CHEM 8040 SEMINAR IN TEACHING ADVANCED PLACEMENT CHEMISTRY (2 credits)
This course provides an introduction to the Advanced Placement high-
school chemistry course and includes instruction on content and methods
specific to teaching an Advanced Placement chemistry course. Emphasis
will be placed on subject content and adaptations of college-level laboratory
experiments to the high-school level.
Prerequisite(s)/Corequisite(s): Concurrent enrollment in the Advanced
Placement Chemistry Institute at UNO and current employment as a high-
school science teacher or instructor permission.

CHEM 8215 INTRODUCTION TO MOLECULAR MODELING (3 credits)
The course covers the advantages and limitations of current modeling
systems, the criteria for choosing the appropriate modeling system to best
solve a given problem and the computer resources needed to conduct the
modeling experiments. Following an introduction to the theory behind
a variety of modeling systems, students model organic and bioorganic
compounds in projects designed to mimic real world applications. (Alternate
Spring semesters). (Cross-listed with CHEM 3210).
Prerequisite(s)/Corequisite(s): CHEM 2260 and CHEM 2274 with a
grade of C- or better.

CHEM 8236 ADVANCED ORGANIC CHEMISTRY - SYNTHESIS (3 credits)
An advanced lecture course in modern theories and organic reactions
with application to synthesis. (Alternate Fall semesters) (Cross-listed with
CHEM 4230).

CHEM 8246 ADVANCED ORGANIC CHEMISTRY - MECHANISM (3 credits)
An advanced lecture course in organic chemical reactions. (Cross-listed with
CHEM 4240).

CHEM 8316 POLYMER CHEMISTRY (3 credits)
An introduction to the chemical and physical properties of polymers.
Emphasis will be on physical properties and structure/property
relationships. Topics will include kinetics and synthesis. Students will gain an
understanding of the characteristics of polymers and their applications.
Prerequisite(s)/Corequisite(s): CHEM 2260 and CHEM 3350 with a
grade of C or better, or instructor permission.

CHEM 8355 PHYSICAL CHEMISTRY I (3 credits)
A presentation of selected topics from the areas of classical
thermodynamics and electrochemistry. (Fall) (Cross-listed with CHEM 3350).
Prerequisite(s)/Corequisite(s): Concurrent enrollment in CHEM 8359.

CHEM 8359 PHYSICAL CHEMISTRY I LABORATORY (1 credit)
Physical chemistry laboratory covering topics in thermodynamics, kinetics
and electrochemistry, to be taken concurrently with CHEM 3350/8355.
Instruction and practice in scientific writing is also an emphasis of the
course. Fulfills the third writing course requirement for students majoring in
chemistry when NSCI 3940 and another approved laboratory course have been completed with a C-
or better. Offered in Fall. (Cross-listed with CHEM 3354).

CHEM 8365 PHYSICAL CHEMISTRY II (3 credits)
A presentation of selected topics from the areas of quantum mechanics,
spectroscopy, kinetics and statistical mechanics. (Cross-listed with
CHEM 3360).
Prerequisite(s)/Corequisite(s): CHEM 3350 and CHEM 3354 with a
grade of C- or better.

CHEM 8369 PHYSICAL CHEMISTRY II LABORATORY (1 credit)
Physical chemistry laboratory covering topics in quantum mechanics,
computational chemistry, spectroscopy, and kinetics, to be taken
concurrently with CHEM 3360. Fulfills the third writing course requirement
for students majoring in chemistry when NSCI 3940 and another approved
laboratory course have been completed with a C- or better. Offered in
Spring. (Cross-listed with CHEM 3364).

CHEM 8406 INSTRUMENTAL ANALYSIS (3 credits)
Study of instrumentation for use in quantitative and trace analysis.
Advanced instrumental methods and electronics for instrumentation are
included. (Spring) (Cross-listed with CHEM 4400).
Prerequisite(s)/Corequisite(s): Concurrent enrollment in CHEM 8409

CHEM 8409 INSTRUMENTAL ANALYSIS LABORATORY (1 credit)
Investigation of instrument performance and use of instrumentation in
quantitative and trace analysis. Advanced instrumental methods and
electronics for instrumentation are included. (Spring) (Cross-listed with
CHEM 4404).
Prerequisite(s)/Corequisite(s): Concurrent enrollment in CHEM 8406

CHEM 8419 INSTRUMENTAL METHODS (1 credit)
Laboratory course involving use of modern instrumentation to conduct
analytical determinations following standard methods. Topics include use
of standards, field sampling and sample storage. (Fall, Spring) (Cross-listed
with CHEM 3414.)
Prerequisite(s)/Corequisite(s): CHEM 2400 and CHEM 2404 with a
grade of C or better.

CHEM 8429 SPECTROMETRIC CHARACTERIZATIONS (1 credit)
Laboratory course involving the use of spectrometric instrumentation for
the identification of compounds containing organic functional groups.
(Cross-listed with CHEM 3424).
Prerequisite(s)/Corequisite(s): CHEM 2260, CHEM 2274, CHEM 2400
and 2404 with a grade of C or better.

CHEM 8506 ADVANCED INORGANIC CHEMISTRY (3 credits)
The application of bonding models for understanding of the composition,
structure, and reactions of inorganic molecules, including organometallic
and bioinorganic complexes. (Cross-listed with CHEM 4500).
Prerequisite(s)/Corequisite(s): CHEM 8555 or may be taken concurrently.

CHEM 8554 BIOCHEMISTRY I LABORATORY (1 credit)
A laboratory course to help integrate the concepts learned in biochemistry
lecture with the development of biochemical laboratory skills including
experimental design, data analysis, presentation of results and
communication of scientific information, with a focus on formal instruction
in journal-style writing and notebook skills. There is an emphasis on protein
properties, including enzyme activity. Fulfills the third writing course
requirement for students majoring in chemistry when NSCI 3940 and
another approved laboratory course have been completed with a C-
or better. (Fall) (Cross-listed with BIOL 4654, BIOL 8564, CHEM 4654).

CHEM 8556 BIOCHEMISTRY I (3 credits)
A comprehensive introduction to biochemistry emphasizing: structure-
function relationships for proteins, carbohydrates, lipids, and nucleic acids;
protein purification; enzyme kinetics and mechanisms; membranes and
membrane transport; carbohydrate metabolism including glycolysis, the
citric acid cycle and oxidative phosphorylation; and important applications
of thermodynamics and the properties of water to living systems. (Fall)
(Cross-listed with BIOL 4650, BIOL 8565, CHEM 4650).
Prerequisite(s)/Corequisite(s): CHEM 2260 and CHEM 2274; and either
CHEM 2400 or BIOL 3020, all with a C- or better. Other comparable courses
taken at accredited colleges or universities are acceptable. CHEM 8554
must be taken concurrently.

CHEM 8664 BIOCHEMISTRY II LABORATORY (1 credit)
A laboratory course to help integrate the concepts learned in Biochemistry
II lecture with the development of biochemical laboratory skills, to gain
practical experience in experimental design, data analysis, presentation of
results and communication of scientific information, with a focus on formal
instruction in journal-style writing and notebook skills. There is an emphasis
on nucleic acid properties. Fulfills the third writing course requirement for
students majoring in chemistry when NSCI 3940 and another approved
laboratory course have been completed with a C- or better. (Spring) (Cross-listed
with BIOL 4664, BIOL 8664, CHEM 4664).
CHEM 8666 BIOCHEMISTRY II (3 credits)
A continuation of the study of the structure and function of biomolecules and biochemical reactions with an emphasis on metabolism of carbohydrates, lipids, amino acids and nucleotides, and the chemistry of signal transduction and genetic information transfer. (Spring) (Cross-listed with BIOL 4660, BIOL 8666, CHEM 4660).
Prerequisite(s)/Corequisite(s): CHEM 8656 and CHEM 8654 or BIOL 8656 and BIOL 8654 with a grade of B- or better. CHEM 8664 must be taken concurrently.

CHEM 8676 PROTEIN PURIFICATION AND CHARACTERIZATION (2 credits)
This course is a study of protein biochemistry, protein purification techniques, and characterization strategies with an emphasis on chromatography and crystallography. The course has a significant laboratory component. (Cross-listed with CHEM 4670).
Prerequisite(s)/Corequisite(s): CHEM 8656 and CHEM 8654 (grade of B or better), or permission of instructor.

CHEM 8936 SPECIAL TOPICS IN CHEMISTRY (1-3 credits)
Selected special topics in chemistry. (Cross-listed with CHEM 4930).
Prerequisite(s)/Corequisite(s): CHEM 2260, CHEM 2400 with a grade of C or better. Some topics will require more advanced prerequisites and will be accepted for advanced course work in chemistry.

CHEM 8966 CHEMISTRY PROBLEMS (1-3 credits)
Independent student research and communication of results. (Cross-listed with CHEM 4960).
Prerequisite(s)/Corequisite(s): CHEM 4950 with a grade of C or better and permission of instructor.

CHEM 8990 RESEARCH IN CHEMISTRY (0 credits)
Experimental or theoretical work in chemistry or an interdisciplinary field involving chemical content, analysis and communication of results.
Prerequisite(s)/Corequisite(s): Permission of instructor, graduate, and sufficient grounding in the research area to fully support successful project accomplishment.