## Biotechnology Major Track A

<table>
<thead>
<tr>
<th>Category</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gen. Educ.</td>
<td>29-34 cr</td>
</tr>
<tr>
<td>Liberal Arts</td>
<td>9-11 cr</td>
</tr>
<tr>
<td>Major</td>
<td>83-85 cr</td>
</tr>
<tr>
<td>Required</td>
<td>59-61 cr</td>
</tr>
<tr>
<td>Req. support course</td>
<td>6 cr</td>
</tr>
<tr>
<td>In-depth electives</td>
<td>18</td>
</tr>
</tbody>
</table>

Completion: 121-130 cr

### Track A Requirement courses: 59-61 cr

- ANSC 222 Introduction to Biotechnology (2 cr)
- BIOL 160 General Biology – Freshman Research Focus (4 cr) or BIOL 150 General Biology (3 cr)
- BIOL 240 Cell and Molecular Biology (3 cr)
- BIOL 324 Microbiology (4 cr)
- BIOL 350 Genetics and Evolution (3 cr)
- BIOL 451 Molecular Biology (4 cr)
- BIOT 380 Junior Seminar (1 cr)
- BIOT 480 Biotechnology Seminar (1 cr)
- CHEM 121 General Chemistry I (5 cr) or CHEM 120 Introduction to General Chemistry (6 cr)
- CHEM 122 General Chemistry II (5 cr)
- CHEM 231 Organic Chemistry I (3 cr)
- CHEM 232 Organic Chemistry II (3 cr)
- CHEM 236 Organic Chemistry Lab I (1 cr)
- CHEM 237 Organic Chemistry Lab II (1 cr)
- CHEM 261 Laboratory Safety (2 cr)
- CHEM 355 Separation Science Laboratory (1 cr)
- CHEM 361 Biochemistry I (3 cr)
- CHEM 362 Biochemistry II (3 cr)
- CHEM 366 Biochemistry Laboratory (1 cr)
- PHYS 121 and PHYS 122 General Physics I, II (Algebra-based) (10 cr) or PHYS 131 and PHYS 132 General Physics I, II (Calculus-based) (10 cr)

### Required Supporting Courses: 6 cr

- MATH 231 Biostatistics (3 cr) or ANSC 341 Biometrics (3 cr)
- PHIL 220 Bioethics (3 cr)

### In-depth Electives (18 credits minimum)

## Biotechnology Major Track B

<table>
<thead>
<tr>
<th>Category</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gen. Educ.</td>
<td>29-34 cr</td>
</tr>
<tr>
<td>Liberal Arts</td>
<td>9-11 cr</td>
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<tr>
<td>Major</td>
<td>79-80 cr</td>
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<tr>
<td>Required</td>
<td>55-56 cr</td>
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<tr>
<td>Req. support courses</td>
<td>6 cr</td>
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<tr>
<td>In-depth electives</td>
<td>18</td>
</tr>
</tbody>
</table>

Completion: 117-125 cr

### Track B Requirement courses: 55-56 cr

- ANSC 222 Introduction to Biotechnology (2 cr)
- BIOL 160 General Biology – Freshman Research Focus (4 cr) or BIOL 150 General Biology (3 cr)
- BIOL 240 Cell and Molecular Biology (3 cr)
- BIOL 324 Microbiology (4 cr)
- BIOL 350 Genetics and Evolution (3 cr)
- BIOL 451 Molecular Biology (4 cr)
- BIOT 380 Junior Seminar (1 cr)
- BIOT 480 Biotechnology Seminar (1 cr)
- CHEM 130 Introduction to Organic Chemistry (5 cr)
- CHEM 233 Foundations of Organic Chemistry (5 cr)
- CHEM 240 Principles of General Chemistry (4 cr)
- CHEM 261 Laboratory Safety (2 cr)
- CHEM 355 Separation Science Laboratory (1 cr)
- CHEM 361 Biochemistry I (3 cr)
- CHEM 362 Biochemistry II (3 cr)
- CHEM 366 Biochemistry Laboratory (1 cr)
- PHYS 121 and PHYS 122 General Physics I, II (Algebra-based) (10 cr) or PHYS 131 and PHYS 132 General Physics I, II (Calculus-based) (10 cr)

### Required Supporting Courses: 6 cr

- MATH 231 Biostatistics (3 cr) or ANSC 341 Biometrics (3 cr)
- PHIL 220 Bioethics (3 cr)

### In-depth Electives (18 credits minimum)
In-Depth Electives Track A and B: 18 credits minimum

Select at least one course involving tissue culture:
- BIOL 463 Animal Cell Culture (3 cr)
- BIOL 464 Stem Cells and Regenerative Medicine (3 cr)
- HORT 369 Plant Tissue Culture (3 cr)

Additional in-depth electives
- ANSC 260 Animal Physiology (4 cr)
- ANSC 333 Advanced Nutrition (3 cr)
- ANSC 447 Endocrinology
- ANSC 448 Physiology of Reproduction (3 cr)
- ANSC 449 Artificial Insemination of Farm Animals (1 cr)

- BIOL 195 Freshman Research Experience (3 cr)
- BIOL 314 Plant Pathology (3 cr)
- BIOL 320 Plant Physiology (3 cr)
- BIOL 325 Medical Microbiology (3 cr)
- BIOL 345 Immunology (3 cr)
- BIOL 351 Epigenetics (3 cr)
- BIOL 352 Applied Genomics (3 cr)
- BIOL 353 Histology (4 cr)
- BIOL 356 Neurobiology (3 cr)
- BIOL 364 Developmental Biology (3 cr)
- BIOL 453 Virology (3 cr)
- BIOL 463 Animal Cell Culture (3 cr)
- BIOL 464 Stem Cells and Regenerative Medicine (3 cr)

- BIOT 295 Biotechnology Research (1 cr)
- BIOT/CSIS 373 Bioinformatics (3 cr)
- BIOT 379 Biotechnology Internship (1-6 cr)
- BIOT 495 Biotechnology Research and Thesis (1-3 cr)

- CHEM 250 Foundations of Analytical Chemistry (4 cr)
- CHEM 356 Chemical Instrumentation Lab (1 cr)
- CHEM 461 Pharmacology (3 cr)

- COMS 318 Communication and Leadership (3 cr)

- CROP 345 Weed Control (3 cr)
- CROP 410 Plant Breeding and Crop Improvement (3 cr)
- CROP 435 Crop Physiology (4 cr)
- CROP 451 Integrated Pest Management (4 cr)

- ENGL 266 Business Writing (3 cr)
- ENGL 367 Technical Writing (3 cr)
- ENGL 371 Proposal Writing: Change Through Rhetoric (3 cr)

- ESM 412 Fate and Transport (4 cr)
- ESM 413 Environmental Analysis (4 cr)

- HORT 200 Plant Propagation (3 cr)
- HORT 369 Plant Tissue Culture (3 cr)
- HORT 420 Floriculture (4 cr)

- MATH 166 Calculus I (4 cr)

1 ANCS 257 and CROP 257 may substitute for BIOL 350.
2 Requires prerequisite course(s) that are not included within the program or consent of the instructor.
3 Required by many graduate and professional programs
Hi Karl,

Speaking on behalf of the Biology Department, I support the changes that you have proposed in the existing Biotechnology major.

Regards,

Mark

Mark Bergland, Chair
Biology Department, AGS 410
University of Wisconsin - River Falls
River Falls, WI 54022
mark.s.bergland@uwrf.edu
715-425-3591 (office) or 715-529-8845 (cell)

Dear Gary, Don, Mark and Marshall

Attached please find the final version of the proposed Biotechnology program revisions and the supporting narrative. I do not believe that there are any significant changes since you last saw the document. I have also attached the summary of the current biotechnology program for comparison. I would like to get this information, including e-mails of support to the CAS Dean’s office by next Wednesday, if possible. Please let me know if you have any questions or concerns.

Thank you,

Karl

Karl P. Peterson, Ph.D.
Professor and Chair
Department of Chemistry
University of Wisconsin-River Falls
715-425-3523
Hi Karl,

The Math Department does not have any concerns about your proposal.

Bob

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Hi Bob

Attached please find the proposed changes to the Biotechnology major and the supporting narrative. We decided to keep the statistics courses (MATH 231 or ANSC 341) in the required supports course area and decouple them from MATH 166, which is now in the allowed electives. I apologize for not consulting you earlier in the process. Please review the changes and let me know if you have any questions or concerns. If there are none, then I would appreciate a brief letter of support to accompany the proposal through the approval process,

Thank you,

Karl

Karl P. Peterson, Ph.D.
Professor and Chair
Department of Chemistry
University of Wisconsin-River Falls
715-425-3523