Biotechnology - B.S. Degree Requirements – Total Credits (57-66)

INTRODUCTORY BIOLOGY (4 credits)

- BIO 121 (*Students with AP credits of Biology with laboratory may omit introductory courses*)

CORE COURSES (9 credits)

- BIO 326 , BIO 327 and BIO 305 (3 credits each)

  *note that as of 2012, students must achieve a C+ or better in at least two core courses prior to being allowed to declare the Biotechnology major

UPPER DIVISION REQUIREMENTS (Total 29 credits)

1. **Biotechnology courses (8 credits)**
   - BIO 463: Molecular Biotechnology (4 credits; 3 credits count towards lab)
   - BIO 464: Applied Biotechnology (4 credits; 3 credits count towards lab)
2. **Bioengineering/Biomaterial Sciences (3 credits)**
   - BEN 468 (Biomaterial and Medical Devices; 3 credits)
3. **Public Policy/Management (6 credits)**
   - EEE 370 (Introduction to Entrepreneurship and Emerging Enterprises; 3 credits)
   - ECO 301(Intermediate microeconomics; 3 credits)
4. **Elective courses (6 credits)**

   Choose two of the following courses:
   - ACC 201 (Introduction to Accounting; 3 credits)
   - BEN 541 (Principles of Tissue Engineering; 3 credits)
   - BIO 345 (Population Biology; 3 credits)
   - BIO 316 (Anatomy and Physiology I)
   - BIO 317 (Anatomy and Physiology II)
   - BIO 355 (General Physiology; 3 credits)
   - BIO 400 (Evolutionary Developmental Biology; 3 credits)
   - BIO 409 (General Microbiology; 4 credits)
   - BIO 422 (Bioinformatics for Life Scientists; 3 credits)
   - BIO 424 (Comparative Vertebrate Biology; 4 credits)
   - BIO 425 (Cell and Developmental Biology Lab; 3 credits)
   - BIO 432 (Environmental Microbiology Lab; 3 credits)
   - BIO 435 (Genetics Lab; 3 credits)
   - BIO 447 (Immunobiology; 3 credits)
   - BIO 448 (Evolutionary Medicine; 3 credits)
   - BIO 455 (Physiology Lab; 3 credits)
   - BIO 462 (Molecular Genetics; 3 credits)

Biotechnology B.S. degree - Elective courses (continued)

- BIO 465 (Molecular Biology Lab; 3 credits)
- BIO 475 (Biochemistry Lab; 3 credits)
- BIO 501 (Biology of Cancer; 3 credits)
- BIO 503 (Developmental Biology; 3 credits)
- BIO 565 (Cellular Physiology; 3 credits)
- BIO 575 (General Biochemistry I; 3 credits)
- BIO 576 (General Biochemistry II; 3 credits)
- BCM 484 (Biomolecular Modeling; 3 credits)
- BTC 401 (Molecular Biology Techniques; 3 credits)
- BPE 420 (Bioseparations; 3 credits)
- BPE 421 Bioprocess Kinetics and Systems Engineering; 3 credits)
- BPE 440 Bioprocess and Systems Laboratory; 3 credits)
- BPE 481 Bioprocess Engineering Design; 3 credits)
- CHE 412 (Metals in Medicine; 3 credits)
- CHE 477 (Structural Biochemistry Lab; 3 credits)
- CIE 472 (Applied Environmental Microbiology; 3 credits)
- ECN 355 (Economics of Health and Medical Care; 3 credits)
- GEO 400 (Food: A Critical Geography; 3 credits)
- LPP 255 (Introduction to the Legal System; 3 credits)
- MAR 301 (Principles of Marketing for Non-Management Students; 3 credits)
- PAF 410 (Practicum in Public Policy; 3 credits)
- PAF 451 (Environmental Policy; 3 credits)
- PHI 393 (Contemporary Ethics; 3 credits)
- PSC 318 (Technology, Politics, and Environment; 3 credits)
- PAF 315 (Methods of Public Policy Analysis and Presentation; 3 credits)
- SHR 355 (Strategic Human Resource Management; 3 credits)
  - In addition, other courses related to biotechnology from other departments (for example, Chemistry, Bioengineering, Physics, Psychology, Biomaterial Institute, Maxwell School, Law School, Whitman School, ESF and Upstate Medical University) can be used as elective courses by petitioning to the Biology Department.

5. SENIOR CAPSTONE SEMINAR COURSE (BIO 421; 3 credits)

6. INTERNSHIP/Independent Research (BIO 460; 0-4 credits)

This requirement can be fulfilled by a) completing an approved internship at a biotech-related company during spring and/or fall semester of junior or senior year or b) by completing an approved independent research in any of the biotech-related topics, including biology, chemistry, engineering, public policy, law or management. For example, if a student chooses to do independent research in biology, s/he can register for 3 credits of BIO 460 each semester. In addition, an approved internship at a biotech-related company over the summer after the junior year can be petitioned to fulfill this requirement.

7. MATH AND CHEMISTRY REQUIREMENTS (19-21 credits)

See following page.

7. MATH AND CHEMISTRY REQUIREMENTS (19-21 credits)

35/17 Chem 106/107: General Chemistry I (4 credit hours) Chem 116/117: General Chemistry II (4 credit hours) Chem 275/276: Organic Chemistry I (5 credit hours) *AND either*

35/17 Math 285/286: Calculus I and II* (6 credit hours total) OR

35/17 Math 295/296: Calculus I and II* (8 credit hours total) OR

35/17 Math 285 or 295: Calculus I and a 300 level Statistics Course* (6-7 credit hours total)