THE UNIVERSITY OF NORTH CAROLINA AT ASHEVILLE
FACULTY SENATE

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Statement of Faculty Senate Action:

APC Document 36 **Add CHEM 223, 419, 434, 438, 439, 446**

Effective Date: Fall 2016

1. Add: On page 102, new course, **CHEM 223:**

223 Foundations of Analytical Chemistry (3)
A course that focuses on the systematic study of chemical analysis using instrumental methods. Topics include equilibria and analysis of acids and bases, spectroscopy, chromatography, and mass spectrometry. Prerequisites: CHEM 145, 233. Spring.

2. Add: On page 104, new course, **CHEM 419:**

419 Nanochemistry (3)
A course that focuses on the study of the most common types of nanomaterials with the emphases on synthesis, chemical modification, and characterization of their structures in the nanometer scale. The concepts include surface, size, shape, self-assembly, defects, and real world applications. An examination and analysis of the current literature will be expected. Prerequisites: CHEM 233. Fall.

3. Add: On page 104, new course, **CHEM 434:**

434 Mechanistic Organic Chemistry (3)
Designed specifically for science majors or pre-health students interested in how organic reactions happen. The concepts of synthetic organic chemistry and how reactions occur mechanistically. An examination of the current literature will be required of students to stay up-to-date on the current research topics in the area of synthetic and mechanistic organic chemistry. At the end of the course, students will be expected to observe a reaction and propose a reasonable determination of the mechanistic process through which the reaction proceeds. An emphasis will be placed on the following topics: electrocyclic, cycloaddition, and sigmatropic reactions, migrations, rearrangements, photochemistry, and heterocycles. Prerequisites: CHEM 232 and 233. Spring.

4. Add: On page 105, new course, **CHEM 438:**

438 Quantum Spectroscopy (3)
A course that focuses on the study of atomic and molecular spectroscopy and spectroscopic methods, with emphasis on fundamental physical and quantum principles and instrument design. Topics include infrared, Raman, microwave, ultraviolet-visible, fluorescence, nuclear magnetic resonance, x-ray and vacuum spectroscopic techniques. Prerequisites: CHEM 233, 331 and PHYS 222 or 231. Fall.

5. Add: On page 105, new course, **CHEM 439:**

439 Gas Phase Kinetics: Atmospheric Chemistry (3)
An introduction to analysis of the chemical reactivity and physical structure of matter, the mathematical models describing matter, and the methods of characterizing and measuring properties of matter related to atmospheric chemistry. This analysis of atmospheric chemistry will use advanced kinetics and thermodynamic principles to understand the past, present and future issues related to the global atmosphere. In addition, students will learn to discuss the relationship of chemistry to society and to their own lives (*i.e.*, discuss the character of chemistry as a humanistic activity that results in the application of these principles to their profession, either in chemistry-related fields, in teaching, or continuing in graduate or professional schools. Prerequisites: CHEM 223, 233, 331. Fall.

6. Add: On page 105, new course, **CHEM 446:**

446 Medicinal Chemistry (3)
Designed specifically for science majors or pre-health students interested in drug discovery and pharmaceutical development, this course examines how medicinal chemists design and synthesize drug candidates to meet FDA requirements for efficacy and safety, and the path of a drug from development to patient administration. Emphasis will be placed on the following topics: drug-receptor/enzyme binding, SAR, PK, ADME, patenting of IP, and the ethical aspects of pharmaceutical development. Prerequisites: CHEM 233, 323. Fall.

Impact Statement: These new courses are expected to be offered once per academic year. At 3 contact hours each semester, this represents 18 new faculty contact hours required to deliver these courses. This increase in hours comes with a simultaneous reduction in contact hours for lecture courses from other deleted courses (see attached staffing table). As lecture courses, there is no impact on Department of Chemistry budget. As these are new courses in the catalog, there will be no negative impact on current students who have declared a major.

Rationale: Teaching and learning in chemistry at the upper level is evolving to focus on the more relevant chemistry concepts that occur at the intersections of the traditional silos of the 5 foundational chemistry disciplines, moving away from a traditional I,II sequence for classes (such as Physical Chemistry I and Physical Chemistry II).

We therefore are adding CHEM 223 as a new course that serves as a foundation course for Analytical Chemistry. There is a need to add this courses because the content in courses in the current curriculum, CHEM 237 (Analytical Chemistry) and 332 (Instrumental Analysis), neither of them serve the requisite foundation content and credit hours necessary for a foundation course. However, a foundational course in Analytical chemistry was offered in a previous catalog, thus allowing us to revert to a previously used course number for CHEM 223.

And by having students take upper-level courses from a menu of course options that each build upon multiple foundation courses, such as CHEM 419, 434, 438, 439, and 446, students will achieve an in-depth understanding of multiple foundational areas with fewer required courses in the major. The upper-level course on spectroscopy was taught in a previous catalog, thus allowing us to revert to a previously used course number for CHEM 438.