CHEMISTRY (CHEM)

CHEM 805 – Chemical Management & Safety  1 credit hour
This course addresses chemical management and safety issues that are commonly encountered in chemical laboratories and stockrooms.

CHEM 810 – Principles of Environmental Chemistry  3 credit hours
A study of the fate of chemicals in the air, water, and soil, and their impact on human health and the natural environment. Topics will include water pollution and water treatment, greenhouse gases and ozone-layer destruction, sources and management of hazardous wastes.

CHEM 820 – Principles of Inorganic Chemistry  3 credit hours
This course emphasizes topic areas that are typically introduced in General Chemistry, such as atomic, molecular, and solid-state structure, periodic trends, and acid-base concepts, but in much greater depth. Three lecture credits without laboratory.

CHEM 822 – Transition Metal Chemistry  2 credit hours
This course emphasizes advanced topics in Inorganic Chemistry pertaining to the structure and properties of transition metals and the complexes they form. Credit will not be granted for both this course and CHEM 821. Prerequisite: CHEM 820 or department permission. Enrollment not allowed in CHEM 822 if CHEM 821 has been completed.

CHEM 823 – Fundamentals of Nanoscience  1 credit hour
This course provides an introduction to the preparation and properties of nanoscale materials in connection to current and future scientific applications. Specific materials systems discussed will be influenced by the publicity of recent research breakthroughs and may include quantum dots, gold and silver nanosensors, semiconductor nanoparticles, and carbon nanotubes. Prerequisite: Enrollment not allowed in CHEM 823 if CHEM 821 has been completed.

CHEM 840 – Organic Chemistry I for High School Teachers  3 credit hours
This course is designed for high school teachers to introduce organic chemistry emphasizing the concepts that will be important for the subject’s students who will encounter these topics in their professional studies. Emphasis will be on traditional organic chemistry areas including nomenclature, reactions, and mechanisms. This class is offered for 3 credits without laboratory.

CHEM 855 – Principles of Biochemistry  3 credit hours
Chemistry of fats, protein, carbohydrates, hormones, vitamins, and other biologically important compounds. A solid background in organic chemistry is needed for success in this course.

CHEM 864 – Principles of Analytical Chemistry  2 credit hours
The following topics will be covered in depth: laboratory equipment and techniques, accuracy and precision, QA and QC, solubility, acid-base equilibrium, titrations, electrochemical methods, and spectroscopy. Students should have a strong background in general chemistry topics prior to enrolling in this course.

CHEM 866 – Analytical Instrumentation  1 credit hour
The following topics will be covered in depth: laboratory equipment and techniques with a focus on advanced electrochemical methods, chromatography, and spectroscopy. Students should have a strong background in general chemistry topics prior to enrolling in this course.

CHEM 883 – Chemical Kinetics  2 credit hours
This course emphasizes the following topic areas: reaction rates, rate laws, integrated rate law, reaction mechanisms, parallel reaction, temperature dependent rate constants, reversible reactions, potential energy surfaces, activated complex theory, transition state theory, catalysis, radical-chain reactions, and photochemistry. This course is offered for 2 credits without laboratory. Prerequisite: Enrollment not allowed in CHEM 883 if CHEM 882 has been completed.

CHEM 889 – Problems in Chemistry  1-3 credit hours
Independent investigations of chemistry problems. Three hours of laboratory work each week for each hour credit. Department Consent Required Total Credits Allowed: 3.00

CHEM 890 – Directed Research  1-3 credit hours
Independent original research of a selected topic in chemistry under the direction of a chemistry graduate faculty member. Total Credits Allowed: 9.00

CHEM 896 – Thesis  6 credit hours

CHEM 899 – Special Topics  1-3 credit hours
This course will cover topics not addressed in other courses offered by the department. Most topics will consist of a highly specialized area of study or revolve around issues or recent trends and innovations related to high school chemistry teaching. Total Credits Allowed: 10.00