CHEMISTRY (CHM)

CHM 099. Preparatory Chemistry 1. 3 Credit Hours.
A description of atoms and periodicity, structure of the atom, atomic
orbital, the Aufbau principle, combining atoms to make molecules,
bonding-covalent and ionic. Naming compounds and compound ions.
Writing balanced chemical equations. Empirical and molecular formulas.
Composition.
Components: LEC.
Grading: GRD.
Typically Offered: Fall, Spring, & Summer.

CHM 100. History of Chemistry. 3 Credit Hours.
Focuses on the development of the chemical sciences from the early
1700 BC until modern day. An emphasis on placing these scientific
events into context with current societal needs is included.
Components: LEC.
Grading: GRD.
Typically Offered: Fall.

CHM 101. Chemistry And Society. 3 Credit Hours.
The basic principles of chemistry for the non-science major with an
emphasis on understanding the chemistry of the world around us,
especially as it pertains to the choices we make as consumers and as
a society. Integrated themes include energy, the environment, food and
nutrition, health and personal care, and other contemporary societal
issues.
Components: LEC.
Grading: GRD.
Typically Offered: Fall.

CHM 102. Fundamentals of Chemistry II. 3 Credit Hours.
A continuation of Chemistry 101.
Prerequisite: CHM 101.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CHM 103. Chemistry for Life Sciences I (Lecture). 3 Credit Hours.
Essentials of inorganic chemistry as it applies to biological systems.
Designed for (but not limited to) those planning health-related careers.
Lecture, 3 hours.
Corequisite: CHM 105.
Components: LEC.
Grading: GRD.
Typically Offered: Fall.

CHM 104. Chemistry for Life Sciences II (Lecture). 3 Credit Hours.
A continuation of CHM 103, with emphasis on organic and biological
chemistry, including biochemical processes and metabolism. Lecture, 3
hours.
Prerequisite: CHM 103.
Components: LEC.
Grading: GRD.
Typically Offered: Spring.

CHM 105. Chemistry for Life Sciences I (Laboratory). 1 Credit Hour.
Designed for those students in CHM 103 requiring a laboratory course.
Laboratory, 3 hours.
Prerequisite: CHM 103. Or Corequisite: CHM 103.
Components: LAB.
Grading: GRD.
Typically Offered: Fall.

CHM 106. Chemistry for Life Sciences II (Laboratory). 1 Credit Hour.
Designed for those students in CHM 104 requiring a laboratory course.
Laboratory, 3 hours.
Prerequisite: CHM 104. Or Corequisite: CHM 104.
Components: LAB.
Grading: GRD.
Typically Offered: Spring.

CHM 110. Chemical Problem Solving. 3 Credit Hours.
Chemical problem solving strategies to prepare students for more
advanced studies in the sciences. Focusing on basic concepts in
chemistry, chemical problem solving, and mathematical preparation for
future studies.
Components: LEC.
Grading: GRD.

CHM 111. Principles of Chemistry I. 3 Credit Hours.
Fundamental principles of chemical science. The beginning course for
science majors and premedical students. Lecture, 3 hours.
Prerequisite: MTH107. And Co-requisite: MTH108 or 140 or 141 Or
Placement into MTH161 or higher.
Components: LEC.
Grading: GRD.
Typically Offered: Fall, Spring, & Summer.

CHM 112. Principles of Chemistry II. 3 Credit Hours.
Continuation of CHM 111. Lecture, 3 hours.
Prerequisite: CHM 111.
Components: LEC.
Grading: GRD.
Typically Offered: Fall, Spring, & Summer.

CHM 113. Chemistry Laboratory I. 1 Credit Hour.
Laboratory techniques of chemistry. To accompany CHM 111.
Laboratory, 3 hours.
Corequisite: CHM 111 or CHM 121.
Components: LAB.
Grading: GRD.
Typically Offered: Fall, Spring, & Summer.

CHM 114. Chemistry Laboratory II. 1 Credit Hour.
Continuation of CHM 113. Intermediate laboratory techniques and
quantitative analysis. To accompany CHM 112. Laboratory, 3 hours.
Corequisite: CHM 112 or CHM 221.
Components: LAB.
Grading: GRD.
Typically Offered: Fall, Spring, & Summer.

CHM 121. Chemistry For The Biosciences I. 4 Credit Hours.
This is the first course in a three course sequence designed to meet
the needs of Life Science students interested in pursuing professional
education in the health sciences. Topics to be covered in this course
include: basic atomic structure, reaction stoichiometry, gases, chemical
equilibrium, acids and bases, thermodynamics, and chemical kinetics. Co-
registration with a separate recitation section is required.
Prerequisite: MTH107. And Co-requisite: MTH108 or 140 or 141 Or
Placement into MTH161 or higher.
Components: LEC.
Grading: GRD.
Typically Offered: Fall & Spring.
CHM 151. Chemistry for Engineers. 3 Credit Hours.
Fundamental principles of chemistry for engineering students. Not recommended for students that plan to enter Medical School. Lecture, 3 hours.
Prerequisite: MTH 105 or MTH 107. Or Corequisites: MTH 105 or MTH 107.
Components: LEC.
Typically Offered: Fall & Spring.

Typically Offered: Fall, Spring, & Summer.

CHM 221. CHM211 Chemistry for the Biosciences II. 4 Credit Hours.
This is the second course in a three course sequence designed to meet the needs of Life Science students interested in pursuing professional education in the health sciences. Topics to be covered in this course include: electronic atomic structure, basic quantum mechanics, molecular geometry, identification of organic molecules, and interpretation of chemical structures via spectroscopic methods. Co-registration with a separate recitation section is required.
Prerequisite: CHM 221.
Components: LEC.
Grading: GRD.
Typically Offered: Spring.

Typically Offered: Fall.

CHM 300. Emerging Scholars Chemistry Workshop. 1-2 Credit Hours.
A Workshop for Bridge the the Baccalaureate Program Scholars enrolled in CHM 1045and CHM 1046 at Miami Dade College to review course content and work throughchemistry problems
Components: WKS.
Grading: GRD.
Typically Offered: Fall.

CHM 331. Physical Chemistry for Premedical Students. 3 Credit Hours.
Fundamentals of thermodynamics as applied to gases, liquids and solutions; chemical kinetics and other selected topics. Lecture, 3 hours.
Prerequisite: CHM 112, MTH 161, and PHY 102.
Components: LEC.
Grading: GRD.
Typically Offered: Spring.
CHM 360. Physical Chemistry I (Lecture). 3 Credit Hours.
Introduction to physical chemistry including thermodynamics, gaseous and liquid states, solutions, homogeneous and heterogeneous equilibrium. Lecture, 3 hours.
Prerequisites: CHM 112, MTH 162 or MTH 172. Requisite: One Semester of Physics.
Components: LEC.
Grading: GRD.
Typically Offered: Fall.

CHM 364. Physical Chemistry (Laboratory I). 1 Credit Hour.
Representative experiments in physical chemistry. Laboratory, 4 hours.
Prerequisite: CHM 360 or CHM 331. Or Corequisite: CHM 360 or CHM 331.
Components: LAB.
Grading: GRD.
Typically Offered: Fall & Spring.

CHM 365. Physical Chemistry II (Lecture). 3 Credit Hours.
Chemical kinetics, introductory quantum chemistry, molecular spectroscopy.
Components: LEC.
Grading: GRD.
Typically Offered: Spring.

CHM 381. Workshop Leaders in Chemistry I. 1 Credit Hour.
Students engaged in Peer-Led Team Teaching of workshops for groups of CHM 111 and/or CHM 112 students may enroll for this course. May be repeated.
Components: THI.
Grading: GRD.
Typically Offered: Fall & Spring.

CHM 382. Workshop Leaders in Chemistry II. 1 Credit Hour.
Students engaged in Peer-Led Team Teaching of workshops for groups of CHM 111 and/or CHM 112 students may enroll for this course. May be repeated.
Components: THI.
Grading: GRD.
Typically Offered: Fall & Spring.

CHM 391. Chemistry Internship For Credit. 1-3 Credit Hours.
Provides chemistry majors with an opportunity to apply skills learned in coursework within settings outside the university. For example students can work in local schools, assisting instructors and mentoring students. They can also work in companies or government agencies for a defined period of time with clearly delineated goals to expand their expertise and practical knowledge of chemistry. Each enrolled student will be closely mentored by a faculty member.
Components: LEC.
Grading: GRD.
Typically Offered: Fall, Spring, & Summer.

CHM 400. Introduction to Teaching in Chemistry Labs. 1 Credit Hour.
Components: SEM.
Grading: GRD.
Typically Offered: Spring.

CHM 401. Environmental Chemistry. 3 Credit Hours.
Major environmental features of the earth; Role of natural and synthetic chemicals in the environment; Atmospheric and aquatic pollution; Application of acid- base theory and oxidation reduction to environmental problems.
Prerequisite: CHM 201 or CHM 222.
Components: LEC.
Grading: GRD.
Typically Offered: Spring.

CHM 402. Inorganic Chemistry. 3 Credit Hours.
Aspects of chemical bonding, acids and bases, steeochemistry, aromaticity, pericyclic reactions, linear free energy relationships, transition state theory, excited state chemistry, reactive intermediaries, mechanisms of uni- and bi-molecular reactions.
Prerequisite: CHM 202 and CHM 360.
Components: LEC.
Grading: GRD.
Typically Offered: Fall.

CHM 441. Inorganic Chemistry (Lecture). 3 Credit Hours.
The relation of atomic and molecular structure to chemical and physical properties; introduction to nonaqueous solvents, coordination compounds, solid state chemistry and nuclear reactions. Lecture, 3 hours.
Prerequisite: CHM 365.
Components: LEC.
Grading: GRD.
Typically Offered: Spring.

CHM 442. Inorganic Chemistry (Laboratory). 1 Credit Hour.
Synthesis of inorganic compounds and determination of their physical and chemical properties. CHM 541 is a co-requisite for ACS chemistry majors. Laboratory, 3 hours.
Prerequisite: CHM 365 and CHM 541.
Components: LAB.
Grading: GRD.
Typically Offered: Spring.

CHM 464. Physical Chemistry (Laboratory II). 1 Credit Hour.
Continuation of CHM 364. Laboratory, 4 hours.
Prerequisite: CHM 365.
Components: LAB.
Grading: GRD.
Typically Offered: Spring.

CHM 488. Undergraduate Research. 1-3 Credit Hours.
Laboratory research under the direction of a member of the chemistry faculty. Thesis optional. Course may be repeated for credit.
Components: THI.
Grading: GRD.
Typically Offered: Fall, Spring, & Summer.

CHM 490. Honors Research. 1-3 Credit Hours.
Laboratory research under the direction of a member of the Chemistry faculty. Thesis required. Course may be repeated for credit.
Components: THI.
Grading: GRD.
Typically Offered: Fall, Spring, & Summer.

CHM 515. Makings of a Scientist. 3 Credit Hours.
By analyzing achievements and advise of few successful scientists, chemists in particular will highlight what qualities are needed to be a successful scientist. Importance of motivation, perseverance, communication skills, adhering to ethical guidelines and ability to deal with colleagues and co-workers will be brought out. Career options available for a trained chemist and how different each one is will be pointed out. Overall this is a course in multi-mentoring of graduate students who are aiming for a career in science and hope to be successful researchers in science, particularly in chemistry.
Components: LEC.
Grading: GRD.
Typically Offered: Fall, Spring, & Summer.

CHM 520. Physical Organic Chemistry. 3 Credit Hours.
Laboratory research under the direction of a member of the Chemistry faculty. Thesis required. Course may be repeated for credit.
Components: LEC.
Grading: GRD.
Typically Offered: Fall.
CHM 522. Synthetic Organic Chemistry. 3 Credit Hours.
Functional group transformations, Synthon approach. Retro-synthetic analyses, multistep syntheses.
Prerequisite: CHM 202.
Components: LEC.
Grading: GRD.
Typically Offered: Fall.

CHM 523. Medicinal Chemistry. 3 Credit Hours.
Medicinal chemistry is primarily concerned with the development of drug molecules, and the interpretation of their mode of action at the molecular level, with an emphasis on chemical synthesis.
Prerequisites: CHM 214, CHM 316.
Components: LEC.
Grading: GRD.
Typically Offered: Spring.

CHM 525. Modern Quantum Chemistry. 3 Credit Hours.
Fundamental reactivity of main group and transition metal inorganic compounds.
Prerequisite: CHM 365.
Components: LEC.
Grading: GRD.
Typically Offered: Fall.

CHM 526. Supramolecular Chemistry. 3 Credit Hours.
Complexation, recognition, and catalysis as applied to bio-organic chemistry. Steric, polar, and lipophilic interactions as well as proximity effects in the design of synthetic enzyme mimics, cationic transport species, etc.
Prerequisites: CHM 365 and CHM 520.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CHM 527. Structural Organic Chemistry. 3 Credit Hours.
Prerequisite: CHM 202.
Components: LEC.
Grading: GRD.
Typically Offered: Spring.

CHM 528. Molecular and Supramolecular Photochemistry. 3 Credit Hours.
Generation of a model that will help rationalize/predict excited state reactions. A brief background on physical aspects of photochemistry will be given. Exploring and understanding of reactions that are triggered by light. Importance of light in life will be highlighted.
Prerequisite: CHM 201 and CHM 202.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CHM 530. Fluorescence Spectroscopy and Microscopy. 3 Credit Hours.
The photophysical properties of organic compounds that illustrates the fundamental principles of fluorescence. It also explains how fluorescence spectra and images can be recorded and how these powerful analytical techniques can be used to address significant problems in biology and medicine.
Prerequisite: CHM 304 and CHM 360.
Components: LEC.
Grading: GRD.
Typically Offered: Fall & Spring.

CHM 531. Topics in Chemistry. 1-3 Credit Hours.
Subject matter offerings based upon student demand and availability of faculty. Subtitles describing the topics to be offered will be shown in parentheses in the printed class schedule following the title, "Topics in Chemistry".
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CHM 532. Synthetic Organic Chemistry. 3 Credit Hours.
Functional group transformations, Synthon approach. Retro-synthetic analyses, multistep syntheses.
Prerequisite: CHM 202.
Components: LEC.
Grading: GRD.
Typically Offered: Fall.

CHM 535. Principles of Bonding and Reactivity in Inorganic Chemistry. 3 Credit Hours.
Bonding principles necessary to understand the structure, stability, and fundamental reactivity of main group and transition metal inorganic compounds.
Prerequisite: CHM 365.
Components: LEC.
Grading: GRD.
Typically Offered: Fall.

CHM 537. Modern Quantum Chemistry. 3 Credit Hours.
Many-electron wave functions and operators. Hartree-Fock approximation, density functional theory, configuration interaction, and many-body perturbation theory.
Prerequisite: CHM 365.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CHM 538. Principles of Spectroscopic Techniques. 3 Credit Hours.
Spectroscopic techniques: nuclear magnetic resonance (NMR), mass spectra (MS), ultraviolet (UV), visible infrared (IR), fluorescence, and other specialized spectroscopic techniques.
Prerequisite: CHM 365.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CHM 539. Principles of Nuclear Magnetic Resonance and Multidimensional Spectroscopy. 3 Credit Hours.
Theory of nuclear magnetic resonance; Bloch equations; relaxation theory; time- domain versus frequency domain spectroscopies, and principles of multidimensional spectroscopy.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CHM 541. Principles of Bonding and Reactivity in Inorganic Chemistry. 3 Credit Hours.
Bonding principles necessary to understand the structure, stability, and fundamental reactivity of main group and transition metal inorganic compounds.
Prerequisite: CHM 365.
Components: LEC.
Grading: GRD.
Typically Offered: Fall.

CHM 543. Supramolecular Chemistry. 3 Credit Hours.
Fundamental reactivity of main group and transition metal inorganic compounds.
Prerequisite: CHM 365.
Components: LEC.
Grading: GRD.
Typically Offered: Fall.

CHM 544. Structural Organic Chemistry. 3 Credit Hours.
Prerequisite: CHM 202.
Components: LEC.
Grading: GRD.
Typically Offered: Spring.

CHM 547. Molecular and Supramolecular Photochemistry. 3 Credit Hours.
Generation of a model that will help rationalize/predict excited state reactions. A brief background on physical aspects of photochemistry will be given. Exploring and understanding of reactions that are triggered by light. Importance of light in life will be highlighted.
Prerequisite: CHM 201 and CHM 202.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CHM 548. Fluorescence Spectroscopy and Microscopy. 3 Credit Hours.
The photophysical properties of organic compounds that illustrates the fundamental principles of fluorescence. It also explains how fluorescence spectra and images can be recorded and how these powerful analytical techniques can be used to address significant problems in biology and medicine.
Prerequisite: CHM 304 and CHM 360.
Components: LEC.
Grading: GRD.
Typically Offered: Fall & Spring.

CHM 549. Topics in Chemistry. 1-3 Credit Hours.
Subject matter offerings based upon student demand and availability of faculty. Subtitles describing the topics to be offered will be shown in parentheses in the printed class schedule following the title, "Topics in Chemistry".
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CHM 551. Modern Quantum Chemistry. 3 Credit Hours.
Many-electron wave functions and operators. Hartree-Fock approximation, density functional theory, configuration interaction, and many-body perturbation theory.
Prerequisite: CHM 365.
Components: LEC.
Grading: GRD.
Typically Offered: Fall.

CHM 552. Structural Organic Chemistry. 3 Credit Hours.
Prerequisite: CHM 202.
Components: LEC.
Grading: GRD.
Typically Offered: Spring.

CHM 555. Modern Quantum Chemistry. 3 Credit Hours.
Fundamental reactivity of main group and transition metal inorganic compounds.
Prerequisite: CHM 365.
Components: LEC.
Grading: GRD.
Typically Offered: Fall.

CHM 556. Principles of Spectroscopic Techniques. 3 Credit Hours.
Spectroscopic techniques: nuclear magnetic resonance (NMR), mass spectra (MS), ultraviolet (UV), visible infrared (IR), fluorescence, and other specialized spectroscopic techniques.
Prerequisite: CHM 365.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CHM 557. Principles of Nuclear Magnetic Resonance and Multidimensional Spectroscopy. 3 Credit Hours.
Theory of nuclear magnetic resonance; Bloch equations; relaxation theory; time- domain versus frequency domain spectroscopies, and principles of multidimensional spectroscopy.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CHM 558. Advanced Analytical Chemistry. 3 Credit Hours.
Provides a strong foundation in the most important concepts in advanced analytical chemistry, including electrochemistry, chemical separations, and bioanalytical chemistry, and in the different classes of instrumental analytical techniques available to current chemists.
Prerequisites: CHM 214, CHM 316.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CHM 559. Advanced Analytical Chemistry. 3 Credit Hours.
Provides a strong foundation in the most important concepts in advanced analytical chemistry, including electrochemistry, chemical separations, and bioanalytical chemistry, and in the different classes of instrumental analytical techniques available to current chemists.
Prerequisites: CHM 214, CHM 316.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CHM 560. Fluorescence Spectroscopy and Microscopy. 3 Credit Hours.
The photophysical properties of organic compounds that illustrates the fundamental principles of fluorescence. It also explains how fluorescence spectra and images can be recorded and how these powerful analytical techniques can be used to address significant problems in biology and medicine.
Prerequisite: CHM 304 and CHM 360.
Components: LEC.
Grading: GRD.
Typically Offered: Fall & Spring.

CHM 561. Advanced Analytical Chemistry. 3 Credit Hours.
Provides a strong foundation in the most important concepts in advanced analytical chemistry, including electrochemistry, chemical separations, and bioanalytical chemistry, and in the different classes of instrumental analytical techniques available to current chemists.
Prerequisites: CHM 214, CHM 316.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CHM 562. Advanced Analytical Chemistry. 3 Credit Hours.
Provides a strong foundation in the most important concepts in advanced analytical chemistry, including electrochemistry, chemical separations, and bioanalytical chemistry, and in the different classes of instrumental analytical techniques available to current chemists.
Prerequisites: CHM 214, CHM 316.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CHM 563. Advanced Analytical Chemistry. 3 Credit Hours.
Provides a strong foundation in the most important concepts in advanced analytical chemistry, including electrochemistry, chemical separations, and bioanalytical chemistry, and in the different classes of instrumental analytical techniques available to current chemists.
Prerequisites: CHM 214, CHM 316.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CHM 564. Advanced Analytical Chemistry. 3 Credit Hours.
Provides a strong foundation in the most important concepts in advanced analytical chemistry, including electrochemistry, chemical separations, and bioanalytical chemistry, and in the different classes of instrumental analytical techniques available to current chemists.
Prerequisites: CHM 214, CHM 316.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.
CHM 593. Readings in Chemistry. 1-3 Credit Hours.
Supervised readings on special topics. Offered by special arrangement. May be repeated for credit.
Components: THI.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CHM 594. Readings in Chemistry. 1-3 Credit Hours.
Supervised readings on special topics. Offered by special arrangement. May be repeated for credit.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CHM 615. Makings of a Scientist. 3 Credit Hours.
By analyzing achievements and advise of few successful scientists, chemists in particular, will highlight what qualities are needed to be a successful scientist. Importance of motivation, perseverance, communication skills, adhering to ethical guidelines and ability to deal with colleagues and co-workers will be brought out. Career options available for a trained chemist and how different each one is will be pointed out. Overall this is a course in multi-mentoring of graduate students who are aiming for a career in science and hope to become successful researchers in science, particularly in chemistry. Prerequisite: CHM 202.
Components: LEC.
Grading: GRD.
Typically Offered: Fall & Spring.

CHM 620. Physical Organic Chemistry. 3 Credit Hours.
Aspects of chemical bonding, acids and bases, stereochemistry, aromaticity, pericyclic reactions, linear free energy relationships, transition state theory, excited state chemistry, reactive intermediaries, mechanisms of uni- and bi-molecular reactions.
Components: LEC.
Grading: GRD.
Typically Offered: Fall.

CHM 622. Synthetic Organic Chemistry. 3 Credit Hours.
Functional group transformations, Synthon approach. Retro-synthetic analyses, multistep syntheses.
Components: LEC.
Grading: GRD.
Typically Offered: Fall.

CHM 624. Supramolecular Chemistry. 3 Credit Hours.
Complexation, recognition, and catalysis as applied to bio-organic chemistry. Steric, polar, and lipophillic interactions as well as proximity effects in the design of synthetic enzyme mimics, cationic transport species, etc.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CHM 625. Structural Organic Chemistry. 3 Credit Hours.
Components: LEC.
Grading: GRD.
Typically Offered: Spring.

CHM 626. Structural Organic Chemistry. 3 Credit Hours.
Components: LEC.
Grading: GRD.
Typically Offered: Spring.

CHM 630. Fluorescence Spectroscopy and Microscopy. 3 Credit Hours.
The photophysical properties of organic compounds that illustrates the fundamental principles of fluorescence. It also explains how fluorescence spectra and images can be recorded and how these powerful analytical techniques can be used to address significant problems in biology and medicine.
Components: LEC.
Grading: GRD.
Typically Offered: Fall & Spring.

CHM 635. Molecular and Supramolecular Photochemistry. 3 Credit Hours.
Generation of a model that will help rationalize/predict excited state reactions. A brief background on physical aspects of photochemistry will be given. Exploring and understanding of reactions that are triggered by light. Importance of light in life will be highlighted.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CHM 639. Principles of Bonding and Reactivity in Inorganic Chemistry. 3 Credit Hours.
Bonding principles necessary to understand the structure, stability, and fundamental reactivity of main group and transition metal inorganic compounds.
Components: LEC.
Grading: GRD.
Typically Offered: Fall.

CHM 641. Modern Quantum Chemistry. 3 Credit Hours.
Many-electron wave functions and operators. Hartee-Fock approximation, density functional theory, configuration interaction, and many-body perturbation theory.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CHM 655. Electrochemistry. 3 Credit Hours.
Modern electrochemical techniques including voltammetry, chronocoulometry, rotating disk electrode, and ultramicroelectrodes.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CHM 665. Principles of Spectroscopic Techniques. 3 Credit Hours.
Spectroscopic techniques: nuclear magnetic resonance (NMR), mass spectra (MS), ultraviolet (UV), visible infrared (IR), fluorescence, and other specialized spectroscopic techniques.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.
CHM 675. Principles of Nuclear Magnetic Resonance and Multidimensional Spectroscopy. 3 Credit Hours.
Theory of nuclear magnetic resonance; Bloch equations; relaxation theory; time- domain versus frequency domain spectroscopies, and principles of multidimensional spectroscopy.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CHM 681. Advanced Analytical Chemistry. 3 Credit Hours.
Provides a strong foundation in the most important concepts in advanced analytical chemistry, including electrochemistry, chemical separations, and bioanalytical chemistry, and in the different classes of instrumental analytical techniques available to current chemists.
Components: LEC.
Grading: GRD.
Typically Offered: Fall & Spring.

CHM 691. Topics in Chemistry. 1-3 Credit Hours.
Subject matter offerings based upon student demand and availability of faculty. Subtitles describing the topics to be offered will be shown in parentheses in the printed class schedule following the title, "Topics in Chemistry."
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CHM 692. Topics in Chemistry. 1-3 Credit Hours.
Subject matter offerings based upon student demand and availability of faculty. Subtitles describing the topics to be offered will be shown in parentheses in the printed class schedule following the title, "Topics in Chemistry."
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CHM 693. Readings in Chemistry. 1-3 Credit Hours.
Supervised readings on special topics. Offered by special arrangement. May be repeated for credit.
Components: THI.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CHM 694. Readings in Chemistry. 1-3 Credit Hours.
Supervised readings on special topics. Offered by special arrangement. May be repeated for credit.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CHM 779. Chemistry Seminar. 1 Credit Hour.
Participation in the departmental seminar program. Required each semester the student is in residence and not enrolled in CHM 680 (excluding summer sessions).
Components: SEM.
Grading: GRD.
Typically Offered: Fall & Spring.

CHM 780. Chemistry Seminar. 1 Credit Hour.
Participation in the chemistry department seminar program, including an oral presentation of special topics.
Components: SEM.
Grading: GRD.
Typically Offered: Fall & Spring.

CHM 785. Introduction to Research. 2 Credit Hours.
Research principles and practices, independent study in selected subject areas, and/or oral presentation of a proposed research topic. Open only to graduate students working toward the M.S. or Ph.D. in chemistry.
Components: SEM.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CHM 788. Problems in Research Planning. 2 Credit Hours.
Formulation of a research program for investigating an original problem not related to the candidate's major laboratory research. A brief written summary and an oral defense of the plan will be required.
Components: THI.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CHM 805. Research Practices. 1-3 Credit Hours.
Research experiences in special techniques. For students electing the non-thesis M.S. option. May be repeated for a total not to exceed six credits.
Components: SEM.
Grading: GRD.
Typically Offered: Fall & Spring.

CHM 810. Master's Thesis. 1-6 Credit Hours.
The student working on his/her master's thesis enrolls for credit, in most departments not to exceed six, as determined by his/her advisor. Credit is not awarded until the thesis has been accepted.
Components: THI.
Grading: SUS.
Typically Offered: Fall, Spring, & Summer.

CHM 820. Research in Residence. 1 Credit Hour.
Used to establish research in residence for the thesis for the master's degree after the student has enrolled for the permissible cumulative total in CHM 710 (usually six credits). Credit not granted. May be regarded as full time residence.
Components: THI.
Grading: GRD.
Typically Offered: Fall, Spring, & Summer.

CHM 830. Doctoral Dissertation. 1-12 Credit Hours.
Required of all candidates for the Ph.D. The student will enroll for credit as determined by his/her advisor, but for not less than a total of 12 hours. Up to 12 hours may be taken in a regular semester, but not more than six in a summer session.
Components: THI.
Grading: SUS.
Typically Offered: Fall, Spring, & Summer.

CHM 840. Post-candidacy Dissertation. 1-12 Credit Hours.
Required of all candidates for the Ph.D. who have advanced to candidacy. The student will enroll for credit as determined by his/her advisor, but not for less than a total of 12. Up to 12 hours may be taken in a regular semester, but not more than six in a summer session.
Components: THI.
Grading: SUS.
Typically Offered: Fall, Spring, & Summer.
CHM 850. Research in Residence. 1 Credit Hour.
Used to establish research in residence for the Ph.D. and D.A., after
the student has been enrolled for the permissible cumulative total in
appropriate doctoral research. Credit not granted. May be regarded as
full-time residence as determined by the Dean of the Graduate School.
Components: THI.
Grading: SUS.
Typically Offered: Fall, Spring, & Summer.

CHM 851. Research in Residence. 0 Credit Hours.
Components: THI.
Grading: GRD.

CHM 880. Doctoral Dissertation Seminar. 1 Credit Hour.
Required of all candidates for the Ph.D. degree when defending their
doctoral dissertation during their final term. A written dissertation and an
oral defense of the Ph.D. dissertation will be required.
Prerequisites: CHM 830, CHM 840.
Components: THI.
Grading: GRD.
Typically Offered: Fall, Spring, & Summer.