

# CHECKSHEET FOR BIOCHEMISTRY MAJOR (AUCC)

NAME \_\_\_\_\_ CSU ID# \_\_\_\_\_ DATE \_\_\_\_\_

## DEPARTMENTAL REQUIREMENTS FOR THE MAJOR IN BIOCHEMISTRY:

These courses are departmental requirements for the major. These courses both meet and exceed all AUCC Category 3A and Category 4 requirements.

### BIOCHEMISTRY [SEE ALSO AUCC CATEGORY 4]:

BC 192 [2] \_\_\_\_\_ \*BC 401 [3] \_\_\_\_\_  
BC 403 [3] \_\_\_\_\_ BC 404 [2] \_\_\_\_\_  
BC 463 [3] \_\_\_\_\_ BC 465 [3] \_\_\_\_\_  
BC 493 [1] \_\_\_\_\_

### AND EITHER:

BC 499A [3] \_\_\_\_\_  
(Prereq: BC 475 \_\_\_\_\_ or BC 495 \_\_\_\_\_)

### OR

BC 499B [3] \_\_\_\_\_

### BIOLOGICAL SCIENCES: (Category 3A)

\*LIFE 102 [4] \_\_\_\_\_  
\*LIFE 201B [3] \_\_\_\_\_ \*LIFE 210 [3] \_\_\_\_\_  
LIFE 203 [2] \_\_\_\_\_ LIFE 212 [2] \_\_\_\_\_  
‡ Bioscience elective (phys/org biol) [3-4] \_\_\_\_\_  
Bioscience elective [3-4] \_\_\_\_\_

### CHEMISTRY: (Category 3A)

\*CHEM 111 [4] \_\_\_\_\_ CHEM 112 [1] \_\_\_\_\_  
\*CHEM 113 [3] \_\_\_\_\_ CHEM 114 [1] \_\_\_\_\_  
CHEM 335 [3] \_\_\_\_\_ CHEM 334 [1] \_\_\_\_\_  
\*CHEM 341 [3] \_\_\_\_\_ \*CHEM 343 [3] \_\_\_\_\_  
CHEM 344 [2] \_\_\_\_\_ CHEM 471 [4] \_\_\_\_\_

### PHYSICS: (Category 3A)

\*PH 121 [5] \_\_\_\_\_ and \*PH 122 [5] \_\_\_\_\_

### OR

\*PH 141 [5] \_\_\_\_\_ and \*PH 142 [5] \_\_\_\_\_

### LOGIC/CRITICAL THINKING (3 CR, DEPT. REQ.)

STAT 301 [3] \_\_\_\_\_ or STAT 307 [3] \_\_\_\_\_

\* = Honors section available

‡ = See list on bottom of page 2.

## HONORS PROGRAM REQUIREMENTS

HONR 192 [4] \_\_\_\_\_

HONR 193 [3] \_\_\_\_\_

HONR 392 [3] \_\_\_\_\_

HONR 492 [3] \_\_\_\_\_

Completion of the above Honors courses fulfills AUCC Categories IA, IIA, and IIIB-IIIF requirements.

Honors section/option in 200-level and upper-division courses:

LIFE 201B OR LIFE 210 [3] \_\_\_\_\_

300- or 400- level BC Honors Option Course [3] \_\_\_\_\_

Honors thesis:

HONR 399 [1] \_\_\_\_\_

HONR 499 [3] \_\_\_\_\_

## CATEGORY 1: CORE COMPETENCIES (11 CREDITS)

### 1A: WRITTEN COMMUNICATION (3 CR)

CO 150 [3] \_\_\_\_\_

### 1B: MATHEMATICS (8 CR, DEPT. REQ.)

\*MATH 155 [4] \_\_\_\_\_ and MATH 255 [4] \_\_\_\_\_

### OR

\*MATH 160 [4] \_\_\_\_\_ and MATH 161 [4] \_\_\_\_\_

## CATEGORY 2: ADD'L CORE COMPETENCIES (3 CR.)

### ADVANCED WRITING

CO 300 [3] \_\_\_\_\_ or

CO 301 A-D [3] \_\_\_\_\_ (CO 301B is for Sciences)

or

CO 302 [3] \_\_\_\_\_ or

JTC 300 [3] \_\_\_\_\_

## CATEGORY 3: FOUNDATIONS AND PERSPECTIVES (24 CREDITS TOTAL)

### 3A: BIOLOGICAL/PHYSICAL SCIENCES

Requirements for this category are met and exceeded by the Departmental requirements for the major in biochemistry.

### 3B: ARTS/HUMANITIES (6 CR)

Choose two courses from the following:

ART 100 [3] \_\_\_\_\_ D 110 [3] \_\_\_\_\_

E 140 [3] \_\_\_\_\_ E 232 [3] \_\_\_\_\_

E 242 [3] \_\_\_\_\_ E 270 [3] \_\_\_\_\_

E 276 [3] \_\_\_\_\_ E 277 [3] \_\_\_\_\_

ETST 240 [3] \_\_\_\_\_ L\*\*\* 200 [3-5] \_\_\_\_\_

L\*\*\* 201 [3-5] \_\_\_\_\_ L\*\*\* 250 [3] \_\_\_\_\_

MU 100 [3] \_\_\_\_\_ MU 111 [3] \_\_\_\_\_

MU 131 [3] \_\_\_\_\_ PHIL 100 [3] \_\_\_\_\_

PHIL 103 [3] \_\_\_\_\_ PHIL 110 [3] \_\_\_\_\_

PHIL 120 [3] \_\_\_\_\_ SPCM 100 [3] \_\_\_\_\_

SPCM 201 [3] \_\_\_\_\_ TH 141 [3] \_\_\_\_\_

### 3C: SOCIAL/BEHAVIORAL SCIENCE (3 CR)

Choose one course from the following:

ANTH 100 [3] \_\_\_\_\_ AREC 202 [3] \_\_\_\_\_

AREC 240 [3] \_\_\_\_\_ ECON 101 [3] \_\_\_\_\_

ECON 202 [3] \_\_\_\_\_ ECON 204 [3] \_\_\_\_\_

ECON 212 [3] \_\_\_\_\_ ECON 240 [3] \_\_\_\_\_

EDUC 275 [3] \_\_\_\_\_ GR 100 [3] \_\_\_\_\_

HDFS 101 [3] \_\_\_\_\_ JTC 100 [3] \_\_\_\_\_

POLS 101 [3] \_\_\_\_\_ POLS 103 [3] \_\_\_\_\_

PSY 100 [3] \_\_\_\_\_ SOC 100 [3] \_\_\_\_\_

SOC 105 [3] \_\_\_\_\_ SOWK 110 [3] \_\_\_\_\_

[CONTINUED ON NEXT PAGE]

**3D: HISTORICAL PERSPECTIVES (3 CR)**

Choose one course from the following:

- |                    |                    |
|--------------------|--------------------|
| AMST 100 [3] _____ | AMST 101 [3] _____ |
| ANTH 140 [3] _____ | ETST 250 [3] _____ |
| ETST 252 [3] _____ | ETST 255 [3] _____ |
| HIST 100 [3] _____ | HIST 101 [3] _____ |
| HIST 115 [3] _____ | HIST 120 [3] _____ |
| HIST 121 [3] _____ | HIST 150 [3] _____ |
| HIST 151 [3] _____ | HIST 170 [3] _____ |
| HIST 171 [3] _____ | HIST 250 [3] _____ |
| HIST 252 [3] _____ | HIST 255 [3] _____ |
| NR 320 [3] _____   |                    |

**3E: GLOBAL & CULTURAL AWARENESS (3 CR)**

Choose one course from the following:

- |                    |                    |
|--------------------|--------------------|
| AGRI 116 [3] _____ | AGRI 270 [3] _____ |
| AM 250 [3] _____   | ANTH 200 [3] _____ |
| E 238 [3] _____    | E 245 [3] _____    |
| ECON 211 [3] _____ | ETST 100 [3] _____ |
| ETST 205 [3] _____ | ETST 253 [3] _____ |
| ETST 256 [3] _____ | HORT 171 [3] _____ |
| IE 116 [3] _____   | IE 270 [3] _____   |
| IE 370 [3] _____   | LB 170 [3] _____   |
| LB 171 [3] _____   | PHIL 170 [3] _____ |
| POLS 131 [3] _____ | POLS 232 [3] _____ |
| POLS 241 [3] _____ | SA 482 [3] _____   |
| SOC 205 [3] _____  | SOCR 171 [3] _____ |

**CATEGORY 4: DEPTH AND INTEGRATION**  
[Fulfills AUCC Category 4 requirements]

**4A: USING COMPETENCIES**

BC 401 [3] \_\_\_\_\_

**4B: BUILDING UPON FOUNDATIONS**

BC 403 [3] \_\_\_\_\_ BC 404 [2] \_\_\_\_\_

**4C: CAPSTONE COURSE**

BC 463 [3] \_\_\_\_\_ BC 493 [1] \_\_\_\_\_

**All-University Requirements:**

42 credits of 300-400 level courses  
120 total credits (minimum) to graduate  
Minimum cumulative GPA of 2.00

**Departmental Requirements:**

- ∞ A minimum grade of C (2.000) must be earned for BC493 and all biochemistry (BC) and LIFE prefix lecture and laboratory courses at or above the 200-level required in the biochemistry major.
- ∞ No more than 10 total credits earned in the following courses may be applied toward graduation: BC 475, BC 484, BC 487A, BC 487B, BC 495, BC 498.
- ∞ Electives, including bioscience electives, are to be selected in consultation with the student's advisor.
- ∞ MATH 117, MATH 118, MATH 124, MATH 125, and MATH 126 (pre-calculus math) are considered review courses by the Department of Biochemistry and Molecular Biology. All entering freshmen should take the Mathematics Placement Examination prior to registration. As a result of that exam, some students may need to take one or more of the math review courses before registering in MATH 155 or MATH 160. Credits earned in the math review courses, either by placement examination or completion of the course(s), may not be used toward a degree in biochemistry.

**± BIOSCIENCE ELECTIVES:**

One of the bioscience electives must be from the following list of physiology/organismal biology courses:

**BMS 300** Prin. of Human Phys.; **BMS 345** Func. Neuroanatomy; **BMS 360** (was **BS 310**) Fund. of Phys.; **BMS 365** Nerve and Muscle-Toxin, Trauma, and Disease; **BMS 410** Phys. Response to the Env.; **BMS 420** Cardiopulm. Phys.; **BMS 430** Endocrinology; **BMS 450** Pharm.; **BMS 500** Mamm. Phys.; **BZ 401** Comp. Animal Phys.; **BZ 403** Comp. Endocrinology; **BZ 440** Plant Phys.

The second bioscience elective must be from the above list or from the following:

**BMS 325** Cell Neurobiol.; **BZ 310** Cell Biol.; **BZ 311** Dev Biol.; **BZ 220** Intro to Evol; **BZ 346** Population & Evolutionary Genetics; **BZ 350** Molecular & Gen Genetics; **BZ 402** Molecular Cytogenics; **BZ 455** Human Heredity and Birth Defects; **CHEM 433** Clinical Chemistry; **ERHS 300** Introduction to Radiation Biology; **MIP 300/302** Gen Microbiology/Lab; **MIP 342/343** Immunology/Lab; **MIP 351/352** Medical Bacteriology/Lab; **MIP 420** Medical & Molecular Virology; **MIP 425** Virology & Cell Culture Lab; **MIP 443** Microbial Physiology; **MIP 450** Microbial Genetics; **MIP 462** Parasitology and Vector Biology; and **SOCR 330** Prin. of Genetic.; **BC 467** Biochemistry of Human Disease.

**(SEE NEXT PAGE FOR COURSE LISTINGS)**

CREDITS				
COURSE	(lec-lab-disc/rec.)	TITLE	SEMESTER	PREREQUISITES
BC192	02(1-0-1)	Freshman Seminar	F	None
BC295	var cr.	Intro. To Indep. Study	F, S	LIFE102 and CHEM112 or concurrent registration; written consent of instructor.
BC401	03(3-0-0)	Comp Biochem I	F	CHEM245 or CHEM343 or concurrent registration or CHEM346 or concurrent registration; MATH155 or MATH160
BC403	03(3-0-0)	Comp Biochem II	S	CHEM245 or CHEM341 or CHEM345
BC404	02(0-6-0)	Comp Lab	F, S	BC401 or concurrent registration; CHEM246 or CHEM344; LIFE212
BC463	03(3-0-0)	Molecular Genetics	F	LIFE201B; BC401 or concurrent registration or BC351
BC465	03(3-0-0)	Mole Reg of Cell Func	S	LIFE210; BC403 or concurrent registration or BC351
BC467	03(3-0-0)	Biochem of Hum Disease	S	BC401; BC463
BC475	03(0-6-1)	Mentored Research	F, S, SS	BC404
BC484	var cr	Sup College Teach	F, S, SS	Written consent of supervising instructor and department chair
BC487A	var cr	Internship	F, S, SS	BC401; BC403; BC404; minimum GPA of 2.0; written consent of instructor
BC487B	var cr	Internship-Internat'l	F, S, SS	BC401; BC463; senior standing; BC495 in lab of host liaison faculty member
BC493	01(0-0-1)	Seminar	F, S	BC401 or concurrent registration
BC495	var cr	Independent Study	F, S, SS	minimum GPA of 3.0; written consent of laboratory mentor
BC498	var cr	Research	F, S, SS	written consent of research mentor and department chair
BC499A	03(0-0-3)	Lab Res-based Thesis	F, S, SS	BC475 or BC495
BC499B	03(0-0-3)	Lit-based Thesis	F, S, SS	BC403
CHEM111	04(3-0-1)	Gen Chemistry I	F, S, SS	MATH118 or placement in MATH124 or higher. Students should complete the sequence: CHEM111/CHEM112/CHEM113/CHEM114. Credit allowed for only one of the following: CHEM107, CHEM111, or CHEM117
CHEM112	01(0-3-0)	Gen Chemistry I Lab	F, S, SS	CHEM111 or concurrent registration; credit not allowed for both CHEM108 and CHEM112
CHEM113	03(3-0-0)	Gen Chemistry II	F, S, SS	CHEM107 or CHEM111 or CHEM 117; MATH124 or placement in MATH155 or higher
CHEM114	01(0-3-0)	Gen Chemistry II Lab	F, S, SS	CHEM112; CHEM113 or concurrent registration
CHEM335	03(3-0-0)	Quantitative Analysis	F, S	CHEM113; CHEM 334 or concurrent registration
CHEM334	01(0-3-0)	Quant Analy Lab	F, S	CHEM114; CHEM335 or concurrent registration
CHEM341	03(3-0-0)	Mod Org Chem I	F, S, SS	CHEM113; credit allowed for only CHEM245 or CHEM341 or CHEM345
CHEM343	03(3-0-0)	Mod Org Chem II	F, S, SS	CHEM245 or CHEM341 or CHEM345; credit not allowed for both CHEM343 and CHEM346
CHEM344	02(0-6-0)	Mod Org Chem Lab	F, S, SS	CHEM343 or concurrent registration or CHEM 346 or concurrent registration; credit not allowed for both CHEM344 and CHEM 246
CHEM471	04(4-0-0)	Fund of Physical Chem	F	CHEM113; MATH161 or MATH255; PH122 or PH142
CO150	03(3-0-0)	College Comp	F, S, SS	Satisfactory Composition Placement Examination scores (SAT 600 or ACT 26 or AP exam score 3,4, or 5 or CO130
CO301B	03(3-0-0)	Writing in Disciplines--Sci	F, S, SS	CO150 or HONR193
LIFE102	04(3-2-0)	Attributes Living Systems	F, S	High school chemistry; intended for students requiring additional courses in biology or areas related to biological science
LIFE201B	03(3-0-0)	Intro Genetics	S	LIFE102 or college-level introductory biology course
LIFE203	02(0-3-1)	Intro Genetics-Lab/Rec	S	LIFE201B or concurrent registration
LIFE210	03(3-0-0)	Eukaryotic Cell Biology	F	LIFE102; CHEM111, CHEM112 or concurrent registration
LIFE212	02(0-3-1)	Eukar Cell Bio-Lab/Rec	F	CHEM112; LIFE210 or concurrent registration
MATH155	04(4-0-0)	Calc for Bio Scientists I	F, S, SS	MATH124; MATH125; credit allowed for only one of the following: MATH141, MATH155, or MATH160
MATH160	04(3-2-0)	Calc for Phys Sci I	F, S, SS	MATH126; MATH124 or concurrent registration; credit allowed for only one of the following: MATH141, MATH155, or MATH160
MATH161	04(3-2-0)	Calc for Phys Sci II	F, S, SS	MATH124; MATH160
MATH255	04(4-0-0)	Calc for Bio Sci II	F, S,	MATH155; MATH126 or concurrent registration; credit not allowed for both MATH255 and MATH161
PH121	05(3-2-1)	Gen Physics I	F, S, SS	co-requisite: MATH125; credit not allowed for both PH121 and PH110, or for both PH121 and PH141
PH122	05(3-2-1)	Gen Physics II	F, S	PH121; credit not allowed for both PH122 and PH142
PH141	05(3-2-1)	Physics for Sci & Eng I	F, S, SS	MATH126; MATH155 or MATH160; students who have had high school physics may enroll in MATH155 or MATH160 concurrently; credit not allowed for both PH141 and PH121
PH142	05(3-2-1)	Phys for Sci & Eng II	F, S	PH141; concurrent registration in MATH161 or MATH255; credit not allowed for both PH142 and PH122
STAT301	03(3-0-0)	Intro to Statistical Mthds	F, S, SS	MATH118; credit allowed for only one course: STAT301, STAT307/ERHS307, STAT311
STAT307	03(3-0-0)	Intro to Biostatistics	F, S	MATH118; credit allowed for only one course: STAT301, STAT307/ERHS307, STAT311

**(SEE NEXT PAGE FOR INTERDISCIPLINARY STUDIES PROGRAM IN MOLECULAR BIOLOGY)**

# INTERDISCIPLINARY STUDIES PROGRAM IN MOLECULAR BIOLOGY

## **REQUIRED COURSES:**

BC401, Comprehensive Biochemistry I [3 cr]  
BC403, Comprehensive Biochemistry II [3 cr]  
BC404, Comprehensive Biochemistry Lab [2 cr]  
BC463, Molecular Genetics [3 cr] **OR** MIP450, Microbial Genetics [3 cr]  
BC493, Seminar [1 cr]  
CHEM111, General Chemistry I [4 cr]  
CHEM112, General Chemistry I Laboratory [1 cr]  
CHEM113, General Chemistry II [3 cr]  
CHEM114, General Chemistry II Laboratory [1 cr]  
CHEM341, Organic Chemistry I [3 cr]  
CHEM343, Organic Chemistry II [3 cr]  
CHEM344, Organic Chemistry Lab [2 cr]  
LIFE102, Attributes of Living Systems [4 cr]  
LIFE201B, 203, Intro Genetics/Lab/Rec [5 cr]; LIFE210, 212 Eukaryotic Cell Biology/Lab/Rec, [5 cr] **OR** BIO310, Cell Biology [4 cr] and either SOCR330/331, Principles of Genetics/Lab [4 cr] or BZ350, Molecular and General Genetics [4 cr]  
MATH155, Calculus for Biological Scientists I [4 cr] **OR** MATH160, Calculus for Physical Scientists I [4 cr]  
MIP300, General Microbiology [3 cr]  
MIP342, Immunology [4 cr]  
PH121/122, General Physics I/II [10 cr] **OR** PH141/142, Physics for Scientists and Engineers I/II [10 cr]  
STAT301, Introduction to Statistical Methods [3 cr] **OR** STAT307, Introduction to Biostatistics [3 cr]

## **COURSE ELECTIVES (MINIMUM OF ONE COURSE):**

BC465, Molecular Regulation of Cell Function [3 cr.]  
BZ346, Population & Evolutionary Genetics [3 cr]  
BZ402, Molecular Cytogenetics [4 cr]  
BZ403, Comparative Endocrinology [3 cr]  
BZ433, Behavioral Genetics [3 cr]  
MIP420, Medical and Molecular Virology [4 cr]  
MIP443, Microbial Physiology [4 cr]

## **LAB ELECTIVES (MINIMUM OF 4 CREDITS):**

BC475, Mentored Research [3 cr]  
BC495/498, Independent Study/Research [var. cr]  
BC499A, Thesis—Lab Research Based [3 cr]  
BC499B, Thesis—Literature Based [3 cr]  
BZ495/498, Independent Study/Research [var. cr]  
MIP302, General Microbiology Lab [2 cr]  
MIP343, Immunology Lab [2 cr]  
MIP425, Virology and Cell Culture Lab [2 cr]  
MIP495/498, Independent Study/Research [var. cr]

**Biochemistry majors:** The ISP requires MIP300 and MIP342, and allows BC465 as an elective. If MIP300 is taken to fulfill a Biochemistry BioScience elective, then MIP342 will still be required in addition to the Biochemistry Bioscience elective in physiology/organismal biology.

**Microbiology majors:** Requires BC401, BC403, and BC404 in place of BC351; LIFE201B, LIFE203B, and LIFE210, LIFE212 (10 credits) and BC493 (1 credit). Will require an additional 6-14 credits.

**Biology majors:** Requires BC401, BC403, and BC404 in place of BC351; CHEM341, CHEM343, and CHEM344 in place of CHEM245 and CHEM246 (3 extra credits); BC463 or MIP450 (3 credits), MIP300 (3 credits), MIP342 (4 credits), BC493 (1 credit). Since 18 credits in biological sciences are required for the major, this program should not require additional courses.