

Biochemistry Requirements for all Concentrations in the Biochemistry Major:

These courses are departmental requirements for the major and both meet and exceed all AUCC Category 3A and Category 4 requirements. A minimum grade of a C must be earned in all Biochemistry (BC) and LIFE prefix courses at or above the 200-level required for the biochemistry major.

Biochemistry:

BC192 (2), BC401 (3), BC403 (3), BC404 (2), BC411 (4), BC493 (1)

Biological Sciences:

LIFE102 (4), LIFE201B (3), LIFE203 (3), LIFE210 (3), LIFE212 (2)

Chemistry:

CHEM111 (4), CHEM112 (1), CHEM113 (3), CHEM114 (1), CHEM341 (3), CHEM343 (3), CHEM344 (2)

Mathematics:

MATH155 or MATH160 (4), MATH255 or 161 (4)

Physics:

PH121 or PH141 (5)

Departmental Requirements for Each Concentration in the Biochemistry Major:

General Biochemistry Concentration

Biochemistry:

BC463 (3), BC465 (3), BC499A or BC499B (3)

Bioscience Electives (9 credits):

A complete list of bioscience electives can be found on Page 3

Physics:

PH122 or PH142 (5)

Statistics:

STAT301 or STAT307 or STAT315 (3)

American Society for Biochemistry & Molecular Biology (ASBMB) Concentration

Biochemistry:

BC360 (1 credit) in addition to General Concentration courses above

Health and Medical Sciences Concentration

Anatomy:

BMS301 (5) or BMS305 (4)

Biochemistry:

BC463 (3), BC465 (3), BC467 (3), BC499A or BC499C (3)

Physics:

PH122 or PH142 (5)

Physiology:

BMS300 or BMS360 (4)

Research:

BC406A (2) or BC475 (3) or BC487 (3) or BC495 (3) or BC496 (3)

Statistics:

STAT301 or STAT307 or STAT315 (3)

Pre-Pharmacy Concentration

Anatomy & Physiology:

BMS300 or BMS360 (4), BMS301 (5), BMS302 (2)

Biochemistry:

BC463 or BC465 (3), BC499A or BC499D (3)

Economics:

ECON202 or 204 (3)

Microbiology:

MIP300 (3), MIP302 (2)

Physics:

PH122 or PH142 (5)

Public Speaking:

SPCM 200 (3)

Statistics:

STAT301 or STAT307 or STAT315 (3)

Data Science Concentration

Advanced Writing:

CO300 or CO301B or CO302 or JTC300 (3)

Biochemistry:

BC463 (3), BC465 (3), BC499A or BC499E (3)

Biological Sciences:

BZ360 (3)

Computer Science:

CS150B (3) or CS152 (2), CS163 or CS164 (4), CS220 (4)

Data Science:

DSCI235 (3), DSCI335 (3)

Research:

BC406A (2) or BC475 (3) or BC487 (3) or BC495 (3) or BC496 (3)

Statistics:

STAT158 (1), STAT315 (3), STAT341 (3)

All University Core Curriculum (AUCC):

An updated and complete list for categories 1 – 3E can be found here: <https://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc>

Department Course List

Course	Credits	Title	Terms	Prerequisites
BC 192	2	BC Freshman Seminar	F	None
BC 295	1 to 3	Intro Independent Study	F,SP,S	LIFE 102 or CHEM 112, may be taken concurrently
BC 360	1	Responsible Conduct in...	F,SP	LIFE 212
BC 401	3	Comp Biochemistry I	F,SP	(CHEM 245 or 343 or 346, may be taken concurrently) and (MATH 155 or 160)
BC 403	3	Comp Biochemistry II	F,SP	CHEM 245 or CHEM 341 or CHEM 345
BC 404	2	Comp Biochem Lab	F,SP	BC 401 may be taken concurrently)and(CHEM 246 or 344 or 346)and(LIFE 203 and 212
BC 406A	2	Investigative Biochemistry	F,SP	BC 404
BC 411	4	Physical Biochemistry	F	BC 351 with a grade of B or better or BC 401; CHEM 113; MATH 161 or MATH 255
BC 463	3	Molecular Genetics	F	BC 351 or BC 401; BZ 350 ; or LIFE 201B must earn a C or better in one of these
BC 465	3	Molec Reg of Cell Function	SP	LIFE 210 and BC 403, may be taken concurrently or BC 351
BC 467	3	Biochem of Human Disease	SP	BC 401
BC 475	3	Mentored Research	F,SP,S	BC 404
BC 484	1 to 18	Supervised College Teaching	F,SP,S	Written consent of the instructor and department chair
BC 487A	1 to 18	Internship	F,SP,S	BC 401; BC 403; BC 404; minimum GPA of 2.0; written consent of department
BC 487B	1 to 18	Internship—International	F,SP,S	BC 401; MC 463; senior standing; BC 495 in lab of host liaison faculty member
BC 493	1	Senior Seminar	F,SP	None
BC 495	1 to 18	Independent Study	F,SP,S	Minimum GPA of 3.0; written consent of laboratory mentor
BC 496	1 to 18	Group Study	F,SP,S	None
BC 498	1 to 6	Research	F,SP,S	Written consent of research mentor and department chair
BC 499A	3	Thesis Lab Research-based	F,SP,S	None
BC 499B-D	3	Thesis Literature-based	F,SP,S	BC 493
BMS 300	4	Princ. Of Human Physiology	F,SP,S	BZ 101 or BZ 110 or LIFE 102; CHEM 103 or CHEM 107 or CHEM 111
BMS 301	5	Human Gross Anatomy	F,SP,S	BZ 110 or LIFE 102
BMS 302	2	Princ. of Physio Lab	F,SP	BMS 300 or CR or BMS 360 or CR
BMS 305	4	Dom Animal Gross Anatomy	SP	BZ 110 or LIFE 102
BMS 360	4	Fundamentals of Physiology	SP	BZ 110 or LIFE 102; CHEM 245 or CR or CHEM 341 or CR
CHEM 111	4	General Chemistry I	F,SP,S	Math 118, 141, 155, 160, 161, 229 or 261; CHEM 105 or CHEM preparation
CHEM 112	1	General Chemistry Lab I	F,SP,S	CHEM 111 or CR; credit allowed for only CHEM 108 or CHEM 112
CHEM 113	3	General Chemistry II	F,SP,S	CHEM 107, CHEM 111 or CHEM 117; MATH 124 or placing in MATH 155 or higher
CHEM 114	1	General Chemistry Lab II	F,SP,S	CHEM 112; CHEM 113 or CR
CHEM 341	3	Mod Organic Chem I	F,SP,S	CHEM 113; credit allowed for only CHEM 245 or CHEM 341 or CHEM 345
CHEM 343	3	Mod Organic Chem II	F,SP,S	CHEM 245, CHEM 341 or CHEM 345; credit allowed for only CHEM 343 or 346
CHEM 344	2	Mod Organic Chem Lab	F,SP,S	CHEM 343 or CHEM 346 or CR in either; credit only for CHEM 344 or CHEM 246
CO 150	3	College Comp	F,SP,S	CO 130
CO 301B	3	Writing in Discipline-Science	F,SP,S	CO 150 or HONR 193
ECON 202	3	Princ. of Microeconomics	F,SP,S	MATH 117, or MATH 118 or MATH 141 or MATH 155 or MATH 160
LIFE 102	4	Attributes of Living Systems	F,SP,S	None
LIFE 201B	3	Intro Genetics	SP	LIFE 102
LIFE 203	2	Intro Genetics Lab/Rec.	SP	LIFE 201B or CR
LIFE 210	3	Intro Eukaryotic Cell Biology	F	LIFE 102; CHEM 111; CHEM 112
LIFE 212	2	Eukaryotic Cell Bio Lab/Rec.	F, SP	CHEM 112; LIFE 210 or CR
MATH 155	4	Calc for Biological Scientists	F,SP,S	MATH 124; MATH 125; credit only for MATH 141, MATH 155 or MATH 160
MATH 160	4	Calc for Phys Sci I	F,SP,S	MATH 124; MATH 126; credit only for MATH 141, MATH 155 or MATH 160
MATH 161	4	Calc for Phys Sci II	F,SP,S	MATH 124; MATH 160
MATH 255	4	Calc for Biol Sci II	F,SP	MATH 126 or CR; MATH 155; credit only for MATH 255 or MATH 161
MIP 300	3	Gen Microbiology	F,SP,S	BZ 110, BZ 120 or LIFE 102; CHEM 245 or CR, CHEM 341 or CR or CHEM 345 or CR
MIP 302	2	Gen Microbiology Lab	F,SP,S	MIP 300 or CR
MIP 342	4	Immunology	F,SP,S	(CHEM 245 or 341 or 345; or CR) and (LIFE 201B OR 210 or MIP 300)
PH 121	5	General Physics I	F,SP,S	MATH 125, or MATH 155 or MATH 157 or MATH 160; may be taken concurrently
PH 122	5	General Physics II	F,SP,S	PH 121; credit allowed for only PH 122 or PH 142
PH 141	5	Phys Sci & Engineers I	F,SP,S	MATH 126; MATH 155 or CR; MATH 160 or CR; credit only for PH 141 or PH 121
PH 142	5	Phys Sci & Engineers II	F,SP,S	PH 141; MATH 161 or CR or MATH 255 or CR; credit only for PH 142 or PH 122
SPCM 200	3	Public Speaking	F,SP,S	None
STAT 301	3	Intro to Statistical Methods	F,SP,S	MATH 117 or higher; credit only for STAT 301, STAT 307, STAT 311, or STAT 315
STAT 307	3	Intro to Biostatistics	F,SP,S	MATH 117 or higher; credit only for STAT 301, STAT 307, STAT 311, or STAT 315
STAT 315	3	Stats for Engr & Scientists	F,SP,S	MATH 155 or MATH 159 or MATH 160

Bioscience Electives

Course	Credits	Title	Terms	Prerequisites
One of the bioscience electives must be from the following list of physiology/organismal biology courses:				
BMS 300	4	Principles of Human Physiol.	F,SP,S	(BZ 101 or BZ 110 or LIFE 102) and (CHEM 103 or CHEM 107 or CHEM 111)
BMS 301	5	Human Gross Anatomy	F,SP,S	BZ 110 or LIFE 102
BMS 305	4	Domestic Animal Gross Anat.	SP	BZ 110 or LIFE 102
BMS 330	4	Microscopic Anat/Mam.	SP	BMS 300 or BMS 360
BMS 345	4	Functional Neuroanatomy	F,SP	BMS 300 or BMS 360
BMS 360	4	Fundamentals of Physiology	SP	(BZ 110 or LIFE 102) and (CHEM 245 or 341, may be taken concurrently)
BMS 420	3	Cardiopulmonary Physiology	F	BMS 300 or BMS 360
BMS 430	3	Endocrinology	F	BMS 300 or BMS 360
BMS 450	3	Pharmacology	SP	BMS 300 or BMS 360
BMS 500	4	Mammalian Physiology	F	BMS 300 or BMS 360
ERHS 332	3	Principles of Epidemiology	SP	MIP 300 or concurrent registration; STAT 301 or STAT 307 or concurrent registration
FSHN 350	3	Human Nutrition	F,SP,S	BMS 300 or concurrent registration; CHEM 245 or CHEM 341
HES 319	4	Neuromuscular	F,SP	BMS 300 and HES 207
HES 403	4	Physiology of Exercise	F,SP,S	BMS 300 or BMS 360; LIFE 102
VS 331	4	Histology	F,SP,S	BMS 300
The second and third bioscience electives must be from the above list or from the following:				
BC 406A*	2	Investigative Biochemistry	F, SP	BC 404
BC 467	3	Biochemistry of Disease	SP	BC 401
BC 475*	3	Mentored Research	F, SP,	BC 404
BC 487*	1 to 18	Internship	F, SP	BC 401, BC 403, and BC 404
BC 495*	1 to 18	Independent Study	F, SP	None
BC 496*	1 to 18	Group Study	F, SP	None
BMS 325	3	Cellular Neurobiology	F	BMS 300 or BMS 360
BMS 405	3	Nerve & Muscle Toxins...	SP	BMS 325 or BMS 345
BZ 220	3	Introduction to Evolution	F,SP,S	BZ 110 or BZ 120 or LIFE 103
BZ 311	4	Developmental Biology	SP,S	BZ 310
BZ 346	3	Pop. And Evolut. Genetics	F	BZ 220; MATH 155; STAT 301 or STAT 307/ERHS 307
BZ 360	3	Bioinformatics & Genomics	F	BZ 110 or BZ 120 or LIFE 102
BZ 401	3	Comparative Animal Phys.	SP	BZ 214
BZ 402	4	Molecular Cytogenetics	SP	(BZ 310 or LIFE 210) and (BZ 350 or LIFE 201A or LIFE 201B or SOCR 330) may be CR
BZ 403	3	Comp. Endocrinology	F	BZ 310
BZ 440	3	Plant Physiology	SP	BZ 120 or LIFE 103
BZ 455	3	Human Heredity & Birth Def	SP	BZ 110 and BZ 111 or LIFE 103
BZ 476	3	Genetics of Model Orgs.	F even	BZ 350 or LIFE 201A or LIFE 201B or SOCR 330.
CHEM 334	1	Quantitative Analysis Lab	F,SP	CHEM 114 and CHEM 335, may be taken concurrently
CHEM 335	3	Intro to Analytical Chemistry	F,SP	CHEM 113 with a minimum grade of C and CHEM 334, may be taken concurrently
CHEM 433	3	Clinical Chemistry	SP	CHEM 334; BC 351 or BC 401
ERHS 450	3	Intro to Radiation Biology	SP	LIFE 102 and PH 122, may be taken concurrently
FSHN 470	3	Integrative Nutr. & Met	F,SP	BC 351 and FSHN 350
FTEC 350	2	Fermentation Microbiology	SP	CHEM 245 or FTEC 210 or LIFE 206 or MIP 302
FTEC 460	3	Brewing Sci & Technology	F,SP	(CHEM 245) and (MATH 118)
MIP 300	3	General Microbiology	F,SP,S	BZ 110 or BZ 120 or LIFE 102; CHEM 245 or CR, CHEM 341 or CR or CHEM 345 or CR
MIP 302	2	General Microbiology Lab	F,SP	MIP 300, may be taken concurrently
MIP 342	4	Immunology	F,SP	(CHEM 245 or 341 or 345; or CR) and (LIFE 201B or LIFE 210 or MIP 300)
MIP 343	2	Immunology Lab	SP	MIP 302 and MIP 342, may be taken concurrently
MIP 351	3	Medical Bacteriology	SP	MIP 342
MIP 352	3	Medical Bacteriology Lab	SP	MIP 302 and MIP 351, may be taken concurrently
MIP 420	4	Medical & Molecular Vir.	F	MIP 342; BC 351 or concurrent registration, or BC 401 or concurrent registration
MIP 425	2	Virology and Cell Culture Lab	F	MIP 302; MIP 420 or concurrent registration
MIP 450	3	Microbial Genetics	F	MIP 300; BC 351 or concurrent registration or BC 401 or concurrent registration
MIP 462	5	Parasitology & Vector Biol.	F	BZ 110 or LIFE 103; BZ 212 or LIFE 206 or MIP 302
NB 501	2	Cell & Molec. Neurophys.	F	One college-level course in each: biology, biochemistry, physics, calculus

* A maximum of three credits of BC 406A, BC 475, BC 487, BC 495, or BC 496 can be applied to the bioscience elective requirement.

Minor Program in Molecular Biology

Required Courses:

BC 401	Comprehensive Biochemistry I [3]
BC 403	Comprehensive Biochemistry II [3]
BC 404	Comprehensive Biochemistry Lab [2]
BC 463	Molecular Genetics [3] or MIP 450 Microbial Genetics [3]
BC 493	Senior Seminar [1]
CHEM 111	General Chemistry I [4]
CHEM 112	General Chemistry I Lab [1]
CHEM 113	General Chemistry II [3]
CHEM 114	General Chemistry II Lab [1]
CHEM 341	Organic Chemistry I [3]
CHEM 343	Organic Chemistry II [3]
CHEM 344	Organic Chemistry Lab [2]
LIFE 102	Attributes of Living Systems [4]
LIFE 201B/203	Intro Genetics/Lab/Rec [5]; LIFE 210, 212 Eukaryotic Cell Biology/Lab/Rec [5] or BZ 310 Cell Biology [4] and either SOCR 330/331 Principles of Genetics/Lab [4] or BZ 350 Molecular & General Genetics [4]
MATH 155	Calculus for Biological Scientists I [4] or MATH 160 Calculus for Physical Scientists [4]
MIP 300	General Microbiology [3]
MIP 342	Immunology [4]
PH 121/122	General Physics I/II [10] or PH 141/142 Physics for Scientists & Engineers I/II [10]
STAT 301	Introduction to Statistical Methods [3] or STAT 307 Introduction to Biostatistics [3]

Course Electives (Minimum of one Course)

BC 465	Molecular Regulation of Cell Function [3]
BZ 346	Population & Evolutionary Genetics [3]
BZ 402	Molecular Cytogenetics [4]
BZ 403	Comparative Endocrinology [3]
BZ 433	Behavioral Genetics [3]
MIP 420	Medical and Molecular Virology [4]
MIP 443	Microbial Physiology [4]

Lab Electives (Minimum of 4 Credits)

BC 475	Mentored Research [3]
BC 495	Independent Study [variable credit]
BC 499A	Thesis, Lab Research-Based [3]
BC 499B-D	Thesis, Literature-Based [3]
BZ 495	Independent Study [variable credit]
MIP 302	General Microbiology Lab [2]
MIP 343	Immunology Lab [2]
MIP 425	Virology and Cell Culture Lab [2]
MIP 495	Independent Study [variable credit]

Updated 9/13/2021