

# Department of Chemistry

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1115 Hand Chemical Laboratory

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The Department of Chemistry offers two degree programs: the Bachelor of Science (B.S.) and the Bachelor of Arts (B.A.) degrees. A total of 124 hours is required to complete each degree program. Our chemistry degree programs provide an excellent foundation for career paths in graduate school, teaching, medicine, pharmacy, dental, and numerous industry positions.

The B.S. degree program offers three additional concentrations: the American Chemical Society (ACS) concentration, the Pre-Medical concentration, and the Pre-Pharmacy concentration. The ACS concentration is designed to prepare graduates for a career in industry or to further their education through graduate studies. The American Chemical Society (ACS) has continually approved the department and its curriculum since 1941, certifying degrees earned by completing the B.S. degree with the ACS concentration. The Pre-Medical concentration is intended to aid students in meeting medical school pre-requisites. This concentration combines required biology courses with specific chemistry courses designed to prepare students for the rigors of medical schools, dental schools, or other professional schools. Our Pre-Medical concentration is based on the pre-requisites required by the University of Mississippi Medical Center (UMMC). The Pre-Pharmacy concentration is designed to meet the pre-requisites for the School of Pharmacy at the University of Mississippi. These requirements mirror those of other pharmacy schools, but students who wish to attend other pharmacy schools should communicate this information to their advisor.

The B.A. degree program has a stronger liberal arts emphasis and could serve as a preparation for a secondary teaching career, chemical sales, or further study at a professional school.

The Department of Chemistry also offers a M.S. (non-thesis and thesis) and Ph.D. in Chemistry (see the Graduate Catalog for description of programs and requirements for more information on these advanced degrees).

## Chemistry Minor Requirements

Students in other majors may earn a minor in Chemistry by achieving at least a 2.00 average in a total of 22 hours of chemistry (CH) courses with 14 of the hours in upper-division courses (3000-4000 level), and a minimum of 11 of the total hours completed at MSU. Students interested in a chemistry minor should contact the Academic Coordinator.

## B.S. in Chemistry

### General Education and College Requirements

#### English Composition

EN 1103	English Composition I	3
or EN 1104	Expanded English Composition I	
EN 1113	English Composition II	3
or EN 1173	Accelerated Composition II	

#### Foreign Language

Foreign Language I	3
Foreign Language II	3

#### Humanities

Literature - A&S core	3
History - A&S core	3

#### Mathematics

MA 1713	Calculus I	3
MA 1723	Calculus II	3

#### Fine Arts

A&S core	3
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#### Natural Sciences

Satisfied within the major

#### Social Sciences

A&S core <sup>1</sup>	6
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#### Major Core

Student should check for prerequisites for all courses. See advisor.

CH 1141	Professional Chemistry: Paths	1
CH 1234	Integrated Chemistry I <sup>1</sup>	4
CH 1244	Integrated Chemistry II <sup>3</sup>	4
CH 2141	Professional Chemistry: Tools	1
CH 3213	Inorganic Chemistry	3
CH 3311	Analytical Chemistry I Laboratory	1
CH 3313	Analytical Chemistry I	3
CH 3141	Professional Chemistry: Literature	1
CH 4141	Professional Chemistry: Research	1
CH 4351	Analytical Chemistry Laboratory II	1
CH 4353	Analytical Chemistry II	3
CH 4554	Integrated Organic I <sup>4</sup>	4
CH 4564	Integrated Organic II <sup>5</sup>	4
CH 4711	Senior Seminar	1

**Oral Communication Requirement**

Satisfied with CH 1141, 2141, 3141, 4141, and 4711 sequence in major

**Jr/Sr Writing**

Satisfied with CH 3141, 4141, and 4711 sequence in major

Note: Students must complete 31 upper division hours in A&amp;S in residence at MSU.

<sup>1</sup> Social Science electives must cover two disciplines and come from A&S core; students in Pre-Medicine concentration must take PSY 1013; students in Pre-Pharmacy concentration who plan to attend the University of Mississippi School of Pharmacy should take EC 2123.

<sup>2</sup> CH 1234 can be replaced by CH 1213 and CH 1211

<sup>3</sup> CH 1244 can be replaced by CH 1223 and CH 1221

<sup>4</sup> CH 4554 can be replaced by CH 4513 and CH 4511

<sup>5</sup> CH 4564 can be replaced by CH 4523 and CH 4521

**Choose one of following paths to complete the B.S. degree:****B.S. with non-A.C.S. certification**

CH 4403 & CH 4421 or CH 4413 or CH 4423	Biophysical Chemistry and Physical Chemistry Laboratory II Thermodynamics and Kinetics Quantum Mechanics and Spectroscopy	
CH 4411 or CH 4421	Physical Chemistry Laboratory I Physical Chemistry Laboratory II	1
CH Electives <sup>6</sup>		6
PH 2213 or PH 1113	Physics I General Physics I	3
PH 2223 or PH 1123	Physics II General Physics II	3
PH 2233 or PH 1133	Physics III General Physics III	3
<b>General Electives</b>		
Consult advisor		40
<b>Total Hours</b>		<b>124</b>

<sup>6</sup> Advisor approved CH or BCH upper-division courses

**A.C.S. concentration**

CH 4603	Undergraduate Research	3
CH 4411	Physical Chemistry Laboratory I	1
CH 4413	Thermodynamics and Kinetics	3

or CH 4403	Biophysical Chemistry	
CH 4421	Physical Chemistry Laboratory II	1
CH 4423	Quantum Mechanics and Spectroscopy	3
BCH 4603	General Biochemistry I	3
BCH 4613	General Biochemistry II	3
or CH 4213	Advanced Inorganic Chemistry I	
CH 4800	Undergraduate Research in Chemistry	4
CH Electives <sup>6</sup>		1
PH 2213	Physics I	3
PH 2223	Physics II	3
PH 2233	Physics III	3
MA 2733	Calculus III	3
<b>General Electives</b>		
Consult advisor		27
<b>Total Hours</b>		<b>124</b>

<sup>6</sup> Advisor-approved CH or BCH upper division courses

## Pre-Medical concentration

Student should check for prerequisites for all courses. See advisor.

CH 4403	Biophysical Chemistry	4
or CH 4413	Thermodynamics and Kinetics	
or CH 4423	Quantum Mechanics and Spectroscopy	
CH 4411	Physical Chemistry Laboratory I	1
or CH 4421	Physical Chemistry Laboratory II	
CH Elective		1
BCH 4603	General Biochemistry I	3
BCH 4613	General Biochemistry II	3
PH 2213	Physics I	3
or PH 1113	General Physics I	
PH 2223	Physics II	3
or PH 1123	General Physics II	
PH 2233	Physics III	3
or PH 1133	General Physics III	
BIO 1134	Biology I	4
BIO 1144	Biology II	4
BIO 2103	Cell Biology	3
BIO 3004	Human Anatomy	4
BIO 3014	Human Physiology	4
<b>General Electives</b>		
Consult advisor <sup>6</sup>		20
<b>Total Hours</b>		<b>124</b>

<sup>6</sup> Recommended Electives: BIO 3304, BIO 3103 or BIO 4133, BIO 4413, MA/ST 2113 or MA/ST 3123

## Pre-Pharmacy Concentration

CH 4403	Biophysical Chemistry	3
or CH 4413	Thermodynamics and Kinetics	
or CH 4423	Quantum Mechanics and Spectroscopy	
CH 4411	Physical Chemistry Laboratory I	1
or CH 4421	Physical Chemistry Laboratory II	

CH Elective		1
BCH 4603	General Biochemistry I	3
BCH 4613	General Biochemistry II	3
BIO 1134	Biology I	4
BIO 1144	Biology II	4
BIO 2103	Cell Biology	3
BIO 3004	Human Anatomy	4
BIO 3014	Human Physiology	4
BIO 3304	General Microbiology	4
PH 2213	Physics I	3
or PH 1113	General Physics I	
PH 2223	Physics II	3
or PH 1123	General Physics II	
PH 2233	Physics III	3
or PH 1133	General Physics III	
ST /MA 2113	Introduction to Statistics	3
or ST 3123	Introduction to Statistical Inference	
or MA 3123	Introduction to Statistical Inference	
CO 1003	Fundamentals of Public Speaking	3
Advisor approved electives <sup>6</sup>		10
<b>Total Hours</b>		<b>124</b>

Note: University of Mississippi School of Pharmacy requires EC 213, ST 2113, and CO 1003

<sup>6</sup> Recommended electives: PHI 3323, BIO 3103 or BIO 4133, BIO 4413, BIO 4405

## B.A. in Chemistry

### General Education and College Requirements

#### English Composition

EN 1103	English Composition I	3
or EN 1104	Expanded English Composition I	
EN 1113	English Composition II	3
or EN 1173	Accelerated Composition II	

#### Foreign Language

Foreign Language I		3
Foreign Language II		3
Foreign Language III		3

#### Humanities

Literature - A&S core		3
History - A&S core		3
Philosophy - A&S core		3
Humanities Electives <sup>1</sup>		9

#### Math

MA 1713	Calculus I	3
MA 1723	Calculus II	3
or MA 2113	Introduction to Statistics	
or ST 2113	Introduction to Statistics	
or MA 3123	Introduction to Statistical Inference	
or ST 3123	Introduction to Statistical Inference	

#### Fine Arts

A&S core		3
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#### Natural Sciences

Satisfied within the major 9-12

**Social Sciences**

A&S core	6
Social Sciences Electives <sup>2</sup>	12

**Major Core**

Student should check for prerequisites for all courses. See advisor.

CH 1141	Professional Chemistry: Paths	1
CH 1234	Integrated Chemistry I <sup>3</sup>	4
CH 1244	Integrated Chemistry II <sup>4</sup>	4
CH 2141	Professional Chemistry: Tools	1
CH 3311	Analytical Chemistry I Laboratory	1
CH 3313	Analytical Chemistry I	3
CH 3141	Professional Chemistry: Literature	1
CH 3213	Inorganic Chemistry	3
or CH 4403	Biophysical Chemistry	
or CH 4413	Thermodynamics and Kinetics	
or CH 4423	Quantum Mechanics and Spectroscopy	
CH 4141	Professional Chemistry: Research	1
CH 4554	Integrated Organic I <sup>5</sup>	4
CH 4564	Integrated Organic II <sup>6</sup>	4
CH 4711	Senior Seminar	1
PH 2213	Physics I	3
or PH 1113	General Physics I	
PH 2223	Physics II	3
or PH 1123	General Physics II	
PH 2233	Physics III	3
or PH 1133	General Physics III	

**Oral Communication Requirement**

Satisfied with CH 1141, 2141, 3141, 4141, and 4711 sequence in the major

**Jr/Sr Writing**

Satisfied with CH 3141, 4141, and 4711 sequence in the major

Note: Student must complete 31 upper division hours in A&amp;S in residence at MSU.

<sup>1</sup> Humanities electives must be courses in A&S and must cover two disciplines.<sup>2</sup> Social Science electives must be courses in A&S. The total 18 hours in Social Science must cover four disciplines; maximum of 6 hours per discipline; only on EC and one CO from A&S core list allowed.<sup>3</sup> CH 1234 can be replaced by CH 1213 and CH 1211<sup>4</sup> CH 1244 can be replaced by CH 1223 and CH 1221<sup>5</sup> CH 4554 can be replaced by CH 4513 and CH 4511<sup>6</sup> CH 4564 can be replaced by CH 4523 and CH 4521**Choose one of following paths to complete the B.A. degree:****B.A., no specified concentration**

CH or BCH Electives	6
General Electives - consult advisor	21
<b>Total Hours</b>	<b>124</b>

**Pre-Health Professional concentration**

BCH 4603	General Biochemistry I	3
BCH 4613	General Biochemistry II	3
BIO 1134	Biology I	4
BIO 1144	Biology II	4

BIO 2103	Cell Biology	3
BIO 3004	Human Anatomy	4
BIO 3014	Human Physiology	4
General Electives - consult advisor		2
<b>Total Hours</b>		<b>124</b>