

# ADVANCED MANUFACTURING AND APPLIED ROBOTICS BS

## More Information

### Advising Requirement

Advising is mandatory for this program. Consult your department advisor or program coordinator for information.

### E-advising Tools

Students are encouraged to use the interactive e-advising tools that have been designed to help them graduate within four years. These tools can be accessed through the Student Center.

The Bachelor of Science in Advanced Manufacturing and Applied Robotics prepares graduates for a variety of careers in today's modern manufacturing workplace. The faculty provide students with a broad undergraduate experience in math, science, business, and the humanities, as well as laboratory courses with a practical, applications orientation. The knowledge and skills gained will enable students to become Certified Manufacturing Technologists (CMfgT), after passing a comprehensive examination administered by the Society of Manufacturing Engineers (SME).

## Advanced Manufacturing and Applied Robotics Program Objectives

The program's objectives are best defined in terms of the following attributes of its graduates.

1. First and foremost, graduates from California State University, Chico's Advanced Manufacturing and Applied Robotics program understand how products are designed, produced, and tested, while meeting the business, environmental, and social responsibilities associated with the production and development of goods.
2. They have expertise in today's modern manufacturing tools including automation, sensing, programming, and robotics.
3. They understand the fundamental behavior of materials and the testing techniques used to determine material properties.
4. They have a solid foundation of materials processing technologies including additive, subtractive, and nano-scale manufacturing techniques for metals, polymers, and composites.
5. They are able to integrate project management, quality assurance methods, supply chain management, and the economic, technical, environmental, and societal issues involved in manufacturing.
6. They are effective at communicating their ideas in oral, written, and graphical form.
7. They function effectively as members of interdisciplinary teams.

## Grading Requirement

All courses taken to fulfill program course requirements must be taken for a letter grade except those courses specified by the department as credit/no credit grading only.

## Course Requirements for the Major: 90 units

Completion of the following courses, or their approved transfer equivalents, is required of all candidates for this degree. Courses in this program may complete more than one graduation requirement.

Course	Title	Units
<b>Lower Division</b>		
AMAR 160	Manufacturing Processes	3
AMAR 260	Applied Advanced Manufacturing	4
CHEM 107	General Chemistry for Applied Sciences	4
ECON 103	Principles of Microeconomic Analysis	3
EECE 215	Practical Circuits and Electronics	4
MATH 105	Introduction to Statistics	3
MATH 119	Precalculus Mathematics	4
MECH 100	Graphics I	1
MECH 100L	Graphics I Laboratory	1
MECH/MECA 140	Introduction to Design and Automation	2
MECH 200	Graphics II	2
MECH 210	Materials Science and Engineering	3
MECH 210L	Materials Science and Engineering Laboratory	1
PHYS 202A	General Physics I	4
<b>Upper Division</b>		
AMAR 300	Applied Mathematics and Programming for Advanced Manufacturing	3
AMAR 316	Introduction to Plastics	3
AMAR 318	Advanced Plastics & Composites	3
AMAR 352W	Industrial Management (W)	3
AMAR 360	Computer Integrated Manufacturing	4
AMAR 420	Robotics for Advanced Manufacturing	4
AMAR 440AW	Capstone Design I	3
AMAR 440B	Capstone Design II	3
AMAR/OSCM 451	Quality Management	3
AMAR 458	Project Management	3
AMAR 460	Robotic Manufacturing Systems	4
AMAR 477	Nanoscale Device Manufacturing	3
CIVL 302W	Engineering Sustainability and Economic Analysis (W)	3
MECA 380	Measurements and Instrumentation	3
OSCM 306	Operations Management	3
<b>Technical Elective</b>		
Select one of the following:		3
AMAR 347	Sustainable Polymer Composites	
AMAR 389	Directed Manufacturing Experience	
BLAW 413	Employment Law	
BSIS 308	Decision Analysis for Business	
ECON 355	The Economics of Government Regulations	
MECA 470	Introduction to Robotics Engineering	
MGMT 303	Survey of Management	
MINS 301	Corporate Technology Integration	
OSCM 440	Supply Chain Management	
OSCM 441	Purchasing and Global Sourcing	

OSCM 442	Production Planning and Inventory Control
<b>Total Units</b>	<b>90</b>

general-education/#A2) requirement must be completed before a student is permitted to register for a GW course.

See Bachelor's Degree Requirements (<https://catalog.csuchico.edu/undergraduate-requirements/bachelors-degree-requirements/>) for complete details on general degree requirements. A minimum of 39 units, including those required for the major, must be upper division.

## General Education Requirements: 48 units

See General Education (<https://catalog.csuchico.edu/colleges-departments/undergraduate-education/general-education/>) and the Class Schedule (<http://www.csuchico.edu/schedule/>) for the most current information on General Education Requirements and course offerings.

This major has approved GE modification(s). See below for information on how to apply these modification(s).

- Take one course in either Arts (C1) or Humanities (C2). The other is waived.
- AMAR 440B is an approved major course substitution for Lifelong Learning and Self-Development (E).
- AMAR 360 fulfills Upper-Division Scientific Inquiry and Quantitative Reasoning (UD-B).

## Diversity Course Requirements: 6 units

You must complete a minimum of two courses that focus primarily on cultural diversity. At least one course must be in US Diversity (USD) and at least one in Global Cultures (GC). See Diversity Requirements (<https://catalog.csuchico.edu/undergraduate-requirements/diversity-requirements/>) for a full list of courses. Most courses taken to satisfy these requirements may also apply to General Education (<https://catalog.csuchico.edu/colleges-departments/undergraduate-education/general-education/>).

Both courses must also satisfy one of the General Education requirements in order for 120 units to fulfill all requirements for the Advanced Manufacturing and Applied Robotics degree. It is suggested that USD and GC requirements be completed within the lower division Area C selection and the upper division Area C and D selections.

## Upper-Division Writing Requirement

Writing Across the Curriculum (EM 17-009 (<http://www.csuchico.edu/prs/EMs/2017/17-009.shtml/>)) is a graduation requirement and may be demonstrated through satisfactory completion of four Writing (W) courses, two of which are designated by the major department. See Mathematics/Quantitative Reasoning and Writing Requirements (<https://catalog.csuchico.edu/undergraduate-requirements/mathematicsquantitative-reasoning-writing-requirements/>) for more details on the four courses. The first of the major designated Writing (W) courses is listed below.

- AMAR 352W Industrial Management (W)

The second major-designated Writing course is the Graduation Writing Assessment Requirement (GW) (EO 665 (<https://calstate.policystat.com/policy/9585618/latest/>)). Students must earn a C- or higher to receive GW credit. The GE Written Communication (A2) (<https://catalog.csuchico.edu/colleges-departments/undergraduate-education/>)