

## Biochemistry

### Recommended Graduation Plan (Fall 2024)

The recommended graduation plan is designed to provide a blueprint for students to complete their degrees on time. Students must meet with their Academic Advisor to develop a more individualized plan to complete their degree.

**NOTE:** This recommended Graduation Plan is applicable to students admitted into the major during the 2024-2025 academic year.

CRWT Placement
CRWT 101 to CRWT 102
CRWT 101S to CRWT 102S

Math Placement
MATH 021/022 to MATH 024 to MATH 110-121

**NOTE:** CRWT and MATH courses are determined by placement testing and should be taken following the sequence above.

First Year					
Fall Semester	HRS	✓	Spring Semester	HRS	✓
BIOL 111 & BIOL 111L - Fundamentals of Biology I Lec & Lab	4+1		BIOL 113 & BIOL 113L - Fundamentals of Biology II Lecture & Lab	4+1	
CHEM 116 & CHEM 116L - General Chemistry I Lecture & Lab <sup>1</sup>	4+1		CHEM 117 & CHEM 117L - General Chemistry II Lecture & Lab	4+1	
Gen Ed: INTD 101 - First Year Seminar	4		Gen Ed: MATH 121 - Calculus I	4	
Gen Ed: CRWT 102 - Critical Reading and Writing II	4		General Education Requirement	4	
			TAS Pathways Module 1: (PATH TS1) Career Assessment/Advising	<b>Degree Rqmt.</b>	
<b>Total:</b>	18		<b>Total:</b>	18	

Second Year					
Fall Semester	HRS	✓	Spring Semester	HRS	✓
CHEM 211 & CHEM 211L - Organic Chemistry I Lec & Lab	4+1		CHEM 213 & CHEM 213L - Organic Chemistry II Lecture & Lab	4+1	
MATH 122 - Calculus II	4		PHYS 117 - Physics II w/ Calculus & PHYS 117L - Introductory Physics II Lab	4+1	
PHYS 116 - Physics I w/ Calculus & PHYS 116L - Introductory Physics I Lab	4+1		General Education Requirement	4	
General Education Requirement	4		General Education Requirement	4	
TAS Pathways Module 2: (PATH TS2) Resume/CV Writing	<b>Degree Rqmt.</b>		TAS Pathways Module 3: (PATH TS3) Interview Preparation	<b>Degree Rqmt.</b>	

<b>Total:</b>	18		<b>Total:</b>	14	
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<b>Third Year</b>					
<b>Fall Semester</b>	<b>HRS</b>	<b>✓</b>	<b>Spring Semester</b>	<b>HRS</b>	<b>✓</b>
CHEM 324 & CHEM 324L - Quantitative Chemical Analysis Lecture & Lab	4+1		CHEM 350 - Physical Chemistry I	4	
CHEM 425 – Biochemistry <b>** I</b>	4		CHEM 446 - Biochemistry II C,	4	
BIOL 332 & BIOL 332L** - Genetics Lecture & Lab <b>WI</b>	4+1.5		General Education Requirement	4	
Elective: TAS-Research Honors Course <b>RE #</b>	1		Elective: TAS-Research Honors Course <b>RE #</b>	1	
			Electives for ACS Certification#	5	
<b>Total:</b>	15.5			18	

<b>Fourth Year</b>					
<b>Fall Semester</b>	<b>HRS</b>	<b>✓</b>	<b>Spring Semester</b>	<b>HRS</b>	<b>✓</b>
CHEM 430 - Experimental Biochemistry Lab <b>WI</b>	2		BIOL 407 & BIOL 407L** - Cell and Molecular Biology Lecture & Lab <b>WI</b>	4+1.5	
CHEM 350L - Physical Chemistry I Lab <b>WI</b>	1.5		Free Elective (minor, certificate, or second major requirement)	4	
Free Elective (minor, certificate, or second major requirement)	4		Elective: TAS-Research Honors Course <b>RE #</b>	1	
Elective: TAS-Research Honors Course <b>RE #</b>	1		Electives for ACS Certification#	5	
General Education Requirement	4				
General Education Requirement	4				
<b>Total:</b>	16.5		<b>Total:</b>	15.5	

**Total Credits Required:** 128 credits

**GPA Required:** overall GPA 2.0 and major GPA 2.0

**General Education courses** can be done in any order with the exception of INTD 101, CRWT and MATH. Those three general education courses will need to be done first. First Year Seminar is taken in the first semester. Failure to complete CRWT and MATH will result in a hold when the student hits 64 credits. The following general education courses can be done in any order. For more info on these courses, please visit the [General Education program requirements website in the College Catalog](#):

- Social Science Inquiry (SOSC 110) [+W]
- Scientific Reasoning

- Historical Perspectives [+W]
- Studies in the Arts & Humanities (*CRWT 102 is a prerequisite to this course*) [+W]
- Global Awareness [+W]
- Distribution Category (Systems, Sustainability, & Society **OR** Culture & Creativity **OR** Values and Ethics) **(Must be outside of TAS)**
- Distribution Category

+W: Students transferring in with 48 or more credits are waived from these general education requirements.

\*\*Offered in both fall and spring semesters

<sup>1</sup>Also satisfies Gen-Ed: Scientific Reasoning Category

<sup>2</sup>Also satisfies Gen-Ed: Quantitative Reasoning Category

# For biochemistry major students, there are two different options to follow to be certified by the American Chemistry Society (ACS), (this is not required to graduate)

- Option 1: Complete Advanced Inorganic Chemistry Lecture (CHEM 451), Advanced Inorganic Chemistry Lab (CHEM 451L) and at least one semester of TAS Research Honors as electives
- Option 2: Complete Advanced Inorganic Chemistry Lecture (CHEM 451), Advanced Inorganic Chemistry Lab (CHEM 451L), Instrumental Analysis Lecture (CHEM 427) and Instrumental Analysis Lab (CHEM 427L) as electives
- These can be taken in the Spring semester of either junior or senior year

**RE** Although no additional electives are required to graduate, the Biochemistry Program strongly recommends taking optional recommended electives (see list of the recommended elective courses from biochemistry major requirements at [www.ramapo.edu/catalog](http://www.ramapo.edu/catalog))

Biochemistry Program strongly recommends taking TAS Research Honors courses (SRSH 301, 302, 401 and 402) during the 3rd and 4th year for hands-on research experience. Students who complete all of TAS Research courses (SRSH 301, 302, 401, and 402) will graduate with TAS Research Honors Distinction.

**C** Biochemistry II (CHEM 446) capstone course is designed to draw from and build on content and skills learned during a student's progression through the major with a significant writing component. In undertaking this course, students will demonstrate: a thorough understanding of the relevant biochemistry material, an ability to apply problem-solving strategies, oral and written communication and presentation skills, an ability to comprehend and critically evaluate scientific literature. Senior presentation for biochemistry major will be one of the requirements for this course. Requires prerequisite CHEM 425

**WI:** Writing Intensive – 3 courses required in the major