

# BIOTECHNOLOGY (BIT)

## College of Agricultural & Environmental Sciences

### BIT 001Y – Introduction to Biotechnology (4 units)

*Course Description:* Principles and technologies of biotechnology as applied to agriculture, the environment, and medicine. Business plans and presentation pitches for new biotechnology products. Bioinformatics approaches exploring genomic databases and DNA manipulations in silica.

*Learning Activities:* Lecture 2 hour(s), Web Virtual Lecture 1 hour(s), Discussion 1 hour(s).

*Grade Mode:* Letter.

*General Education:* Science & Engineering (SE).

### BIT 091 – Undergraduate Seminars in Biotechnology (1 unit)

*Course Description:* Undergraduate oriented seminar series focused on biotechnology research and product development. Speakers from campus and the private sectors discuss ongoing research, product development and biotechnology careers.

*Learning Activities:* Seminar 1 hour(s).

*Grade Mode:* Pass/No Pass only.

### BIT 092 – Internship in Biotechnology (1-12 units)

*Course Description:* Work experience on or off campus in subject area pertaining to biotechnology or in a business, industry or agency associated with biotechnology. Internship supervised by faculty member in the animal or plant sciences.

*Prerequisite(s):* Consent of instructor.

*Learning Activities:* Internship 3-36 hour(s).

*Grade Mode:* Pass/No Pass only.

### BIT 098 – Directed Group Study (1-5 units)

*Course Description:* Directed group study.

*Prerequisite(s):* Consent of instructor.

*Learning Activities:* Variable 1-15 hour(s).

*Repeat Credit:* May be repeated.

*Grade Mode:* Pass/No Pass only.

*General Education:* Science & Engineering (SE).

### BIT 099 – Special Study for Undergraduates (1-5 units)

*Course Description:* Special study for undergraduates.

*Prerequisite(s):* Consent of instructor.

*Learning Activities:* Independent Study 3-15 hour(s).

*Grade Mode:* Pass/No Pass only.

### BIT 150 – Applied Bioinformatics (4 units)

This version has ended; see updated course, below.

*Course Description:* Concepts and programs needed to apply bioinformatics in biotechnology research. Sequence analysis and annotation and use of plant and animal databases for students in biological and agricultural sciences.

*Prerequisite(s):* BIS 101; (ECS 010 or ECS 015 or PLS 021 or PLS 021V); (PLS 120 or STA 013 or STA 013Y or STA 100); or consent of instructor.

*Learning Activities:* Lecture 2 hour(s), Discussion/Laboratory 2 hour(s).

*Enrollment Restriction(s):* Limited enrollment.

*Credit Limitation(s):* Only 2 units of credit for students who have completed ECS 124.

*Grade Mode:* Letter.

*General Education:* Science & Engineering (SE); Visual Literacy (VL).

### BIT 150 – Applied Bioinformatics (4 units)

*Course Description:* Concepts and programs needed to apply bioinformatics in biotechnology research. Sequence analysis and annotation and use of plant and animal databases for students in biological and agricultural sciences.

*Prerequisite(s):* BIS 101; (ECS 032A or ECS 032B or ECS 010 or ECS 015 or PLS 021 or PLS 021V); (PLS 120 or STA 013 or STA 013Y or STA 100); or consent of Instructor.

*Learning Activities:* Lecture 2 hour(s), Discussion/Laboratory 2 hour(s).

*Enrollment Restriction(s):* Limited enrollment.

*Credit Limitation(s):* Only 2 units of credit for students who have completed ECS 124.

*Grade Mode:* Letter.

*General Education:* Science & Engineering (SE); Visual Literacy (VL).

This course version is effective from, and including: Spring Quarter 2024.

### BIT 160 – Principles of Plant Biotechnology (3 units)

*Course Description:* Principles and concepts of plant biotechnology including recombinant DNA technology, molecular biology, genomics, cell and tissue culture, gene transfer and crop improvement strategies using transgenic crops.

*Prerequisite(s):* (BIS 001A or BIS 002A); (BIS 101 or PLS 152).

*Learning Activities:* Lecture 3 hour(s).

*Credit Limitation(s):* Not open for credit to students who have completed PLB 160. (Former PLB 160.)

*Grade Mode:* Letter.

*General Education:* Science & Engineering (SE).

### BIT 161A – Genetics & Biotechnology Laboratory (6 units)

*Course Description:* Techniques of genetic analysis at the molecular level including recombinant DNA, gene mapping and basic computational biology.

*Prerequisite(s):* PLS 152 or BIS 101; and consent of instructor.

*Learning Activities:* Lecture 3 hour(s), Laboratory 9 hour(s).

*Credit Limitation(s):* Not open for credit to students who have completed PLB 161A.

*Grade Mode:* Letter.

*General Education:* Science & Engineering (SE).

### **BIT 161B – Plant Genetics & Biotechnology Laboratory (4 units)**

*Course Description:* Advanced techniques of genetic analysis at the molecular and cellular levels, including transformation, gene expression and analysis of transgenic plants.

*Prerequisite(s):* PLS 152 or BIS 101; and consent of instructor.

*Learning Activities:* Lecture 1 hour(s), Laboratory 8 hour(s).

*Credit Limitation(s):* Not open for credit to students who have taken PLB 161B. (Former PLB 161B.)

*Grade Mode:* Letter.

*General Education:* Science & Engineering (SE); Scientific Literacy (SL).

### **BIT 171 – Professionalism & Ethics in Genomics & Biotechnology (3 units)**

*Course Description:* Real and hypothetical case studies to illustrate ethical issues in genomics and biotechnology. Training and practice in difficult ethical situations and evaluating personal and social consequences.

*Prerequisite(s):* Upper division standing in a natural science major.

*Learning Activities:* Lecture 1 hour(s), Discussion 2 hour(s).

*Grade Mode:* Letter.

*General Education:* Science & Engineering (SE); Scientific Literacy (SL); Writing Experience (WE).

### **BIT 188 – Undergraduate Research Proposal (3 units)**

*Course Description:* Preparation and review of a scientific proposal.

Problem definition, identification of objectives, literature survey, hypothesis generation, design of experiments, data analysis planning, proposal outline and preparation.

*Prerequisite(s):* Upper division standing.

*Learning Activities:* Lecture/Discussion 3 hour(s).

*Cross Listing:* PLS 188.

*Grade Mode:* Letter.

*General Education:* Science & Engineering (SE); Writing Experience (WE).

### **BIT 189L – Laboratory Research in Genomics & Biotechnology (2-5 units)**

*Course Description:* Formulating experimental approaches to current questions in biotechnology; performance of proposed experiments.

*Prerequisite(s):* BIT 188; and consent of instructor.

*Learning Activities:* Laboratory 3-12 hour(s), Discussion 1 hour(s).

*Repeat Credit:* May be repeated 12 unit(s).

*Grade Mode:* Pass/No Pass only.

### **BIT 192 – Internship in Biotechnology (1-12 units)**

*Course Description:* Work experience on or off campus in a subject area pertaining to biotechnology or in a business, industry or agency associated with biotechnology. Internship supervised by faculty member in the animal or plant sciences.

*Prerequisite(s):* Consent of instructor.

*Learning Activities:* Internship 3-36 hour(s).

*Grade Mode:* Pass/No Pass only.

### **BIT 194H – Honors Thesis in Biotechnology (1-2 units)**

*Course Description:* Independent study of selected topics under the direction of a member or members of the staff. Completion will involve the writing of a senior thesis.

*Prerequisite(s):* BIT 188; BIT 189L; consent of instructor; senior standing in Biotechnology with 3.250 GPA or higher.

*Learning Activities:* Independent Study 3-6 hour(s).

*Grade Mode:* Pass/No Pass only.

*General Education:* Science & Engineering (SE); Writing Experience (WE).

### **BIT 198 – Directed Group Study (1-5 units)**

*Course Description:* Directed group study.

*Prerequisite(s):* Consent of instructor.

*Learning Activities:* Variable 1-15 hour(s).

*Repeat Credit:* May be repeated.

*Grade Mode:* Pass/No Pass only.

*General Education:* Science & Engineering (SE).

### **BIT 199 – Special Study for Advanced Undergraduates (1-5 units)**

*Course Description:* Special study for advanced undergraduates.

*Prerequisite(s):* Consent of instructor.

*Learning Activities:* Independent Study 3-15 hour(s).

*Grade Mode:* Pass/No Pass only.