learning Objectives

1. An understanding of the major areas of Food Science and Chemistry including organic, analytical, physical, inorganic, biochemistry and food chemistry.
2. An ability to formulate research questions, design and carry out experiments, and analyze and interpret self-generated experimental data.
3. Knowledge of the supporting disciplinary skills such as mathematics, physics, computer science and biology.
4. An ability to communicate complex technical information in clear and concise written and oral format(s).
5. An ability to competently use modern instrumentation for the acquisition of information on chemical and food substances, appropriate to the degree.
6. An understanding of the impact of chemistry and food science in a global and societal context.
7. A strong proficiency in safe and environmentally responsible practices when handling chemicals in the laboratory and workplace.
8. A broad molecular view of the world that promotes career choices and professional pursuits in a science-related career and/or a graduate or professional program.

Year One (AY 2010 – 2011)

1. After noticing a continued decline in the math skills of students enrolled in foundation courses CHEM 107 and CHEM 108 over a several year period, math co- and pre-requisites were examined for these courses. There was a demonstrated correlation between student placement into a non-credit bearing math course and failure of CHEM 107. The following curriculum changes were put forth, to take place in the AY 2011 – 2012: CHEM 107 co-requisite is placement in to a math course at the level of MATH
123, College Algebra, or higher. CHEM 108 pre-requisite is a passing grade in MATH 123, College Algebra, or a higher-level math course.

2. Assessment to fully probe the nature and magnitude of student learning in the laboratory component of the foundation sequence CHEM 107 and CHEM 108 was monitored using a laboratory practical examination. The laboratory practical was to be scaled up to include all laboratory sections of CHEM 107 during the fall 2011 semester.

**Year Two (AY 2011 – 2012)**

1. Assessment tool of the laboratory practical examination was administered to all laboratory sections of CHEM 107.

2. A pretest aimed at assessing baseline graphing abilities was implemented for all CHEM 108 students. Graphical interpretation, generation and analysis were areas of significant weakness indicated by preliminary analysis of previous years’ lab practical assessments.

3. Assessment of Mid-Program Students was implemented. The department had not previously had a formal plan for assessing students at the mid-point of their chemistry or biochemistry degree program. The same lab practical given to CHEM 108 students at the end of the course was administered to students taking CHEM 321, Instrumental Analysis.

4. Assessment of capstone experience continued to be refined.
   a. In addition to the oral and written reports presented by students completing CHEM 497 and CHEM 498, Chemical Research 1 and 2, students were required to prepare a portfolio including progress reports and relevant literature searches.
   b. Changes were made (as suggested by Susan Chang, Director of Assessment) to the tool used by faculty for assessment of student oral research presentations

5. Prepared assessment report

**Year Three (AY 2012 – 2013)**

1. Graphical interpretation, generation and analysis still proved to be areas of significant weakness indicated by preliminary analysis of previous years’ laboratory practical assessments. An additional graphing laboratory was included in the laboratory experience of CHEM 107 fall 2012 semester.

2. A study commenced to look at indicators for success in CHEM 107 and CHEM 108. Data compiled includes final grades in the foundation courses, and math, reading and critical skills SAT component scores. Analysis is underway to determine if a link exists between the final grades and component scores.

3. Another studied commenced to determine if success in CHEM 301, Biochemistry I, can be correlated to success in CHEM 107 and CHEM 108. This data is being collected to determine if the prerequisite for CHEM 301 requires modification.

4. Continue to assess, and as needed refine, the capstone experience.

5. Begin exit interviews of graduating seniors.

6. Prepare assessment report

**Year Four (AY 2013 – 2014)**
1. A thorough analysis of the laboratory practical exams administered for CHEM 107 and CHEM 108 administered over previous semesters will be undertaken during the spring 2014 semester.

2. Administer alumni survey; initial cohort will focus on students graduating within the past five years.

3. Prepare assessment report

Year Five (AY 2014 – 2015)
Evaluation of the assessment measures will allow the department to determine areas of strength, as well as deficiencies. Corresponding changes to the curriculum can be implemented.