

Curriculum in Biomedical Research

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Freshman Fall Semester

| Course | Course Name | Cr |
|-----------------|------------------------------|----|
| BIOL 201 | Organisms ^{\$} | 4 |
| CHEM 101 | General Chemistry I | 4 |
| ENGL 101 | English Composition I | 3 |
| XXX xxx | Social Science | 3 |
| BIOL 191 | University Seminar I | 1 |

Total Credits 15

Freshman Spring Semester

| Course | Course Name | Cr |
|-----------------|----------------------------------|----|
| BIOL 202 | Evolution, Ecology and Diversity | 4 |
| CHEM 102 | General Chemistry II | 4 |
| ENGL 102 | English Composition II | 3 |
| MTSC 122 | Trigonometry | 3 |
| BIOL 192 | University Seminar II | 1 |
| BIOL 194 | Intro. to Biology Professions | 1 |

Total Credits 16

Sophomore Fall Semester

| Course | Course Name | Cr |
|-----------------|--|----|
| BIOL 215 | Cell Biology | 4 |
| CHEM 210 | Organic Chemistry I | 4 |
| MVSC 101 | Fitness and Wellness | 2 |
| MTSC 261 | Calculus for Life Sciences (or MTSC 251/252-Calc I & II) | 4 |
| ENGL 200 | Speech | 3 |
| BIOL 301 | Problems in Biology (optional) | |

Total Credits 17

Sophomore Spring Semester

| Course | Course Name | Cr |
|-----------------|---------------------------------|----|
| BIOL 210 | Genetics* | 4 |
| CHEM 211 | Organic Chemistry II | 4 |
| ENGL 2xx | Literature[#] | 3 |
| BIOL 321 | Biostatistics | 3 |
| BIOL 299 | Soph. Seminar – Sci. Literature | 1 |

Total Credits 15

Summer Research Internship

Junior Fall Semester

| Course | Course Name | Cr |
|----------|--------------------|----|
| BIOL 310 | Molecular Biology* | 4 |

Junior Spring Semester

| Course | Course Name | Cr |
|----------|--------------------------|----|
| CHEM 403 | Biochemistry (offered in | |

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spring) **OR**

| | | | | | |
|------------------|--------------------------------|---|------------------|--|---|
| BIOL xxx | Biology Elective | 4 | BIOL 422 | Biochemical Mechanisms (offered in fall) | 4 |
| HIST xxx | History[#] | 3 | GLOB 395 | Global Societies | 3 |
| PHYS 211 | Fundamentals of Physics I | 4 | PHYS 212 | Fundamentals of Physics II | 4 |
| BIOL 301 | Problems in Biology (optional) | | BIOL 399 | Junior Seminar-Sci. Writing* | 1 |
| | | | BIOL 470 | Biotechnological Processes | 4 |
| Total Credits 15 | | | Total Credits 16 | | |

Summer Research Internship

Senior Fall Semester

| Course | Course Name | Cr |
|---------------|--|----|
| XX xxx | Arts and Humanities[#] | 3 |
| BIOL xxx | Biomedical Elective | 4 |
| BIOL xxx | Biology Elective | 4 |
| BIOL 451 | Senior Research (Capstone I)** | 2 |
| Total Credits | | 13 |

Senior Spring Semester

| Course | Course Name | Cr |
|-------------------------|---|-------|
| PHIL 105/202/322 | Ethics course (Humanities). PHIL 322 recommended | 3 |
| BIOL xxx | Biomedical Elective | 4 |
| BIOL xxx | Biology Elective | 4 |
| XXX xxx | Open Elective | 3-4 |
| 23-499 | Senior Seminar (Capstone II)** | 1 |
| Total Credits | | 15-16 |

Total Credits: 122-123

** Senior Capstone (if BIOL 301 or internship already completed, 451 can be waived but not 499)

* Writing Intensive Course(s)

One of these courses must be used to meet the African American Experience

[§] General Biology I and II (BIOL 101 AND 102) together can substitute for BIOL 201 and 202

BIOLOGY ELECTIVES: Students must not take less than 18 credits of Biology courses from the course elective list below. These are the only ones that can satisfy the Biology elective requirement for this track. Substitutions can be requested, under special circumstances, but require written approval of advisor and Chair in advance.

The Curriculum Tracks are designed for the intended career goal, including anticipation of entrance examinations, so students should adhere to the suggested sequence. It is advisable for the student to check possible post graduate school requirements during their Junior year to ensure that satisfy expectations of intended graduate/profession choices.

BIOMEDICAL RESEARCH ELECTIVES:

Students must take at least two of the following three courses: BIOL-375 Molecular Genetics and Genomics; BIOL-410 Advanced Molecular Biology; BIOL-415 Advanced Cell Biology.

REQUIREMENTS: Students must take each of the five biology core courses (201-202-215-210-310) in sequence and earn a grade of “C” or higher in each respectively before being able to progress to the next in the sequence (BIOL 101-102 can substitute for 201-202 but both of each group must be taken and same grade criteria apply).

In order for a student to take any 300 or 400 level Biology Department course, he or she must have earned a grade of "C" or better in the first four core courses. These grade requirements take precedence over and supersede any lesser specific prerequisites of all 300 or 400 level Biology electives. All students must pass the Biology Comprehensive Assessment (BCA) examination of core courses given to all students in BIOL-399. If they do not pass, then the student must take BIOL 498 and pass the BCA, which is required for successful completion of this course, and the biology program.

TRANSFER CREDITS: Students who receive transfer credit for courses that are equivalent to BIOL 101 and BIOL102 will be considered to have met the prerequisite for BIOL 215. Students transferring with a grade of “C” or better in Anatomy & Physiology I (207) and Anatomy & Physiology II (208) and Microbiology (322) usually have one (1) Biology elective waived.

SPECIAL NOTES: **For all programs and tracks, a grade of “C” or better is required for all Biology courses.** For the Biomedical and for the Health Professions tracks, a grade of “C” or better is also required in all CMNST courses.

All Biology majors must complete an independent research project. Those who have completed a research project with a biology faculty member (e.g. 23-301 for credit, or via a paid stipend) prior to the beginning of their senior year, and especially if the project was an internship at another institution, the student must present their data to their advisor in order to be exempted from the required Senior Capstone I course. If they have not completed a research project, or their internship is inadequate, then they must register for 23-451 or 452 to complete a Capstone research project.

If you take, 23-422 instead of 24-403, then you will need to take another Chemistry course if you want a minor in Chemistry – Instrumental Analysis (24-306) with lab is suggested. Another set of courses the student can consider is Physics-317 (Foundations of Bioengineering) and Physics 409 (Biosensors and Bio-instrumentation) as electives with advisor, instructor, and Biology Chair approval.

All Biology majors are required to successfully complete Senior Seminar (Capstone II, 23-499), no exceptions.

General Note: The minimum University requirement for graduation is 121 hours; in Biology you will usually complete between 121-125 hours depending on selections.

Cell/Molecular/Biotechnology

| Biology Electives: | Open Electives: |
|-----------------------------------|---------------------------------------|
| 23-305 Developmental Biology | 41-105 Management Processes |
| 23-322 Microbiology | 41-325 Organizational Behavior |
| 23-375 Mol. Genetics and Genomics | 41-341 Business Ethics |
| 23-420 Immunology | 41-435 Entrepreneurship |
| 23-317 Principles of Virology | 46-300 Principles of Marketing |
| 23-405 Cell Morphogenesis | 35-301 Introduction to Bioinformatics |
| 23-307 Principles of Physiology | 25-252 Calculus II |

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|----------------------|---------------------|
| 23-370 Human Anatomy | 23-411 Pharmacology |
| | 23-311 Neuroscience |

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