

Program Transmittal Narrative – “Organic First” introductory chemistry sequence.

The Chemistry department is proposing a new chemistry sequence for the first and second years as an alternative to the current two-year general chemistry / organic chemistry sequence. The new sequence is designed to better meet the needs of students in the sciences (Biology, Animal Science, Chemistry, pre-professional tracks) who typically require two years of chemistry. Our objectives in offering this new sequence include increasing student recruitment, retention, and progression in science and technology majors and increasing student learning in chemistry.

The alternative and traditional sequences will be offered in parallel.

Concept. The organic first curriculum replaces the current two-semester general and organic chemistry courses with four one-semester courses which cover similar content but in a different order. Each sequence is an entry point for professional schools or for further study in chemistry.

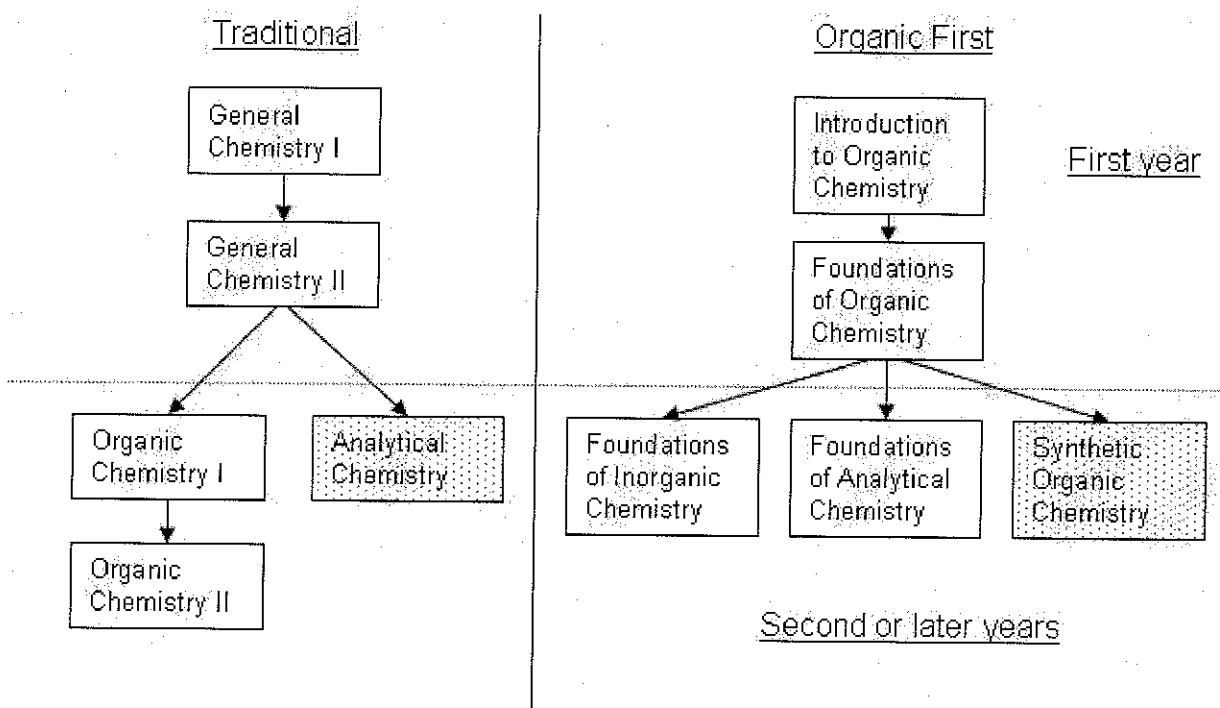


Figure 1. Traditional and organic first curricula.

Shaded courses are typically optional for students in preprofessional programs

The first two courses will not be the traditional organic courses. Those courses presuppose a thorough grounding in chemical principles. Instead, our first course, Organic Introduction to Chemistry, Chem 130, will use examples from organic chemistry to teach fundamental chemical concepts. The second course, Foundations of Organic Chemistry, will more closely follow traditional organic chemistry ideas but will emphasize chemical properties and the relationship between structure and function instead of organic synthetic methods.

New chemistry curriculum

Subject: New chemistry curriculum
From: Earl Blodgett <earl.d.blodgett@uwrf.edu>
Date: Tue, 26 Feb 2008 12:49:32 -0600
To: Michael Kahlow <michael.a.kahlow@uwrf.edu>

G'day Mike:

The faculty in the Physics department are supportive of the new chemistry curriculum, and are grateful that you are willing to continue to offer the traditional course for a while. We see no conflicts or points of concern.

We look forward to seeing how this all plays out.

Earl Blodgett
Chair, Department of Physics

On 2/25/08 8:41 AM, "Michael Kahlow" <michael.a.kahlow@uwrf.edu> wrote:

new chemistry curriculum

Subject: new chemistry curriculum
From: Karen Klyczek <karen.k.klyczek@uwrf.edu>
Date: Thu, 28 Feb 2008 11:24:57 -0600
To: Michael Kahlow <michael.a.kahlow@uwrf.edu>
CC: Ross Jilk <ross.jilk@uwrf.edu>, "Barb.s.nielsen" <Barb.s.nielsen@uwrf.edu>, "D.B.Rusterholz" <d.b.rusterholz@uwrf.edu>, Jeff Rosenthal <jeffrey.rosenthal@uwrf.edu>

Mike et al.,

The Biology Department faculty reviewed your proposal for changing the chemistry curriculum, including the proposals for new courses. Our department is unanimous in support of this proposal. The proposed sequence of courses will provide enhanced preparation for biology and pre-professional majors, and is likely to increase the chances that students will be successful. Let us know how we can help with assessment, etc. Thank you for all of you work on this project.

Best regards,
Karen

--
Karen Klyczek
Biology Department
University of Wisconsin-River Falls
410 S. Third St., River Falls, WI 54022
Ph 715-425-3591
Fx 715-425-0738
Skype kklyczek

CURRENT CHEMISTRY CURRICULAR TRACKS

CORE REQUIREMENTS

CHEM 120/121	5-6
CHEM 122	5
CHEM 231, 236/246	4-5
CHEM 232, 237/247	4
CHEM 251/256	3
CHEM 355	1
CHEM 480	1
MATH 166	4
PHYS	10
151/152/156/157 or PHYS 161/162/166/167	
Total	37- 39

ACS POLYMER (PHYS 161/162 required)

(One extra credit of lab (366 or
495) required if CHEM
236/237 is taken)

ACS CHEMISTRY (CHEM 246/247, PHYS 161/162 required)

CHEM 341	3
CHEM 342	3
CHEM 356	1
CHEM 361	3
CHEM 401	1
CHEM 402	1
CHEM 422	3
CHEM elective	3
BIOL 150	3
BIOL 240	3
BIOL 324	4
BIOL 350	3
BIOL 451	4
MATH 167	4
MATH 266	3
Total	31
Total core + option	69- 70

ACS BIOCHEMISTRY (CHEM 246/247, PHYS 161/162 required)

CHEM 341	3
CHEM 342	3
CHEM 356	1
CHEM 361	3
CHEM 362	3
CHEM 366	1
CHEM 401	1
CHEM 402	1
CHEM 422	3
BIOL 150	3
BIOL 240	3
BIOL 324	4
BIOL 350	3
BIOL 451	4
MATH 167	4
MATH 266	3
Total	42
Total core + option	80- 81

EDUCATION

CHEM 341	3
CHEM 342	3
CHEM 356	1
CHEM 401	1
CHEM 402	1
CHEM 422	3
MATH 167	4
MATH 266	3
Total	19
Total core + option	56- 58

BIOCHEMISTRY

CHEM 341	3
CHEM 342	3
or	
CHEM 340	3
CHEM 432	3
CHEM 361	3
CHEM 362	3
CHEM 366	1
CHEM 495	1
BIOL 150	3
BIOL 240	3
BIOL 350	3
Req for CHEM 341/342	
MATH 167	4
MATH 266	3
Total	23- 30
Total core + option	60- 69

CHEMISTRY

CHEM 341	3
CHEM 342	3
CHEM 356	1
CHEM 401	1
CHEM 402	1
CHEM elective	3
MATH 167	4
MATH 266	3
Total	19
Total core + option	56- 58

Req for CHEM
341/342

MATH 167

MATH 266

Total

Total core +
option

23-
30

60-
69

PROPOSED CHEMISTRY CURRICULAR TRACKS

CORE REQUIREMENTS A

CHEM 120/121	5-6
CHEM 122	5
CHEM 231, 236/246	4-5
CHEM 232, 237/247	4
CHEM 250	4
CHEM 355	1
CHEM 480	1
MATH 166	4
PHYS	10
151/152/156/157 or PHYS	
161/162/166/167	
Total	38- 40

CORE REQUIREMENTS B

CHEM 130	5
CHEM 233	5
CHEM 240	4
CHEM 250	4
CHEM 333	4
CHEM 355	1
CHEM 480	1
MATH 166	4
PHYS	10
151/152/156/157 or PHYS	
161/162/166/167	
Total	38

CHEMISTRY

CHEM 341	3
CHEM 342	3
CHEM 356	1
CHEM 401	1
CHEM 402	1
CHEM elective	3
MATH 167	4
MATH 266	3
Total	19
Total core + option	57- 59

BIOCHEMISTRY

CHEM 341	3
CHEM 342	3
or	
CHEM 340	3
CHEM 432	3
CHEM 361	3
CHEM 362	3
CHEM 366	1
CHEM 495	1
BIOL 150	3
BIOL 240	3
BIOL 350	3
Req for CHEM 341/342	
MATH 167	4
MATH 266	3
Total	23- 30
Total core + option	61- 70

EDUCATION

CHEM 341	3
CHEM 342	3
CHEM 356	1
CHEM 401	1
CHEM 402	1
CHEM 422	3
MATH 167	4
MATH 266	3
Total	19
Total core + option	57- 59

ACS CHEMISTRY (PHYS 161/162 required; CHEM 246/247 req for Core A)

CHEM 341	3
CHEM 342	3
CHEM 356	1
CHEM 361	3
CHEM 401	1
CHEM 402	1
CHEM 422	3
CHEM elective	3
BIOL 150	3
BIOL 240	3
MATH 167	4
MATH 266	3
Total	31
Total core + option	70- 71

ACS BIOCHEMISTRY (PHYS 161/162 required; CHEM 246/247 req for Core A)

CHEM 341	3
CHEM 342	3
CHEM 356	1
CHEM 361	3
CHEM 362	3
CHEM 366	1
CHEM 401	1
CHEM 422	3
BIOL 150	3
BIOL 240	3
BIOL 324	4
BIOL 350	3
BIOL 451	4
MATH 167	4
MATH 266	3
Total	42
Total core + option	81- 82

ACS POLYMER (PHYS 161/162 required)

(One extra credit of lab (366 or
cr 495) required if CHEM
236/237 is taken)

CHEM 311	3
CHEM 341	3
CHEM 342	3
CHEM 356	1
CHEM 361	3
CHEM 362	3
CHEM 401	1
CHEM 402	1
CHEM 411	3
CHEM 416	1
CHEM 422	3
CHEM 495	1
BIOL 150	3
BIOL 240	4
MATH 167	4
MATH 266	3
Total	31
Total core + option	70- 71

Current Chemistry Major Core Requirements

Core Requirements for All Chemistry Major Programs: 21-22 cr. hrs.

CHEM 121 General Chemistry I 5 cr. or CHEM 120 Introduction to General Chemistry 6 cr.

CHEM 122 General Chemistry II 5 cr.

CHEM 231 Organic Chemistry I 3 cr.

CHEM 232 Organic Chemistry II 3 cr.

CHEM 251 Analytical Chemistry 2 cr.

CHEM 256 Analytical Chemistry Lab 1 cr.

CHEM 355 Separation Science Laboratory 1 cr.

CHEM 480 Chemical Communications and Research (writing intensive) 1 cr.

Required Supporting Courses: 14-21 cr. hrs.

MATH 166 Calculus I 4 cr.

MATH 167 Calculus II 4 cr.

MATH 266 Calculus III 3 cr.

Choose one of the following two physics series A. or B.: 10 cr. hrs.

(Option B is required for ACS-approved options)

A. PHYS 151 General Physics I

PHYS 152 General Physics II

PHYS 156 General Physics Laboratory I

PHYS 157 General Physics Laboratory II

B. PHYS 161 General Physics I

PHYS 162 General Physics II

PHYS 166 General Physics Laboratory I

PHYS 167 General Physics Laboratory II

Chemistry Major-Liberal Arts

Chemistry Major- Liberal Arts: 35-38 Total Credits

Core Requirements 21-22 cr. hrs.

Required Supporting Courses 14-21 cr. hrs.

(not counted in total for major)

Regular Option Required Courses: 11 cr. hrs.

CHEM 236 Organic Chemistry Lab I 1 cr.

CHEM 237 Organic Chemistry Lab II 1 cr.

CHEM 341 Chemical Thermodynamics and Kinetics 3 cr.

CHEM 342 Molecular Structure and Spectroscopy 3 cr.

CHEM 356 Chemical Instrumentation Lab (writing intensive) 1 cr.

CHEM 401 Advanced Chemistry Lab I (writing intensive) 1 cr.

CHEM 402 Advanced Chemistry Lab II (writing intensive) 1 cr.

Directed Electives for the Regular Option: 3 cr. hrs.

Choose from:

CHEM 311 Polymer Chemistry 3 cr.

CHEM 361 Biochemistry I 3 cr.

CHEM 411 Polymer Science 3 cr.

CHEM 422 Advanced Inorganic Chemistry (writing intensive) 3 cr.

CHEM 432 Advanced Organic Chemistry 3 cr.

CHEM 461 Pharmacology 3 cr.

CHEM 495 Undergraduate Research 1 cr.

Biochemistry Option

Required Courses: 16 cr. hrs.

CHEM 236 Organic Chemistry Lab I 1 cr.

CHEM 237 Organic Chemistry Lab II 1 cr.

CHEM 361 Biochemistry I 3 cr.

CHEM 362 Biochemistry II 3 cr.

CHEM 366 Biochemistry Laboratory (writing intensive) 1 cr.

CHEM 495 Undergraduate Research 1 cr.

Choose option A. or B. below: 6 cr. hrs.

A. CHEM 341 Chemical Thermodynamics and Kinetics

CHEM 342 Molecular Structure and Spectroscopy

B. CHEM 340 Physical Chemistry of Biological Systems

CHEM 432 Advanced Organic Chemistry

If option B. is chosen, MATH 167 and 266 are not required.

Additional required supporting courses, biochemistry option only: 6 cr. hrs.

BIOL 240 Cell and Molecular Biology 3 cr.

BIOL 350 Genetics and Evolution (writing intensive) 3 cr.

Chemistry Major- Education

Major Requirements - Secondary Education 35-36 Total Credits

Core Requirements: 21-22 cr. hrs.

Required Supporting Courses: 21 cr. hrs.

(not counted in total for major)

Secondary Education Option

Required Courses: 14 cr. hrs.

CHEM 236 Organic Chemistry Lab I 1 cr.

CHEM 237 Organic Chemistry Lab II 1 cr.

CHEM 341 Chemical Thermodynamics and Kinetics 3 cr.

CHEM 342 Molecular Structure and Spectroscopy 3 cr.

CHEM 356 Chemical Instrumentation Lab (writing intensive) 1 cr.

CHEM 401 Advanced Chemistry Lab I (writing intensive) 1 cr.

CHEM 402 Advanced Chemistry Lab II (writing intensive) 1 cr.

CHEM 422 Advanced Inorganic Chemistry (writing intensive) 3 cr.

Chemistry Major ACS-Approved

Chemistry Major ACS-Approved: 42-48 Total Credits

Core Requirements 21-22 cr. hrs.

Required Supporting Courses 21 cr. hrs.

(not counted in total for major)

ACS Regular Option

Required Courses: 19 cr. hrs.

CHEM 246 Synthetic and Analytical Techniques in Organic Chem I 2 cr.

CHEM 247 Synthetic and Analytical Techniques in Organic Chem II 1 cr.

CHEM 341 Chemical Thermodynamics and Kinetics 3 cr.

CHEM 342 Molecular Structure and Spectroscopy 3 cr.

CHEM 356 Chemical Instrumentation Lab (writing intensive) 1 cr.

CHEM 361 Biochemistry I 3 cr.

CHEM 401 Advanced Chemistry Lab I (writing intensive) 1 cr.

CHEM 402 Advanced Chemistry Lab II (writing intensive) 1 cr.

CHEM 422 Advanced Inorganic Chemistry (writing intensive) 3 cr.

CHEM 495 Undergraduate Research 1 cr.

Directed Electives for the Regular Option 3 cr. hrs.

Choose from:

CHEM 311 Polymer Chemistry 3 cr.

CHEM 362 Biochemistry II 3 cr.

CHEM 366 Biochemistry Laboratory (writing intensive) 1 cr.

CHEM 411 Polymer Science 3 cr.

CHEM 416 Polymer Laboratory 1 cr.

CHEM 432 Advanced Organic Chemistry 3 cr.

CHEM 489 Special Topics in Chemistry .5-3 cr.

ACS Biochemistry Option

Required Courses: 21 cr. hrs.

CHEM 246 Synthetic and Analytical Techniques in Organic Chem I 2 cr.

CHEM 247 Synthetic and Analytical Techniques in Organic Chem II 1 cr.

CHEM 341 Chemical Thermodynamics and Kinetics 3 cr.

CHEM 342 Molecular Structure and Spectroscopy 3 cr.

CHEM 356 Chemical Instrumentation Lab (writing intensive) 1 cr.

CHEM 361 Biochemistry I 3 cr.

CHEM 362 Biochemistry II 3 cr.

CHEM 366 Biochemistry Laboratory (writing intensive) 1 cr.

CHEM 401 Advanced Chemistry Lab I (writing intensive) 1 cr.

CHEM 422 Advanced Inorganic Chemistry (writing intensive) 3 cr.

Additional required supporting courses, biochemistry option only: 10 cr. hrs.

BIOL 240 Cell and Molecular Biology 3 cr.

BIOL 350 Genetics and Evolution (writing intensive) 3 cr.

BIOL 451 Molecular Biology 4 cr.

ACS Polymer Option

Required Courses: 26-27 cr. hrs.

Option I

CHEM 236 Organic Chemistry Lab I 1 cr.
CHEM 237 Organic Chemistry Lab II 1 cr.
CHEM 311 Polymer Chemistry 3 cr.
CHEM 341 Chemical Thermodynamics and Kinetics 3 cr.
CHEM 342 Molecular Structure and Spectroscopy 3 cr.
CHEM 356 Chemical Instrumentation Lab (writing intensive) 1 cr.
CHEM 361 Biochemistry I 3 cr.
CHEM 366 Biochemistry Laboratory (writing intensive) 1 cr.
or CHEM 495 Undergraduate Research
CHEM 401 Advanced Chemistry Lab I (writing intensive) 1 cr.
CHEM 402 Advanced Chemistry Lab II (writing intensive) 1 cr.
CHEM 411 Polymer Science 3 cr.
CHEM 416 Polymer Laboratory 1 cr.
CHEM 422 Advanced Inorganic Chemistry (writing intensive) 3 cr.
CHEM 495 Undergraduate Research 1 cr.

Option II

CHEM 246 Synthetic and Analytical Techniques in Organic Chem I 2 cr.
CHEM 247 Synthetic and Analytical Techniques in Organic Chem II 1 cr.
CHEM 311 Polymer Chemistry 3 cr.
CHEM 341 Chemical Thermodynamics and Kinetics 3 cr.
CHEM 342 Molecular Structure and Spectroscopy 3 cr.
CHEM 356 Chemical Instrumentation Lab (writing intensive) 1 cr.
CHEM 361 Biochemistry I 3 cr.
CHEM 401 Advanced Chemistry Lab I (writing intensive) 1 cr.
CHEM 402 Advanced Chemistry Lab II (writing intensive) 1 cr.
CHEM 411 Polymer Science 3 cr.
CHEM 416 Polymer Laboratory 1 cr.
CHEM 422 Advanced Inorganic Chemistry (writing intensive) 3 cr.
CHEM 495 Undergraduate Research 1 cr.

Chemistry Major - Dual Degree (Engineering)

This major is awarded jointly with a B.S. in engineering after the student has successfully completed a three-year program at UW-River Falls with a minimum grade point average of 3.0 and a two-year program at either UW-Madison or the University of Minnesota.

Required courses 29-30 cr. hrs.

CHEM 121 General Chemistry I 5 cr.

or CHEM 120 Introduction to General Chemistry 6 cr.

CHEM 122 General Chemistry II 5 cr.

CHEM 231 Organic Chemistry I 3 cr.

CHEM 232 Organic Chemistry II 3 cr.

CHEM 246 Synthetic and Analytical Techniques in Organic Chem I 2 cr.

CHEM 247 Synthetic and Analytical Techniques in Organic Chem II 1 cr.

CHEM 251 Analytical Chemistry 2 cr.

CHEM 256 Analytical Chemistry Lab 1 cr.

CHEM 341 Chemical Thermodynamics and Kinetics 3 cr.

CHEM 342 Molecular Structure and Spectroscopy 3 cr.

CHEM 355 Separation Science Laboratory 1 cr.

Credits transferred from Engineering School 30 cr. hrs.

Required supporting courses at UWRF 34 cr. hrs.

PHYS 166 General Physics Laboratory I 1 cr.

PHYS 167 General Physics Laboratory II 1 cr.

PHYS 161 General Physics I 4 cr.

PHYS 162 General Physics II 4 cr.

PHYS 211 Scientific Programming 3 cr.

PHYS 264 General Physics 4 cr.

MATH 166 Calculus I 4 cr.

MATH 167 Calculus II 4 cr.

MATH 256 Linear Algebra 3 cr.

MATH 266 Calculus III 3 cr.

MATH 331 Differential Equations 3 cr.

Chemistry Minor

Liberal Arts and Education Minor: 22-25 Total Credits

Required Courses: 10-11 cr. hrs.

CHEM 121 General Chemistry I 5 cr.

or CHEM 120 Introduction to General Chemistry 6 cr.

CHEM 122 General Chemistry II 5 cr.

Directed electives: Liberal Arts Minor: 12 cr. hrs.

or Secondary Education Minor: 14 cr. hrs.

At least one course must be at the 300 level or above.

CHEM 231 Organic Chemistry I 3 cr.

CHEM 232 Organic Chemistry II 3 cr.

CHEM 236 Organic Chemistry Lab I 1 cr.

CHEM 237 Organic Chemistry Lab II 1 cr.

CHEM 246 Synthetic and Analytical Techniques in Organic Chem I 2 cr.

CHEM 247 Synthetic and Analytical Techniques in Organic Chem II 1 cr.

CHEM 251 Analytical Chemistry 2 cr.

CHEM 256 Analytical Chemistry Lab 1 cr.

CHEM 311 Polymer Chemistry 3 cr.

CHEM 340 Physical Chemistry of Biological Systems 3 cr.

CHEM 341 Chemical Thermodynamics and Kinetics 3 cr.

CHEM 342 Molecular Structure and Spectroscopy 3 cr.

CHEM 355 Separation Science Laboratory 1 cr.

CHEM 356 Chemical Instrumentation Lab (writing intensive) 1 cr.

CHEM 361 Biochemistry I 3 cr.

CHEM 362 Biochemistry II 3 cr.

CHEM 366 Biochemistry Laboratory (writing intensive) 1 cr.

CHEM 411 Polymer Science 3 cr.

CHEM 416 Polymer Laboratory 1 cr.

CHEM 422 Advanced Inorganic Chemistry (writing intensive) 3 cr.

CHEM 432 Advanced Organic Chemistry 3 cr.

CHEM 452 Instrumental Analysis 3 cr.

CHEM 461 Pharmacology 3 cr.

CHEM 495 Undergraduate Research 1 cr.

Chemistry Major Core Requirements – Proposed
Changes from current requirements are highlighted.

Core A Requirements for All Chemistry Major Programs: (22-23 cr.)

CHEM 121 General Chemistry I 5 cr.
or CHEM 120 Introduction to General Chemistry 6 cr.
CHEM 122 General Chemistry II 5 cr.
CHEM 231 Organic Chemistry I 3 cr.
CHEM 232 Organic Chemistry II 3 cr.
CHEM 250 Foundations of Analytical Chemistry 4 cr.
CHEM 355 Separation Science Laboratory 1 cr.
CHEM 480 Chemical Communications and Research (writing intensive) 1 cr.

Core B Requirements for All Chemistry Major Programs: (24 cr.)

CHEM 130 Introduction to Organic Chemistry 5 cr.
CHEM 233 Foundations of Organic Chemistry 5 cr.
CHEM 240 Foundations of Inorganic Chemistry 4 cr.
CHEM 250 Foundations of Analytical Chemistry 4 cr.
CHEM 333 Organic Synthetic Methods 4 cr.
CHEM 355 Separation Science Laboratory 1 cr.
CHEM 480 Chemical Communications and Research (writing intensive) 1 cr.

Required Supporting Courses: 14-21 cr. hrs.

MATH 166 Calculus I 4 cr.
MATH 167 Calculus II 4 cr.
MATH 266 Calculus III 3 cr.

Choose one of the following two physics series A. or B.: 10 cr. hrs.

(Option B is required for ACS-approved options)

A. PHYS 151 General Physics I
PHYS 152 General Physics II
PHYS 156 General Physics Laboratory I
PHYS 157 General Physics Laboratory II
B. PHYS 161 General Physics I
PHYS 162 General Physics II
PHYS 166 General Physics Laboratory I
PHYS 167 General Physics Laboratory II

Chemistry Major-Liberal Arts

Chemistry Major- Liberal Arts: 35-38 Total Credits

Core Requirements 22-24 cr. hrs.

Required Supporting Courses 14-21 cr. hrs.

(not counted in total for major)

Regular Option Required Courses: 9-11 cr. hrs.

CHEM 236 Organic Chemistry Lab I 1 cr. (Core A only)

CHEM 237 Organic Chemistry Lab II 1 cr. (Core A only)

CHEM 341 Chemical Thermodynamics and Kinetics 3 cr.

CHEM 342 Molecular Structure and Spectroscopy 3 cr.

CHEM 356 Chemical Instrumentation Lab (writing intensive) 1 cr.

CHEM 401 Advanced Chemistry Lab I (writing intensive) 1 cr.

CHEM 402 Advanced Chemistry Lab II (writing intensive) 1 cr.

Directed Electives for the Regular Option: 3 cr. hrs.

Choose from:

CHEM 311 Polymer Chemistry 3 cr.

CHEM 361 Biochemistry I 3 cr.

CHEM 411 Polymer Science 3 cr.

CHEM 422 Advanced Inorganic Chemistry (writing intensive) 3 cr.

CHEM 432 Advanced Organic Chemistry 3 cr.

CHEM 461 Pharmacology 3 cr.

CHEM 495 Undergraduate Research 1 cr.

Biochemistry Option

Required Courses: 14-16 cr. hrs.

CHEM 236 Organic Chemistry Lab I 1 cr. (Core A only)

CHEM 237 Organic Chemistry Lab II 1 cr. (Core A only)

CHEM 361 Biochemistry I 3 cr.

CHEM 362 Biochemistry II 3 cr.

CHEM 366 Biochemistry Laboratory (writing intensive) 1 cr.

CHEM 495 Undergraduate Research 1 cr.

Choose option A. or B. below: 6 cr. hrs.

A. CHEM 341 Chemical Thermodynamics and Kinetics

CHEM 342 Molecular Structure and Spectroscopy

B. CHEM 340 Physical Chemistry of Biological Systems

CHEM 432 Advanced Organic Chemistry

If option B. is chosen, MATH 167 and 266 are not required.

Additional required supporting courses, biochemistry option only: 6 cr. hrs.

BIOL 240 Cell and Molecular Biology 3 cr.

BIOL 350 Genetics and Evolution (writing intensive) 3 cr.

Chemistry Major- Education

Major Requirements - Secondary Education 35-36 Total Credits

Core Requirements: 22-24 cr.

Required Supporting Courses: 21 cr. hrs.

(not counted in total for major)

Secondary Education Option

Required Courses: 12-14 cr. hrs.

CHEM 236 Organic Chemistry Lab I 1 cr. (Core A only)

CHEM 237 Organic Chemistry Lab II 1 cr. (Core A only)

CHEM 341 Chemical Thermodynamics and Kinetics 3 cr.

CHEM 342 Molecular Structure and Spectroscopy 3 cr.

CHEM 356 Chemical Instrumentation Lab (writing intensive) 1 cr.

CHEM 401 Advanced Chemistry Lab I (writing intensive) 1 cr.

CHEM 402 Advanced Chemistry Lab II (writing intensive) 1 cr.

CHEM 422 Advanced Inorganic Chemistry (writing intensive) 3 cr.

Chemistry Major ACS-Approved

Chemistry Major ACS-Approved: 42-48 Total Credits

Core Requirements 22-24 cr. hrs.

Required Supporting Courses 21 cr. hrs.

(not counted in total for major)

ACS Regular Option

Required Courses: 16-19 cr. hrs.

CHEM 246 Synthetic and Analytical Techniques in Organic Chem I 2 cr. (Core A only)

CHEM 247 Synthetic and Analytical Techniques in Organic Chem II 1 cr. (Core A only)

CHEM 341 Chemical Thermodynamics and Kinetics 3 cr.

CHEM 342 Molecular Structure and Spectroscopy 3 cr.

CHEM 356 Chemical Instrumentation Lab (writing intensive) 1 cr.

CHEM 361 Biochemistry I 3 cr.

CHEM 401 Advanced Chemistry Lab I (writing intensive) 1 cr.

CHEM 402 Advanced Chemistry Lab II (writing intensive) 1 cr.

CHEM 422 Advanced Inorganic Chemistry (writing intensive) 3 cr.

CHEM 495 Undergraduate Research 1 cr.

Directed Electives for the Regular Option 3 cr. hrs.

Choose from:

CHEM 311 Polymer Chemistry 3 cr.

CHEM 362 Biochemistry II 3 cr.

CHEM 366 Biochemistry Laboratory (writing intensive) 1 cr.

CHEM 411 Polymer Science 3 cr.

CHEM 416 Polymer Laboratory 1 cr.

CHEM 432 Advanced Organic Chemistry 3 cr.

CHEM 489 Special Topics in Chemistry .5-3 cr.

ACS Biochemistry Option

Required Courses: 18-21 cr. hrs.

CHEM 246 Synthetic and Analytical Techniques in Organic Chem I 2 cr. (Core A only)

CHEM 247 Synthetic and Analytical Techniques in Organic Chem II 1 cr. (Core A only)

CHEM 341 Chemical Thermodynamics and Kinetics 3 cr.

CHEM 342 Molecular Structure and Spectroscopy 3 cr.

CHEM 356 Chemical Instrumentation Lab (writing intensive) 1 cr.

CHEM 361 Biochemistry I 3 cr.

CHEM 362 Biochemistry II 3 cr.

CHEM 366 Biochemistry Laboratory (writing intensive) 1 cr.

CHEM 401 Advanced Chemistry Lab I (writing intensive) 1 cr.

CHEM 422 Advanced Inorganic Chemistry (writing intensive) 3 cr.

Additional required supporting courses, biochemistry option only: 10 cr. hrs.

BIOL 240 Cell and Molecular Biology 3 cr.

BIOL 350 Genetics and Evolution (writing intensive) 3 cr.

BIOL 451 Molecular Biology 4 cr.

ACS Polymer Option

Required Courses: 24-27 cr. hrs.

Option I

CHEM 236 Organic Chemistry Lab I 1 cr. (Core A only)

CHEM 237 Organic Chemistry Lab II 1 cr. (Core A only)
CHEM 311 Polymer Chemistry 3 cr.
CHEM 341 Chemical Thermodynamics and Kinetics 3 cr.
CHEM 342 Molecular Structure and Spectroscopy 3 cr.
CHEM 356 Chemical Instrumentation Lab (writing intensive) 1 cr.
CHEM 361 Biochemistry I 3 cr.
CHEM 366 Biochemistry Laboratory (writing intensive) 1 cr.
or CHEM 495 Undergraduate Research
CHEM 401 Advanced Chemistry Lab I (writing intensive) 1 cr.
CHEM 402 Advanced Chemistry Lab II (writing intensive) 1 cr.
CHEM 411 Polymer Science 3 cr.
CHEM 416 Polymer Laboratory 1 cr.
CHEM 422 Advanced Inorganic Chemistry (writing intensive) 3 cr.
CHEM 495 Undergraduate Research 1 cr.

Option II

CHEM 246 Synthetic and Analytical Techniques in Organic Chem I 2 cr. (Core A only)
CHEM 247 Synthetic and Analytical Techniques in Organic Chem II 1 cr. (Core A only)
CHEM 311 Polymer Chemistry 3 cr.
CHEM 341 Chemical Thermodynamics and Kinetics 3 cr.
CHEM 342 Molecular Structure and Spectroscopy 3 cr.
CHEM 356 Chemical Instrumentation Lab (writing intensive) 1 cr.
CHEM 361 Biochemistry I 3 cr.
CHEM 401 Advanced Chemistry Lab I (writing intensive) 1 cr.
CHEM 402 Advanced Chemistry Lab II (writing intensive) 1 cr.
CHEM 411 Polymer Science 3 cr.
CHEM 416 Polymer Laboratory 1 cr.
CHEM 422 Advanced Inorganic Chemistry (writing intensive) 3 cr.
CHEM 495 Undergraduate Research 1 cr.

Chemistry Major - Dual Degree (Engineering)

This major is awarded jointly with a B.S. in engineering after the student has successfully completed a three-year program at UW-River Falls with a minimum grade point average of 3.0 and a two-year program at either UW-Madison or the University of Minnesota.

Required courses 29-30 cr. hrs.

CHEM 121 General Chemistry I 5 cr.

or CHEM 120 Introduction to General Chemistry 6 cr.

CHEM 122 General Chemistry II 5 cr.

CHEM 231 Organic Chemistry I 3 cr.

CHEM 232 Organic Chemistry II 3 cr.

CHEM 246 Synthetic and Analytical Techniques in Organic Chem I 2 cr.

CHEM 247 Synthetic and Analytical Techniques in Organic Chem II 1 cr.

CHEM 250 Analytical Chemistry 4 cr.

CHEM 341 Chemical Thermodynamics and Kinetics 3 cr.

CHEM 342 Molecular Structure and Spectroscopy 3 cr.

CHEM 355 Separation Science Laboratory 1 cr.

Credits transferred from Engineering School 30 cr. hrs.

Required supporting courses at UWRF 34 cr. hrs.

PHYS 166 General Physics Laboratory I 1 cr.

PHYS 167 General Physics Laboratory II 1 cr.

PHYS 161 General Physics I 4 cr.

PHYS 162 General Physics II 4 cr.

PHYS 211 Scientific Programming 3 cr.

PHYS 264 General Physics 4 cr.

MATH 166 Calculus I 4 cr.

MATH 167 Calculus II 4 cr.

MATH 256 Linear Algebra 3 cr.

MATH 266 Calculus III 3 cr.

MATH 331 Differential Equations 3 cr.

Chemistry Minor

Liberal Arts and Education Minor: 22-25 Total Credits

Required Courses: 10-11 cr. hrs.

Option A:

CHEM 121 General Chemistry I 5 cr.

or CHEM 120 Introduction to General Chemistry 6 cr.

CHEM 122 General Chemistry II 5 cr.

Option B:

CHEM 130 Introduction to Organic Chemistry 5 cr.

CHEM 233 Foundations of Organic Chemistry 5 cr.

Directed electives: Liberal Arts Minor: 12 cr. hrs.

or Secondary Education Minor: 14 cr. hrs.

At least one course must be at the 300 level or above.

CHEM 231 Organic Chemistry I 3 cr.

CHEM 232 Organic Chemistry II 3 cr.

CHEM 236 Organic Chemistry Lab I 1 cr. (Core A only)

CHEM 237 Organic Chemistry Lab II 1 cr. (Core A only)

CHEM 240 Foundations of Inorganic Chemistry 4 cr.

CHEM 246 Synthetic and Analytical Techniques in Organic Chem I 2 cr.

CHEM 247 Synthetic and Analytical Techniques in Organic Chem II 1 cr.

CHEM 250 Analytical Chemistry 4 cr.

CHEM 311 Polymer Chemistry 3 cr.

CHEM 333 Organic Synthetic Methods 4 cr.

CHEM 340 Physical Chemistry of Biological Systems 3 cr.

CHEM 341 Chemical Thermodynamics and Kinetics 3 cr.

CHEM 342 Molecular Structure and Spectroscopy 3 cr.

CHEM 355 Separation Science Laboratory 1 cr.

CHEM 356 Chemical Instrumentation Lab (writing intensive) 1 cr.

CHEM 361 Biochemistry I 3 cr.

CHEM 362 Biochemistry II 3 cr.

CHEM 366 Biochemistry Laboratory (writing intensive) 1 cr.

CHEM 411 Polymer Science 3 cr.

CHEM 416 Polymer Laboratory 1 cr.

CHEM 422 Advanced Inorganic Chemistry (writing intensive) 3 cr.

CHEM 432 Advanced Organic Chemistry 3 cr.

CHEM 452 Instrumental Analysis 3 cr.

CHEM 461 Pharmacology 3 cr.

CHEM 495 Undergraduate Research 1 cr.