CHEMISTRY (CHEM)

CHEM 101  Introduction to Chemistry  3 Hours
A one semester terminal course covering applied chemistry and environmental considerations which can be used for general education requirements in the science field for non-science majors and minors. In-class laboratory constitutes 20 percent of class. It does not count toward a major or minor in chemistry nor does it satisfy the requirements for certain home economics and agriculture majors. **Colonnade E-NS, E-SL | NS, SL**
Course Fee: $15
Recent Term(s) Offered: winter 2017; spring 2017; summer 2017; fall 2017; winter 2018; spring 2018; summer 2018; fall 2018; winter 2019; spring 2019; summer 2019; fall 2019

CHEM 105  Fundamentals of General Chemistry  3 Hours
The first half of a one-year course predominantly for majors in agriculture and consumer and family sciences, and for non-science majors desiring a full year sequence in chemistry. It does not count toward a major or a minor in chemistry. Note: Two years of high school algebra required. **Colonnade E-NS | NS**
Prerequisite(s): CHEM 106 (may be taken concurrently)
Recent Term(s) Offered: spring 2017; fall 2017; spring 2018; summer 2018; fall 2018; spring 2019; summer 2019; fall 2019

CHEM 106  Fundamentals of General Chemistry Laboratory  1 Hour
Laboratory to accompany CHEM 105. Pre-lab lecture and laboratory meet two and one-half hours per week. **Colonnade E-SL | SL**
Prerequisite(s): CHEM 105 (may be taken concurrently)
Course Fee: $30
Recent Term(s) Offered: spring 2017; summer 2017; fall 2017; spring 2018; summer 2018; fall 2018; spring 2019; summer 2019; fall 2019

CHEM 107  Fundamentals of Organic Chemistry  3 Hours
A continuation of CHEM 105 with a major portion of the course devoted to organic chemistry which ends the one-year course for non-science majors. It does not count toward a major or minor in chemistry. **Colonnade E-SL | SL**
Prerequisite(s): CHEM 105 and CHEM 106 and CHEM 108 (may be taken concurrently) with a minimum grade of C
Recent Term(s) Offered: spring 2017; fall 2017; spring 2018; summer 2018; fall 2018; spring 2019; summer 2019; fall 2019

CHEM 108  Fundamentals of Organic Chemistry Laboratory  1 Hour
The laboratory to accompany CHEM 107. A major portion of the course deals with experiments in organic and biochemistry. Pre-lab lecture and laboratory meet two and one-half hours per week. **Colonnade E-SL | SL**
Prerequisite(s): CHEM 105 and CHEM 106 and CHEM 107 (may be taken concurrently) with a minimum grade of C
Course Fee: $30
Recent Term(s) Offered: spring 2017; fall 2017; spring 2018; summer 2018; fall 2018; spring 2019; summer 2019; fall 2019

CHEM 109  Chemistry for the Health Sciences  4 Hours
A course designed to emphasize the practical aspects on inorganic, organic and biochemistry as related to human health. The course is offered specifically for students in the allied health programs, but is also recommended for students in physical education, recreation, health and safety and other disciplines dealing with human health. It does not count toward a major or minor in chemistry, but does satisfy general education requirement. **Colonnade E-NS | NS**
Recent Term(s) Offered: spring 2017; summer 2017; fall 2017; spring 2018; summer 2018; fall 2018; spring 2019; summer 2019; fall 2019

CHEM 111  Introduction to Forensic Chemistry  3 Hours
A combination of lecture and in-class laboratory activities designed to introduce the fundamentals of forensic chemistry including evidence collection and preservation, arson investigation, poisons and toxicity, determination of time and death, the chemistry of explosions, and DNA/blood analysis. In-class laboratory constitutes 20% of the class. **Colonnade E-NS, E-SL | NS, SL**
Recent Term(s) Offered: spring 2018

CHEM 116  Introduction to College Chemistry  3 Hours
A one-semester course for students desiring a general survey of chemistry with a mathematical emphasis. An introductory course for College Chemistry students whose ACT score in mathematics would indicate marginal success in CHEM 120. Does not count toward a major or minor in chemistry nor does it satisfy the requirements for certain consumer and family science or agriculture majors. CHEM 106 laboratory is optional. **Colonnade E-NS | NS**
Prerequisite(s): (MATH 116 (may be taken concurrently) or MATH 117 (may be taken concurrently) or MATH 118 (may be taken concurrently) or MATH 119 (may be taken concurrently) or MATH 122 (may be taken concurrently) or MATH 126 (may be taken concurrently) or MATH 136 (may be taken concurrently) or MATH 132 (may be taken concurrently) or MA 116C (may be taken concurrently) or MATH 116E (may be taken concurrently))
Recent Term(s) Offered: spring 2017; summer 2017; fall 2017; winter 2018; spring 2018; summer 2018; fall 2018; winter 2019; spring 2019; summer 2019; fall 2019

CHEM 120  College Chemistry I  3 Hours
The first half of the standard year-long general chemistry course sequence for science majors and minors. **Colonnade E-NS | NS**
Prerequisite(s): ((ACT Math with a score of 26 or SAT Math Score with a score of 630) or (ACT Math with a score of 22 and MPE - Algebra with a score of 18) or (SAT Math Score with a score of 560 and MPE - Algebra with a score of 18) or (MATH 116 with a minimum grade of C or MA 116C with a minimum grade of C)) and CHEM 121 (may be taken concurrently) with a minimum grade of C)
Recent Term(s) Offered: winter 2017; spring 2017; summer 2017; fall 2017; winter 2018; spring 2018; summer 2018; fall 2018; winter 2019; spring 2019; summer 2019; fall 2019

CHEM 121  College Chemistry I Laboratory  2 Hours
Laboratory to accompany CHEM 120. One third of each meeting is spent reviewing material from the lecture and the remaining time is used to carry out laboratory investigations. Pre-lab lecture and laboratory meet once each week for three hours per week. **Colonnade E-SL | SL**
Prerequisite(s): CHEM 120 (may be taken concurrently) with a minimum grade of C
Course Fee: $45
Recent Term(s) Offered: spring 2017; summer 2017; fall 2017; spring 2018; summer 2018; fall 2018; spring 2019; summer 2019; fall 2019
CHEM 222 College Chemistry II 3 Hours
A continuation of the standard year long general chemistry course sequence for science majors and minors.
Prerequisite(s): CHEM 120 with a minimum grade of C and CHEM 121 with a minimum grade of C and CHEM 223 (may be taken concurrently) with a minimum grade of C
Corequisite(s): CHEM 223
Recent Term(s) Offered: winter 2017; spring 2017; summer 2017; fall 2017; winter 2018; spring 2018; summer 2018; fall 2018; winter 2019; spring 2019; summer 2019; fall 2019

CHEM 223 College Chemistry II Laboratory 2 Hours
Laboratory to accompany CHEM 222. Pre-lab lecture and laboratory meet for four hours per week.
Prerequisite(s): CHEM 222 (may be taken concurrently) with a minimum grade of C
Course Fee: $45
Recent Term(s) Offered: spring 2017; summer 2017; fall 2017; spring 2018; summer 2018; fall 2018; spring 2019; summer 2019; fall 2019

CHEM 295 Introduction to Research Methodology 1 Hour
To familiarize Ogden Research Scholars and other research oriented students with the fundamentals of choosing a research topic, performing a bibliographical search on a subject, classification or instruments, data taking, data reduction, professional ethics and other research oriented topics. The common points of research methodology in the different scientific areas will be accentuated. Examples will be drawn from the various disciplines. Use of computers will be emphasized. (Course does not count toward any major or minor). Note: Ogden Research Scholar, 3.2 grade point average at the end of freshman year, or Ogden College faculty member recommendation required.
Equivalent(s): PHYS 295, CS 295, BIOL 295, GEOL 295, MATH 295, ENGR 295
Recent Term(s) Offered: None

CHEM 299 Introduction to Chemical Research 3 Hours
Course designed to introduce the student to independent chemical research. Each credit hour requires 2 1/2 hours laboratory work per week with written and oral reports of laboratory work suggested. Note: Consent of a faculty research advisor.
Prerequisite(s): permission of instructor
Course Fee: $25
Recent Term(s) Offered: spring 2017; summer 2017; fall 2017; spring 2018; summer 2018; fall 2018; winter 2019; spring 2019; summer 2019; fall 2019

CHEM 304 Biochemistry for the Health Sciences 4 Hours
A brief treatment of organic chemistry is used as an introduction to carbohydrates, lipids, proteins and nucleic acids emphasizing their functional roles in the biological system. Specific topics will include bioenergetics, enzymes, acid-based balance, hematology and immunology. The course is offered specifically for students in the four-year nursing program, but is also recommended for students in physical education, recreation, health and safety and other disciplines dealing with human health. This course does not count toward a major or minor in biology or chemistry.
Prerequisite(s): (CHEM 109 or CHEM 107)
Recent Term(s) Offered: spring 2017; fall 2017; spring 2018; spring 2019

CHEM 306 Food Chemistry 3 Hours
An understanding of the fundamental building blocks in foods (proteins, lipids, carbohydrates, and minerals) and chemical, physical, and biological phenomena that affect food quality, texture, flavor and safety.
Prerequisite(s): (CHEM 107 and CHEM 108 or CHEM 109)
Recent Term(s) Offered: None

CHEM 314 Introductory Organic Chemistry 5 Hours (repeatable max of 5 hrs)
A brief survey course primarily for various pre-professional and science area curricula requiring one semester of organic chemistry.
Prerequisite(s): CHEM 222 with a minimum grade of C and CHEM 223 with a minimum grade of C
Course Fee: $35
Recent Term(s) Offered: None

CHEM 320 Principles of Inorganic Chemistry 3 Hours
A treatment of the usual topics in theoretical inorganic chemistry presented at a level not requiring calculus.
Prerequisite(s): CHEM 222 with a minimum grade of C and CHEM 223 with a minimum grade of C
Recent Term(s) Offered: fall 2017; fall 2018; fall 2019

CHEM 330 Quantitative Analysis 5 Hours (repeatable max of 5 hrs)
A study of the common techniques and theory of gravimetric, volumetric, electrochemical, and optical methods of analysis. Lecture, 3 hours; laboratory, 2 hours. Laboratory meets four and one-half hours per week.
Prerequisite(s): CHEM 222 with a minimum grade of C and CHEM 223 with a minimum grade of C
Course Fee: $50
Recent Term(s) Offered: spring 2017; summer 2017; fall 2017; spring 2018; summer 2018; fall 2018; spring 2019; summer 2019; fall 2019

CHEM 340 Organic Chemistry I 3 Hours
The first half of the standard one-year course for chemistry majors. Discussion includes various organic mechanisms and preparations. The entire sequence of CHEM 340-CHEM 341, CHEM 342-CHEM 343 should be completed. If only one semester of organic chemistry is desired, CHEM 341 should be taken.
Prerequisite(s): CHEM 222 with a minimum grade of C and CHEM 223 with a minimum grade of C and CHEM 341 (may be taken concurrently) with a minimum grade of C
Recent Term(s) Offered: spring 2017; summer 2017; fall 2017; spring 2018; summer 2018; fall 2018; spring 2019; summer 2019; fall 2019

CHEM 341 Organic Chemistry Laboratory I 2 Hours
Laboratory work includes studies of typical organic reactions and preparations.
Prerequisite(s): CHEM 222 with a minimum grade of C and CHEM 223 with a minimum grade of C and CHEM 340 (may be taken concurrently) with a minimum grade of C
Course Fee: $50
Recent Term(s) Offered: spring 2017; summer 2017; fall 2017; spring 2018; summer 2018; fall 2018; spring 2019; summer 2019; fall 2019

CHEM 342 Organic Chemistry II 3 Hours
A continuation of CHEM 340.
Prerequisite(s): CHEM 340 with a minimum grade of C and CHEM 341 with a minimum grade of C and CHEM 343 (may be taken concurrently) with a minimum grade of C
Recent Term(s) Offered: spring 2017; summer 2017; fall 2017; spring 2018; summer 2018; fall 2018; spring 2019; summer 2019; fall 2019

CHEM 343 Organic Chemistry Laboratory II 2 Hours
Laboratory work includes studies of typical organic reactions and preparations.
Prerequisite(s): CHEM 222 with a minimum grade of C and CHEM 223 with a minimum grade of C and CHEM 340 (may be taken concurrently) with a minimum grade of C
Course Fee: $50
Recent Term(s) Offered: spring 2017; summer 2017; fall 2017; spring 2018; summer 2018; fall 2018; spring 2019; summer 2019; fall 2019

CHEM 295, CS 295, BIOL 295, GEOL 295, MATH 295, ENGR 295
Recent Term(s) Offered: None

CHEM 320 Principles of Inorganic Chemistry 3 Hours
A treatment of the usual topics in theoretical inorganic chemistry presented at a level not requiring calculus.
Prerequisite(s): CHEM 222 with a minimum grade of C and CHEM 223 with a minimum grade of C
Recent Term(s) Offered: fall 2017; fall 2018; fall 2019

CHEM 330 Quantitative Analysis 5 Hours (repeatable max of 5 hrs)
A study of the common techniques and theory of gravimetric, volumetric, electrochemical, and optical methods of analysis. Lecture, 3 hours; laboratory, 2 hours. Laboratory meets four and one-half hours per week.
Prerequisite(s): CHEM 222 with a minimum grade of C and CHEM 223 with a minimum grade of C
Course Fee: $50
Recent Term(s) Offered: spring 2017; summer 2017; fall 2017; spring 2018; summer 2018; fall 2018; spring 2019; summer 2019; fall 2019

CHEM 340 Organic Chemistry I 3 Hours
The first half of the standard one-year course for chemistry majors. Discussion includes various organic mechanisms and preparations. The entire sequence of CHEM 340-CHEM 341, CHEM 342-CHEM 343 should be completed. If only one semester of organic chemistry is desired, CHEM 341 should be taken.
Prerequisite(s): CHEM 222 with a minimum grade of C and CHEM 223 with a minimum grade of C and CHEM 341 (may be taken concurrently) with a minimum grade of C
Recent Term(s) Offered: spring 2017; summer 2017; fall 2017; spring 2018; summer 2018; fall 2018; spring 2019; summer 2019; fall 2019

CHEM 341 Organic Chemistry Laboratory I 2 Hours
Laboratory work includes studies of typical organic reactions and preparations.
Prerequisite(s): CHEM 222 with a minimum grade of C and CHEM 223 with a minimum grade of C and CHEM 340 (may be taken concurrently) with a minimum grade of C
Course Fee: $50
Recent Term(s) Offered: spring 2017; summer 2017; fall 2017; spring 2018; summer 2018; fall 2018; spring 2019; summer 2019; fall 2019

CHEM 342 Organic Chemistry II 3 Hours
A continuation of CHEM 340.
Prerequisite(s): CHEM 340 with a minimum grade of C and CHEM 341 with a minimum grade of C and CHEM 343 (may be taken concurrently) with a minimum grade of C
Recent Term(s) Offered: spring 2017; summer 2017; fall 2017; spring 2018; summer 2018; fall 2018; spring 2019; summer 2019; fall 2019
CHEM 343 Organic Chemistry II Laboratory 2 Hours
Includes studies of typical organic reactions and an introduction to qualitative organic analysis.
Prerequisite(s): CHEM 340 with a minimum grade of C and CHEM 341 with a minimum grade of C and CHEM 342 (may be taken concurrently) with a minimum grade of C
Course Fee: $50
Recent Term(s) Offered: spring 2017; summer 2017; fall 2017; spring 2018; summer 2018; fall 2018; spring 2019; summer 2019; fall 2019

CHEM 369 Cooperative Education in Chemistry I 3-6 Hours
(repeatable max of 6 hrs)
Practical out-of-the classroom experience in a supervised work situation with a cooperating business, industry, or governmental agency, emphasizing laboratory skills in chemistry.
Restriction(s): Students with a semester level of Freshman may not enroll.
Recent Term(s) Offered: spring 2017; fall 2017; summer 2018; spring 2019

CHEM 389 Cooperative Education in Chemistry II 3-6 Hours
(repeatable max of 6 hrs)
Practical out-of-the classroom experience in a supervised work situation with a cooperating business, industry, or governmental agency, emphasizing laboratory skills in chemistry.
Restriction(s): Students with a semester level of Freshman or Sophomore may not enroll.
Recent Term(s) Offered: fall 2017; fall 2018

CHEM 398 Undergraduate Seminar 1 Hour
A formal introduction to the chemical literature culminating in a student presentation on a selected topic. A treatment pertaining to career opportunities for chemists, resume writing, interview techniques and outside speakers from industry and academics will be included.
Restriction(s): Students with a semester level of Freshman or Sophomore may not enroll.
Recent Term(s) Offered: fall 2017; fall 2018; fall 2019

CHEM 399 Research Problems in Chemistry 3 Hours
Special research assignments in accord with the interest of the student. Requires a minimum of (3) hours laboratory work per week for each hour of credit. A written report of the work is required. Note: Consent of faculty research advisor required.
Course Fee: $25
Recent Term(s) Offered: spring 2017; summer 2017; fall 2017; spring 2018; summer 2018; fall 2018; winter 2019; spring 2019; summer 2019; fall 2019

CHEM 412 Introduction to Physical Chemistry 5 Hours (repeatable max of 5 hrs)
A study of the chemical principles involved in thermodynamics, kinetics, equilibrium, surface phenomena, macromolecules, molecular structure and other selected topics using biological examples. The course is specifically for secondary education students and those students not qualifying for the CHEM 450-CHEM 452 sequence. It is not acceptable for the ACS-program students.
Prerequisite(s): (CHEM 314 with a minimum grade of C or CHEM 340 with a minimum grade of C) and MATH 136 with a minimum grade of C and (PHYS 231 with a minimum grade of C or PHYS 255 with a minimum grade of C) and CHEM 330 with a minimum grade of C
Course Fee: $50
Recent Term(s) Offered: spring 2017; summer 2017; fall 2017; spring 2018; summer 2018; fall 2018; spring 2019; summer 2019

CHEM 420 Inorganic Chemistry 3 Hours
A study of such topics as atomic structure, molecular structure, bonding theory, ionic substances, electron deficient compounds, acid-base theory, coordination chemistry, and organometallic chemistry.
Prerequisite(s): CHEM 450 with a minimum grade of C and CHEM 451 with a minimum grade of C and CHEM 320 with a minimum grade of C
Recent Term(s) Offered: spring 2017; spring 2018; spring 2019

CHEM 421 Inorganic Chemistry Laboratory 1 Hour
A laboratory course emphasizing the synthesis and characterization of inorganic compounds of the main group and transition metals. Laboratory meetings once a week for three hours.
Prerequisite(s): CHEM 420 (may be taken concurrently) with a minimum grade of C
Recent Term(s) Offered: spring 2017; spring 2018; spring 2019

CHEM 425 Polymer Chemistry 4 Hours
The principles of polymer chemistry: synthesis of polymers, reactions of synthetic and biological polymers, thermodynamics and kinetics of polymerization, characterization of polymers such as molecular weights and morphology and fabrication and application of polymeric materials.
Prerequisite(s): CHEM 342 with a minimum grade of C and CHEM 343 with a minimum grade of C and CHEM 330 with a minimum grade of C
Course Fee: $35
Recent Term(s) Offered: None

CHEM 430 Forensic Chemistry 3 Hours
A study of the methods and instrumentation used in the crime laboratory and in the medical technology laboratory. Topics discussed will include drugs, blood enzymes, organic and inorganic analysis, gunshot residue, fingerprints, chromatography, spectrophotometry, electrochemistry and electrophoresis.
Prerequisite(s): (CHEM 314 with a minimum grade of C or CHEM 340 with a minimum grade of C) and CHEM 330 with a minimum grade of C
Course Fee: $35
Recent Term(s) Offered: spring 2017; spring 2019

CHEM 435 Instrumental Analysis 3 Hours
Modern instrumental methods of analysis including spectroscopic, electroanalytical and chromatographic techniques.
Prerequisite(s): CHEM 330 with a minimum grade of C and CHEM 340 with a minimum grade of C and CHEM 436 (may be taken concurrently) with a minimum grade of C
Course Fee: $35
Recent Term(s) Offered: fall 2017; fall 2018; fall 2019

CHEM 436 Instrumental Analysis Laboratory 2 Hours
A laboratory to accompany CHEM 435 focusing on techniques involving modern instrumental analysis. Pre-lab lecture and laboratory meets 4.5 hours per week.
Prerequisite(s): CHEM 435 (may be taken concurrently) with a minimum grade of C
Recent Term(s) Offered: fall 2017; fall 2018; fall 2019

CHEM 440 Introduction to Synthetic Organic Methodology 3 Hours
An advanced course designed to address a broad spectrum of topics including an overview of the year-long organic chemistry sequence and a systematic treatment of modern synthetic organic chemistry focusing on basic reactions and methodologies.
Prerequisite(s): CHEM 342 with a minimum grade of C
Recent Term(s) Offered: fall 2017; fall 2019
CHEM 446  Biochemistry I  3 Hours
A study of biochemical compounds and their role in intermediary metabolism. Special topics include biochemical energetics and coenzyme mechanisms.
Prerequisite(s): (CHEM 314 with a minimum grade of C or CHEM 340 with a minimum grade of C)
Equivalent(s): BIOL 446
Recent Term(s) Offered: spring 2017; summer 2017; fall 2017; spring 2018; fall 2018; spring 2019; fall 2019

CHEM 447  Biochemistry Laboratory  2 Hours
A basic laboratory study involving selected experiments which illustrate biochemical principles including separation, identification and chemical properties of carbohydrates, lipids, proteins and enzymes.
Prerequisite(s): (BIOL 446 (may be taken concurrently) with a minimum grade of C or CHEM 446 (may be taken concurrently) with a minimum grade of C)
Equivalent(s): BIOL 447
Course Fee: $50
Recent Term(s) Offered: spring 2017; fall 2017; spring 2018; fall 2018; spring 2019; fall 2019

CHEM 450  Physical Chemistry I  3 Hours
A detailed study of the fundamental principles and models describing the physical and chemical properties of matter at both the microscopic and macroscopic levels. Selected topics may include thermodynamics and equilibria, the kinetic theory of gases, transport properties, chemical kinetics, introductory quantum mechanics, spectroscopy, statistical thermodynamics, and interdisciplinary applications.
Prerequisite(s): (CHEM 314 with a minimum grade of C or CHEM 340 with a minimum grade of C) and CHEM 330 with a minimum grade of C and (PHYS 231 with a minimum grade of C or PHYS 255 with a minimum grade of C) and MATH 136 with a minimum grade of C and CHEM 451 (may be taken concurrently) with a minimum grade of C
Recent Term(s) Offered: fall 2017; fall 2018; fall 2019

CHEM 451  Physical Chemistry I Laboratory  2 Hours
A laboratory to accompany CHEM 450 that emphasizes the treatment and analysis of scientific data as well as formal scientific communication. Experiments may include measurements of thermochemical properties, phase and chemical equilibria, kinetic rates, spectroscopic properties, and supporting computational chemistry. Pre-lab lecture and laboratory meets 4.5 hours per week.
Prerequisite(s): CHEM 450 (may be taken concurrently) with a minimum grade of C
Course Fee: $50
Recent Term(s) Offered: fall 2017; fall 2018; fall 2019

CHEM 452  Physical Chemistry II  3 Hours
A laboratory to accompany CHEM 452. Experiments may include measurements of thermochemical properties, phase and chemical equilibria, kinetic rates, spectroscopic properties, and supporting computational chemistry. Pre-lab lecture and laboratory meets 4.5 hours per week.
Prerequisite(s): CHEM 452 (may be taken concurrently) with a minimum grade of C
Course Fee: $50
Recent Term(s) Offered: spring 2017; spring 2018; spring 2019

CHEM 453  Physical Chemistry II Laboratory  2 Hours
A laboratory to accompany CHEM 453. Experiments may include measurements of thermochemical properties, phase and chemical equilibria, kinetic rates, spectroscopic properties, and supporting computational chemistry. Pre-lab lecture and laboratory meets 4.5 hours per week.
Prerequisite(s): CHEM 452 (may be taken concurrently) with a minimum grade of C
Course Fee: $50
Recent Term(s) Offered: spring 2017; spring 2018; spring 2019

CHEM 454  Advanced Investigations in Chemistry Laboratory  2 Hours
Special topics are presented to acquaint advanced students with significant problems and developments of current interest in the fields of analytical, biological, inorganic, organic, physical, polymer and coal chemistry. The course may be repeated for credit provided topics differ.
Note: Consent of instructor required.
Recent Term(s) Offered: winter 2017; summer 2017; winter 2018; winter 2019; summer 2019

CHEM 455  Cooperative Education in Chemistry III  3-6 Hours
Practical out-of-the-classroom experience in a supervised work situation with a cooperating business, industry, or governmental agency, emphasizing laboratory skills in chemistry.
Restriction(s): Students with a semester level of Freshman, Junior or Sophomore may not enroll.
Recent Term(s) Offered: None
CHEM 490  Materials Chemistry  3 Hours
A study of the three major classes of materials: metals, polymers, and ceramics. Topics discussed will include chemical composition, bonding, common chemical and physical properties, microstructures, and how processing and uses are affected by chemical and physical properties.
Prerequisite(s): (CHEM 412 with a minimum grade of C or CHEM 452 with a minimum grade of C) and CHEM 330 with a minimum grade of C
Recent Term(s) Offered: fall 2019

CHEM 491  Materials Chemistry Laboratory  3 Hours
A laboratory course in materials that includes experiments on liquid flow, solid deformation, thermal properties, electrical conductivity of materials, microscopy, diffraction techniques, processing and testing of shaped articles. Note: Permission of department may be required.
Prerequisite(s): CHEM 330 and (CHEM 412 or CHEM 452)
Recent Term(s) Offered: None