This document describes the essential steps to the Chemistry Ph.D. Formal coursework advances the student’s general knowledge and develops necessary expertise for the desired area of research. Our core curriculum and electives provide modern instruction for graduate students with a wide range of research interests. The essence of the degree is the conduct of cutting-edge research in chemistry. The preparation and defense of research proposals is integral to the training. Effective communication of results is essential to scientific research.

The Ph.D. in Chemistry must include:

a. 21 credits of graduate coursework by the end of the fourth semester; see details below
b. 12 credits of Ph.D. research (CHEM 898 pre-candidacy, CHEM 899 post-candidacy; note that these credits do not count toward the 21 credits of graduate coursework)
c. 2 credits of seminar coursework (CHEM 889 series; note that these credits do not count toward the 21 credits of graduate coursework)
d. Oral defense of a written research proposal on the candidate’s dissertation and oral evaluation of general chemistry knowledge as part of advancement to candidacy by May 31 of the second year of graduate study

e. Preparation and oral defense of a publication-quality dissertation that advances the field

I. Details of coursework requirements:

a. At least 12 of the 21 credits of coursework must be in courses numbered 600 or higher. This formal coursework establishes the intellectual foundation for the proposed area of specialization. Students may fulfill this requirement by selecting from the frequently taught courses, listed below. (Advanced Special Topics Courses may be used to fulfill this requirement.)

CHEM601 (Advanced Inorganic Chemistry I)
CHEM602 (Advanced Inorganic Chemistry II)
CHEM608 (Organometallic Chemistry)
CHEM623 (Optical Methods)
CHEM624 (Separation Methods)
CHEM625 (Electrochemical Methods)
CHEM637 (Atmospheric Chemistry)
CHEM641 (Organic Reaction Mechanisms)
CHEM647 (Organic Synthesis)
CHEM684 (Thermodynamics)
CHEM705 (Nuclear Chemistry)
CHEM723 (Marine Geochemistry)
CHEM687 (Statistical Mechanics)
CHEM690 (Quantum Chemistry I)
CHEM691 (Quantum Chemistry II)
CHEM689 (Structure and Bonding)
BCHM671 (Protein Chemistry & Enzymatic Catalysis)
BCHM673 (Regulation of Metabolism)
BCHM674 (Nucleic Acids)
BCHM675 (Biophysical Chemistry)

b. Students are required to take CHEM 611 (Professional Skills for New Graduate Students, 1 credit), and CHEM 612 (Scientific Presentations, 1 credit) in their first year in the program.
c. The remaining 7 credits may be chosen from courses numbered 400 or higher in chemistry, biochemistry, or in fields related to the proposed area of concentration such as biology, physics, materials science and engineering, and meteorology. Students are encouraged to take those classes best suited for developing a firm foundation for their research efforts.

**Students must have completed 15 credits and have at least a 3.0 GPA at the end of the second semester. Other requirements for remaining in good standing in the program can be found on the Departmental web site:**

As described in the Graduate Catalog, GPAs are calculated without considering +’s and –’s:
http://www.gradschool.umd.edu/catalog/academic_record.htm#6

**II. Additional information:**

a. The required courses for the undergraduate degree in chemistry (CHEM 401, 425, 481, 482, 483, 484) cannot be used to fulfill the course requirements for an advanced degree in chemistry.

b. Entering students who have performed graduate-level studies at other institutions may request a waiver of graduate course requirements through the Associate Chair upon completion of at least one semester in the program in good standing.

c. Entering students are advised about course selection during graduate student orientation. Continuing students select graduate courses upon consultation with their Ph.D. advisor and mentoring committee.

Revised April, 2010