### Intellectual Foundation
- **Written Communication** 9 sh
  - ENGL100: Composition (3 sh)
  - WC Competency 1
  - WC Competency 2

### Oral Communication
- **3 sh**

### Mathematical and Computational Thinking
- **3 sh**
  - MATH141: Calculus I 3

### Critical Thinking
- **CT Competency 1**
- **CT Competency 2**

### Knowledge and Inquiry
- **21 sh**
  - **Natural Science Inquiry** 6 sh
    - CHEM120 4
    - CHEM121 4
  - **Historical, Behavioral, and Social Science Inquiry** 6 sh
  - **Philosophical, Literary, and Aesthetic Inquiry** 9 sh

### Personal and Social Responsibility
- **12 sh**
  - **Global Awareness and Citizenship** 9 sh
  - **Wellness** 3 sh

### Experiential Learning
- **EL Competency 1**
- **EL Competency 2**

### Electives
- **17 sh**

### First Year Student Seminar
- **1 sh**
  - SCI119: First Year Seminar 1

### Major Area and Cognate Courses
- **60 sh**
  - **Foundational** 23 sh
    - CHEM220: Organic Chemistry I# 4
    - CHEM221: Organic Chemistry II# 4
    - CHEM301: Inorganic Chemistry# 3
    - CHEM316: Quantitative Analysis# 4
    - CHEM320: Physical Chemistry I# or 4
      - CHEM321: Quantum Chemistry†
    - CHEM410: Biochemistry I# 4
  - **In-depth** 16 sh
    - Must take at least four of these five courses
    - CHEM317: Instrumental Analysis# 4
    - CHEM320: Physical Chemistry I# or 4
      - CHEM321: Quantum Chemistry†
    - CHEM415: Biochemistry II# 4
    - CHEM430: Advanced Organic # 4
    - CHEM440: Advanced Inorganic Chemistry# 4
  - **Chemistry Electives** 7 sh
    - CHEM3xx/4xx #*
  - **Independent Study** 1 sh
    - CHEM499: Independent Study# 1

### # 47 Hours of Advanced Coursework
* Except CHEM328 and CHEM369
† One of these must be used as a foundational course. The other may be used as one of the four in-depth courses or a chemistry elective.

### Cognates
- **11 sh**
  - PHYS170: Intermediate General Physics I 4
  - PHYS171: Intermediate General Physics II 4
  - MATH142: Calculus II 3
Lock Haven University  
Chemistry Department  
Chemistry, B.S. Track  
Suggested Course Sequence

**Fall Freshman (example)**  
ENGL100: Composition (3)  
SCI119: First Year Student Seminar (1)  
CHEM120: Principles of Chemistry I (4)  
MATH141: Calculus I (3)  
HBSS1 (Historical, Behavioral, and Social Science Inquiry) (3)

**Spring Freshman (example)**  
CHEM121: Principles of Chemistry II (4)  
MATH142: Calculus II (3)  
PHYS170: Intermediate General Physics I (4)  
GAC1 (Global Awareness and Citizenship) (3)  
PLA1 (Philosophical, Literary, and Aesthetic Inquiry) (3)

Credit Total: ______14

**Fall Sophomore (example)**  
CHEM220: Organic Chemistry I (4)  
CHEM316: Quantitative Analysis (4)  
PHYS171: Intermediate General Physics II (4)  
Elective (3)

**Spring Sophomore (example)**  
CHEM221: Organic Chemistry II (4)  
CHEM410: Biochemistry I (4) or CHEM In-depth (4)  
HBSS2 (3)  
Oral Communication (3)  
PLA2 (3)

Credit Total: ______15

**Fall Junior (example)**  
CHEM320: Physical Chemistry I (4)  
CHEM301: Inorganic Chemistry (3)  
CHEM Elective (3-4), and/or CHEM In-depth (4)  
GAC2 (3)  
Elective (3)

**Spring Junior (example)**  
CHEM321: Quantum Chemistry (4)  
CHEM440: Advanced Inorganic Chemistry (4)  
CHEM410 Biochemistry I (4)  
CHEM In-depth (4), and/or CHEM Elective (3-4)  
Elective (3)

Credit Total: _____12-16

**Fall Senior (example)**  
CHEM301: Inorganic Chemistry (3)  
CHEM320: Physical Chemistry I (4), In-depth (4), and/or CHEM Elective (3-4)  
GAC3 (3)  
Wellness (3)  
Elective (3)

**Spring Senior (example)**  
CHEM440 Advanced Inorganic Chemistry (4)  
CHEM 321: Quantum Chemistry (4), In-depth (4), and/or CHEM Elective (3-4)  
CHEM499 (1)  
PLA3 (1)  
Electives (5)

Credit Total: _____15-17

Credit Total: _____12-17