

# BIOCHEMISTRY, BS (CALs)

## REQUIREMENTS

### UNIVERSITY REQUIREMENTS

All undergraduate students must complete both the following Core General Education (Core GenEd) and University Degree and Quality of Work requirements. The requirements below apply to students whose first term at UW-Madison or whose earliest post-high school college attendance at any institution is Summer 2026 or later.

Students whose first term at UW-Madison or whose earliest post-high school college attendance at any institution occurred before Summer 2026 should refer to the archived Guide (<https://guide.wisc.edu/archive/>) for the requirements that apply to them.

### CORE GENERAL EDUCATION (CORE GENED) REQUIREMENTS

Civics & Perspectives 3 credits of Civics & Perspectives coursework.

Communication & Literacy 6 credits of Communication & Literacy coursework. This requirement may be partially satisfied by a qualifying placement test score. More information: <https://go.wisc.edu/qualifyingenglishplacement> (<https://go.wisc.edu/qualifyingenglishplacement/>)

Humanities & Arts 6 credits of Humanities & Arts coursework.

Mathematics & Quantitative Reasoning 6 credits of Mathematics & Quantitative Reasoning coursework. This requirement may be partially satisfied by a qualifying placement test score. More information: <https://go.wisc.edu/qualifyingmathplacement> (<https://go.wisc.edu/qualifyingmathplacement/>)

Natural Science & Wellness Complete both:
 

- 6 credits of Natural Science & Wellness or Natural Science & Wellness + Laboratory coursework.
- one course must be in Natural Science & Wellness + Laboratory coursework.

Social & Behavioral Science 3 credits of Social & Behavioral Science coursework.

Total Credits 30 credits.

For more information see the policy (<https://policy.wisc.edu/library/UW-1095/>).

### UNIVERSITY DEGREE AND QUALITY OF WORK REQUIREMENTS

All undergraduate degree recipients must complete the following minimum requirements. Requirements for some programs will exceed these requirements; see program requirements for additional information.

Total Degree 120 degree credits.

Residency Complete 30 credits in residence. A course is considered "in residence" if it is taken when in undergraduate degree-seeking status and:
 

- is offered by UW-Madison and completed on the UW-Madison campus or at an approved off-site location, or
- is offered by UW-Madison in an online or distance format, or is completed during participation in a UW-Madison study abroad/study away program.

Quality of Work Achieve at least the minimum grade point average specified by the school, college, and/or academic program.

Math Demonstrate minimal mathematics competence by:
 

- placing above MATH 96, or
- successfully completing MATH 96, or
- successfully completing a more advanced mathematics course such as MATH 112, MATH 113, MATH 114, MATH 141, MATH 211, or MATH 221.

English Language If required to take the UW-Madison English as a Second Language Assessment Test (MSN-ESLAT), demonstrate minimal English language competence by:
 

- earning credit for ESL 118, or
- achieving a qualifying MSN-ESLAT placement test score.

Language Complete one:
 

- 2 high school units of a single language other than English, or
- one course with the second semester Language designation.

Major Declaration Declare and complete the requirements for at least one major.

## COLLEGE OF AGRICULTURAL AND LIFE SCIENCES REQUIREMENTS

### CALS GRADUATION REQUIREMENTS

Cumulative Credits
 

- Students must earn 120 degree credits.
- Students declared in Biological Systems Engineering BS must earn 125 degree credits.

Quality of Work Students must maintain a minimum cumulative grade point average of 2.000 to remain in good standing and be eligible for graduation.

Residency Students must complete 30 degree credits in residence at UW-Madison after earning 86 credits toward their undergraduate degree.

In addition to the university's general requirements, all undergraduate students in CALS must satisfy a set of college and major requirements. Courses may not double count within university requirements, CALS college requirements, or major requirements. A course may count toward university requirements and a college and/or a major requirement; similarly, a course counted toward college requirements may also be used to satisfy a university and/or a major requirement.

## CALS COLLEGE REQUIREMENTS

CALS First-Year Seminar 1 credit. See the full list of eligible courses below or use this link: <https://go.wisc.edu/calsfirstyearseminars> (<https://go.wisc.edu/calsfirstyearseminars/>)

Ethnic Studies 3 credits with the Ethnic Studies designation.

Communication A Complete either:

- 1 course with the Communication A designation, or
- satisfaction of Communication A based on UW Placement Test.

Quantitative Reasoning A Complete either:

- 1 course with the Quantitative Reasoning A designation, or
- satisfaction of Quantitative Reasoning A based on UW Placement Test.

Introductory Chemistry Complete one:

- CHEM 103
- CHEM 108
- CHEM 109

CALS International Comparisons 3 credits. See the full list of eligible courses below or use this link: <https://go.wisc.edu/calsinternationalcomparisons> (<https://go.wisc.edu/calsinternationalcomparisons/>)

Communication B 1 course with the Communication B designation.

Quantitative Reasoning B 1 course with the Quantitative Reasoning B designation.

Biological Science 5 credits with the Biological Science designation.

Additional Science 3 credits with the Biological, Physical, or Natural Science designations.

Science Breadth 3 credits with the Biological, Physical, Natural, or Social Science designations.

Humanities 6 credits with the Humanities or Literature designation.

Social Sciences 3 credits with the Social Sciences designation.

Capstone Learning Experience Each major articulates the required capstone learning experience.

### CALS First-Year Seminars

Code	Title	Credits
AN SCI 135	Grand Challenges and Career Opportunities in Animal and Dairy Sciences	1
BIOCHEM 100	Biochemistry First-Year Seminar	1
COUN PSY 125	The Wisconsin Experience Seminar	1
F&W ECOL 101	Orientation to Wildlife Ecology	1
F&W ECOL 105	Environment, Pollutants, and You	3
GENETICS 155	Freshman Seminar in Genetics	1
INTEGSCI 100	Exploring Biology	2
INTEGSCI 140	Exploring Service in STEM	1
INTER-AG 155	Issues in Agriculture, Environment, and Life Sciences	1

LSC 155	First-Year Seminar in Science Communication	1
MICROBIO 150	Microbiomes and Microbiology - First-Year Seminar	1
PLANTSCI/AGROECOL 100	First-Year Seminar in Agroecology and Plant Science	1
PL PATH 155	Food Frontlines: Security, Sustainability, and Survival	1
SOIL SCI 155	First-year Seminar in Soil and Environmental Sciences	1

### Learning Community/Student Group Courses

The following learning community/student group courses are approved as CALS First-Year Seminars.

COUN PSY 117	PEOPLE First Year Seminar	1
INTEGSCI 110	BioHouse Seminar: Biology for the 21st Century	1
INTER-AG 117	GreenHouse Roots Seminar	1
INTER-AG 140	CALS QuickStart: Foundations	1
INTER-AG 175	WISE Seminar	1

### CALS International Comparisons

Code	Title	Credits
The 3 credit requirement may be fulfilled as either a stand-alone 3 credit course or as a set of courses as listed below.		
A A E/ENVIR ST 244	The Environment and the Global Economy	4
A A E 319	The International Agricultural Economy	3
A A E/NUTR SCI 350	World Hunger and Malnutrition	3
A A E 352	Global Health: Economics, Natural Systems, and Policy (approved for enrollments Summer 2021 and later)	4
A A E/INTL ST 373	Globalization, Poverty and Development	3
A A E/INTL ST 374	The Growth and Development of Nations in the Global Economy	3
A A E/ECON 473	Economic Growth and Development in Southeast Asia	3
A A E/ECON 474	Economic Problems of Developing Areas	3
A A E/ECON/INTL BUS 462	Latin American Economic Development	3
A A E/ECON 477	Agricultural and Economic Development in Africa	3
AGROECOL 377	Global Food Production and Health	3
AN SCI/DY SCI 370	Livestock Production and Health in Agricultural Development	3
ASIAN/HISTORY/POLI SCI 255	Introduction to East Asian Civilizations (approved for enrollments Summer 2021 and later)	3-4
C&E SOC/SOC 341	Labor in Global Food Systems (approved for enrollments Summer 2020 and later)	3
C&E SOC/ENVIR ST/SOC 540	Sociology of International Development, Environment, and Sustainability	3

CSCS 500	Global Health and Communities: From Research to Praxis	3
DY SCI 471	Food Production Systems and Sustainability	3
ENTOM/ ENVIR ST 201	Insects and Human Culture—a Survey Course in Entomology	3
ENTOM/ ENVIR ST 205	Our Planet, Our Health (approved for enrollments Fall 2026 and later)	3
ENTOM/ ZOOLOGY 371	Medical Entomology: Biology of Vector and Vector-borne Diseases	3
F&W ECOL/ ENVIR ST 100	Forests of the World (approved for enrollments Summer 2020 and later)	3
F&W ECOL/ ENVIR ST/ ZOOLOGY 360	Extinction of Species	3
LSC 251	Science, Media and Society (approved for enrollments Summer 2020 and later)	3
PL PATH/ BOTANY 123	Plants, Parasites, and People	3
PL PATH 311	Global Food Security	3
PLANTSCI 370	World Vegetable Crops	3
The following study abroad courses fulfill the CALS International Comparisons requirement. Only the specific course numbers and titles listed, including Topics titles (in parentheses), are approved to meet the CALS International Comparisons requirement.		
BIOCHEM 307	Study Abroad: Introduction to Biological Sciences Research in Japan (approved for enrollments Fall 2026 and later)	3
NUTR SCI/INTER- AG 421	Global Health Field Experience (UW Mobile Clinics and Health Care in Uganda)	3
INTER-AG 321 & INTER-AG/ NUTR SCI 421	Study Abroad Pre-Departure Seminar and Global Health Field Experience (UW Global Health Community Health and Asset-Based Community Development in Sri Lanka)	3
INTER-AG 321 & INTER-AG/ NUTR SCI 421	Study Abroad Pre-Departure Seminar and Global Health Field Experience (UW Agriculture, Health and Nutrition in Uganda)	3
INTER-AG/ NUTR SCI 421	Global Health Field Experience (UW Health, Education and Tanzanian Culture)	3

## REQUIREMENTS FOR THE MAJOR MATHEMATICS

### Mathematics Requirements

Code	Title	Credits
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Complete all of the following options:

MATH 221	Calculus and Analytic Geometry 1	5
MATH 222	Calculus and Analytic Geometry 2	4

## CHEMISTRY

### General Chemistry

Code	Title	Credits
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Complete one of the following options:

CHEM 103 & CHEM 104	General Chemistry I and General Chemistry II	9
CHEM 109	Advanced General Chemistry	5
CHEM 115 & CHEM 116	Chemical Principles I and Chemical Principles II (satisfies both general and analytical chemistry requirements)	10

### Organic Chemistry

Code	Title	Credits
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Complete ALL of the following courses:

CHEM 343	Organic Chemistry I	3
CHEM 345	Organic Chemistry II	3
CHEM 344	Introductory Organic Chemistry Laboratory	2

### Analytical Chemistry

Code	Title	Credits
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Complete one of the following options:

CHEM 327	Fundamentals of Analytical Science	4
CHEM 329	Fundamentals of Analytical Science	4
CHEM 115 & CHEM 116	Chemical Principles I and Chemical Principles II (satisfies both general and analytical chemistry requirements)	10

### Physical Chemistry

Code	Title	Credits
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Complete one:

CHEM 665	Biophysical Chemistry (Recommended)	3
CHEM 561	Physical Chemistry I	3

## BIOLOGY

Students must complete either Option A (introductory + upper-level biology), or Option B (biocore), for 16 total credits of biological science coursework.

**Option A (Introductory and Upper-Level Biology)****Option A Introductory Biology**

Code	Title	Credits
Complete one of the following introductory biology options:		
BIOLOGY/BOTANY/ ZOOLOGY 151 & BIOLOGY/ BOTANY/ ZOOLOGY 152	Introductory Biology and Introductory Biology (recommended)	10
BIOLOGY/ ZOOLOGY 101 & BIOLOGY/ ZOOLOGY 102 & BOTANY/ BIOLOGY 130	Animal Biology and Animal Biology Laboratory and General Botany	10

**And Option A Upper-Level Biology**

At least 6 credits of upper-level biological science coursework are required (to achieve 16 total credits—more than 6 credits may be required if introductory biology totals less than 10 credits due to transfer credits). Select from the course list below. To see courses offered in specific upcoming semesters, please see the biochemistry website ([https://biochem.wisc.edu/undergraduate\\_program/advanced-biology-courses-undergraduate-program/](https://biochem.wisc.edu/undergraduate_program/advanced-biology-courses-undergraduate-program/)).

**Important:** A course may not double count in both the "upper-level biology" and the "biochemistry" requirements for the major. Biochemistry courses on this list can count only for "upper-level biology" if they are above-and-beyond what is needed to fulfill the "biochemistry" portion of the major. For example, if students have taken BIOCHEM 501, they will need one advanced biochemistry elective to fulfill the biochemistry requirement, and then any additional biochemistry courses taken can count for upper-level biology.

Code	Title	Credits
AGROECOL 370	Grassland Ecology	3
AGROECOL 377	Global Food Production and Health	3
ANAT&PHY 335	Physiology	5
ANAT&PHY 337	Human Anatomy	3
ANAT&PHY 435	Fundamentals of Human Physiology	5
AN SCI/ FOOD SCI 305	Introduction to Meat Science and Technology	4
AN SCI/DY SCI/ NUTR SCI 311	Comparative Animal Nutrition	3
AN SCI/DY SCI 320	Animal Health and Disease	3
AN SCI 361	Breeding and Genetics of Livestock and Companion Animals	3
AN SCI 362	Veterinary Genetics	3
AN SCI/DY SCI 370	Livestock Production and Health in Agricultural Development	3
AN SCI/DY SCI 414	Ruminant Nutrition & Metabolism	3
AN SCI 415	Application of Monogastric Nutrition Principles	3
AN SCI/DY SCI 434	Reproductive Physiology	3
AN SCI/ FOOD SCI 515	Commercial Meat Processing	2

AN SCI 610	Quantitative Genetics	3
AN SCI/ NUTR SCI 626	Experimental Diet Design	1
B M E/MED PHYS/ PHMCOL- M/PHYSICS/ RADIOL 619	Microscopy of Life	3
BIOCHEM/ NUTR SCI 510	Nutritional Biochemistry and Metabolism	3
BIOCHEM/ NUTR SCI 560	Principles of Human Disease and Biotechnology	2
BIOCHEM/ M M & I 575	Biology of Viruses	2
BIOCHEM 601	Protein and Enzyme Structure and Function	2
BIOCHEM/B M I/ BMOLCHEM/ MATH 609	Mathematical Methods for Systems Biology	3
BIOCHEM/ GENETICS/ MICROBIO 612	Prokaryotic Molecular Biology	3
BIOCHEM/ GENETICS/ MD GENET 620	Eukaryotic Molecular Biology	3
BIOCHEM/ BOTANY 621	Plant Biochemistry	3
BIOCHEM 625	Mechanisms of Action of Vitamins and Minerals	2
BIOCHEM/ GENETICS 631	Plant Genetics and Development	3
BIOCHEM/ NUTR SCI 645	Molecular Control of Metabolism and Metabolic Disease	3
BSE 349	Quantitative Techniques for Biological Systems	3
BSE 364	Engineering Properties of Food and Biological Materials	3
BSE 365	Measurements and Instrumentation for Biological Systems	3
BSE/ENVIR ST 367	Renewable Energy Systems	3
BSE 460	Biorefining: Energy and Products from Renewable Resources	3
BSE 461	Food and Bioprocessing Operations	3
BSE 472	Sediment and Bio-Nutrient Engineering and Management	3
BMOLCHEM/ MICROBIO 668	Microbiology at Atomic Resolution	3
B M E 430	Biological Interactions with Materials	3
B M I/STAT 541	Introduction to Biostatistics	3
B M I/ COMP SCI 576	Introduction to Bioinformatics	3
BOTANY 300	Plant Anatomy	4
BOTANY 305	Plant Morphology and Evolution	4
BOTANY 330	Algae	3
BOTANY/ PL PATH 332	Fungi	4
BOTANY 400	Plant Systematics	4

BOTANY 401	Vascular Flora of Wisconsin	4	FOOD SCI/ MICROBIO 324	Food Microbiology Laboratory	2
BOTANY/ F&W ECOL 402	Dendrology: Woody Plant Identification and Ecology	3	FOOD SCI/ MICROBIO 325	Food Microbiology	3
BOTANY/ANTHRO/ ZOOLOGY 410	Evolutionary Biology	3	FOOD SCI 410	Food Chemistry	3
BOTANY 422	Plant Geography	3	FOOD SCI 440	Principles of Food Engineering	3
BOTANY 455	The Vegetation of Wisconsin	4	FOOD SCI 511	Chemistry and Technology of Dairy Products	3
BOTANY/ ZOOLOGY 460	General Ecology	4	FOOD SCI 514	Integrated Food Functionality	4
BOTANY/ENTOM/ ZOOLOGY 473	Plant-Insect Interactions	3	FOOD SCI 550	Fermented Foods and Beverages	2
BOTANY/AMER IND/ ANTHRO 474	Ethnobotany	3-4	FOOD SCI 611	Chemistry and Technology of Dairy Products	3
BOTANY 500	Plant Physiology	3-4	F&W ECOL 300	Forest Measurements	4
BOTANY/ENTOM/ PL PATH 505	Plant-Microbe Interactions: Molecular and Ecological Aspects	3	F&W ECOL 306	Terrestrial Vertebrates: Life History and Ecology	4
BOTANY/ENVIR ST/ F&W ECOL/ ZOOLOGY 516	Conservation Biology	3	F&W ECOL 318	Principles of Wildlife Ecology	3
BOTANY/ PL PATH 563	Phylogenetic Analysis of Molecular Data	3	F&W ECOL/ ENVIR ST/ ZOOLOGY 360	Extinction of Species	3
BOTANY/ GENETICS/M M & I/ PL PATH 655	Biology and Genetics of Fungi	3	F&W ECOL 379	Principles of Wildlife Management	3
CHEM 575	Advanced Topics in Chemistry (Topics in Chemical Biology)	1-4	F&W ECOL 410	Silviculture: Applied Forest Ecology	3
CRB 625	Stem Cell Seminar	1	F&W ECOL/ A A E 430	Decision Methods for Natural Resource Managers	3
CRB 640	Fundamentals of Stem Cell and Regenerative Biology	3	F&W ECOL/ ZOOLOGY 520	Ornithology	3
CRB 675	Topics in Cell and Regenerative Biology	1-3	F&W ECOL/ ZOOLOGY 521	Birds of Southern Wisconsin	3
DY SCI 378	Lactation Physiology	3	F&W ECOL/ SURG SCI 548	Diseases of Wildlife	3
DY SCI 535	Dairy Farm Management Practicum	3	F&W ECOL 550	Forest Ecology	3
ENTOM/ ZOOLOGY 302	Introduction to Entomology	4	F&W ECOL 561	Wildlife Management Techniques	3
ENTOM 321	Physiology of Insects	3	F&W ECOL/ LAND ARC/ ZOOLOGY 565	Principles of Landscape Ecology	2
ENTOM 331	Taxonomy of Mature Insects	4	F&W ECOL 590	Integrated Resource Management	3
ENTOM 351	Principles of Economic Entomology	3	F&W ECOL 655	Animal Population Dynamics	3
ENTOM/ ZOOLOGY 371	Medical Entomology: Biology of Vector and Vector-borne Diseases	3	GEN&WS 533	Special Topics in Gender and Biology	3
ENTOM 432	Taxonomy and Bionomics of Immature Insects	4	GENETICS 466	Principles of Genetics	3
ENTOM/ ZOOLOGY 540	Theoretical Ecology	3	GENETICS 467	General Genetics 1	3
ENTOM/GENETICS/ ZOOLOGY 624	Molecular Ecology	3	GENETICS 468	General Genetics 2	3
ENVIR ST/ LAND ARC 361	Wetlands Ecology	3	GENETICS 525	Epigenetics	3
ENVIR ST/ POP HLTH 471	Introduction to Environmental Health	3	GENETICS 545	Genetics Laboratory	2
ENVIR ST/ POP HLTH 502	Air Pollution and Human Health	3	GENETICS 545	Genetics Laboratory	2
ENVIR ST/ F&W ECOL 515	Natural Resources Policy	3	GENETICS/MD GENET 565	Human Genetics	3
ENVIR ST/ ATM OCN 520	Bioclimatology	3	GENETICS 566	Advanced Genetics	3
			M M & I 301	Pathogenic Bacteriology	2
			M M & I 341	Immunology	3
			M M & I/ENTOM/ PATH-BIO/ ZOOLOGY 350	Parasitology	3
			M M & I/PATH- BIO 528	Immunology	3
			M M & I 554	Emerging Infectious Diseases and Bioterrorism	2

MED PHYS/ H ONCOL 410	Radiobiology	2-3	PL PATH 622	Plant-Bacterial Interactions	2-3
MED PHYS/ B M E/H ONCOL/ PHYSICS 501	Radiation Physics and Dosimetry	3	PL PATH/M M & I/ ONCOLOGY 640	General Virology-Multiplication of Viruses	3
MICROBIO 303	Biology of Microorganisms	3	PLANTSCI 300	Cropping Systems	3
MICROBIO 304	Biology of Microorganisms Laboratory	2	PLANTSCI 302	Forage Management and Utilization	3
MICROBIO 305	Critical Analyses in Microbiology	1	PLANTSCI 320	Environment of Cultivated Plants	3
MICROBIO/ BOTANY 335	The Microbiome of Plants, Animals, and Humans	3	PLANTSCI 338	Plant Breeding and Biotechnology	3
MICROBIO 345	Introduction to Disease Biology	3	PLANTSCI 340	Plant Genome Engineering and Editing	3
MICROBIO 357	General Bioinformatics for Microbiologists	3	PLANTSCI 501	Principles of Plant Breeding	3
MICROBIO/ SOIL SCI 425	Environmental Microbiology	3	PLANTSCI/ ATM OCN 532	Environmental Biophysics	3
MICROBIO 450	Diversity, Ecology and Evolution of Microorganisms	3	PLANTSCI 550	Molecular Approaches for Crop Improvement	3
MICROBIO 470	Microbial Genetics & Molecular Machines	3	PSYCH 454	Behavioral Neuroscience	3
MICROBIO 520	Planetary Microbiology: What Life Here Tells Us About Life Out There	3	PSYCH 513	Hormones, Brain, and Behavior	4
MICROBIO/ SOIL SCI 523	Soil Microbiology and Biochemistry	3	PSYCH 612	Neuropharmacology	3
MICROBIO 525	Field Studies of Planetary Microbiology and Life in the Universe	3	SOIL SCI 323	Soil Biology	3
MICROBIO 526	Physiology of Microorganisms	3	SOIL SCI 326	Plant Nutrition Management	3
MICROBIO 527	Advanced Laboratory Techniques in Microbiology	2	SOIL SCI/ F&W ECOL 451	Environmental Biogeochemistry	3
MICROBIO 551	Capstone Research Project in Microbiology	2	SOIL SCI/ CIV ENGR/ M&ENVTOX 631	Toxicants in the Environment: Sources, Distribution, Fate, & Effects	3
MICROBIO 626	Microbial and Cellular Metabolomics	3	ZOOLOGY 300	Invertebrate Biology and Evolution	3
NEURODPT 629	Molecular and Cellular Mechanisms of Memory	3	ZOOLOGY 301	Invertebrate Biology and Evolution Lab	2
NTP/ NEURODPT 610	Cellular and Molecular Neuroscience	4	ZOOLOGY 303	Aquatic Invertebrate Biology	3
NTP/NEURODPT/ PSYCH 611	Systems Neuroscience	4	ZOOLOGY 304	Marine Biology	2
NUTR SCI 332	Human Nutritional Needs	3	ZOOLOGY/ ENVIR ST 315	Limnology-Conservation of Aquatic Resources	2
NUTR SCI/ A A E 350	World Hunger and Malnutrition	3	ZOOLOGY 316	Laboratory for Limnology- Conservation of Aquatic Resources	2-3
NUTR SCI 379	Introduction to Epidemiology	3	ZOOLOGY 335	Human/Animal Relationships: Biological and Philosophical Issues	3
NUTR SCI 431	Nutrition in the Life Span	3	ZOOLOGY 403	Endocrinology	3
ONCOLOGY 401	Introduction to Experimental Oncology	2	ZOOLOGY 425	Behavioral Ecology	3
ONCOLOGY/ M&ENVTOX/ PHM SCI/PHMCOL- M/POP HLTH 625	Toxicology I	3	ZOOLOGY 430	Comparative Anatomy of Vertebrates	5
PHM SCI 310	Drugs and Their Actions	2	ZOOLOGY 470	Introduction to Animal Development	3
PL PATH 300	Introduction to Plant Pathology	4	ZOOLOGY/ ENVIR ST 510	Ecology of Fishes	3
PL PATH 517	Plant Disease Resistance	2-3	ZOOLOGY/ ENVIR ST 511	Ecology of Fishes Lab	2
PL PATH 559	Diseases of Economic Plants	3	ZOOLOGY/ PSYCH 523	Neurobiology	3
PL PATH 602	Ecology, Epidemiology and Control of Plant Diseases	3	ZOOLOGY/ GEOSCI 542	Invertebrate Paleontology	3
			ZOOLOGY 555	Laboratory in Developmental Biology	3
			ZOOLOGY 570	Cell Biology	3
			ZOOLOGY 611	Comparative and Evolutionary Physiology	3
			ZOOLOGY 612	Comparative Physiology Laboratory	2

ZOOLOGY/ ANTHRO/ PSYCH 619	Biology of Mind	3
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### Option B (Biocore)

Biocore is an honors-level, integrated sequence of lecture and lab courses that covers introductory and intermediate biology topics. Students must apply and be accepted to the program to take BIOCORE classes.

Code	Title	Credits
Complete these lecture courses:		
BIOCORE 381	Evolution, Ecology, and Genetics	3
BIOCORE 383	Cellular Biology	3
BIOCORE 485	Principles of Physiology	3
BIOCORE 587	Biological Interactions	3
Complete two of these lab classes:		
BIOCORE 382	Evolution, Ecology, and Genetics Laboratory	4
BIOCORE 384	Cellular Biology Laboratory	
BIOCORE 486	Principles of Physiology Laboratory	
<b>Total Credits</b>		<b>16</b>

## PHYSICS (CALCULUS-BASED)

### Physics Requirements

Code	Title	Credits
Complete one of the following options. Students should consult with their advisor if they have credit for PHYSICS 103 and PHYSICS 104 to discuss options.		
PHYSICS 207 & PHYSICS 208	General Physics and General Physics (recommended)	10
PHYSICS 201 & PHYSICS 202	General Physics and General Physics	10

## BIOCHEMISTRY

One set of introductory coursework and the capstone course are required, for a total of three BIOCHEM courses.

### Introductory Courses

Complete one of the following options:

Code	Title	Credits
<b>Option 1</b>		
BIOCHEM 507 & BIOCHEM 508	General Biochemistry I and General Biochemistry II (recommended)	6
<b>Option 2</b>		
BIOCHEM 501	Introduction to Biochemistry	3
AND one of the following advanced biochemistry electives:		
BIOCHEM/ NUTR SCI 510	Nutritional Biochemistry and Metabolism	
BIOCHEM/ NUTR SCI 560	Principles of Human Disease and Biotechnology	
BIOCHEM/ M M & I 575	Biology of Viruses	

BIOCHEM 601	Protein and Enzyme Structure and Function
BIOCHEM/B M I/ BMOLCHEM/ MATH 609	Mathematical Methods for Systems Biology
BIOCHEM/ GENETICS/ MICROBIO 612	Prokaryotic Molecular Biology
BIOCHEM/ GENETICS/ MD GENET 620	Eukaryotic Molecular Biology
BIOCHEM/ BOTANY 621	Plant Biochemistry
BIOCHEM 625	Mechanisms of Action of Vitamins and Minerals
BIOCHEM/ GENETICS 631	Plant Genetics and Development
BIOCHEM/ NUTR SCI 645	Molecular Control of Metabolism and Metabolic Disease

### Capstone Course (required)

Code	Title	Credits
BIOCHEM 551	Biochemical Methods	4

## HONORS IN THE MAJOR ADMISSIONS CRITERIA

Students admitted to the university and to the College of Agricultural and Life Sciences are invited to apply to be considered for admission to the CALS Honors Program.

### New First-Year Students

- Complete program application including essay questions

### Transfer and Continuing UW-Madison Students

- UW-Madison cumulative GPA of at least 3.25
- Complete program application including essay questions

## HOW TO APPLY

The application is available on the CALS Honors Program website (<https://cals.wisc.edu/academics/undergraduate/current-students/honors-program/>). Applications are accepted at any time.

New first-year students with accepted applications will automatically be enrolled in Honors in Research. It is possible to switch to Honors in the Major in the student's first semester on campus after receiving approval from the advisor for that major. Transfer and continuing students may apply directly to Honors in Research or Honors in the Major (after approval from the major advisor).

## REQUIREMENTS

All CALS Honors programs have the following requirements:

- Earn at least a cumulative 3.25 GPA at UW-Madison (some programs have higher requirements)
- Complete the program-specific requirements listed below
- Submit completed thesis documentation to CALS Academic Affairs

## HONORS IN THE MAJOR IN BIOCHEMISTRY: REQUIREMENTS

To earn honors in the major in biochemistry, students must satisfy the requirements for the major (above) as well as the following requirements. All courses used for honors in the major requirements must receive "B" or better grades to fulfill requirements.

- Earn a 3.300 overall university GPA
- Earn a 3.300 GPA for all BIOCHEM courses, and all courses accepted in the major
- Complete BIOCHEM 507 and BIOCHEM 508 for Honors
- Complete a two-semester Senior Honors Thesis for 6 credits total, present research in a public forum and submit documentation to CALS Academic Affairs.
- Complete at least 14 credits of any combination of the following coursework:
  - Honors courses that would fulfill the biological science requirement in the major (see above)
  - Statistics coursework (can be AP or transfer credit and does not need to be taken for honors): STAT 301, STAT 371, or STAT/ B M I 541
  - Biochemistry elective coursework beyond the major requirements (does not need to be taken for Honors): NUTR SCI/ BIOCHEM 510, BIOCHEM/NUTR SCI 560, M M & I/ BIOCHEM 575, BIOCHEM 601, MATH/B M I/BIOCHEM/ BMOLCHEM 609, MICROBIO/BIOCHEM/GENETICS 612, MD GENET/BIOCHEM/GENETICS 620, BOTANY/ BIOCHEM 621, BIOCHEM 625, BIOCHEM/GENETICS 631, BIOCHEM/NUTR SCI 645
  - Honors coursework in MATH, CHEM, or PHYSICS from the list below:

### Math

Code	Title	Credits
MATH 341	Linear Algebra	3
MATH 375	Topics in Multi-Variable Calculus and Linear Algebra	5
MATH 376	Topics in Multi-Variable Calculus and Differential Equations	5
MATH 521	Analysis I	3
MATH 522	Analysis II	3
MATH 541	Modern Algebra 1	3
MATH 542	Modern Algebra 2	3

### Chemistry

Code	Title	Credits
CHEM 109	Advanced General Chemistry	5
CHEM 115	Chemical Principles I	5
CHEM 116	Chemical Principles II	5
CHEM 343	Organic Chemistry I	3
CHEM 345	Organic Chemistry II	3
CHEM 329	Fundamentals of Analytical Science	4
CHEM 547	Advanced Organic Chemistry	3
CHEM 561	Physical Chemistry I	3
CHEM 563	Physical Chemistry Laboratory I	1
CHEM 562	Physical Chemistry II	3

CHEM 564	Physical Chemistry Laboratory II	1
CHEM 665	Biophysical Chemistry	3

### Physics

Code	Title	Credits
PHYSICS 201	General Physics	5
PHYSICS 202	General Physics	5
PHYSICS 207	General Physics	5
PHYSICS 208	General Physics	5
PHYSICS 241	Introduction to Modern Physics	3
PHYSICS 247	A Modern Introduction to Physics	5
PHYSICS 248	A Modern Introduction to Physics	5
PHYSICS 249	A Modern Introduction to Physics	4