### CHECKSHEET FOR BIOCHEMISTRY MAJOR AND CONCENTRATIONS

**NAME:** ________________________  **CSU ID#:** ________________________  **DATE:** ____________

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**DEPARTMENTAL REQUIREMENTS FOR ALL CONCENTRATIONS IN THE BIOCHEMISTRY MAJOR:**

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]**
- **BMS 300 [4]**
- **BC 401 [3]**
- **BC 403 [3]**
- **BC 404 [2]**
- **BC 411 [4]**
- **BC 463 [3]**
- **BC 465 [3]**
- **BC 493 [1]**

**PHYSIOLOGY:**

- **BMS 301 [5]**
- **BMS 305 [4]**

**ANATOMY:**

- **BC 375 [3]**
- **BC 487 [3]**
- **BC 495 [3]**

**RESEARCH:**

- **BC 475 [3]**
- **BC 487 [3]**
- **BC 495 [3]**

**HEALTH AND MEDICAL SCIENCE CONCENTRATION:**

**PHYSIOLOGY:**

- **BMS 300 [4]**  **OR BMS 360 [4]**

**ANATOMY:**

- **BMS 301 [5]**  **OR BMS 305 [4]**

**RESEARCH:**

- **BC 375 [3]**  **OR BC 487 [3]**
- **OR BC 495 [3]**

**BIOCHEMISTRY:**

- **BC 467 [3]**
- **BC 499A [3]**  **OR BC 499C [3]**

**CHEMISTRY:**

- **PSY 100 [3]**
- **CHEM 111 [4]**  **CHEM 112 [1]**  **SOC 100 [3]**
- **SOC 105 [3]**
- **CHEM 113 [3]**
- **CHEM 341 [3]**
- **CHEM 344 [2]**

**PHYSICS:**

- **CHEM 114 [1]**
- **CHEM 343 [3]**

**MCAT:**

- **PSY 100 [3]**  **OR SOC 100 [3]**

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**BIOLOGICAL SCIENCES: (Category 3A)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>*LIFE 102 [4]</td>
<td></td>
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</table>

**CHEMISTRY: (Category 3A)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CHEM 344 [2]</td>
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**PHYSICS: (Category 3A)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>*PH 121 [5] and *PH 122 [5]</td>
<td></td>
</tr>
<tr>
<td>OR</td>
<td></td>
</tr>
</tbody>
</table>

**MCAT:**

- **PSY 100 [3]**  **OR SOC 100 [3]**

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**PRE-PHARMACY CONCENTRATION:**

**PHYSIOLOGY:**

- **BMS 300 [4]**  **OR BMS 360 [4]**
- **BMS 302 [2]**

**MICROBIOLOGY/IMMUNOLOGY:**

- **MIP 300 [3]**  **MIP 302 [2]**
- **MIP 342 [4]**

**PUBLIC SPEAKING AND ECONOMICS:**

- **SPCM 200 [3]**  **ECON 202 [3]**

**BIOCHEMISTRY:**

- **BC 499A [3]**  **OR BC 499D [3]**

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

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
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</table>

* = Honors section available

Ø A minimum grade of C must be earned for BC 493 and all Biochemistry (BC) and LIFE prefix lecture and laboratory courses at or above the 200-level required in the biochemistry major.

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**DEPARTMENTAL REQUIREMENTS FOR EACH CONCENTRATION IN THE BIOCHEMISTRY MAJOR:**

### GENERAL CONCENTRATION:

**BIOCHEMISTRY:**

- **BC 499A [3]**
- **OR**
- **BC 499B [3]**

**BIOCHEMISTRY ELECTIVES:**

† Bioscience elective (phys/org biol) [3-4]

‡ Bioscience elective [7-8]
SCIENCE REQUIREMENTS:

CATEGORY 1: CORE COMPETENCIES (11 CREDITS)

1A: WRITTEN COMMUNICATION (3 CR)
CO 150 [3]

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


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] **UCD-Pharm D program does not accept**

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] or D 110 [3]
ETST 240 [3] or L*** 200 [3-5]
L*** 201 [3-5] or L*** 250 [3]
MU 100 [3] or MU 111 [3]
MU 131 [3] or PHIL 100 [3]
PHIL 103 [3] or PHIL 110 [3]
PHIL 120 [3] or SPCM 100 [3]
SPCM 201 [3] or TH 141 [3]

3C: SOCIAL/BEHAVIORAL SCIENCE (3 CR)

Choose one course from the following:
ANTH 100 [3] or AREC 202 [3]
ECON 202 [3] or ECON 204 [3]
ECON 212 [3] or ECON 240 [3]
EDUC 275 [3] or GR 100 [3]
HDFS 101 [3] or JTC 100 [3]
POLS 101 [3] or POLS 103 [3]
SOC 105 [3] or SOC 100 [3]
PSY 100 [3] or SOWK 110 [3]

3D: HISTORICAL PERSPECTIVES (3 CR)

Choose one course from the following:
AMST 100 [3] or AMST 101 [3]
ANTH 140 [3] or ETS 250 [3]
ETST 252 [3] or ETS 255 [3]
HIST 100 [3] or HIST 101 [3]
HIST 115 [3] or HIST 120 [3]
HIST 121 [3] or HIST 150 [3]
HIST 151 [3] or HIST 170 [3]
HIST 171 [3] or HIST 250 [3]
HIST 252 [3] or HIST 255 [3]

3E: GLOBAL & CULTURAL AWARENESS (3 CR)

Choose one course from the following:
AM 250 [3] or ANTH 200 [3]
ECON 211 [3] or ETST 100 [3]
ETST 205 [3] or ETST 253 [3]
ETST 256 [3] or HORT 171 [3]
POLS 241 [3] or SA 482 [3]
SOC 205 [3] or SOCR 171 [3]

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-IIIIf 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 4: DEPTH AND INTEGRATION

[fulfills AUCC Category 4 requirements]

4A: USING COMPETENCIES
BC 401 [3]

4B: BUILDING UPON FOUNDATIONS

4C: CAPSTONE COURSE
<table>
<thead>
<tr>
<th>COURSE</th>
<th>(lec-lab-disc/rec)</th>
<th>TITLE</th>
<th>SEMESTER</th>
<th>PREREQUISITES</th>
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<tbody>
<tr>
<td>BC192</td>
<td>02(1-0-1)</td>
<td>BC Freshman Seminar</td>
<td>F</td>
<td>None</td>
</tr>
<tr>
<td>BC295</td>
<td>var cr</td>
<td>Intro Independent Study</td>
<td>F, S</td>
<td>LIFE102; CHEM112 or concurrent registration; written consent of instructor.</td>
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<tr>
<td>BC401</td>
<td>03(3-0-0)</td>
<td>Comp Biochem I</td>
<td>F</td>
<td>CHEM245 or CHEM343 or concurrent registration or CHEM346 or concurrent registration; MATH155 or MATH160</td>
</tr>
<tr>
<td>BC403</td>
<td>03(3-0-0)</td>
<td>Comp Biochem II</td>
<td>S</td>
<td>CHEM245 or CHEM341 or CHEM345</td>
</tr>
<tr>
<td>BC404</td>
<td>02(0-6-0)</td>
<td>Comp Lab</td>
<td>F, S</td>
<td>BC401 or concurrent registration; CHEM246 or CHEM344 or CHEM 346; LIFE203; LIFE212</td>
</tr>
<tr>
<td>BC411</td>
<td>04(3-0-1)</td>
<td>Physical Biochemistry</td>
<td>F</td>
<td>BC 351 with a grade of B or better or BC401; CHEM113; MATH161 or MATH255</td>
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<tr>
<td>BC463</td>
<td>03(3-0-0)</td>
<td>Molecular Genetics</td>
<td>F</td>
<td>BC351 or BC401 with a C or better; BZ350 with a C or better or LIFE201B with a C or better</td>
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<tr>
<td>BC465</td>
<td>03(3-0-0)</td>
<td>Molec Reg of Cell Funct</td>
<td>S</td>
<td>LIFE210; BC403 or concurrent registration or BC351</td>
</tr>
<tr>
<td>BC467</td>
<td>03(3-0-0)</td>
<td>Biochem of Hum Disease</td>
<td>S</td>
<td>BC401</td>
</tr>
<tr>
<td>BC475</td>
<td>03(0-6-1)</td>
<td>Mentored Research</td>
<td>F, S, SS</td>
<td>BC404</td>
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<tr>
<td>BC484</td>
<td>var cr</td>
<td>Sup College Teach</td>
<td>F, S, SS</td>
<td>Written consent of supervising instructor and department chair</td>
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<tr>
<td>BC487A</td>
<td>var cr</td>
<td>Internship</td>
<td>F, S, SS</td>
<td>BC401; BC403; BC404; minimum GPA of 2.0; written consent of department</td>
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<tr>
<td>BC487B</td>
<td>var cr</td>
<td>Internship-Internatl'</td>
<td>F, S, SS</td>
<td>BC401; BC463; senior standing; BC495 in lab of host liaison faculty member</td>
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<tr>
<td>BC493</td>
<td>01(0-0-1)</td>
<td>Senior Seminar</td>
<td>F, S</td>
<td>Minimum GPA of 3.0; written consent of laboratory mentor</td>
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<tr>
<td>BC495</td>
<td>var cr</td>
<td>Independent Study</td>
<td>F, S, SS</td>
<td>Written consent of research mentor and department chair</td>
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<tr>
<td>BC498</td>
<td>var cr</td>
<td>Research</td>
<td>F, S, SS</td>
<td>Minimum GPA of 3.0; written consent of laboratory mentor</td>
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<td>BC499A</td>
<td>03(0-0-3)</td>
<td>Thesis Lab Res-based</td>
<td>F, S, SS</td>
<td>BC493 or concurrent registration</td>
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<tr>
<td>BC499B-D</td>
<td>03(0-0-3)</td>
<td>Thesis Lit-based</td>
<td>F, S, SS</td>
<td>BC493 or concurrent registration</td>
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<tr>
<td>BMS300</td>
<td>04(4-0-0)</td>
<td>Princ of Human Phys</td>
<td>F, S, SS</td>
<td>BZI01 or BZI10 or LIFE102; CHEM103 or CHEM107 or CHEM111</td>
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<tr>
<td>BMS301</td>
<td>05(3-2-1)</td>
<td>Human Gross Anatomy</td>
<td>F</td>
<td>BZI10 or LIFE102</td>
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<tr>
<td>BMS302</td>
<td>02(1-3-0)</td>
<td>Princ of Physio Lab</td>
<td>F, S</td>
<td>BMS300 or concurrent registration or BMS360 or concurrent registration</td>
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<tr>
<td>BMS305</td>
<td>04(3-0-0)</td>
<td>Dom Animal Gross Anat</td>
<td>F, S</td>
<td>BZI10 or LIFE102</td>
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<tr>
<td>BMS360</td>
<td>04(4-0-0)</td>
<td>Fund of Physiology</td>
<td>S</td>
<td>BZI10 or LIFE102; CHEM245 or concurrent regist. or CHEM345 or concurrent regist.</td>
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<tr>
<td>CHEM111</td>
<td>04(3-0-1)</td>
<td>General Chemistry I</td>
<td>F, S, SS</td>
<td>CHEM118 or placement in MATH155 or higher. Students should complete the sequence: CHEM111/CHEM112/CHEM113/CHEM114. Credit allowed for only CHEM107, CHEM111, or CHEM117</td>
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<tr>
<td>CHEM112</td>
<td>1(0-3-0)</td>
<td>Gen Chemistry Lab I</td>
<td>F, S, SS</td>
<td>CHEM111 or concurrent registration; credit allowed for only CHEM108 or CHEM112</td>
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<tr>
<td>CHEM113</td>
<td>03(3-0-0)</td>
<td>Gen Chemistry II</td>
<td>F, S, SS</td>
<td>CHEM107 or CHEM111 or CHEM117; MATH124 or placement in MATH155 or higher</td>
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<tr>
<td>CHEM114</td>
<td>01(3-0-0)</td>
<td>Gen Chemistry Lab II</td>
<td>F, S, SS</td>
<td>CHEM112; CHEM113 or concurrent registration</td>
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<tr>
<td>CHEM341</td>
<td>03(3-0-0)</td>
<td>Mod Organic Chem I</td>
<td>F, S, SS</td>
<td>CHEM113; credit allowed for only CHEM245 or CHEM341 or CHEM345</td>
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<tr>
<td>CHEM343</td>
<td>03(3-0-0)</td>
<td>Mod Organic Chem II</td>
<td>F, S, SS</td>
<td>CHEM245 or CHEM341 or CHEM345; credit allowed for only CHEM343 or CHEM346</td>
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<tr>
<td>CHEM344</td>
<td>02(0-6-0)</td>
<td>Mod Org Chem Lab</td>
<td>F, S, SS</td>
<td>CHEM343 or concurrent registration or CHEM346 or concurrent registration; credit allowed for only CHEM344 or CHEM246</td>
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<tr>
<td>CO150</td>
<td>03(3-0-0)</td>
<td>College Comp</td>
<td>F, S, SS</td>
<td>Satisfactory Composition Placement Examination scores (SAT 600 or ACT 26 or AP Exam score 3, 4, or 5) or CO130</td>
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<tr>
<td>CO301B</td>
<td>03(3-0-0)</td>
<td>Writing in Disciplines--Sci</td>
<td>F, S, SS</td>
<td>CHEM111 or concurrent registration; credit allowed for only CHEM108 or CHEM112</td>
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<td>ECON202</td>
<td>03(2-0-1)</td>
<td>Princ of Microeconomics</td>
<td>F, S, SS</td>
<td>CHEM117 or MATH118 or MATH141 or MATH155 or MATH160</td>
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<tr>
<td>LIFE102</td>
<td>04(3-3-0)</td>
<td>Attributes Living Systems</td>
<td>F, S, SS</td>
<td>High school chemistry; prerequisite for additional higher-level science courses</td>
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<tr>
<td>LIFE201B</td>
<td>03(3-0-0)</td>
<td>Intro Genetics</td>
<td>S</td>
<td>LIFE102 or college-level introductory biology course</td>
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<tr>
<td>LIFE203</td>
<td>02(0-3-1)</td>
<td>Intro Genetics-Lab/Rec</td>
<td>S</td>
<td>LIFE201B or concurrent registration</td>
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<tr>
<td>LIFE210</td>
<td>03(3-0-0)</td>
<td>Intro Eukaryotic Cell Biol</td>
<td>F</td>
<td>CHEM102; LIFE111; CHEM112</td>
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<tr>
<td>LIFE212</td>
<td>02(0-3-1)</td>
<td>Eukar Cell Bio-Lab/Rec</td>
<td>F</td>
<td>CHEM112; LIFE210 or concurrent registration</td>
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<tr>
<td>MATH155</td>
<td>04(3-2-0)</td>
<td>Calc for Biol Scientists I</td>
<td>F, S, SS</td>
<td>MATH124; MATH125; credit allowed for only MATH141, MATH155, or MATH160</td>
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<tr>
<td>MATH160</td>
<td>04(3-2-0)</td>
<td>Calc for Phys Sci I</td>
<td>F, S, SS</td>
<td>MATH124; MATH126; credit allowed for only MATH141, MATH155, or MATH160</td>
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<tr>
<td>MATH161</td>
<td>04(3-2-0)</td>
<td>Calc for Phys Sci II</td>
<td>F, S, SS</td>
<td>MATH124; MATH126; credit allowed for only MATH141, MATH155, or MATH160</td>
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<tr>
<td>MATH255</td>
<td>04(4-0-0)</td>
<td>Calc for Biol Sci II</td>
<td>F</td>
<td>MATH126 or concurrent registration; MATH155; credit allowed for only MATH255 or MATH161</td>
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<td>MIP300</td>
<td>03(3-0-0)</td>
<td>Gen Microbiology</td>
<td>F, S, SS</td>
<td>BZI10 or BZI120 or LIFE102; CHEM245 or concurrent registration or CHEM341 or concurrent registration or CHEM345 or concurrent registration</td>
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<tr>
<td>MIP302</td>
<td>02(0-4-0)</td>
<td>Gen Microbiology Lab</td>
<td>F</td>
<td>MIP300 or concurrent registration</td>
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<tr>
<td>MIP342</td>
<td>04(3-0-1)</td>
<td>Immunology</td>
<td>F, S</td>
<td>CHEM245 or concurrent registration or CHEM341 or concurrent registration or CHEM345 or concurrent registration; LIFE201B or LIFE210 or MIP300</td>
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<tr>
<td>PH121</td>
<td>05(3-2-1)</td>
<td>General Physics I</td>
<td>F, S, SS</td>
<td>MATH125 or concurrent registration; credit allowed for only PH121 or PH141</td>
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<tr>
<td>PH122</td>
<td>05(3-2-1)</td>
<td>General Physics II</td>
<td>F, S</td>
<td>PH121; credit allowed for only PH122 or PH142</td>
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<tr>
<td>PH141</td>
<td>05(3-2-1)</td>
<td>Phys Sci &amp; Engineers I</td>
<td>F, S, SS</td>
<td>MATH126; MATH155 or concurrent registration; MATH160 or concurrent registration; credit allowed for only PH141 or PH121</td>
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<tr>
<td>PH142</td>
<td>05(3-2-1)</td>
<td>Phys Sci &amp; Engineers II</td>
<td>F, S</td>
<td>PH141; MATH161 or concurrent registration or MATH255 or concurrent registration; credit allowed for only PH142 or PH122</td>
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<tr>
<td>SPCM200</td>
<td>03(3-0-0)</td>
<td>Public Speaking</td>
<td>F, S, SS</td>
<td>MATH117 or higher; credit allowed for only STAT301, STAT307, STAT311, or STAT315</td>
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<tr>
<td>STAT301</td>
<td>03(3-0-0)</td>
<td>Intro Statistical Methods</td>
<td>F, S, SS</td>
<td>MATH117 or higher; credit allowed for only STAT301, STAT307, STAT311, or STAT315</td>
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<tr>
<td>STAT307</td>
<td>03(3-0-0)</td>
<td>Intro to Biostatistics</td>
<td>F, S, SS</td>
<td>MATH117 or higher; credit allowed for only STAT301, STAT307, STAT311, or STAT315</td>
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</tbody>
</table>

(SEE NEXT PAGE FOR MINOR PROGRAM IN MOLECULAR BIOLOGY)
MINOR 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, Senior 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
BZ310, 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]

COURSE ELECTIVES (MINIMUM OF ONE COURSE):

BC465, Molecular Regulation of Cell Function [3 cr.]
BZ346, Population & Evolutionary Genetics [3 cr]
BZ402, Molecular Cytogenics [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, Independent Study [var. cr]
BC499A, Thesis—Lab Research Based [3 cr]
BC499B-D, Thesis—Literature Based [3 cr]
BZ495, Independent Study [var. cr]
MIP302, General Microbiology Lab [2 cr]
MIP343, Immunology Lab [2 cr]
MIP425, Virology and Cell Culture Lab [2 cr]
MIP495, Independent Study [var. cr]