



Rensselaer

BIOCHEMISTRY & BIOPHYSICS B.S.

FIRST YEAR

| Fall | | | Spring | | |
|-----------|--|----|-----------|-------------------------------------|----|
| Number | Course | CR | Number | Course | CR |
| MATH 1010 | Calculus I | 4 | MATH 1020 | Calculus II | 4 |
| CHEM 1110 | Chemistry I with Advanced Lab ¹ | 4 | CHEM 1200 | Chemistry II | 4 |
| BIOL 1010 | Introduction to Biology | 4 | BIOL 2120 | Intro. Cell & Molecular Biology | 3 |
| BIOL 1015 | Introduction to Biology Laboratory | 4 | BIOL 2125 | Intro. Cell & Molecular Biology Lab | 1 |
| | HASS Core Elective ² | | | HASS Core Elective ² | 4 |

SECOND YEAR

| Fall | | | Spring | | |
|-----------|-------------------------|----|-----------|---------------------------------|----|
| Number | Course | CR | Number | Course | CR |
| CHEM 2250 | Organic Chemistry I | 3 | CHEM 2260 | Organic Chemistry II | 3 |
| CHEM 2230 | Organic Chemistry Lab I | 1 | CHEM 2240 | Organic Chemistry Lab II | 1 |
| PHYS 1100 | Physics I | 4 | PHYS 1200 | Physics II | 4 |
| | Quantitative Option | 4 | BIOL 4620 | Molecular Biology | 4 |
| BIOL 2500 | Genetics and Evolution | 4 | | HASS Core Elective ² | 4 |

THIRD YEAR (WITH 3RD YEAR FALL SEMESTER AWAY)

| The Arch Summer Semester ⁷ | | | Spring | | |
|---------------------------------------|---|----|-----------|---|----|
| Number | Course | CR | Number | Course | CR |
| BCBP 4760 | Molecular Biochemistry I ⁶ | 4 | BCBP 4770 | Molecular Biochemistry II ⁶ | 4 |
| CHEM 4440 | Physical Chemistry for Life Sciences ³ | 4 | BCBP 4710 | Biochemistry Laboratory ^{6,8} (Advanced Lab Option) | 6 |
| BIOL 4200 | Biostatistics | 4 | | Restricted Elective ⁵ | 2 |
| | HASS Core Elective ² | 4 | | HASS Core Elective ² | 4 |

FOURTH YEAR (WITH 3RD YEAR FALL SEMESTER AWAY)

| Fall | | | Spring | | |
|-----------|--|----|--------|--|----|
| Number | Course | CR | Number | Course | CR |
| | Molecular Biophysics Module ⁶ | 4 | | Molecular Biophysics Module ⁶ | 4 |
| BCBP 4990 | Senior Research Thesis ⁴ | 4 | | HASS Core Elective ² | 4 |
| | Restricted Elective ⁵ | 4 | | Elective | 4 |
| | Elective | 4 | | Elective | 4 |

THIRD YEAR (WITH 3RD YEAR SPRING SEMESTER AWAY)

| The Arch Summer Semester ⁷ | | | Fall | | |
|---------------------------------------|---|----|-----------|--|----|
| Number | Course | CR | Number | Course | CR |
| CHEM 4440 | Physical Chemistry for Life Sciences ³ | 4 | BIOL 4720 | Molecular Biology Laboratory ^{6,8} (Advanced Lab Option) | 6 |
| BIOL 4200 | Biostatistics | 4 | BCBP 4760 | Molecular Biochemistry I ⁶ | 4 |
| | Elective | 4 | | Restricted Elective ⁵ | 2 |
| | HASS Core Elective ² | 4 | | Elective | 4 |

FOURTH YEAR (WITH 3RD YEAR SPRING SEMESTER AWAY)

| Fall | | | Spring | | |
|-----------|--|----|-----------|--|----|
| Number | Course | CR | Number | Course | CR |
| | Molecular Biophysics Module ⁶ | 4 | | Molecular Biophysics Module ⁶ | 4 |
| BCBP 4990 | Senior Research Thesis ⁴ | 4 | BCBP 4770 | Molecular Biochemistry II ⁶ | 4 |
| | Restricted Elective ⁵ | 4 | | HASS Core Elective ² | 4 |
| | HASS Core Elective ² | 4 | | Elective | 4 |

This curriculum requires a minimum of 128 credit hours.

FOOTNOTES

1. Students may substitute CHEM 1100 for CHEM 1110.
2. Humanities and Social Sciences (HASS) Core Electives: A total of 24 credits of HASS Core Electives should be taken. Students should take an Inquiry course during their first year. For a listing of HASS Inquiry courses go to: <https://info.rpi.edu/hass-inquiry>. In addition, students should take a HASS Communications Intensive course during their first three semesters.
3. Students may substitute Macroscopic or Microscopic Physical Chemistry (CHEM 4410 & CHEM 4420).
4. Senior Research Thesis (BCBP 4990) is recommended; however, students may substitute with any of the BIOL, BCBP, or CHEM courses listed below.
5. Restricted Electives: at least 6 credits in science or engineering. Restricted electives must be 4000 level courses. Molecular Biophysics Modules, Laboratory Option, and the Quantitative Option may be taken in different semesters than those shown if electives are shifted. Only 2 credits from research, mentoring, or independent study courses may count toward this requirement.
6. Molecular Biochemistry I & II, molecular biophysics modules, and laboratory options cannot be satisfied with transfer credits.
7. For students who have applied for and been granted an exception, The Arch Summer courses would be taken during the fall semester. For listing of the exception process go to: <http://info.rpi.edu/arch/students/#ExceptionProcess>
8. The Advanced Lab Option fulfills the Communication Intensive (CI) in major requirement and the Culminating Experience requirement.

MOLECULAR BIOPHYSICS MODULES (CHOOSE 2)

| | | | |
|-----------|---------------------|-----------|-------------------------------|
| BCBP 4310 | Genetic Engineering | BCBP 4660 | The Biology of Systems |
| BCBP 4550 | Molecular Modeling | BCBP 4800 | Methods in Biophysics |
| BCBP 4600 | Data Analytics | BCBP 4870 | Protein Struct. Determination |

QUANTITATIVE OPTION (CHOOSE 1)

| | | | |
|-----------|-------------------------------|-----------|-----------------------------|
| CSCI 1010 | Intro. to Comp. Programming | MATH 2400 | Intro to Diff. Equations |
| CSCI 1100 | Computer Science I | MATH 4720 | Math. In Medicine & Biology |
| MATH 2010 | Multivar. Calc. & Matrix Alg. | | |

COURSES THAT CAN BE TAKEN IN LIEU OF SENIOR RESEARCH THESIS (BCBP 4990)

| | | | |
|-----------|---------------------------------|----------------|---------------------------------|
| BIOL 4100 | From Neuron to Behavior | BIOL 4630 | Molecular Biology II |
| BIOL 4150 | Cellular Neuroscience | BIOL/BCBP 4660 | The Biology of Systems |
| BIOL 4220 | Mach. Learning for Env. Biology | BIOL 4860 | Evolution |
| BIOL 4250 | Developmental Biology | BIOL 4870 | Lake George BLUE |
| BIOL 4260 | Advanced Cell Biology | BIOL 4961 | Human Population |
| BIOL 4270 | Human Physiology | BIOL 4990 | Senior Research Thesis |
| BIOL 4310 | Microbiology | BCBP 4310 | Genetic Engineering |
| BIOL 4350 | Virology | BCBP 4800 | Methods in Biophysics |
| BIOL 4540 | Sequence Analysis | BCBP 4870 | Protein Structure Determination |
| BIOL 4550 | Molecular Modeling | CHEM 4310 | Biorganic Mechanisms |

ADVANCED LABORATORY OPTION (CHOOSE 1)

| | | | |
|-----------|-------------------------|-----------|------------------------------|
| BIOL 4710 | Biochemistry Laboratory | BIOL 4720 | Molecular Biology Laboratory |
|-----------|-------------------------|-----------|------------------------------|