

k-state

study guide

kansas state university

Chemistry

Why study chemistry?

Why Chemistry? Because you are curious about how the world around you actually works! For example, through chemistry we have been able to answer fundamental questions about atomic structure, DNA, and photosynthesis, and we have subsequently transformed this essential knowledge base into highly practical applications. Through chemistry we synthesize compounds that can treat illness, harness solar energy, or monitor our environment. Chemistry has also allowed us to manufacture durable materials, bio-implants and nanoscale devices. Chemistry is all around us, and our quality of life is intimately linked to sensible developments of new materials and to a better understanding of all biological processes.

A degree in chemistry will give you a unique insight into areas that are central to biology, geology, materials science, medicine, environmental science, and many branches of engineering. It will give you practical skills through extensive hands-on experience with state-of-the-art equipment and it will provide you with a genuinely scientific approach to problem solving, and data analysis and interpretation. In short, a degree in chemistry will enable you to participate actively, productively, and responsibly in the material world around you.

Career opportunities

The chemistry program at K-State has a history of academic excellence and we continue to produce graduates that are sought by chemical industries, governmental laboratories, and educational institutions. A chemistry degree can also lead to other career paths and many of our chemistry graduates continue their studies in professions such as medicine, pharma-

cology, agriculture, chemical engineering, journalism, law, forensic science, and biochemistry. Many graduates decide to continue their education after completing their first degree and over half of our graduates attend medical school or graduate school. Students who plan to become high school science teachers may choose to earn dual degrees in chemistry and education.

Faculty

Our faculty is committed to providing the best possible education for our students, and several of our faculty members have received prestigious teaching awards in recognition of their efforts. In addition to their teaching duties, our professors are also extensively involved in research programs that cover all areas of modern chemistry.

Research opportunities

We strive to give all our undergraduate chemistry students the opportunity to participate in ongoing research projects which gives our students tangible advantages when it comes to seeking employment and post-graduate careers. Students who participate in undergraduate research work closely with K-State chemistry professors and internationally known scientists and are given opportunities to present their work at meetings and conferences which provide additional opportunities for networking and interacting with other scientists.

Facilities

The Department of Chemistry is located in three adjacent buildings; the Chemistry/Biochemistry Building, the H. H. King Chemical Laboratory, and Willard Hall. Teaching and research in chemistry is conducted in modern laboratories that are

equipped with state-of-the-art instrumentation allowing students to gain experience that is crucial to their future careers. Most lecture rooms are equipped with the latest teaching technologies for instruction using a variety of media. To further support our students the department provides a staffed help room that is an educational resource dedicated exclusively to undergraduate students in chemistry.

Student activities

Most of our undergraduate students choose to participate in many different activities that are arranged by the local section of the American Chemical Society and by Alpha Chi Sigma, a professional fraternity that organizes chemistry magic shows and other outreach programs. Our students are also involved in activities that take place in the local community during National Chemistry Week and University Open House.

Scholarships and awards

The Department of Chemistry at K-State is fortunate enough to have a substantial number of awards and stipends available for undergraduate students. Funds for these scholarships have been made possible thanks to generous contributions from K-State chemistry alumni.

Chemistry majors have also received a number of prestigious national scholarships. For example, the Department of Chemistry has had ten Goldwater, one Rhodes, one Udall, one Truman, two Phi Kappa Phi, and two Fulbright Scholars.

Graduate study

The department offers graduate programs leading to the M.S. and Ph.D. degrees in analytical, biological, inorganic, materials, organic, and physical chemistry. The fact

that the department has a strong research program provides many direct benefits to the undergraduate students. The faculty is always aware of the very latest scientific developments and undergraduate students are encouraged to join active and productive research groups. Furthermore, the department maintains a weekly seminar program that brings distinguished scientists (including Nobel Laureates) with international reputations to present seminars on their own research and to interact informally with our faculty and students.

Financial assistance

The department provides financial assistance to well-qualified students whose primary major is chemistry. Contact Student Financial Assistance at 785-532-6420 or e-mail ksusfa@k-state.edu for scholarship information.

Curriculum

The department offers programs leading to the B.S. and B.A. degrees in chemistry; the only difference being the amount of foreign language studied. The B.S. degree in chemistry consists of two programs: (i) the chemistry program, and (ii) the chemical science program.

Chemistry program

The chemistry program is the preferred program for students who are preparing for graduate study in chemistry or who plan for employment as chemists. This program leads to the professional degree in chemistry as approved by the American Chemical Society.

Chemistry (39–41 hours)*

Hrs.	Courses
5	CHM 220 Chemical Principles I and
5	CHM 250 Chemical Principles II or
4	CHM 210 Chemistry I and
4	CHM 230 Chemistry II and
4	CHM 371 Chemical Analysis
3	CHM 531 Organic Chemistry I
2	CHM 532 Organic Chemistry lab
3	CHM 550 Organic Chemistry II
3	CHM 585 Physical Chemistry I
3	CHM 595 Physical Chemistry II
3	CHM 566 Instrumental Methods of Analysis
2	CHM 596 Physical Methods lab
2	CHM 657 Inorganic Techniques
3	CHM 711 Inorganic Chemistry I

3	CHM 712 Inorganic Chemistry II
2	CHM 599 Senior Thesis Research

Mathematics (12 hours)

Hrs.	Courses
4	MATH 220 Analytic Geometry and Calculus I
4	MATH 221 Analytic Geometry and Calculus II
4	MATH 222 Analytic Geometry and Calculus III

Biochemistry (3 hours)

Hrs.	Courses
3	BIOCH 521 General Biochemistry or
3	BIOCH 755 Biochemistry I

Physics (10 hours)

Hrs.	Courses
5	PHYS 213 Engineering Physics I
5	PHYS 214 Engineering Physics II

*CHM 711 or 712 may be replaced with CHM 752 (Advanced Organic Chemistry, 3 hours). Alternatively, CHM 711 or 712 may be replaced with BIOCH 755, 756, and 765 (Biochemistry I, Biochemistry I lab, and Biochemistry II, 8 hours), in which case, CHM 657 may be taken for 1 or 2 hours.

Chemical science program

The chemical science program serves students who want a strong background in chemistry but who do not require as much specialization as provided by the chemistry program.

Chemistry (25–27 hours)

Hrs.	Courses
5	CHM 220 Chemical Principles I and
5	CHM 250 Chemical Principles II or
4	CHM 210 Chemistry I and
4	CHM 230 Chemistry II and
4	CHM 371 Chemical Analysis
3	CHM 531 Organic Chemistry I
2	CHM 532 Organic Chemistry lab
3	CHM 550 Organic Chemistry II
3	CHM 500 General Physical Chemistry or
3	CHM 585 Physical Chemistry I
3	CHM 566 Instrumental Methods of Analysis
1	CHM 596 Physical Methods lab

Biochemistry (5 hours)

Hrs.	Courses
3	BIOCH 521 General Biochemistry
2	BIOCH 522 General Biochemistry lab

Mathematics (8 hours)

Hrs.	Courses
4	MATH 220 Analytic Geometry and Calculus I
4	MATH 221 Analytic Geometry and Calculus II

Physics (8 hours)

Hrs.	Courses
4	PHYS 113 General Physics I
4	PHYS 114 General Physics II

Chemistry minor (18–20 hours)

Hrs.	Courses
4	CHM 210 Chemistry I**
4	CHM 230 Chemistry II**
4	CHM 371 Chemical Analysis**
3	CHM 350 General Organic Chemistry or
3	CHM 531 Organic Chemistry I
2	CHM 351 General Organic Chemistry lab or
2	CHM 532 Organic Chemistry lab
3	CHM 500 General Physical Chemistry or
3	CHM 585 Physical Chemistry I

**CHM 220 (Chemical Principles I, 5 hours) and CHM 250 (Chemical Principles II, 5 hours) may replace CHM 210, CHM 230, and CHM 371.

For more information about chemistry, contact:

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For more information about Kansas State University, contact:

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3131–37120–7/05–200D-200A