



Graduate Courses in Chemistry, Spring 2022

BIOMATERIALS • BIOPHYSICAL • COMPUTATIONAL
INORGANIC • ORGANIC • SCIENCE EDUCATION

- The Chemistry Department at Rutgers Newark (<http://chemistry.rutgers.edu/>) will offer Graduate Courses in Biomaterials, Biophysical, Computational, Organic, Inorganic Chemistry and Science Education in Spring 2022.
- **When/where:** Courses will be held at the Rutgers-Newark campus in Smith Hall Rm. 240/241 (SMT-240 / SMT-241) or 110 Warren Street Rm 311 (WRN-311).
- Register [HERE](#) or scan the code



Main Group Metal Chemistry (26:160:577)

MONDAYS 6:00 - 9:00 PM

Smith Hall Room 240

Instructor: Prof. Frieder Jäkle

FJAEKLE@NEWARK.RUTGERS.EDU

This inorganic chemistry course will cover the basics as well as recent advances and developments in main group chemistry. Special emphasis will be given to the synthesis, properties, and reactivity of main group organometallic compounds. Several topics of intense current research such as the development of powerful Lewis acids, the stabilization of low-valent metal complexes, the realization of multiple bonding in main group chemistry, the synthesis of inorganic/organometallic polymers and luminescent materials, and applications of main group organometallic species in homogeneous catalysis will be discussed.

Biophysical Chemistry (26:160:551)

TUESDAYS 6:00 - 9:00 PM

Smith Hall Room 241

Instructor: Prof. Colin Kinz-Thompson

COLIN.KINZTHOMPSON@RUTGERS.EDU

This physical chemistry course covers the application of physics and chemistry-based theories and techniques to the study of biological systems. No previous biological knowledge or course work is necessary. We will cover the physics governing the structure, function and dynamics of different biomolecules, and then learn about several different techniques capable of measuring these properties. Additionally, we will emphasize the role of mathematical modeling in interpreting such experiments.

Advanced Organic Chemistry (26:160:511)

WEDNESDAYS 6:00 - 9:00 PM

Smith Hall Room 241

Instructor: Prof. Stacey Brenner-Moyer

SEB244@NEWARK.RUTGERS.EDU

This physical organic chemistry course builds upon the basic organic reaction mechanisms taught in undergraduate and introductory graduate coursework. We will learn about the experimental tools employed to derive the fundamental organic reaction mechanisms that have come to be accepted as fact, and we will evolve our understanding of organic reaction mechanisms beyond the simplified versions presented in undergraduate textbooks. Specifically, the physical chemistry experimental tools to be emphasized include molecular orbital theory, kinetic data, linear free-energy relationships, and isotope



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effects. We will learn how these data are integrated to provide comprehensive, self-consistent, and sophisticated models for the reactivity of organic molecules.

Hybrid Biomaterials (26:160:592)

THURSDAYS 6:00 - 9:00 PM

Smith Hall Room 240

Instructor: Prof. Fei Zhang

FEI.ZHANG@NEWARK.RUTGERS.EDU

Functional biomaterials with more than one chemical component are emerging research topics that involve the fundamentals of chemistry, biology, physics, material science, and nanotechnology. Such materials generally exhibit unique structures at the molecular level and their heterogeneity properties promise broad applications such as biosensing, bioimaging, nanomedicine, tissue engineering, etc. This course introduces the fundamentals of biomaterials and nanotechnology, focusing on selected research topics including biomineralization, design of artificial photo synthesis materials, heterogenous hydrogels, and the development of synthetic cells. Upon successful completion of this course, students will acquire the knowledge of biomaterials, practice literature presentation skills, learn scientific assay writing, and have a holistic view of multidisciplinary research activities.

Quantum Mechanics (26:160:561)

THURSDAYS 6:00 - 9:00 PM

Smith Hall Room 241

Instructor: Prof. Neepa Maitra

NM169@NEWARK.RUTGERS.EDU

Graduate Quantum Mechanics covers fundamental concepts, techniques, and applications of quantum mechanics, including formalism, angular momentum, symmetries, semiclassical methods, and perturbation theory. The class covers the first 5 chapters of Sakurai and Napolitano's Modern Quantum Mechanics book and will review the mathematical tools needed to successfully tackle the subject. An undergraduate course in quantum mechanics, or physical chemistry 2 or equivalent, and a good background in undergraduate linear algebra, are strongly recommended as pre-requisite.

Special Topics in Chemistry: Science Education (21:160:405/26:160:596)

Counts toward the 60-credit degree requirement but not the 24-credit chem course requirement

MONDAYS/THURSDAYS 1:00 - 2:20 PM

110 Warren St, Room 311

Instructor: Prof. Courtney Sobers

CJ.SOBERS@RUTGERS.EDU

This course will cover the basics of scholarship of teaching and learning (SoTL) and discipline-based education research (DBER) as it relates to the physical and life sciences, in addition to topics of current interest. The course will provide an overview of science education and SoTL/DBER research, including research ethics and methods. Special emphasis will be placed on inclusive practices, evidence-based pedagogy, and grading/assessments. Additional topics may include accessibility in science, comparison of lecture versus laboratory courses, syllabus design, course evaluations, and digital pedagogy.