

## Biochemistry Major Requirements

Catalog Year: 2015-16

Degree: Bachelor of Science

Credit Hours: 75+

"PR" indicates a pre-requisite. "CO" indicates a co-requisite.

Courses within this major may also satisfy general education requirements. Please consult <http://registrar.cofc.edu/general-edu> for more information.

### Required Courses

- CHEM 111 Principles of Chemistry (3) PR: MATH 111 or equivalent; CO: CHEM 111L
- CHEM 111L Principles of Chemistry Lab (1) CO: CHEM 111
  
- CHEM 112 Principles of Chemistry (3) PR: CHEM 111, CHEM 111L or HONS 153, HONS 153L or HONS 191, HONS 191L; CO: CHEM 112L
- CHEM 112L Principles of Chemistry Lab (1) CO: CHEM 112
  
- CHEM 220 Fundamentals of Analytical Chemistry (3) PR: CHEM 112 and CHEM 112L or HONS 154 and HONS 154L; CO: CHEM 220L
- CHEM 220L Fundamentals of Analytical Chemistry Lab (2) PR: CHEM 112 and CHEM 112L or HONS 154 and HONS 154L; CO: CHEM 220
  
- CHEM 231 Organic Chemistry (3) PR: CHEM 112, CHEM 112L or HONS 154, HONS 154L; CO: CHEM 231L
- CHEM 231L Introduction to Organic Chemistry Laboratory Techniques (1) CO: CHEM 231
  
- CHEM 232 Organic Chemistry (3) PR: CHEM 231, CHEM 231L; CO: CHEM 232L
- CHEM 232L Organic Synthesis and Analysis (1) CO: CHEM 232
  
- CHEM 311 Inorganic Chemistry (3) PR: CHEM 232, CHEM 232L
  
- CHEM 341 Thermodynamics, Statistical Thermodynamics and Chemical Kinetics (3) PR: CHEM 220/220L, MATH 229 or (MATH 220 and MATH 221); CO: CHEM 341L
- CHEM 341L Thermodynamics, Statistical Thermodynamics and Chemical Kinetics Laboratory (1) CO: CHEM 341
  
- CHEM 342 Quantum Chemistry and Spectroscopy (3) PR: CHEM 220/220L, MATH 229 or (MATH 220 and MATH 221); CO: CHEM 342L
- CHEM 342L Quantum Chemistry and Spectroscopy Laboratory (1) CO: CHEM 342
  
- CHEM 351 Biochemistry (3) PR: CHEM 232, CHEM 232L
  
- CHEM 352 Biochemistry II (3) PR: CHEM 351
  
- CHEM 354L Biochemistry II (1) PR: CHEM 351
  
- CHEM 490 Chemistry and Biochemistry Seminar (1) PR: Junior or senior standing
  
- CHEM 492 Senior Seminar (1) PR: CHEM 341 and senior standing

**Select 2 of the following courses that add up to a minimum of 3 lab credit hours. (Note: CHEM 371 is 2 credit hours lab and 1 credit hour lecture)**

- CHEM 312L Inorganic Chemistry Laboratory (1) CO: CHEM 311
- CHEM 355 Research Methods in Biochemistry (2) PR: CHEM 354L
- CHEM 371 Chemical Synthesis Character (3) PR: CHEM 220, CHEM 220L, CHEM 232, CHEM 232L
- CHEM 421L Instrumental Laboratory (1) PR: CHEM 220, CHEM 220L; CO: CHEM 421
- CHEM 422L Environmental Chemistry Laboratory (1) PR or CO: CHEM 422
- CHEM 481 Introductory Research (2) PR: Instructor permission

CHEM 482          Introductory Research II (2) *PR: Instructor permission*

**Select one of the following courses:**

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CHEM 353          Chemical Biology (3) *PR: CHEM 351*

CHEM 356          Biochemical Basis of Disease (2) *PR: CHEM 351*

CHEM 421          Instrumental Methods of Analysis (3) *PR: CHEM 220, CHEM 220L; CO: CHEM 421L*

CHEM 422          Environmental Chemistry (3) *PR: CHEM 220, CHEM 220L*

CHEM 431          Advanced Organic Chemistry (3) *PR: CHEM 232, CHEM 232L*

**Biology Requirement**

BIOL 111          Introduction to Cell and Molecular Biology (3) *PR: None; CO: BIOL 111L*

BIOL 111L          Introduction to Cell and Molecular Biology Lab (1) *CO: BIOL 111*

**OR**

HONS 151          Honors Biology I (3) *PR: None; CO: HONS 151L*

HONS 151L          Honors Biology I Lab (1) *CO: HONS 151*

BIOL 112          Evolution, Form, and Function of Organisms (3) *PR: BIOL 111 and 111L; CO: BIOL 112L*

BIOL 112L          Evolution, Form, and Function of Organisms Lab (1) *CO: BIOL 112*

**OR**

HONS 152          Honors Biology II (3) *PR: HONS 151 and 151L; CO: HONS 152L*

HONS 152L          Honors Biology II Lab (1) *CO: HONS 152*

BIOL 312          Molecular Biology (3) *PR: BIOL 111 and 111L or HONS 151 and 151L and BIOL 112 and 112L or HONS 152 and 152L; BIOL 211 and 211D and BIOL 305 or CHEM 232 and 232L; and CHEM 111 and 111L and CHEM 112 and 112L; PR or CO: MATH 250 or instructor permission for biochemistry majors*

BIOL 312L          Molecular Biology Laboratory (1) *PR or CR: BIOL 312 and MATH 250 or instructor permission for biochemistry majors*

**Physics Requirement**

PHYS 111          General Physics I (3) *PR or CO: MATH 120 or equivalent or instructor permission; CO: PHYS 111L*

PHYS 111L          General Physics I Lab (1) *CO: PHYS 111*

PHYS 112          General Physics II (3) *PR: PHYS 111 or HONS 157; CO or PR: MATH 220 or equivalent or instructor permission; CO: PHYS 112L*

PHYS 112L          General Physics II Lab (1) *CO: PHYS 112*

**Mathematics Requirement**

MATH 120          Introductory Calculus (4) *PR: Placement or C- or better in MATH 111*

MATH 229          Vector Calculus with Chemical Applications (5) *PR: Placement or C- or better MATH 120 or HONS 115*

**OR**

MATH 220          Calculus II (4) *PR: MATH 120 or HONS 115*

**AND**

MATH 221          Calculus III (4) *PR: MATH 220*

**Notes:**

- Students with a double major in Physics and/or Mathematics should complete the MATH 120, 220, and 221 sequence.
- MATH 250 is a pre-requisite for all 300-level BIOL courses but can be waived with instructor permission for biochemistry majors
- Honors students can take the alternative sequence of HONS191/HONS 191L, HONS 192/HONS 192L, HONS 293/HONS 293L, and HONS 294/HONS 294L in lieu of CHEM111/111L, CHEM112/112L, CHEM 231/231L, and CHEM 232/232L.
- Honors students can take the alternative sequence of HONS 157/HONS 157L and HONS 158/HONS 158L in lieu of PHYS 111/111L and PHYS112/112L.
- All junior and senior chemistry majors are strongly encouraged to attend the scheduled department seminars.
- Students who have completed PHYS 101 Introductory Physics I and PHYS 102 Introductory Physics II before declaring a chemistry or biochemistry major may satisfy this requirement by taking additional related courses. Please see the department chair for the list of courses.