

04-16a, b
Withdrawn 2/1/05

b. Catalog Description Change

Current Catalog Description Change:

Degrees offered by the Department of Chemistry are the Bachelor of Science degree in Chemistry, the Bachelor of Arts degree in Chemistry, and the Bachelor of Science in Education with a Chemistry major. The first two degrees are under the College of Natural Science and Mathematics, and the third is under the College of Education and Educational Technology. The department offers a formal pre-medical concentration in the B.A. curriculum and a Chemistry minor.

The B.S. degree in Chemistry is a professional degree and is certified by the American Chemical Society. The student completing this major should be qualified to assume a position in industry or government as a chemist or to pursue graduate studies leading to the M.S. or Ph.D. degree in chemistry, biochemistry, materials science, forensic science or an associated field.

The curriculum leading to the B.A. degree in Chemistry is designed to allow for the workable union of other disciplines with chemistry in such a way as to retain the fundamental science and mathematics requirements needed for a career in chemistry. A careful selection of electives will qualify the student for entrance into many fields in which there is an acute need for persons with scientific training, and, at the same time, satisfy the entrance requirements of various professional and graduate schools. This degree may also be of interest to students who have completed a significant number of credits in another degree program and decide they want to earn a degree in chemistry.

The B.A. degree in Chemistry can incorporate a complementary program in almost any other field in the university; some disciplines which make useful combinations include biology, business administration, computer science, criminology (forensic science), English (technical writing), geoscience, government, physics, and safety science. In particular, a student seeking a career in forensic science should major in chemistry.

The B.A. program offers a concentration in Pre-Medicine. This concentration includes all courses required for entrance into medical school and is sequenced to prepare students to take the MCAT in the spring of their junior year. A degree in chemistry, with Pre-Medical concentration, gives students the flexibility of choosing medical school, graduate school, or employment in the chemical industry after graduation.

Both degrees in chemistry also provide excellent preparation for entrance into a variety of other professional schools, including dental, veterinary, pharmacy, chiropractic, and law. Students considering going to one of these professional schools after completion of a chemistry degree should work closely with their advisor and select additional courses as required by the professional school.

The curriculum leading to the B.S. in Education with a Chemistry major is designed to prepare the student to teach chemistry at the secondary school level. Upon completion of the

specified coursework and the requirements of the teacher certification process, the student is eligible for Pennsylvania certification by the Pennsylvania Department of Education. Additionally, the curriculum in this degree program is designed so that students have the opportunity to obtain a B.S.Ed.--Chemistry degree certified by the American Chemical Society.

Proposed Catalog Description Change:

Degrees offered by the Department of Chemistry are the Bachelor of Science in Chemistry, the Bachelor of Arts in Chemistry, and the Bachelor of Science in Education with a Chemistry major. The first two degrees are under the College of Natural Science and Mathematics, and the third is under the College of Education and Educational Technology. The department offers formal pre-medical minor program in both the B.S. and B.A. curricula, and preparatory programs for other professional schools can be developed for either degree. The department also offers a Chemistry minor.

The B.S. in Chemistry is a professional degree and is certified by the American Chemical Society. The student completing this major should be qualified to assume a position in industry or government as a chemist or to pursue graduate studies leading to the M.S. or Ph.D. degree in chemistry, biochemistry, materials science, forensic science or an associated field. The B.S. degree, combined with the Chemistry Pre-Medical minor, includes all courses required for entrance into medical school, and gives the student the flexibility of choosing medical school or graduate school after graduation.

The curriculum leading to the B.A. in Chemistry is designed to allow for the workable union of other disciplines with chemistry in such a way as to retain the fundamental science and mathematics requirements needed for a career in chemistry. A careful selection of electives will qualify the student for entrance into many fields in which there is an acute need for persons with scientific training, and, at the same time, satisfy the entrance requirements of various professional and graduate schools. This degree may also be of interest to students who have completed a significant number of semester hours in another degree program and decide they want to earn a degree in chemistry. As with the B.S. degree, a Chemistry B.A. with Pre-Medical minor includes all courses required for entrance into medical school.

The B.A. in Chemistry can incorporate a complementary program in almost any other field in the university; some disciplines which make useful combinations include biology, business administration, computer science, criminology (forensic science), English (technical writing), geoscience, government, physics, and safety science. In particular, a student seeking a career in forensic science should major in chemistry.

Either degree in chemistry provides excellent preparation for entrance into a variety of professional schools, including dental, veterinary, pharmacy, chiropractic and law. The student considering going to one of these professional schools after completion of a chemistry degree should work closely with their advisor and select additional courses as required by the professional school.

The curriculum leading to the B.S. in Education with a Chemistry major is designed to prepare the student to teach chemistry at the secondary school level. Upon completion of the specified coursework and the requirements of the teacher certification process, the student is eligible for Pennsylvania certification by the Pennsylvania Department of Education. The B.S. in Education with a Chemistry major degree program is also certified by the American Chemical Society.

**Current Program:
Bachelor of Science—Chemistry**

Liberal Studies: As outlined in Liberal Studies section with the following specifications:

Mathematics: MATH 123

Natural Sciences: PHYS 131-141 and 132-142

Liberal Studies Electives: 3cr, no courses with CHEM prefix

Major:

Required Courses:

CHEM 113	Concepts in Chemistry I	4cr
CHEM 114	Concepts in Chemistry II	4cr (1)
CHEM 214	Intermediate Inorganic Chemistry	2cr
CHEM 231	Organic Chemistry I	4cr
CHEM 232	Organic Chemistry II	4cr
CHEM 301	Introduction to Chemical Research	1cr
CHEM 321	Quantitative Analysis	4cr
CHEM 322	Instrumental Analysis	4cr
CHEM 341	Physical Chemistry I	4cr
CHEM 342	Physical Chemistry II	3cr
CHEM 343	Physical Chemistry Laboratory I	1cr
CHEM 344	Physical Chemistry Laboratory II	1cr
CHEM 410	Advanced Inorganic Chemistry Laboratory	1cr
CHEM 411	Advanced Inorganic Chemistry	3cr
CHEM 498	Problems in Chemistry	2cr

Controlled Electives: (2)

Additional Chemistry electives from the following: 3cr

CHEM 331, 421, 435, 441, 481

Other Requirements:

BIOC 301	Biochemistry I	3cr	14-18
BIOL 111	Principles of Biology I	4cr	
MATH 124	Calculus II for Physics, Chemistry and Mathematics	4cr	

One additional mathematics elective from the following: MATH 171, 241, 342 3-4cr

Foreign language intermediate level (3) 0-3cr

Free Electives: 8-12

Total Degree Requirements: 120

- (1) CHEM 111 and 112 can be substituted for CHEM 113 and 114, respectively, for the B.S.--Chemistry degree.
- (2) Qualifying students can also use 500 or 600 level CHEM courses to meet this requirement.
- (3) Intermediate-level Foreign Language may be included in Liberal Studies elective.

**Proposed Program:
Bachelor of Science--Chemistry**

49 Liberal Studies: As outlined in Liberal Studies section with the following specifications: 49

Mathematics: MATH 123

Natural Sciences: PHYS 131-141 and 132-142

Liberal Studies Electives: 3cr, no courses with CHEM prefix

45

Major:

Required Courses:

CHEM 113	Concepts in Chemistry I(1)	4cr	45
CHEM 114	Concepts in Chemistry II(1)	4cr	
CHEM 214	Intermediate Inorganic Chemistry	2cr	
CHEM 231	Organic Chemistry I	4cr	
CHEM 232	Organic Chemistry II	4cr	
CHEM 301	Introduction to Chemical Research	1cr	
CHEM 321	Quantitative Analysis	4cr	
CHEM 322	Instrumental Analysis	4cr	
CHEM 341	Physical Chemistry I	4cr	
CHEM 342	Physical Chemistry II	3cr	
CHEM 343	Physical Chemistry Laboratory I	1cr	
CHEM 344	Physical Chemistry Laboratory II	1cr	
CHEM 410	Advanced Inorganic Chemistry Laboratory	1cr	
CHEM 411	Advanced Inorganic Chemistry	3cr	
CHEM 498	Problems in Chemistry	2cr	

Controlled Electives: (2)

Additional Chemistry electives from the following: 3cr

CHEM 331, 421, 435, 441, 481

Other Requirements:

BIOC 301	Biochemistry I(3)	3cr	14-18
BIOL 111	Principles of Biology I	4cr	
MATH 124	Calculus II for Physics, Chemistry and Mathematics	4cr	

One additional mathematics elective from the following: MATH 171, 241, 342 3-4cr

Foreign Language Intermediate Level (4) 0-3cr

Free Electives: 8-12

Total Degree Requirements: 120

- (1) CHEM 111 and 112 can be substituted for CHEM 113 and 114, respectively, for the B.S. --Chemistry degree.
- (2) Qualifying students can also use 500 or 600 level CHEM courses to meet this requirement.
- (3) Students obtaining the chemistry pre-medical minor may substitute CHEM 351 for BIOC 301.
- (4) Intermediate-level foreign language may be included in Liberal Studies elective.

04-16b

**Current Program:
Bachelor of Arts - Chemistry**

Liberal Studies: As outlined in the Liberal Studies section with the following specifications:
Mathematics: MATH 123
Natural Sciences: PHYS 111-121 and 112-122 *or* PHYS 131-141 and 132-142
Liberal Studies Elective: 3cr, no courses with CHEM prefix

Major: 30-33
Required Courses:
CHEM 113 Concepts in Chemistry I 4cr
CHEM 114 Concepts in Chemistry II 4cr
CHEM 214 Intermediate Inorganic Chemistry 2cr
CHEM 231 Organic Chemistry I 4cr
CHEM 232 Organic Chemistry II 4cr
CHEM 321 Quantitative Analysis 4cr
CHEM 341 Physical Chemistry I 4cr
CHEM 343 Physical Chemistry I Laboratory 1cr

Controlled Electives (2)
At least 3cr from the following: CHEM 301, 322, CHEM 342, 351, 410, 411, BIOC 301, 302, 311 3-6cr

Other Requirements: 19-22
MATH 124 Calculus II for Physics, Chemistry, and Mathematics 4cr
Planned program (with advisor approval) in complementary field of at least 15cr, with at least 6cr of 300/400-level courses (3) 15cr
Foreign Language Intermediate Level (4) 0-3cr

Free Electives: 16-22

Total Degree Requirements: 120

- (1) CHEM 111 and 112 can be substituted for CHEM 113 and 114, respectively, for the B.A.-Chemistry degree.
- (2) Students electing a concentration in Pre-Medicine must take CHEM 351 (4cr) or BIOC 301 and 302 (6cr).
- (3) Students electing a concentration in Pre-Medicine must take BIOL 111, 151, 263, 331, and a 300-level BIOL elective.
- (4) Intermediate-level foreign language may be included as Liberal Studies elective.

**Proposed Program:
Bachelor of Arts - Chemistry**

Liberal Studies: As outlined in the Liberal Studies section with the following specifications: 49
Mathematics: MATH 123
Natural Sciences: PHYS 111-121 and 112-122 *or* PHYS 131-141 and 132-142
Liberal Studies Elective: 3cr, no courses with CHEM prefix

Major: 30-33
Required Courses:
CHEM 113 Concepts in Chemistry I (1) 4cr
CHEM 114 Concepts in Chemistry II (1) 4cr
CHEM 214 Intermediate Inorganic Chemistry 2cr
CHEM 231 Organic Chemistry I 4cr
CHEM 232 Organic Chemistry II 4cr
CHEM 321 Quantitative Analysis 4cr
CHEM 341 Physical Chemistry I 4cr
CHEM 343 Physical Chemistry I Laboratory 1cr

Controlled Electives (2)
At least 3cr from the following: CHEM 301, 322, CHEM 342, 351, 410, 411, 498, BIOC 301, 302, 311 3-6cr

Other Requirements: 19-22
MATH 124 Calculus II for Physics, Chemistry, and Mathematics 4cr
Planned program (with advisor approval) in complementary field of at least 15cr, with at least 6cr of 300/400-level courses (3) 15cr
Foreign Language Intermediate Level (4) 0-3cr

Free Electives: 16-22

Total Degree Requirements: 120

- (1) CHEM 111 and 112 can be substituted for CHEM 113 and 114, respectively, for the B.A.-Chemistry degree.
- (2) Students obtaining a chemistry pre-medical minor must take CHEM 351 (4cr) or BIOC 301 and 302 (6cr).
- (3) Students obtaining a chemistry Pre-Medical minor must take BIOL 111, 151, 263, 331, and a 300/400-level BIOL elective.
- (4) Intermediate-level foreign language may be included as Liberal Studies elective.