Albertson College of Idaho CATALOG 2003-2004

Albertson College of Idaho

Chemistry is an experimental science. Classroom and laboratory work combine to form a unique, personalized education, which can lead to a successful career or entrance into medical, dental, graduate, or other professional schools.

The Chemistry Department is located in Boone Science Hall, which houses the classrooms, laboratories, computers, and equipment necessary for the study of the natural sciences. Senior faculty, rather than student assistants, direct all laboratory and class instruction.

Opportunities are available for independent study conducted individually or as a member of a research team. Research projects in areas such as pollution analysis, toxicity studies, chemical synthesis, computer simulations and chemical kinetics are encouraged for both lower and upperdivision students. Summer research opportunities are also available. Internships can be designed to match individual backgrounds and interests.

Pre-professional students seeking advanced degrees in medicine, dentistry, or veterinary science, should give serious consideration to a chemistry major, as well as the courses CHE-412 Biochemistry, BIO-130 Frontiers in Genetics, BIO-220 Organismal Biology, BIO-230 Molecular & Cellular Biology, and BIO-374 Animal Physiology.

Chemistry Major

Consists of 34 credits, comprising the following required courses and three other upper-division credits.

- CHE-141 General Chemistry I
- CHE-142 General Chemistry II
- CHE-252 Analytical Chemistry I
- CHE-301 Organic Chemistry I
- CHE-302 Organic Chemistry II
- CHE-399 Physical Chemistry I or PHY-313 Thermal Physics
- CHE-400 Physical Chemistry II
- CHE-451 Analytical Chemistry II
- CHE-494 Independent Study

Students preparing for graduate work in chemistry are strongly advised to complete courses in addition to those required for the major (e.g., CHE-412, 420, MAT-211).

Chemistry Minor

Consists of 18 credits including, CHE-141, CHE-142, 252, 301 and four additional upper-division credits in chemistry.

Chemistry (CHE)

LOWER DIVISION

Note: CHE-141 & CHE-142 are suitable for students intending to major in the sciences and/or have some background in chemistry. Other students are encouraged to take CHE-136 & CHE-136L.

CHE-136 Chemistry of the Environment 3.0 cr.

Spring. A course for non-majors who wish to study the importance of chemistry in understanding contemporary environmental problems. The role of science and technology in society will also be examined. This course may be taken alone or together with CHE-136L. Three hours of lecture weekly.

CHE-136L Chemistry of the Environment Lab 1.0 cr.

Spring. Prereq. or coreq.: any college chemistry lecture course. A laboratory course for non-majors who wish to explore the chemical phenomena associated with contemporary environmental problems. One 3½ hour laboratory weekly.

CHE-141 General Chemistry I 4.0 cr.

Fall. Prereq.: high school algebra; high school chemistry is highly recommended. A college level course in general chemistry designed for all chemistry and other science majors. Emphasis is placed on atomic and molecular structure, chemical periodicity, descriptive organic chemistry, and thermochemistry. Six hours of lecture and laboratory weekly.

CHE-142 General Chemistry II 4.0 cr.

Spring. Prereq.: CHE-141. A continuation of the study of general chemistry including equilibrium, electrochemistry, thermodynamics, kinetics and environmental chemistry. Six hours of lecture and laboratory weekly.

CHE-252 Analytical Chemistry I 4.0 cr.

Fall. Prereq.: CHE-142. An introduction to the theory and techniques of analytical chemistry including volumetric/gravimetric methods, acid/base chemistry, potentiometry, chromatography and complex equilibria. Three hours of lecture and one 3½ hour laboratory weekly.

UPPER DIVISION

CHE-301 Organic Chemistry I & CHE-302 Organic Chemistry II 4.0 cr. each

Fall, spring. Prereq.: CHE-142; CHE-301 is a prereq. to 302. A study of the aliphatic and aromatic compounds of carbon. Study includes structure, nomenclature, typical reaction of functional groups, structure reactivity relationships, synthesis and mechanisms of reactions. Three hours of lecture and one 3½ hour laboratory weekly.

CHE-394 Special Topics in Chemistry 2.0 cr.

Not Offered 2003/2004. Prereq.: CHE-302 or permission. A course for students pursuing a major or minor in chemistry. Specialized subjects in inorganic, analytical, organic, physical, environmental or biochemistry will be examined in a lecture and seminar format. Topics involving current literature and research will be emphasized.

Four hours of lecture weekly.

CHE-397 Internship 1.0 to 3.0 cr.

Fall, winter, spring. Prereq.: At least sophomore standing and permission. Internships are designed to give students experience in their fields of interest. A written summary of the internship and weekly consultation with the instructor may be required. This course does not fulfill the general graduation requirement for independent work. See internship guidelines.

CHE-399 Physical Chemistry I 3.0 cr.

Not Offered 2003/2004. Prereq.: CHE-142 or 252, MAT-152. Pre or coreq.: PHY 231-232 or 271-272 (271-272 preferred). A study of the properties of gases, the laws of thermodynamics, solutions, equilibria, and phase diagrams. Three hours of lecture weekly.

CHE-400 Physical Chemistry II 3.0 cr.

Winter. Prereq.: CHE-142 or 252, MAT-152. Pre or Coreq.: PHY 231-232 or 271-272 (271-272 preferred). CHE-399 is not a prerequisite. A study of reaction kinetics, quantum and statistical mechanics, atomic and molecular structure and spectroscopy. Three hours of lecture weekly.

CHE-412 Biochemistry 3.0 cr.

Spring. Prereq.: CHE-301. A lecture and reading course in biochemical principles. Topics include thermodynamics, biomolecules, enzymes, metabolism, and expression and transmission of genetic information. Three hours of lecture weekly.

CHE-412L Biochemistry Lab 1.0 cr.

Spring. Coreq.: CHE-412. A laboratory study of the concepts and techniques involved in biochemistry. The course will primarily focus on protein structure and function. The course will emphasize spectroscopy, protein isolation techniques, chromatography, electrophoresis, peptide structure determination, enzyme kinetics, and techniques in nucleic acid chemistry. One 3½ hour laboratory weekly.

CHE-420 Inorganic Chemistry 3.0 cr.

Fall. Prereq.: CHE-301; Coreq.: CHE-420L. A select coverage of topical inorganic chemistry comprising nuclear chemistry, molecular symmetry, polyatomic bonding, coordination chemistry, and bioinorganic chemistry. Three hours of lecture weekly.

CHE-420L Inorganic Chemistry Lab 1.0 cr.

Fall. Prereq.: CHE-301; Coreq.: CHE-420. A research experience encompassing synthesis, characterization and scientific writing with the goals of preparing anion sensors and heavy metal sequestering agents. One 3½ hour laboratory weekly.

CHE-451 Analytical Chemistry II 4.0 cr.

Spring. Prereq.: CHE-252 and 301. An advanced study of the techniques of analytical

chemistry including instrumentation theory, separation theory, optical methods and automated analysis. Three hours of lecture and one 3½ hour laboratory weekly.

CHE-494 Independent Study 1.0 to 3.0 cr.

Fall, winter, spring. Prereq.: permission. Reading, research, or special laboratory assignments as approved by the instructor. A written report is required for research projects. See independent study guidelines.

CHE-497 Internship 1.0 to 3.0 cr.

Fall, winter, spring, summer. Prereq.: permission. Individually arranged programs of work and study with the department, academic institutions, private industries, or government agencies. A paper or the write up of a laboratory notebook is required. Does not fulfill requirements for the chemistry major. See internship guidelines.