

CHEMISTRY, BACHELOR OF SCIENCE (BS) - CONCENTRATION IN COMPUTATIONAL CHEMISTRY - ROCK STUDIES

If you are a Liberal Studies student, please click here (<http://catalog.sru.edu/undergraduate/health-engineering-sciences/chemistry/chemistry-bs-concentration-computational-chemistry-liberal/#curriculumguidetext>) for your Curriculum Guide.

Curriculum Guide

GPA Requirement

Major GPA: 2.0 or higher
Overall GPA: 2.0 or higher

Summary*

| Code | Title | Hours |
|------|--|-------|
| | Rock Studies Requirements | 45 |
| | Other Basic Requirements | 0-3 |
| | Computer Competency | 0-3 |
| | Major Requirements | 56 |
| | Natural Science and Math College-Wide Requirements | 12 |
| | Computational Chemistry Concentration | 21 |
| | ACS Certification – Optional | 0-3 |

* All undergraduate degree programs require a minimum of 120 credits. Some courses meet multiple requirements, but are only counted once toward the 120 credit total required to graduate.

Rock Studies Requirements

| Code | Title | Hours |
|------------------------------|------------------------------------|-------|
| The Rock | | |
| SUBJ 139 | University Seminar ¹ | 3 |
| ENGL 102 | Critical Writing | 3 |
| ENGL 104 | Critical Reading | 3 |
| MATH 225 | Calculus I ^{2,3} | 4 |
| Select one of the following: | | 3 |
| COMM 200 | Civil Discourse: Theory & Practice | |
| PHIL 110 | Ethics and Civil Discourse | |
| POLS 235 | Civil Discourse and Democracy | |
| Subtotal | | 16 |

Integrated Inquiry

| | | |
|--|--|---|
| <i>Creative and Aesthetic Inquiry</i> | | |
| Select 3 Credits (http://catalog.sru.edu/undergraduate/rock-studies/rock-studies-quick-guide/) | | 3 |
| <i>Humanities Inquiry</i> | | |
| Select 3 Credits (http://catalog.sru.edu/undergraduate/rock-studies/rock-studies-quick-guide/) | | 3 |
| <i>Social Science Inquiry</i> | | |

| | | |
|--|--|----|
| Select 3 Credits (http://catalog.sru.edu/undergraduate/rock-studies/rock-studies-quick-guide/) | | 3 |
| <i>Natural Sciences Inquiry</i> | | |
| CHEM 107 & CHEM 111 | General Chemistry I and General Chemistry I Lab ^{2,3} | 4 |
| <i>Physical Sciences Inquiry</i> | | |
| PHYS 211 | General Physics I with Lab ^{2,3} | 4 |
| Subtotal | | 17 |
| Thematic Thread | | |
| Select 12 Credits (http://catalog.sru.edu/undergraduate/rock-studies/rock-studies-quick-guide/) ⁴ | | 12 |
| Total Hours | | 45 |

- Course offered in multiple subjects; cannot take in first major subject
- Course counts for 50% of Major requirements and Major GPA
- Course can be counted as a Rock Studies Requirement, but earns credit only once toward your 120-credits total.
- From at least 3 categories; no more than 6 credits from one department; 6 credits must be 300-level or above.

Basic Math Requirement

Check with your adviser or a current degree audit report to see if you have been exempted from this course. The credit earned in this course will not be counted toward the 120 credit hour minimum needed to earn a degree.

| Code | Title | Hours |
|--|-------------------|-------|
| Complete one of the following: | | 0-3 |
| Meet required minimum SAT or ACT math score OR | | |
| ACSD 110 | Beginning Algebra | |
| Total Hours | | 0-3 |

Computer Competency

| Code | Title | Hours |
|---|--|-------|
| Demonstrate "computer competency" by one of the following: | | 0-3 |
| Pass Computer Competency Exam OR | | |
| Select one of the following at SRU or another post-secondary institution: | | |
| CPSC 100 | Introduction to Computing for Liberal Arts | |
| CPSC 110 | Computer Concepts | |
| CPSC 130 | Introduction to Computing and Programming | |
| PE 202 | Technology for Wellness | |
| Total Hours | | 0-3 |

Major/Concentration Requirements

- 28 major credits must be taken at SRU or PASSHE
- 28 major credits must be taken at the 300 level or above

| Code | Title | Hours |
|--|---------------------------------------|-------|
| Required Introductory Chemistry Courses | | |
| CHEM 108 | General Chemistry II ¹ | 3 |
| CHEM 112 | General Chemistry II Lab ¹ | 1 |
| Subtotal | | 4 |
| Required Foundation Chemistry Courses | | |
| CHEM 201 | Organic Chemistry I ¹ | 3 |

| | | |
|----------|--|----|
| CHEM 211 | Organic Chemistry Laboratory I ¹ | 1 |
| CHEM 243 | Introduction to Research in Chemistry ¹ | 1 |
| CHEM 301 | Physical Chemistry I ¹ | 3 |
| CHEM 321 | Physical Chemistry Laboratory I ¹ | 1 |
| CHEM 335 | Biochemistry I ¹ | 3 |
| CHEM 336 | Biochemistry Laboratory I ¹ | 1 |
| CHEM 350 | Analytical Chemistry ¹ | 3 |
| CHEM 351 | Analytical Chemistry Lab ¹ | 1 |
| CHEM 442 | Inorganic Chemistry ¹ | 3 |
| CHEM 452 | Physical Inorganic Chemistry Laboratory ¹ | 1 |
| CHEM 491 | Chemistry Seminar ¹ | 1 |
| Subtotal | | 22 |

Required In-Depth Chemistry Courses

| | | |
|----------|---|----|
| CHEM 202 | Organic Chemistry II ¹ | 3 |
| CHEM 212 | Organic Chemistry Laboratory II ¹ | 1 |
| CHEM 302 | Physical Chemistry II ¹ | 3 |
| CHEM 425 | Instrumental Analysis ¹ | 3 |
| CHEM 426 | Instrumental Analysis Laboratory ¹ | 1 |
| CHEM 460 | Materials Chemistry ¹ | 3 |
| Subtotal | | 14 |

Additional Required In-Depth Chemistry Courses

| | | |
|---|---|---|
| Select one lecture and one laboratory course: | | 4 |
| CHEM 337 | Biochemistry II ¹ | |
| CHEM 338 | Biochemistry Laboratory II ¹ | |
| CHEM 340 | Air Quality Assessment ¹ | |
| CHEM 370 | Water Quality Assessment ¹ | |
| CHEM 415 | Forensic Analysis ¹ | |
| CHEM 416 | Forensic Analysis Lab ¹ | |
| CHEM 475 | Advanced Organic Synthesis ¹ | |
| Subtotal | | 4 |

Cognate Courses

| | | |
|-------------|---|----|
| BIOL 104 | Principles of Biology with Lab ¹ | 4 |
| PHYS 213 | General Physics III/ Lab ¹ | 4 |
| MATH 230 | Calculus II ¹ | 4 |
| Subtotal | | 12 |
| Total Hours | | 56 |

¹ Course counts for 50% of Major requirements and Major GPA

* Some courses may require pre-requisites. Please see course descriptions to determine if there are any pre-requisites for that specific course.

Natural Science and Math College Wide Requirements

| Code | Title | Hours |
|-------------|---|-------|
| CHEM 107 | General Chemistry I ^{1,2} | 3 |
| CHEM 111 | General Chemistry I Lab ^{1,2} | 1 |
| PHYS 211 | General Physics I with Lab ^{1,2} | 4 |
| MATH 225 | Calculus I ^{1,2} | 4 |
| Total Hours | | 12 |

¹ Course counts for 50% of Major requirements and Major GPA² Course can be counted as a Rock Studies Requirement, but earns credit only once toward your 120-credits total.**Computational Chemistry Concentration**

| Code | Title | Hours |
|--|---|-------|
| Computer Science Courses | | |
| CPSC 146 | Programming Principles ¹ | 3 |
| CPSC 246 | Advanced Programming Principles ¹ | 3 |
| CPSC 374 | Algorithms and Data Structures ¹ | 3 |
| CPSC 480 | Topics in Computer Science: Machine Learning ¹ | 3 |
| Subtotal | | 12 |
| Required Math and Science Courses | | |
| PHYS 385 | Computational Physics ¹ | 3 |
| STAT 152 | Elementary Statistics I ¹ | 3 |
| MATH 240 | Linear Algebra and Differential Equations ¹ | 3 |
| Subtotal | | 9 |
| Total Hours | | 21 |

¹ Course counts for 50% of Major requirements and Major GPA**ACS Certification – Optional**

| Code | Title | Hours |
|-------------|--------------------------------|-------|
| CHEM 490 | Independent Study ¹ | 2 |
| CHEM 496 | Research ¹ | 1 |
| Total Hours | | 3 |

¹ Course counts for 50% of Major requirements and Major GPA**Co-curricular and Experiential Learning**

Students are encouraged to explore additional curricular and co-curricular opportunities. There is a strong correlation between long-term student success and participation in the following types of programs and activities:

1. High-Impact Practice (HIP) designated classes (e.g., Organic Chemistry II Lab)
2. Student-faculty research
3. Student leadership development (Chemistry Club)
4. Career education and development
5. Internships
6. Student teaching (serve as Lab Assistants and tutors)
7. Volunteering

CHEMISTRY - BS (6118)

Concentration in Computational Chemistry (CCHM)

This program is effective as of Fall 2019.

Revised 9-2019

UCC 3.5.2019

Important Curriculum Guide Notes

This Curriculum Guide is provided to help SRU students and prospective students better understand their intended major curriculum. Enrolled SRU students should note that the My Rock Audit may place already-earned and/or in progress courses in different, yet valid, curriculum categories. Enrolled SRU students should use the My Rock Audit Report and materials and information provided by their faculty advisers to ensure accurate progress towards degree completion. *The information on this guide is current as of the date listed. Students are responsible for curriculum requirements at the time of enrollment at the University.*

PASSHE - Pennsylvania State System of Higher Education Institutions