

Fall 2021 Course Advising Grid

Shaded cells are required. "O" indicates optional courses. No selections by faculty means varies by student interests.

	464	468	470	601	610	628	629	631	642	644	646	648	658	689	Other Courses
Balbuena															
Banerjee				O											
Barondeau						O				O					BICH 603
Batteas								O					O		MSEN 601, PHYS 607
Begley															
Bluemel		O													
Burgess					O								O	O	
Dunbar															
Fang					O										
Folden															
Gabbai					O	O	O		O		O				
Gladysz					O				O		O				
J. Grunlan															MEEN 607
M. Grunlan															
Gutierrez							O						O		PHYS 607
Hilty													O		
Laganowsky															BICH 603
Lindahl				O											BICH 603
Liu							O								
Michaudel												O			
Nippe															
North								O			O				
Ozerov					O		O		O		O				
Pellois															
Pentzer			O		O										
Powers					O		O		O		O				
Raushel															
Sacchettini															
Sczepanski					O					O				O	BICH 603
Sheldon		O		O				O							
Singleton					O										
Son		O													
Tabor															
Thomas															
Wand															
Watanabe					O					O					
Wooley															
Yan				O											
Yennello															PHYS 625
Zhang				O	O								O		
Zhou		O				O	O		O						

464 Nuclear Chemistry: Credit 3. Properties of the nucleus; radioactivity; decay kinetics; nuclear masses; theory of radioactive decay; nuclear reactions; radiochemistry; nuclear energy; hands-on demonstrations; applications to non-nuclear problems.

468 Materials Chemistry: Credit 3. Structure, bonding and reactivity of inorganic solids developed from a perspective emphasizing models of chemical bonding, symmetry and electronic structure; methods for characterizing extended periodic solids; descriptions of band structure and contrasts to molecular orbital theory; synthetic routes, quantum confinement and finite size effects of relevance to nanoscale materials.

470 Industrial Chemistry: Credit 3. Applications of organic and inorganic chemical reactions in the manufacture of commercial products; chemistry of petroleum refining and petrochemical processing; industrial polymerization processes; commodity and fine chemical production; influence of kinetics and thermodynamics on economics of industrial chemical production; pollution abatement technology.

601 Analytical Chemistry: Credit 3. Fundamentals of chemical instrumentation. Modular approach to instrumental methods of chemical analysis; modules to be covered include digital electronics, modern optics, basic quantification and signal-to-noise enhancements.

610 Organic Reactions: Credit 3. Introduction to mechanisms and scope of the basic organic reaction types as applied to major functional groups.

628 Coordination & Bioinorganic Chemistry: Credit 3. Structure and reactivity of coordination compounds; reactions of metal ions with small biomolecules and the reactions of toxic metal ions; role of metal ions in biological systems including the function of metal ions in enzymes.

629 Main Group Chemistry: Credit 3. Chemistry of the ns and np elements of the periodic table and the noble gases including the organometallic chemistry of these elements.

631 Statistical Thermodynamics: Credit 3. Methods of statistical mechanics based primarily on Boltzmann statistics; approach to thermodynamics through partition function; statistical concept of entropy.

642 Organometallic Chemistry & Homogeneous Catalysis: Credit 3. Synthesis, structure and reactivity of organometallic compounds; elementary processes for general and radical reactions, mechanism of reactions at metal centers and applications to homogeneous catalysis

644 Natural Product Biosynthesis: Credit 3. Survey of the chemical reactions occurring in living systems, describe the experimental methods used to study these reactions and examine the biosynthesis of the major families of natural products; emphasis on the mechanistic chemistry of the biosynthetic pathway.

646 Physical Organic Chemistry: Credit 3. A detailed introduction to the theory and principles of organic chemistry; bonding and structure in organic chemistry, stereochemistry, reactive intermediates in organic chemistry and transition state theory; kinetics and thermodynamic approaches.

648 Principles of Quantum Mechanics: Credit 3. Classical mechanics and development of wave mechanics; application of wave mechanics to special chemical problems.

658 Molecular Modeling: Credit 2. An introduction to molecular modeling with an emphasis on quantum level calculations. Lectures will cover the basic theory behind the calculations and lab work will focus on the practical application of modern computational chemistry codes.

689 Biomedical Chemistry: *Special Topic:* The organic chemistry of biological pathways.

BICH 603 Principles of Biochemistry & Biophysics: Credit 3. A modern quantitative, analytical and model-building-based approach to expand knowledge of the biochemical and biophysical properties of macromolecules found in living matter, including proteins, lipids, carbohydrates and nucleic acids.

MSEN 601 Fundamental Materials Science and Engineering: Credit 3. Fundamentals of microstructure- properties and relationship of materials. Topics will include: electronic and atomic structure of solids, structure of crystalline materials, imperfections in crystalline materials, introduction to dislocation theory, mechanical properties, fundamental thermodynamics of materials, phase equilibria and diagrams, diffusion, and kinetics of phase transformations.

PHYS 607 Statistical Mechanics: Credit 3. Classical statistical mechanics, Maxwell-Boltzmann distribution, and equipartition theorem; quantum statistical mechanics, Bose-Einstein distribution and Fermi-Dirac distribution; applications such as polyatomic gases, blackbody radiation, free electron model for metals, Debye model of vibrations in solids, ideal quantum mechanical gases and Bose-Einstein condensation; if time permits, phase transitions and nonequilibrium statistical mechanics.

PHYS 625 Nuclear Physics: Credit 3. Nuclear models, nuclear spectroscopy, nuclear reactions, electromagnetic properties of nuclei; topics of current interest.