CHEM 102
What's in Our Food
3 Credit Hours
This course surveys food science from a consumer perspective. It provides students with a foundational understanding of how science plays an integral role in the food industry from ingredient selection to final product quality. Topics include food sensory, food chemistry, health claims & nutrition, ingredient & process technology, food regulation, safety, and preservation, as well as consumer trends.

CHEM 103
Environmental Science
3 Credit Hours
This course surveys scientific laws, principles, models and concepts to help the students understand both environmental and resource problems and their possible solutions and how these concepts, problems and solutions are connected. Topics may include applied aspects of environmental chemistry, global warming, biomass energy, green chemistry and the effects on non-industrialized agricultural societies and industrialized societies on the environment.

CHEM 106
Chemistry Essentials
3 Credit Hours
This course reviews fundamental concepts in arithmetic and algebra, introduces basic concepts in chemistry and teaches problem-solving skills used in chemical calculations. Emphasis is on the use of dimensional analysis techniques. Offered fall.

CHEM 109
Survey of General, Organic and Bio-Chemistry
4 Credit Hours
Pre/Corequisite: P (RQ) Completion of MATH-099 or concurrent enrollment in a 100-level Math course, C: CHEML-109 (RQ)
This course provides a survey of basic concepts in general chemistry, organic chemistry and biochemistry. Lecture and laboratory topics include atomic structure and chemical bonding, dimensional analysis, composition and reactions of some inorganic compounds, a survey of functional group structure and reactivity of organic compounds in general and in biochemical systems. Structure and function of biomolecules like carbohydrates, lipids, proteins, enzymes, vitamins and nucleic acids will also be discussed. Lecture 3, Laboratory 3

CHEM 111
General Chemistry I
5 Credit Hours
Pre/Corequisite: P (RQ) Completion of MATH-099 or completion of HS Chemistry within the last 3 years or CHEM 106 with a grade of "C" or better, E: CHEML-111 MATH-112 (RQ)
This course focuses on the study of atomic structure, periodicity, basic quantum theory, bonding, stoichiometry, thermochemistry, the gaseous state, physical changes and states of matter, properties of solutions, and acids and bases. Lecture 3, Laboratory 4.

CHEM 112
General Chemistry II
5 Credit Hours
Pre/Corequisite: P (RQ) CHEM-111 with a C or better, C: CHEML-112 (RQ)
This course focuses on the study of acid-base and solubility equilibria, kinetics, thermodynamics, electro-chemistry, coordination compounds, nuclear chemistry and descriptive topics in inorganic chemistry. Lecture 3, Laboratory 4.

CHEM 150
Chemistry-Connecting Dots to Community
3 Credit Hours
Students in this course will learn basic chemistry concepts that have relevance in daily life with an emphasis on developing activities to communicate those concepts to middle school kids. Students will work in groups to plan, design and deliver demonstrations, activities and handouts. Students will present these activities at planned events and may be expected to attend off campus presentations.

CHEM 150
Special Topics in Chemical Science
1 to 3 Credit Hours
This course focuses on the study of topics not regularly scheduled and not covered in other courses. Suggested topics concern nuclear science, forensic science and environmental science. Prerequisite: A high school or college chemistry course or consent of instructor.

CHEM 209
Survey of Organic Chemistry with Biological Applications
4 Credit Hours
Pre/Corequisite: P (RQ) CHEM-112, E: CHEML-209 (RQ)
This is a one-semester survey course in organic chemistry with biological applications designed for students in General Biology, Natural Science, Secondary Education, etc. This course explores the structure, bonding, physical properties and nomenclature of organic materials and biological systems along with stereochemistry and reaction mechanisms of organic compounds exemplified by biological reactions. Analysis of organic molecules using various spectroscopy: IR, NMR, UV, an MS, will be taught . Application of the organic reactions in biological systems will be covered through introduction to the following topics: Amino Acids, Lipids, Carbohydrates, Metabolism, Peptides, and Proteins. This course is not intended for Biology Pre-Health majors, as they need to take the CHEM 251/252 series. This course does not provide adequate preparation for Organic Chemistry II, CHEM 252. This course does not provide adequate preparation for Biochemistry I, CHEM 301.

CHEM 211
Analytical Chemistry
5 Credit Hours
Pre/Corequisite: P (RQ) CHEM-112, C: CHEML-211 (RQ)
This course involves theories and applications of analytical methods. Environmental, household and industrial samples are quantitatively assayed using gravimetric, volumetric, electroanalytical and spectrometric methods. Lecture 3, Laboratory 4. Offered fall.
CHEM 250
**Special Topics in Chemistry**
1 to 3 Credit Hours
*Pre/Corequisite:* P (RQ) CHEM-112 and consent of instructor
This course includes formal courses covering individual topics or groups of topics not regularly scheduled and not covered in other courses. Suggested topics include clinical, environmental, food, forensic, geochemistry, industrial and nuclear chemistry.

CHEM 251
**Organic Chemistry I**
3 Credit Hours
*Pre/Corequisite:* P (RQ) CHEM-112 with a C or better, or equivalent as determined by the department, E: CHEML-251 (RQ)
This course discusses bonding, structure, reactivity, isomerism, nomenclature and stereochemistry of aliphatic and aromatic hydrocarbons (saturated and unsaturated). Particular emphasis is placed on the mechanism of organic reactions (physical-organic chemistry) and spectroscopy. Lecture 4. Offered fall.

CHEML 251
**Organic Chemistry I Lab**
2 Credit Hours
*Pre/Corequisite:* P (RQ) CHEM-112 with a C or better , E: CHEML-251 (RQ)
This course explores methods of purification and separation of organic compounds: distillation, extraction, crystallization, thin layer, column and gas-liquid chromatography and resolution. The preparation of several simple organic compounds is included. Laboratory 4. Offered fall.

CHEM 252
**Organic Chemistry II**
3 Credit Hours
*Pre/Corequisite:* P (RQ) CHEM-251, E: CHEML-252 (RQ)
This course discusses the structure and reactivity of a variety of functional groups (halides, alcohols, ethers, carboxylic acids and derivatives, aldehydes, ketones, and amines). Emphasis is placed on the mechanisms of reactions and the spectral properties of the various functional groups. The knowledge of functional group chemistry is extended to compounds of biological importance: fats, amino acids, proteins, carbohydrates, alkaloids and organic pesticides. Lecture 4. Offered spring.

CHEML 252
**Organic Chemistry II Lab**
2 Credit Hours
*Pre/Corequisite:* P (RQ) CHEML 251 , E: CHEM-252 (RQ)
This course explores reactions and properties of typical organic functional groups. Preparation of typical classes of organic compounds is also included. Laboratory 4. Offered spring.

CHEM 301
**Biochemistry I**
3 Credit Hours
*Pre/Corequisite:* P (RQ) CHEM-252, E: CHEML-301-optional for Chemistry and Natural Science majors (RQ)
This course discusses structures and properties of amino acids, proteins, carbohydrates, enzymes, coenzymes and nucleic acids. Introductions to bioenergetics and metabolism are included. Offered fall.

CHEML 301
**Biochemistry Laboratory I**
1 Credit Hour
*Pre/Corequisite:* E (RQ) CHEM 301
This course is an introduction to biochemical laboratory techniques. Experiments include purification and characterization of various biomolecules and enzyme kinetics. Laboratory 3. Offered fall.

CHEM 302
**Biochemistry II**
3 Credit Hours
*Pre/Corequisite:* P (RQ) CHEM-301 CHEML-301
This course discusses metabolism of carbohydrates, lipids, amino acids, proteins and nucleic acids. Biosynthesis of macromolecules and regulatory processes are included. Offered spring.

CHEML 304
**Synthesis and Characterization Lab**
2 Credit Hours
*Pre/Corequisite:* P (RQ) CHEM-209 or CHEML-251
This course includes syntheses of a variety of organic and inorganic compounds. Products are characterized using both chemical and spectral techniques. Laboratory 4. Offered fall odd years.

CHEM 305
**Advanced Inorganic Chemistry**
3 Credit Hours
*Pre/Corequisite:* E (RQ) CHEM-112
Topics explored in this course include atomic structure, periodicity, bonding theory, acid-base concepts, coordination and organometallic and bioinorganic chemistry. Offered spring even years.

CHEM 311
**Instrumental Methods of Analysis**
4 Credit Hours
*Pre/Corequisite:* P (RQ) CHEM-112 MATH-201 PHYS-201 or PHYS 211, C: CHEML-311 (RQ)
This course covers spectrometric, electro-chemical, chromatographic and calorimetric methods of analysis. Lecture 2, Laboratory 4. Offered spring odd years.
CHEM 331
Physical Chemistry I
4 Credit Hours
Pre/Corequisite: P (RO) CHEM-112 MATH-202 PHYS-202 or PHYS-212, C: CHEML-331 (RO)
This course discusses the laws and applications of thermodynamics; reaction and phase equilibria; reaction kinetics. The laboratory component explores: thermochemical and cryoscopic studies, phase diagrams, measurement of thermodynamic quantities and studies of surface phenomena. Lecture 3, Laboratory 4. Offered spring.

CHEM 332
Physical Chemistry II
4 Credit Hours
Pre/Corequisite: P (RO) CHEM-112 MATH-202 PHYS-202 or PHYS-212, C: CHEML-332 (RO)
This course discusses electrochemical systems; transport phenomena; atomic and molecular quantum mechanics; spectroscopy, statistical mechanics. The laboratory component explores: electrochemical measurements, macromolecular characterization, spectroscopic determination of physical properties of molecules, quantum mechanical computations with application of group theory to chemical symmetry. Lecture 3, Laboratory 3. Offered fall odd years.

CHEM 350
Special Topics: Chemistry
1 to 2 Credit Hours
This course includes formal courses covering individual topics or groups of topics not regularly scheduled and not covered in other courses. Suggested topics include advanced quantum, environmental, industrial, materials, medicinal, organometallic, physical-organic and polymer chemistry. NOTE: Consent of instructor required.

CHEM 351
Introduction to Research I
1 to 3 Credit Hours
This is the first part of a research course in the use of the chemical library and individual laboratory study of some problem in chemistry. Offered at the request of students. Note: Science majors with junior or senior status and/or consent of the department supervisor.

CHEM 352
Introduction to Research II
1 to 3 Credit Hours
This is the second part of a research course in the use of the chemical library and individual laboratory study of some problem in chemistry. Offered at the request of students. NOTE: Science majors with junior or senior status and/or consent of the department supervisor.

CHEM 353
Independent Study
1 to 3 Credit Hours
This course is an informal study of advanced topics in chemistry on a tutorial basis. Offered at the request of students. NOTE: Science majors with junior or senior status and/or consent of the department supervisor.

CHEM 357
Senior Seminar
1 Credit Hour
Pre/Corequisite: P (RO) CHEM-356 and senior status
In this course students conduct library or laboratory research. A paper is written and a presentation is given to faculty and students.

CHEM 360
Internship
0 to 3 Credit Hours
The student will spend a specified number of hours in a chemical work setting, report regularly to an academic supervisor and receive assignments appropriate to his/her type of work. Offered by special arrangement.