BIORESOURCE AND AGRICULTURAL ENGINEERING (BS)

Degree Requirements and Curriculum

In addition to the program requirements listed on this page, students must also satisfy requirements outlined in more detail in the Minimum Requirements for Graduation (https://catalog.calpoly.edu/academic-standards-policies/general-requirements-bachelors-degree/) section of this catalog, including:

- 40 units of upper-division courses
- 2.0 GPA
- Graduation Writing Requirement (GWR)
- U.S. Cultural Pluralism (USCP)

Note: No Major or Support courses may be selected as credit/no credit. In addition, no more than 12 units of cooperative or internship courses can count towards your degree requirements.

Code	Title	Units
MAJOR COURSES		
BRAE 1128	Careers in BioResource and Agricultural Engineering	2
BRAE 1150	Design Graphics and CAD for Agricultural Engineering	2
BRAE 1239	Engineering Surveying	3
BRAE 2216	Fundamentals of Electricity	4
BRAE 2220	Introduction to Biological Systems (5B & 5C) [1]	4
BRAE 2221	Engineering Mechanics with Agricultural Applications I	4
BRAE 2222	Engineering Mechanics with Agricultural Applications II	4
BRAE 2236	Principles of Irrigation	4
BRAE 3234	Equipment Engineering I	4
BRAE 3312	Hydraulics	3
BRAE 3320	Bioresource Engineering	3
BRAE 3332	Environmental Controls for Agricultural Structures	3
BRAE 4403	Agricultural Engineering Ethics, Economics, and Optimization	3
BRAE 4414	Irrigation Engineering	3
BRAE 4422	Equipment Engineering II	3
BRAE 4428	Agricultural Robotics and Automation	4
BRAE 4433	Agricultural Structures Design	4
BRAE 4460	Senior Project I	1
BRAE 4461	Senior Project II	2
BRAE Focus Area		
Select from the following:		6
BRAE 3335	Internal Combustion Engines	
BRAE 4302	Servo Hydraulics	
BRAE 4447	Advanced Surveying with GIS Applications	
BRAE 4448	Bioconversion	
BRAE 5435	Hydrology and Drainage	
BRAE 5436	Food and Agriculture Process Water Engineering	
BRAE 5532	Water Pumps and Wells	
BRAE 5533	Irrigation Project Design	
Approved Elective		
Select from the following: [2]		3
BRAE 3335	Internal Combustion Engines	
BRAE 3345	Photogrammetry and Remote Sensing with GIS Applications	
BRAE 3348	Energy for a Sustainable Society	
BRAE 3349	Water for a Sustainable Society	
BRAE 4302	Servo Hydraulics	
BRAE 4447	Advanced Surveying with GIS Applications	

BRAE 4448	Bioconversion	
BRAE 5405	Chemigation	
BRAE 5435	Hydrology and Drainage	
BRAE 5436	Food and Agriculture Process Water Engineering	
BRAE 5532	Water Pumps and Wells	
BRAE 5533	Irrigation Project Design	
MSCI 4438	Aquaculture	
SUPPORT COURSES		
CHEM 1122	Fundamentals of Chemical Reactivity (5A) [1]	4
CSC 1032	Programming for Scientists and Engineers	3
Select from the following: 4B [1]		3
ECON 2001	Survey of Economics	
ECON 2040	Macroeconomics	
MATH 1261	Calculus I (2) [1]	4
MATH 1262	Calculus II	4
MATH 2263	Calculus III	3
PHYS 1141	General Physics I	4
PHYS 1143	General Physics II	4
STAT 3210	Engineering Statistics (Upper-Division 2/5) [1]	3
GENERAL EDUCATION (GE)		
(See GE program requirements below)		27
FREE ELECTIVES		
Free Electives		0
Total Units		**128**

[1] Required in Major or Support; also satisfies General Education (GE) requirement.

[2] If a course is taken to meet a Major requirement, it cannot be double-counted as an Approved Elective.

General Education (GE) Requirements

General Education (GE) Requirements

- 43 units required, 16 of which are specified in Major and/or Support.
- If any of the remaining 27 Units is used to satisfy a Major or Support requirement, additional units of Free Electives may be needed to complete the total units required for the degree.
- See the complete GE course listing (https://catalog.calpoly.edu/academic-standards-policies/general-requirements-bachelors-degree/#generaleducationtext).
- A grade of C- or better is required in one course in each of the following GE Areas: 1A (English Composition), 1B (Critical Thinking), 1C (Oral Communication), and 2 (Mathematics and Quantitative Reasoning).

Lower-Division General Education

Area 1	**English Communication and Critical Thinking**	
1A	Written Communication	3
1B	Critical Thinking	3
1C	Oral Communication	3
Area 2	**Mathematics and Quantitative Reasoning**	
2	Mathematics and Quantitative Reasoning (3 units in Support) [1]	0
Area 3	**Arts and Humanities**	
3A	Arts	3
3B	Humanities: Literature, Philosophy, Languages other than English	3
Area 4	**Social and Behavioral Sciences (Area 4 courses must come from at least two different course prefixes.)**	
4A	American Institutions (Title 5, Section 40404 Requirement)	3
4B	Social and Behavioral Sciences (3 units in Support) [1]	0
Area 5	**Physical and Life Sciences**	
5A	Physical Sciences (3 units in Support) [1]	0
5B	Life Sciences (3 units in Major) [1]	0
5C	Laboratory (may be embedded in a 5A or 5B course) (1 units in Major) [1]	0
Area 6	**Ethnic Studies**	
6	Ethnic Studies	3
Upper-Division General Education		
Upper-Division 2/5	Mathematics and Quantitative Reasoning or Physical and Life Sciences (3 units in Support) [1]	0
Upper-Division 3	Arts and Humanities	3
Upper-Division 4	Social and Behavioral Sciences (Area 4 courses must come from at least two different course prefixes.)	3
Total Units		**27**

[1] Required in Major or Support; also satisfies General Education (GE) requirement.