

GRADUATE COUNCIL CURRICULUM REPORT #1, OCTOBER 2013

I. 400-level courses [for graduate credit]

New Courses:

- 1) College of Engineering
Electrical, Computer and Biomedical Engineering

ELE 425 Renewable and Efficient Electric Power Systems (3)

This course introduces students to renewable and efficient electrical power systems, ranging from the basic concepts of electric power engineering to renewable energy systems such as wind and solar systems. Pre: ELE 212 or 220 or OCE 206, and PHY 204, and MTH 244 or 362; or permission of instructor.

II. 500/600-level courses

Changes:

- 1) Graduate School of Oceanography

OCG 555 Modern Oceanographic Imaging and Mapping – course to be cross-listed with OCE 555

- 2) College of Nursing

NUR 601 Foundations of Nursing Science – course to be deleted

NUR 660 Philosophical Foundations of Healthcare Research – course title changed to “Philosophical and Theoretical Bases of Health Research” and course description changed to “Presentation of the philosophical and theoretical bases of contemporary healthcare research”

New Courses

- 1) Graduate School of Oceanography

OCG (GEO, CVE) 519 Marine Environmental Organic Chemistry (3)

Physico-chemical properties of organic compounds, their transformations and environmental fluxes with a focus on marine topics. Offered alternate years. Pre: graduate standing or permission of instructor.

- 2) College of Human Science and Services
Communicative Disorders (Speech/Language Pathology)

CMD 586X Multisensory Instruction in Language and Literacy (3)

Intervention for reading, spelling, and written expression based on principles of Orton Gillingham approach for working with individuals with dyslexia and other learning disabilities. Pre: matriculated graduate student in Speech-Language Pathology or permission of instructor.

- 3) The Graduate School
Interdisciplinary Neuroscience Program

NEU 504 Neuroethics (1)

Neuroethics is the study of ethical issues regarding research in neuroscience. Students will learn the implications of neuroscience research for human self-understanding, ethics and policy. Pre: graduate standing or permission of instructor.

Additional Curricular Matters

- 1) College of Arts and Sciences
Department of Chemistry

Proposed Graduation Requirements

The coursework requirements for both Ph.D. and thesis M.S. degrees will be compressed. As we are proposing to compress the core courses in the four classic areas of chemistry into three interdisciplinary courses, the number of courses required for a Ph.D. and M.S. degree could be compressed accordingly.

Ph.D. Degree

- 1) Complete CHM 500, 505, 506 and 507.
- 2) Complete a minimum of six credits of additional classroom coursework.
Graduate-level courses taken in other departments require pre-approval by the Graduate Curriculum Committee.

- 3) Pass Qualifying Exams, complete Thesis Proposal, and pass Comprehensive Exam.
- 4) Earn three seminar credits as specified in CHM 642, 643, & 644.
- 5) Complete a total of 72 credit hours of work, complete the residency requirement, and write and orally defend a dissertation.

M.S. Degree (Non-Thesis Option)

- 1) Complete CHM 500, 505, 506 and 507.
- 2) Complete a minimum of 12-15 additional credits of classroom coursework. Graduate-level courses taken in other departments require pre-approval by the Graduate Curriculum Committee.
- 3) Pass a Comprehensive Exam. This exam shall be in a written format and will be a minimum of four hours in length. The exam shall be written by the student's advisor in consultation with the Department and will cover the coursework taken by the student. This exam will be taken near the completion of the student's formal coursework.
- 4) Earn one seminar credit, CHM 642.
- 5) Complete five to eight credit hours of directed research (CHM 551 and 552).

OVERARCHING STATEMENT (from the Chemistry Department)

Development of an Interdisciplinary Curriculum for First-Year Graduate Students in Chemistry

Chemistry is a richly interdisciplinary undertaking. To enable our students to make new discoveries and invent new applications, we must inculcate them with a rigorous understanding of fundamental chemical principles, delivered through courses (firmly rooted in the interdisciplinary nature of the field)/(that recognize/exploit the unavoidably interdisciplinary nature of the field). The collection of courses we propose represents a unified effort to immediately immerse the first-year graduate students in this fully interdisciplinary practice of chemistry. The courses are rigorous, emphasizing the integration of fundamental principles as the operational basis for chemistry, but they are also charged with

this interdisciplinary flavor. The goal is to accelerate our students' ability to develop a grounded, sophisticated understanding of core chemical principles and to apply these fundamental concepts to modern, translational research topics.

Rather than compartmentalizing our courses into the traditional divisions of chemistry, we propose to present the material from the beginning in a way that makes clear our expectation—and the necessity of modern chemical research—that the students be able to integrate their existing knowledge so that they can cope with cross-disciplinary research. For the purpose of curriculum delivery, we will teach the core curriculum in three courses, though there will be thematic overlap between them. All incoming graduate students will be required to take these courses concurrently, so they represent a comprehensive, unified curriculum in modern chemistry.

CHM 505 – Chemical Synthesis and Mechanism

- Molecular structure and reaction mechanisms
- Controlling the reactivity of complex molecules
- Organometallic complexes and catalysis
- Synthesis and design of organic polymers
- Synthesis and manipulation on the nanoscale

CHM 506 – Fundamentals of Chemical Analysis

- Scientific development of chemical analysis
- Physical principles of measurement
- Small molecule analysis.
- Analysis of extended structures.
- Analysis of multicomponent / multiphase systems.

CHM 507 – Chemical Structure and Material Property

- Scientific development of the physical basis of chemical structure and reactivity
- Physical principles of chemical structure calculation and chemical reactivity prediction

- Theoretical analysis of small molecule structure and reactivity/energetics
- Theoretical analysis of macro- and extended-scale structures and reactivity/energetics