

# BS AGRICULTURAL SYSTEMS MANAGEMENT

## Program Learning Objectives

1. An ability to apply knowledge, techniques, skills and modern tools of mathematics, science, engineering, and technology to solve broadly defined engineering problems appropriate to the discipline;
2. An ability to design systems, components, or processes meeting specified needs for broadly-defined engineering problems appropriate to the discipline;
3. An ability to apply written, oral, and graphical communication in broadly defined technical and non-technical environments; and an ability to identify and use appropriate technical literature;
4. An ability to conduct standard tests, measurements, and experiments and to analyze and interpret the results to improve processes; and
5. An ability to function effectively as a member or leader on a technical team.

## 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/generalrequirementsbachelorsdegree/#generaleducationtext>) section of this catalog, including:

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

Note: No Major or Support courses may be selected as credit/no credit.

### MAJOR COURSES

|                         |  |     |
|-------------------------|--|-----|
| BRAE 128                | Careers in Bioresource and Agricultural Engineering            | 2   |
| BRAE 129                | Laboratory Skills and Safety                                   | 1   |
| BRAE 142                | Agricultural Power and Machinery Management                    | 4   |
| BRAE 150                | Design Graphics and CAD for Agricultural Engineering           | 2   |
| BRAE 152                | 3-D Solids Modeling  | 1   |
| BRAE 203                | Agricultural Systems Analysis                                  | 4   |
| BRAE 237<br>or BRAE 239 | Introduction to Engineering Surveying<br>Engineering Surveying | 2-4 |
| BRAE 301                | Hydraulic and Mechanical Power Systems                         | 4   |
| BRAE 317                | Agricultural Systems Management Theory                         | 4   |
| BRAE 321                | Agricultural Safety  | 3   |
| BRAE 324                | Principles of Agricultural Electrification                     | 4   |
| BRAE 340                | Irrigation Water Management                                    | 4   |
| BRAE 342                | Agricultural Materials   | 4   |
| BRAE 343                | Mechanical Systems Analysis                                    | 4   |

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|-------------------------|---|---|
| BRAE 348                | Energy for a Sustainable Society (Upper-Division B) <sup>1</sup>      | 4 |
| BRAE 418                | Agricultural Systems Management I                                     | 4 |
| BRAE 419                | Agricultural Systems Management II                                    | 4 |
| BRAE 425                | Computer Controls for Agriculture                                     | 3 |
| BRAE 432                | Agricultural Buildings  | 4 |
| BRAE 438<br>or BRAE 440 | Drip/Micro Irrigation <sup>2</sup><br>Agricultural Irrigation Systems | 4 |
| BRAE 460                | Senior Project Organization   | 1 |
| BRAE 465                | Senior Project Operation, Testing, and Safety                         | 2 |

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|---|--|----|
| <b>Approved Electives<sup>2,3</sup></b> |  |    |
| See Approved Electives below            |  | 12 |

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|-------------------------|---|---|
| <b>SUPPORT COURSES</b>  |   |   |
| AGB 212                 | Agricultural Economics  | 4 |
| AGB 260                 | Agribusiness Data Literacy  | 4 |
| AGB 310                 | Agribusiness Credit and Finance   | 4 |
| AGB 369                 | Agricultural Personnel Management   | 4 |
| BUS 212<br>or AGB 214   | Financial Accounting for Nonbusiness Majors<br>Agribusiness Financial Accounting                  | 4 |
| CHEM 110<br>or CHEM 127 | World of Chemistry (B1 & B3) <sup>1</sup><br>General Chemistry for Agriculture and Life Science I | 4 |
| ENGL 147                | Writing Arguments about STEM (A3) <sup>1</sup>  | 4 |

Select from the following: 4

|          |  |  |
|----------|--|--|
| MATH 119 | Precalculus Trigonometry (B4) <sup>1</sup>                         |  |
| STAT 217 | Introduction to Statistical Concepts and Methods (B4) <sup>1</sup> |  |
| STAT 218 | Applied Statistics for the Life Sciences (B4) <sup>1</sup>         |  |

|          |   |   |
|----------|---|---|
| MATH 221 | Calculus for Business and Economics (GE Electives) <sup>1</sup> | 4 |
| PHYS 121 | College Physics I   | 4 |
| SS 120   | Introductory Soil Science                                       | 4 |

### Animal or Plant Production Course

Any ASCI, DSCI, PLSC course except for internship or enterprise courses. 3

### GENERAL EDUCATION (GE)

(See GE program requirements below.) 52

### FREE ELECTIVES

Free Electives 0

**Total units 180-182**

## Approved Electives

Minimum of 9 units must be upper division

No more than 4 units of internship or enterprise may be used

Select from the following: 12

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| Any AGB course eligible for the Agribusiness minor |  |  |
| AGC 102  | Orientation to Agricultural Communication & Agricultural Science |  |

|                         |  |
|-------------------------|--|
| BRAE 200                | Special Problems for Undergraduates (4 units maximum)    |
| BRAE 236                | Principles of Irrigation                                 |
| BRAE 302                | Servo Hydraulics   |
| BRAE 331                | Irrigation Theory  |
| BRAE 333                | Aquacultural Engineering                                 |
| BRAE 335                | Internal Combustion Engines                              |
| BRAE 337                | Landscape Irrigation                                     |
| BRAE 344                | Fabrication Systems                                      |
| BRAE 345                | Aerial Photogrammetry and Remote Sensing                 |
| BRAE/NR 349             | Water for a Sustainable Society                          |
| BRAE 400                | Special Problems (4 units maximum)                       |
| BRAE 405                | Chemigation  |
| BRAE/EE 434             | Automotive Engineering for a Sustainable Future          |
| BRAE 435                | Drainage   |
| BRAE 436                | Food and Agriculture Process Water Engineering           |
| BRAE 438<br>or BRAE 440 | Drip/Micro Irrigation<br>Agricultural Irrigation Systems |
| BRAE 447                | Advanced Surveying with GIS Applications                 |
| BRAE 448                | Bioconversion  |
| BRAE 450                | Solar Photovoltaic System Engineering                    |
| BRAE 532                | Water Wells and Pumps                                    |
| BRAE 533                | Irrigation Project Design                                |
| CHEM 212                | Introduction to Organic Chemistry                        |
| FSN 125                 | Introduction to Food Science                             |
| FSN 204                 | Food Processing Operations                               |
| FSN 230                 | Elements of Food Processing                              |
| FSN 275                 | Elements of Food Safety                                  |
| FSN 330                 | Principles of Food Engineering                           |
| FSN 334                 | Food Packaging   |
| FSN 340                 | Fermented Foods  |
| FSN 354                 | Packaging Function in Food Processing                    |
| FSN 370                 | Food Plant Sanitation and Prerequisite Programs          |
| FSN 375                 | Food Safety  |
| FSN 444                 | Food Engineering   |
| IME 141                 | Manufacturing Processes: Net Shape                       |
| IME 142                 | Manufacturing Processes: Materials Joining               |
| IME 143                 | Manufacturing Processes: Material Removal                |
| IME 144                 | Introduction to Design and Manufacturing                 |
| IME 319                 | Human Factors Engineering                                |
| IME 320                 | Human Factors and Technology                             |
| ITP 330                 | Packaging Fundamentals                                   |
| ITP 341                 | Packaging Polymers and Processing                        |

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|---|--|
| NR/LA 218   | Introduction to Geographic Information Systems (GIS) |
| NR 306  | Natural Resource Ecology and Habitat Management      |
| NR/CRP 408  | Water Resource Law and Policy                        |
| NR 416  | Environmental Impact Analysis and Management         |
| SS 221  | Soil Health and Plant Nutrition                      |
| <b>Animal or Plant Production Course</b>                                |  |
| Any ASCI, DSCI, PLSC course except for internship or enterprise courses |  |
| <b>Total units</b>  | <b>12</b>  |

- <sup>1</sup> Required in Major or Support; also satisfies General Education (GE) requirement.
- <sup>2</sup> If a course is taken to meet a Major requirement, it cannot be double-counted as an Approved Elective.
- <sup>3</sup> Consultation with advisor is recommended prior to selecting Approved Electives; bear in mind your selections may impact pursuit of post-baccalaureate studies and/or goals.

## General Education (GE) Requirements

- 72 units required, 20 of which are specified in Major and/or Support.
- If any of the remaining 52 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/generalrequirementsbachelorsdegree/#generaleducationtext>).
- A grade of C- or better is required in one course in each of the following GE Areas: A1 (Oral Communication), A2 (Written Communication), A3 (Critical Thinking), and B4 (Mathematics/Quantitative Reasoning).

| Area A  | English Language Communication and Critical Thinking                 |   |
|---|--|---|
| A1  | Oral Communication   | 4 |
| A2  | Written Communication  | 4 |
| A3  | Critical Thinking (4 units in Support) <sup>1</sup>                  | 0 |
| Area B  | Scientific Inquiry and Quantitative Reasoning                        |   |
| B1  | Physical Science (4 units in Support) <sup>1</sup>                   | 0 |
| B2  | Life Science   | 4 |
| B3  | One lab taken with either a B1 or B2 course                          |   |
| B4  | Mathematics/Quantitative Reasoning (4 units in Support) <sup>1</sup> | 0 |
| Upper-Division B (4 units in Major) <sup>1</sup>                                  |  | 0 |
| Area C  | Arts and Humanities  |   |
| Lower-division courses in Area C must come from three different subject prefixes. |  |   |
| C1  | Arts: Arts, Cinema, Dance, Music, Theater                            | 4 |
| C2  | Humanities: Literature, Philosophy, Languages other than English     | 4 |

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|---|--|---|
| Lower-Division C Elective - Select a course from either C1 or C2                          | 4  |   |
| Upper-Division C  | 4  |   |
| <b>Area D</b>   | <b>Social Sciences - Select courses in Area D from at least two different prefixes</b> |   |
| D1  | American Institutions (Title 5, Section 40404 Requirement)                             | 4 |
| D2  | Lower-Division D   | 4 |
| Upper-Division D  | 4  |   |
| <b>Area E</b>   | <b>Lifelong Learning and Self-Development</b>  |   |
| Lower-Division E  | 4  |   |
| <b>Area F</b>   | <b>Ethnic Studies</b>  |   |
| F   | Ethnic Studies   | 4 |
| <b>GE Electives in Areas B, C, and D</b>  |  |   |
| Select courses from two different areas; may be lower-division or upper-division courses. |  |   |
| GE Electives (4 units in Support plus 4 units in GE) <sup>1</sup>                         | 4  |   |
| <b>Total units</b>  | <b>52</b>  |   |

<sup>1</sup> Required in Major or Support; also satisfies General Education (GE) requirement.