

Department of Chemistry

Chemistry

I. Introduction

Chemistry is regarded as the central science because of its role in connecting different subjects and its importance in interdisciplinary research, such as chemical biology, materials science, energy, agricultural development, drug discovery and so on.

Established in 2011, the Chemistry Department of SUSTech has 23 full-time faculty members now. Thanks to the strong support from both the central government and the Shenzhen municipal government, the department aims to be one of the best in China and has attracted many outstanding experts from all over the world, some of whom are tenured full professors or equivalents in the US before joining SUSTech. All faculty members are supported by various high-level talent programs in China—including 4 supported by the prestigious Thousand Talents Program, 8 supported by the Young Thousand Talents Program, 1 supported by the Outstanding Youth Fund, and 20 supported by the Peacock Plan-Overseas High-Caliber Personnel of Shenzhen. In particular, the Chemistry Department strives to gain internationally reputed achievements in research and to foster excellent scientists and engineers in the areas of inorganic chemistry, organic chemistry, bioanalytical chemistry, and physical chemistry/molecular materials chemistry. The Department of Chemistry has been awarded with research grants of more than one billion RMB (or 160 million US\$). In the last three years, more than 100 research papers have been published in prestigious chemistry journals, such as Nature Communication, Chem. Soc. Rev., J. Am. Chem.Soc., Angew. Chem. Int. Ed., and etc., some of which were highlighted in Nature, Nature Chemistry, or used as VIP cover papers.

Adhering to our university's motto of "Research, Innovation and Entrepreneurship," the Chemistry Department focuses on cultivating students' innovation, critical thinking and ability for interdisciplinary cooperation. The curriculum design emphasizes not only the basic theory, but also practical training particularly in the areas of new medicine, new energy, and new materials. Undergraduates are strongly encouraged to participate in various research programs supervised by professors to cultivate their creativity, practical skills and ability for interdisciplinary cooperation. The department maintains a wide array of sophisticated instrumentation necessary for modern chemical research and teaching.

The department chair is Prof. Xumu Zhang, a former distinguished professor of chemistry at Rutgers University, the State University of New Jersey, and a recipient of ACS Cope Scholar Award in 2002. Prof. Robert H. Grubbs of Caltech (2005 Nobel Laureate of Chemistry) serves as a chairman of the advisory board of the Chemistry Department.

II. Objectives

The undergraduate Chemistry program is aimed at training new generations of top-notch innovative personnel who have a solid background in mathematics and physics, extensive knowledge of chemistry, strong experimental skills, an international perspective and an entrepreneurial spirit.

III. Period of Study and Degree Requirements

Time length: 4 years

Degree conferred:Bachelor of Science

The minimum credit requirement for graduation: 148.5 Credits

IV. Discipline

Chemistry

V. Main Courses

General Chemistry, General Chemistry Laboratory, Inorganic Chemistry I & II, Organic Chemistry I & II, Analytical Chemistry, Instrumental Analysis, Physical Chemistry I & II, Inorganic Chemistry Laboratory, Analytical Chemistry Laboratory, Organic Chemistry Laboratory, Physical Chemistry Laboratory, Polymer Chemistry, Modern Strategic Synthesis, Principle of Chemical Engineering, Frontiers of Chemical Science, Supramolecular Chemistry, Advanced Instrumentation Systems I & II, Medicinal Chemistry, and so on.

VI. Practice-Based Courses

General Chemistry Laboratory, Inorganic Chemistry Laboratory, Analytical Chemistry Laboratory, Organic Chemistry Laboratory, Physical Chemistry Laboratory, Undergraduate Research Program, Undergraduate Thesis, and so on. (See Table 3) .

VII. Course Structure and Credit Requirements

General Education (GE) Required Courses: 66.5 Credits;

General Education (GE) Elective Courses: 10 Credits;

Major Required Courses: 44 Credits;

Major Elective Courses: 12 Credits;

Research Projects: 8 Credits;

Undergraduate Thesis/Projects: 8 Credits;

The minimum credit requirement for graduation: 148.5 credits.

VIII. Course Arrangement

Table 1: Major Required Courses (Foundational and Core courses)

Course Code	Course Name	Credits	Lab Credits	Hours /Week	Term	Advised term to take the course	Prerequisite	Dept.
CH102	General Chemistry Laboratory	1	1	2	Spr.	1/ Spr.	CH101	Chem.
CH201	Inorganic Chemistry I	4		4	Fall	2/ Fall	CH101	Chem.
CH203	Organic Chemistry I	4		4	Fall	2/ Fall	CH101	Chem.
CH205	Analytical Chemistry	4		4	Fall	2/ Fall	CH101	Chem.
CH207	Analytical Chemistry Laboratory	2	2	4	Fall	2/ Fall	CH101	Chem.
CH202	Inorganic Chemistry II	4		4	Spr.	2/ Spr.	CH201	Chem.
CH204	Inorganic Chemistry Laboratory	2	2	4	Spr.	2/ Spr.	CH201,CH102	Chem.
CH206	Organic Chemistry II	4		4	Spr.	2/ Spr.	CH101	Chem.
CH208	Organic Chemistry Laboratory	2	2	4	Spr.	2/ Spr.	CH203,CH206	Chem.
CH301	Physical Chemistry I	4		4	Fall	3/ Fall	GE101,GE102,P HY101,PHY102, CH101	Chem.
CH303	Physical Chemistry Laboratory	2	2	4	Fall	3/ Fall	CH301,CH302	Chem.
CH305	Instrumental Analysis	4	2	6	Spr.	3/ Spr.	CH205,CH207	Chem.
CH302	Physical Chemistry II	4		4	Spr.	3/ Spr.	CH301	Chem.
CH403	Principle of Chemical Engineering	3		3	Fall	4/ Fall	GE101,GE102,P HY101,PHY102, CH203,CH206,C H301,CH302	Chem.
CH480	Undergraduate Research Program	8	8	8	Fall & Spr.	3/ Fall & Spr.		Chem.
CH490	Undergraduate Thesis	8	8	8	Fall & Spr.	4/ Fall & Spr.		Chem.
Total		60	27	71				

Table 2: Major Elective Courses

Course Code	Course Name	Credits	Lab Credits	Hours /Week	Term	Advised term to take the course	Prerequisite	Dept.
CH210	Frontiers of Chemical Science	2		2	Spr.	2/ Spr.		Chem.
CH309	Advanced Organic Chemistry Laboratory	2	2	4	Fall	3/ Fall	CH203, CH206, CH208	Chem.
CH311	Modern Strategic Synthesis	3		3	Fall	3/ Fall	CH202,CH206	Chem.
CH313	Chemical Biology	3		3	Fall	3/ Fall	CH203,CH206	Chem.
GE351	Scientific Literature and Writing	1		1	Fall	3/ Fall		Chem.
CH315	Polymer Chemistry	3		3	Fall	3/ Fall	CH101, CH203,CH206,CH301,CH302	Chem.
CH317	Medicinal Chemistry	3		3	Fall	3/ Fall	CH203,CH206	Chem.
CH319	Advanced Inorganic Chemistry Laboratory	2	2	4	Fall	3/ Fall	CH201,CH202,CH102,CH204	Chem.
CH321	Polymer Chemistry Laboratory	1	1	1	Fall	3/ Fall	CH101, CH203,CH206,CH301,CH302	Chem.
CH304	Nanomaterials Synthesis and Nanotechnology	2		2	Spr.	3/ Spr.	CH101, PHY101,PHY102 , CH201,CH202,CH301,CH302	Chem.
CH306	Laboratory for Micro-Nano Synthesis, Technology and Application	2	2	4	Spr.	3/ Spr.	CH101, PHY101,PHY102 ,CH201,CH202,CH301,CH302	Chem.
CH308-14	Supramolecular Chemistry	3		3	Spr.	3/ Spr.	CH101, CH203,CH206, CH301,CH302	Chem.
CH310-15	Colloid & Surface Chemistry	2		2	Spr.	3/ Spr.	CH101, CH203,CH206, CH301,CH302	Chem.
CH312	Organic Spectroscopy	2		2	Spr.	3/ Spr.	CH203,CH206	Chem.
CH314	Asymmetric Synthesis	3		3	Spr.	3/ Spr.	CH203,CH206,CH311	Chem.
CH212-16	Advanced Instrumentation Systems I	4	2	6	Spr.	3/ Spr.	CH101	Chem.
CH316	Bioinorganic Chemistry	2		2	Spr.	3/ Spr.	CH101	Chem.
CH318	Single Crystal X-ray Structure	2		2	Spr.	3/ Spr.	CH101	Chem.

-14	Analysis							
CH320	Organic Name Reactions	2		2	Spr.	3/ Spr.	CH101	Chem.
CH401	Computational Chemistry	3	1	4	Fall	4/ Fall	CH301,CH302	Chem.
CH405	Advanced Inorganic Chemistry	3		3	Fall	4/ Fall	CH101, CH201,CH202	Chem.
CH407	Selected Topics in Nanoscience and Nanotechnology	3	1	4	Fall	4/ Fall	CH101, PHY101,PHY102 , CH201,CH202, CH301,CH302	Chem.
CH409	Organic Optoelectronic Materials and Devices	4	1	5	Fall	4/ Fall	CH203,CH206	Chem.
CH307 -13	Advanced Instrumentation Systems II	2	2	4	Fall	4/ Fall	CH212	Chem.
Total		59	14	73				

Table 3: Overview of Practice-Based Courses

Course Code	Course Name	Credits	Lab Credits	Hours /Week	Term	Advised term to take the course	Prerequisite	Dept.
CH102	General Chemistry Laboratory	1	1	2	Spr.	1/ Spr.	CH101	Chem.
CH207	Analytical Chemistry Laboratory	2	2	4	Fall	2/ Fall	CH101	Chem.
CH204	Inorganic Chemistry Laboratory	2	2	4	Spr.	2/ Spr.	CH201,CH102	Chem.
CH208	Organic Chemistry Laboratory	2	2	4	Spr.	2/ Spr.	CH203,CH206	Chem.
CH303	Physical Chemistry Laboratory	2	2	4	Fall	3/ Fall	CH301,CH302	Chem.
CH305	Instrumental Analysis	4	2	6	Spr.	3/ Spr.	CH205,CH207	Chem.
CH309	Advanced Organic Chemistry Laboratory	2	2	4	Fall	3/ Fall	CH203, CH206, CH208	Chem.
CH321	Polymer Chemistry Laboratory	1	1	2	Fall	3/Fall	CH101,CH203,CH206,PHY101,PHY102	Chem.
CH319	Advanced Inorganic Chemistry Laboratory	2	2	4	Fall	3/ Fall	CH201,CH202,CH102,CH204	Chem.
CH306	Laboratory for Micro-Nano Synthesis, Technology and Application	2	2	4	Spr.	3/ Spr.	CH101, PHY101,PHY102,CH201,CH202,CH301,CH302	Chem.
CH212-16	Advanced Instrumentation Systems I	4	2	6	Spr.	3/ Spr.	CH101	Chem.
CH401	Computational Chemistry	3	1	4	Fall	4/ Fall	CH301,CH302	Chem.
CH407	Selected Topics in Nanoscience and Nanotechnology	3	1	4	Fall	4/ Fall	CH101, PHY101,PHY102, CH201,CH202, CH301,CH302	Chem.
CH409	Organic Optoelectronic Materials and Devices	4	1	5	Fall	4/ Fall	CH203,CH206	Chem.
CH307-13	Advanced Instrumentation Systems	2	2	4	Fall	4/ Fall	CH212	Chem.

	II							
CH480	Undergraduate Research Program	8	8	16	Fall & Spr.	3/ Fall & Spr.		Chem.
CH490	Undergraduate Thesis	8	8	16	Fall & Spr.	4/ Fall & Spr.		Chem.
合计		52	41	93				

Table 4: Overview of Course Hours and Credits

Course Category	Total Course Hours	Total Credits	The Minimum Credit Requirement
General Education (GE) Required Courses	1168	66.5	66.5
General Education (GE) Elective Courses	3144	182.5	10
Major Required Courses	990	44	44
Major Elective Courses	1314	59	12
Research Projects, and Undergraduate Thesis/Projects	576	16	16
Total	7192	368	148.5