

5. Organic Chemistry Courses at UNR

Lecture Courses

CHEM 220A INTRODUCTORY ORGANIC CHEMISTRY

Formerly CHEM 142 (3 credit lecture). Prerequisite CHEM 121 (CHEM 122 recommended).

CHEM 241 & 242 ORGANIC CHEMISTRY I & II

3-credit lectures. Prerequisite: CHEM 122 or 202.

CHEM 341 & 342 ORGANIC CHEMISTRY FOR SCIENTISTS AND PROFESSIONALS I & II

3-credit lectures. Prerequisite: CHEM 202. CHEM 102 or 122 is also acceptable as a prerequisite, with a grade of A or B recommended as preparation.

See your departmental adviser to help select the organic chemistry sequence that is right for you. Only your major department can tell you which courses will meet major requirements. The following are advising guidelines:

Nursing majors:

Take CHEM 220A/220L Introductory Organic Chemistry and lab.
CHEM 241/242/220L is also acceptable.

Environmental science, life sciences, ecology and conservation biology majors:

CHEM 241/242 is recommended. CHEM 341/342 is acceptable. CHEM 220A is also acceptable for some Nutrition and Biology majors (see your department adviser).

Molecular biology majors:

CHEM 341/342 is recommended. CHEM 241/242 is acceptable.

Chemistry majors and minors, Biochemistry and Chemical Engineering majors:

CHEM 341/342 is required. If you have already taken CHEM 241/242 and wish to change to a Chemistry major or minor, see the department for required upper-level electives.

Pre-medicine and pre-dental students:

Either CHEM 241/242 or CHEM 341/342 is acceptable for medical and dental school. The 200-level sequence is broader and includes more biological applications. On the other hand, taking the 300-level sequence (and performing well) may be viewed favorably by professional school admissions committees.

Students who have taken CHEM 121 & 122:

CHEM 241/242 is the recommended sequence following CHEM 121/122. CHEM 341/342 may be taken if required for your major. A grade of A or B in CHEM 122 is strongly recommended as preparation for CHEM 341.

Students who have taken CHEM 201 & 202:

CHEM 341/342 is the recommended sequence following CHEM 201/202. CHEM 241/242 is acceptable if CHEM 341/342 is not required for your major.

Students who have taken CHEM 241 and need the second semester:

CHEM 242 is usually recommended. If you have changed to a major requiring CHEM 342 and obtained an A or B in CHEM 241, you may take CHEM 342. (See your dept. advisor.)

Laboratory Courses

CHEM 220L Introductory Organic Chemistry Laboratory (1 credit)

For students taking CHEM 220A. Co- or prerequisite: CHEM 220A. May also be taken with CHEM 242.

CHEM 345 Organic Chemistry Laboratory (2 credits)

Intended for students needing one two-credit lab course. Co- or prerequisite: CHEM 342; or prerequisite: CHEM 242.

CHEM 347 Laboratory Techniques of Organic Chemistry I (2 credits)

Intended for chemistry majors, as the first semester of a two-semester lab course. Co- or prerequisite: CHEM 341.

CHEM 348 Laboratory Techniques of Organic Chemistry II (2 credits)

Prerequisite: CHEM 347; and Co- or prerequisite: CHEM 342.

Organic Chemistry Lecture Course Descriptions:

CHEM 241 ORGANIC CHEMISTRY I (3 credits)

The objective of this course, together with the second-semester CHEM 242, is to give the student a broad understanding of introductory organic chemistry at a fundamental level and an appreciation of its relevance to biology. The foundation will be laid with key concepts of molecular structure and bonding. The chemistry of hydrocarbons will be surveyed and functional groups defining classes of organic compounds will be introduced. Fundamentals of stereochemistry, the 3-dimensional shapes of molecules, and relevance to biological applications will be discussed. The basics of reaction mechanisms, organic synthesis, and light-absorption spectroscopy will be covered. The prerequisite for this course is CHEM 122 or 202. **This course provides good background for students in life and environmental sciences. Chemistry and biochemistry majors, and other pre-professional majors desiring a more in-depth treatment, should enroll in CHEM 341.**

CHEM 242 ORGANIC CHEMISTRY II (3 credits)

The goal of this course, which is a continuation of CHEM 241, is to provide a comprehensive description of organic chemistry at a level sufficient for understanding biological, health, and environmental applications. The course will treat oxygen- and nitrogen-containing functional groups, fundamental multistep reaction mechanisms, reactions important in organic syntheses, and molecules and reactions of biological interest. Methods for determining the structures of natural organic compounds will be illustrated. CHEM 241 is the prerequisite for this course.

CHEM 341 ORGANIC CHEMISTRY FOR SCIENTISTS AND PROFESSIONALS I (3 credits)

Organic chemistry is a key discipline underlying biochemistry, biotechnology, chemical engineering, chemistry, medicine, pharmacy, and other fields. The goal of this course, together with the second-semester CHEM 342, is to equip students entering these areas with a thorough understanding of the concepts and facility with the skills of organic chemistry. Molecular structure and bonding will be introduced at a theoretical level to familiarize students with molecular orbitals and their use in understanding chemical phenomena. Hydrocarbons will be covered in detail. Stereochemical (3-dimensional) aspects of structure will be stressed, and organic synthesis will be emphasized by means of problem solving. Aromatic compounds will be covered, beginning with theoretical descriptions, and ultraviolet spectroscopy will be

developed by a quantum mechanical approach. The prerequisite is CHEM 202; CHEM 122 is also acceptable, with a grade of A or B in CHEM 122 strongly recommended.

CHEM 341 is intended for chemistry, biochemistry, molecular biology, chemical engineering, and other students on scientific or professional career paths, and assumes a strong background in general chemistry.

CHEM 342 ORGANIC CHEMISTRY FOR SCIENTISTS AND PROFESSIONALS II (3 credits)

The objective of this course, which is a continuation of CHEM 341, is to give students of chemistry, physical sciences and molecular biological sciences a complete and in-depth understanding of organic chemistry. The chemistry of the remaining functional groups not covered in CHEM 341 will be discincludng nomenclature, stereoisomerism, and stereoselectivity of reactions. Organic functional groups will be introduced and stratussed in detail. Problem solving will be used to give the student a working understanding of multistep reaction mechanisms, modern reagents used for organic synthesis, and synthetic strategy. Polyfunctional compounds and interactions between functional groups will also be covered, as well as applications of organic chemistry in biochemistry, biotechnology, and materials science. Modern organic analytical methods, such as mass spectrometry and nuclear magnetic resonance will be covered in detail. CHEM 341 is the prerequisite for this course, although CHEM 241 with an A or B will be accepted.