

Chemistry

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Course Descriptions:

Chem J418/J518 Environmental Chemistry (3 cr) Chemistry of atmosphere, soil, and water; pollution monitoring and remediation; treatment of waste in the environment. Additional projects/assignments reqd for grad cr. Prereq: Chem 253, and Chem 275 or 277, or perm. (Spring only)

Chem J435/J535 Principles of Chemical Instrumentation (2 cr). Practical theory and application of modern analog/digital electronics and small computers to chemical measurement and control systems. Registration for Chem 535 requires completion of an additional term paper or other assignment. One hr of lec and one 3-hr lab a wk. Prereq: Chem 253 or 454, Phys 212, or perm. (Fall only)

Chem 441 Chemical Literature (1 cr). Survey of important chemistry reference works and periodicals; use of these sources. Prereq: perm. (Spring only)

Chem J453/J553 Separation Theory and Chromatography (2 cr). Gas and liquid chromatography and related fields. Students enrolled in Chem 553 are required to complete additional written assignments. Prereq: Chem 306.

Chem 454 Instrumental Analysis (4 cr). For students in chemistry and allied fields. Techniques in operating new and specialized instruments for qualitative and quantitative analysis and analytical methods of an advanced nature. Three lec and one 4-hr lab a wk. Prereq: Chem 253 and 305. Prereq or coreq: Chem 306. (Spring only)

Chem 455 Survey of Analytical Chemistry (3 cr). Fundamentals of modern analytical chemistry. Open only to chemistry M.S. and Ph.D. students. Cr is not allowed in both Chem 454 and 455. Prereq: Chem 306 and perm.

Chem J456/J556 Molecular Spectroscopy (3 cr). Interpretation of IR, UV, NMR, and mass spectra. Registration for Chem 556 requires completion of additional assignments. Prereq: Chem 306 or perm.

Chem 463-J464/ID-J564 Inorganic Chemistry (3 cr). WSU Chem 507. Principles, complex ions and coordination compounds, theory of acids and bases, bonding theory, non-aqueous solvents, familiar elements and their relationship to the periodic table. Additional projects/assignments reqd for grad cr. Prereq for 463: Chem 305 or perm. Prereq or coreq for Chem J464/J564: Chem 463, or 466, or perm. (Chem 463: fall only. Chem 464: spring only)

Chem 465 Inorganic Chemistry Laboratory (1 cr). Lab to accompany Chem 464. One 3-hr lab a wk. Coreq: Chem 464. (Spring only)

Chem 466 Survey of Inorganic Chemistry (3 cr). Fundamentals of modern inorganic chemistry. Open only to chemistry M.S. and Ph.D. students. Cr is not allowed in both Chem 463 and 466. Prereq: Chem 306 and perm.

Chem J467/J567 Inorganic Spectroscopy (2 cr). Applications of spectroscopic methods to investigation of inorganic and organometallic compounds; topics include multinuclear and multidimensional NMR, IR and Raman, EPR, mass spectroscopy, Mossbauer spectroscopy, and x-ray crystallography. Additional projects/assignments reqd for grad cr. Prereq: Chem 306 and 454. (Alt/yrs)

Chem 468 Organometallic Chemistry (2 cr). Structure, bonding, and reaction chemistry of organotransition metal compounds; applications to homogeneous catalysis. Additional projects/assignments reqd for grad cr. Prereq: Chem 305-306. Prereq or coreq: Chem 463 or 466 or perm. (Alt/yrs)

Chem J472/J572 Rational Design of Pharmaceuticals (3 cr). Synthetic chemistry necessary for design and preparation of medicinal agents, and mechanistic chemistry germane to action of pharmaceuticals. Graduate students are required to write an original research proposal on a topic related to drug discovery. Prereq or coreq: Chem 473, 476 or perm. (Alt/yrs)

Chem 473 Intermediate Organic Chemistry (3 cr). Theories and mechanisms of organic chemistry. Prereq: Chem 372. Prereq or coreq: Chem 306. (Fall only)

Chem 476 Survey of Organic Chemistry (3 cr). Fundamentals of modern organic chemistry. Open only to chemistry M.S. and Ph.D. students. Cr is not allowed in both Chem 473 and 476. Prereq: Chem 306 and perm.

Chem 484 Biochemistry Laboratory (2 cr). See MMBB 484.

Chem 491 (s) Research (1-6 cr, max 6). Submission of a report of the research done for placement in the permanent dept files is required. Prereq: perm of dept.

Chem 495 Thermodynamics and Kinetics (3 cr). Prereq: Chem 306 or equiv. (Fall only)

Chem 496 Survey of Physical Chemistry (3 cr). Fundamentals of modern physical chemistry. Open only to chemistry M.S. and Ph.D. students. Cr is not allowed in both Chem 495 and 496. Prereq: Chem 306 and perm.

Chem 497 (s) Practicum in Tutoring (1 cr, max 2). Tutorial services performed by advanced students under faculty supervision. Graded P/F. Prereq: perm. Chem 498 (s) Internship (cr arr). Prereq: perm.

Chem 499 (s) Directed Study (cr arr). Prereq: perm.

Chem 500 Master's Research and Thesis (cr arr).

Chem 501 (s) Seminar (cr arr). Prereq: perm.

Chem 502 (s) Directed Study (cr arr). Prereq: perm.

Chem 504 (s) Workshop (cr arr). Prereq: perm.

Chem 506 Introduction to Teaching and Research Skills (2 cr). Skills required of teaching assistants in laboratory, recitations, office hours, help sessions; skills required for research; use of library; introduction to faculty research. Graded P/F. Prereq: perm. (Fall only)

Chem 507 (s) Topics in Physical Chemistry (1-9 cr, max 9). Selected topics in modern physical chemistry such as computational quantum mechanics, statistical mechanics, nonequilibrium thermodynamics, group theory, molecular dynamics, theory of condensed phases, or other topics not covered in regularly scheduled courses. Prereq: Chem 495, 496, or perm.

Chem 509-510 Advanced Physical Chemistry (3 cr). Application of quantum theory to chemical bonding, molecular spectroscopy, and molecular structure. Prereq: Chem 306, 495, 496, or perm. (Chem 509: spring only. Chem 510: fall only)

Chem 513 Nuclear Chemistry (2 cr). Intro to artificial and natural radioactivity, tracer methods, and atomic energy. Prereq: Chem 306 or Phys 305 or perm. (Alt/yrs)

Chem 518 Environmental Chemistry (3 cr). See Chem J418/J518.

Chem 535 Principles of Chemical Instrumentation (2 cr). See Chem J435/J535.

Chem 541 Biochemistry (3 cr). See MMBB 541.

Chem 542 Biochemistry and Molecular Biology (3 cr). See MMBB J442/J542.

Chem 550 Radioanalytical Chemistry (2 cr). Fundamental concepts of radiochemistry, including the principles of radioactive decay processes and counting techniques; in-depth treatment of radioanalytical techniques, especially neutron activation and isotope dilution methods; decay processes as sources of x-rays; the use of synchrotron radiation in analytical chemistry. Prereq: Chem 454, or 455, or perm. (Alt/yrs)

Chem 551 Electronic Spectrometry (2 cr). A brief review of fundamental concepts, including electronic transitions, optical properties of materials, and laws of radiation absorption; detailed coverage of instrumentation used for ultraviolet and visible absorption spectroscopy, with regard to optical components, overall design strategy, and signal processing; analytical performance related to these aspects and presented from both theoretical and practical standpoints; in-depth coverage of luminescence spectroscopy, including phosphorimetry and fluorimetry; atomic spectroscopy (both flame and plasma-based versions), including principles of operation, instrumental requirements, and analytical application; survey of x-ray absorption and fluorescence spectroscopy. Prereq: Chem 454, 455 or perm. (Alt/yrs)

Chem 552 Analytical Vibrational Spectrometry (2 cr). Introduction to vibrational transitions, optical properties of materials, and laws of radiation absorption and emission (including why they are not always obeyed in practice); detailed discussion of instrumentation used for mid-infrared, near infrared, and Raman spectrometry; illustration of transmission spectrometry with examples including microscopy and spectral imaging, open-path monitoring, and spectroscopy of aqueous solutions and hyphenated techniques; introduction of time- and phase-resolved measurements; detailed coverage of specular reflection, reflection-absorption of thin films, diffuse reflection, attenuated total reflection spectrometry, and remote measurements through optical fibers; discussion of application of near infrared spectroscopy to agricultural commodity analysis and process monitoring. Prereq: Chem 454, 455 or perm. (Alt/yrs)

Chem 553 Separation Theory and Chromatography (2 cr). See Chem J453/J553.

Chem 556 Molecular Spectroscopy (3 cr). See Chem J456/J556.

Chem 557 (s) Topics in Analytical Chemistry (1-9 cr, max 9). Atomic and molecular analytical spectroscopy; modern electrochemical methods; radioanalytical techniques; surface analysis techniques. Prereq: Chem 454, 455, or perm.

Chem 558 Electrochemistry (2 cr). Fundamental concepts of electrochemistry, including the principles of redox processes; in-depth treatment of electroanalytical techniques, especially voltammetric and potentiometric methods; advanced treatment of selected topics, including ultramicro and in vivo electrochemical techniques. Prereq: Chem 454, or 455, or perm. (Alt/yrs)

Chem 561 Advanced Inorganic Chemistry (3 cr). Theoretical approach to the underlying principles of inorganic chemistry; integration of theory and descriptive chemistry. Prereq: Chem 306, 463, 466, or perm. (Alt/yrs)

Chem ID564 Inorganic Chemistry (3 cr). See Chem 463-J464/J564.

Chem ID565 (s) Topics in Inorganic Chemistry (1-9 cr, max 9). WSU Chem 508. Coordination compounds; halogens; less familiar elements; clathrate, interstitial, nonstoichiometric compounds; chemical bonding; inorganic reaction mechanisms. Prereq: Chem 463, 466, or perm.

Chem 567 Inorganic Spectroscopy (2 cr). See Chem J467/J567.

Chem 569 Fluorine Chemistry (2 cr). Brief history of fluorine beginning with its isolation in 1886 through current areas of interest in fluorochemicals; in-depth study of modern synthetic methods of fluorinated compounds and their potential applications today and in the future. Prereq: Chem 463, 466, or perm. (Alt/yrs)

Chem 571 (s) Topics in Organic Chemistry (1-9 cr, max 9). Selected topics from the current literature. Prereq: Chem 473, 476, or perm.

Chem 572 Rational Design of Pharmaceuticals (3 cr). See Chem J472/J572.

Chem 573 Synthetic Organic Chemistry (3 cr). Use of organic reactions in synthesis.
Prereq: Chem 473, 476, or perm. (Alt/yrs)

Chem 590 Doctoral Research Proposal (1 cr). Taken no later than one semester after completion of cumulative exams; required for advancement to Ph.D. candidacy. Includes review of relevant literature and original research proposal describing the student's intended research project.

Chem 600 Doctoral Research and Dissertation (cr arr)