

70 / Chemistry

Elective	[Chem 421 Analytical Chemistry II] (Chem 210)	5
CORE	[Humanities and Fine Arts]	3
CORE	[Bio 101 General Biology]	4
		16-17

Senior Year

1st Semester

Chem 401	Physical Chemistry I (Math 250, Phys 250-260)	
OR		
Elective	[Chem 422 Adv Inorganic Chemistry] (Chem 102, Math 250)	4
Elective	[Chem 497 Research in Chemistry]	1
CORE	[Humanities and Fine Arts]	3
CORE	[Hist 120 or 320 U.S. Hist]	3
CORE	[International Cultural Studies]	3
		14

2nd Semester

Chem 402	Physical Chemistry II (Chem 401) (4)	
OR		
Elective	[Chem 472 Organic Instrumental Analysis] (Chem 302) (5)	4-5
Elective	[Chem 497 Research in Chemistry]	2
Elective	[Phys 372 Electronic Circuits] (Phys 290)	4
CORE	[Humanities and Fine Arts]	3
CORE	[Psy 100 or Soc 110]	3
		16-17

(Prerequisites)

[Department Recommendations]

For additional information contact:

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Course Descriptions

Chem 100 (F, S) 5 hrs. cr.
Introductory Chemistry

Basic principles and practical applications of inorganic, organic and biochemistry which satisfies the needs of students in certain health-related programs. Four lectures, one three-hour lab per week. Prerequisite: Math 30 or satisfactory score on the Mathematics Placement Test.

Chem 101 (F, S, SS) 5 hrs. cr.
General Chemistry I

Introduction to theories of chemistry with emphasis on the relationship of structure to properties of matter and the quantitative aspect of these changes. Four lectures, one three-hour lab per week. Prerequisite or corequisite: Math 140 or higher level math course.

Chem 102 (F, S, SS) 5 hrs. cr.
General Chemistry II

Continuation of Chem 101. Emphasis on the dynamics and thermodynamics of chemical processes and on the properties and reactions of analogous groups of cations and anions. Four lectures, one three-hour lab per week. Prerequisites: Chem 101 with a minimum grade of "C" or permission of instructor and Math 140 or higher level math course.

Chem 190 (Demand) 1-2 hrs. cr.

Laboratory in Chemistry

A lower division laboratory course to be used by students who are transferring chemistry courses without a laboratory to MSSU. This will make the transferred course equivalent to the MSSU course. Class may be repeated for credit as needed.

Chem 201 (F) 5 hrs. cr.

Analytical Chemistry I

Standard first course in quantitative chemical analysis. The lecture and lab include the theory and practice of methods of analysis. While the primary emphasis in the first semester is on the interpretation of the experimental results, other aspects of the analytical process are introduced. Three lectures, two three-hour labs per week. Prerequisite: Chem 102.

Chem 297 (F, S) 1-3 hrs. cr.

Introduction to Research in Chemistry (Writing Intensive)

Introduction to research techniques; laboratory work and literature search under the supervision of an instructor on a chemical research project. Involves laboratory experimentation as well as a written report on a project from any area of chemistry. Open to students having 1) a minimum of 15 hours of chemistry, 2) freshman or sophomore standing, 3) the ability to undertake independent work and 4) permission of the instructor. Enrollment must be approved by the adviser and the department head.

Chem 298 (Demand) 1-3 hrs. cr.

Topics in Chemistry

Designed to give instruction in some area of Chemistry not covered in other courses. Prerequisite: Chem 201 or permission of instructor.

Chem 300 (F, S) 5 hrs. cr.

Introduction to Modern

Organic Chemistry

(Writing Intensive)

Principles of organic chemistry—nomenclature, structure, properties, stereochemistry, reactions—will be studied by the functional group approach. Designed for students who require a general knowledge of organic chemistry in their chosen career or as background for other courses in technical or professional training programs. Four lectures, one three-hour lab per week. Prerequisite: Chem 102.

Chem 301 (F) 5 hrs. cr.

Organic Chemistry I

Primary emphasis is on the properties, nomenclature, and reactions of aliphatic compounds. The functional group approach is used. A brief introduction to organic reaction mechanisms and spectroscopy is included. Four lectures, one three-hour lab per week. Prerequisite: Chem 102.

Chem 302 (S) 5 hrs. cr.

Organic Chemistry II

(Writing Intensive)

A continuation of Chem 301. The functional group approach is continued with the study of aromatic and aliphatic compounds. Emphasis is placed on the properties, nomenclature, reactions, and reaction mechanisms of these compounds. Organic spectroscopy is discussed in detail as related to the identification of functional groups and molecular structures. Four lectures, one three-hour lab per week. Prerequisite: Chem 301 with a grade of "C" or better.

Chem 320 (S) 2 hrs. cr.

Computer Applications in Chemistry

An introduction to computer applications and software commonly used for scientific study (and in upper-division courses). Students will become proficient in using the operating system, the local-area network, and spreadsheets and graphing applications, and will be introduced to computer data acquisition and interfacing, Internet information sources, and presentation software. This course satisfies the computer literacy requirement for chemistry, biochemistry, biology, and environmental health majors. One lecture, one three-hour lab per week. Prerequisite: Math 130 (or higher) and Chem 101.

- Chem 351 (F) 5 hrs. cr.
Biochemistry (*Writing Intensive*)
 Fundamental concepts of the chemistry of lipids, carbohydrates, and proteins with emphasis on the physiological aspects of these compounds. The interrelationship of these compounds in living systems will be presented through bioenergetics, and chemical mechanisms reaction pathways. Four lectures, one three-hour lab per week. Prerequisite: Chem 300 or 302.
- Chem 390 (Demand) 1-2 hrs. cr.
Laboratory in Chemistry
 A upper division laboratory course to be used by students who are transferring chemistry courses without a laboratory to MSSU. This will make the transferred course equivalent to the MSSU course. Class may be repeated for credit as needed.
- Chem 400 (F) 4 hrs. cr.
Elementary Physical Chemistry
 A one semester course, designed particularly for biochemical, biological, and pre-professional students, which surveys the fundamentals of physical chemistry. Principles of thermodynamics and chemical kinetics, and their application to aqueous solutions, will be emphasized. Solution equilibria, spectroscopy, and transport processes will also be examined. Three lectures, one three-hour lab per week. Note: This course does not meet the requirements for the B.S. in Chemistry. Prerequisite: Chem 102 with a "C" or better.
- Chem 401 (F, Odd) 4 hrs. cr.
Physical Chemistry I
 For the first section of the class, a microscopic approach to the understanding of chemical and physical properties of chemical systems is taken. The focus is on quantum theory and molecular spectroscopy. In the last part of the class, a macroscopic approach to the understanding of chemical and physical properties of chemical systems is used. Topics include the laws of thermodynamics and the relationships between the properties of chemical systems at equilibrium. Three lectures, one three-hour lab per week. Prerequisites: Math 250 and Phys 280.
- Chem 402 (S, Odd) 4 hrs. cr.
Physical Chemistry II
 Continuation of Chem 401. A microscopic approach (quantum theory) and the macroscopic approach (thermodynamics) to understanding chemical systems are linked using statistical mechanics. Chemical kinetics is also studied. Three lectures, one three-hour lab per week. Prerequisite: Chem 401.
- Chem 421 (S, Odd) 5 hrs. cr.
Analytical Chemistry II
 Continuation of Chemistry 201. A study of the overall analytical process. Lecture and lab deal mainly with electrochemical and spectrophotometric methods of analysis and their application in chemical analysis, but also include other physiochemical and separatory techniques used in modern analytical processes. Three lectures, two three-hour labs per week. Prerequisite: Chem 201.
- Chem 422 (S, Even) 4 hrs. cr.
Advanced Inorganic Chemistry
 Contemporary state of the several bond models in chemistry, a review of the energetics of reactions and coordination theory, followed by the chemistry of the families of the elements in the periodic table. Three lectures, one three-hour lab per week. Prerequisites: Chem 102 and Math 250.
- Chem 427 (S, Odd) 5 hrs. cr.
Organic Instrumental Analysis (*Writing Intensive*)
 Designed to familiarize the student with current instrumentation. The approach is through (1) lectures devoted to a particular type of instrumentation and (2) laboratories designed to give hands-on experience in the working of the instrument. Two lectures, two three-hour labs per week. Prerequisite: 15 hours of chemistry with a grade of "C" or better.
- Chem 430 (Demand) 1-3 hrs. cr.
Internship in Chemistry
 In conference with departmental representatives at least six weeks in advance, the student shall elect to work and observe in any area of applied chemistry in which on-the-job experience would be beneficial to the student's training. Prerequisites, Junior standing in Chemistry with a minimum of 20 hours of chemistry or by permission.
- Chem 472 (S, Odd) 4 hrs. cr.
Organic Qualitative Analysis
 Systematic identification of organic compounds and mixtures; organic spectroscopy is emphasized. Two lectures, two three-hour labs per week. Prerequisite: Chem 302.
- Chem 490 (F, S) 1-3 hrs. cr.
Seminar
 For upper division chemistry majors. Content varies, depending on the student's needs, from library research to special topics in chemistry. Prerequisite: Senior standing or permission of department head.
- Chem 496 (F, S) 2 hrs. cr.
Problems in Chemistry (*Writing Intensive*)
 A practical research class especially designed for students seeking a Bachelor of Science in Education with a major in chemistry. The class involves laboratory work and a literature search under the supervision of an instructor on a chemical research project. Involves lab experimentation as well as a written report on a project from any area of chemistry. Open to students needing a problems course in chemistry to satisfy Missouri Certification Standards for Secondary Teachers in Chemistry. Students must have a minimum of 20 hours of chemistry and permission of the instructor. Enrollment must be approved by the adviser and the department head.
- Chem 497 (F, S) 1-3 hrs. cr.
Research in Chemistry (*Writing Intensive*)
 Independent research techniques; lab work and literature search under the supervision of an instructor on a chemical research project. Involves lab experimentation as well as a written report on a project from any area of chemistry. Open to students having 1) a minimum of 20 hours of chemistry, 2) junior or senior standing, 3) the ability to undertake independent work and 4) permission of the instructor. Enrollment must be approved by the adviser and the department head.
- Chem 498 (Demand) **Advanced Topics in Chemistry**
 Designed to give advanced instruction in some area not covered in other courses. For upper division majors. Prerequisites to be determined by department.
- Chem 499 (F, S) 1-3 hrs. cr.
Independent Study
 Independent investigation techniques; includes a paper on a selected topic with both a critical survey of the chemical literature and results from advanced lab experimentation. Open to students having (1) minimum of 25 hrs. of chemistry, (2) ability to undertake independent work and (3) permission of instructor. Enrollment must be approved by adviser, department head, and school dean.