

CORROSION ENGINEERING, BS

Bachelor of Science in Corrosion Engineering (425000BS)

The Bachelor of Science in Corrosion Engineering can be combined with the "Cooperative Education, College of Engineering and Polymer Science" certificate, for a nominal five-year plan of study that includes four total years of coursework and one full year of relevant work experience. Alternatively, the Bachelor of Science in Corrosion Engineering can be earned without the certificate, with a nominal four-year plan of study.

The Corrosion Engineering program is a comprehensive engineering program that incorporates the fundamental and applied aspects of aqueous and high temperature corrosion. The program incorporates laboratory and project management experiences throughout the curriculum. Students will be prepared to enter into the engineering workforce and make an impact in industries including Refining, Transportation Systems, Water Distribution, Energy, Food and Chemical Processing and others.

The purpose of the Corrosion Engineering curriculum is to prepare students for professional careers in the practical application of chemistry, mathematics, and physics to develop economic ways of controlling the degradation of materials.

The Corrosion Engineering undergraduate program offered by the Department of Chemical, Biomolecular, and Corrosion Engineering at The University of Akron is accredited by the Engineering Accreditation Commission of ABET, <https://www.abet.org/>.

Requirements for Admission

All students who meet the minimum requirements for admittance into The University of Akron and intend to major in engineering or engineering technology are accepted into the College of Engineering and Polymer Science and welcome to begin study towards their intended major.

Students must show success in key classes early in the program curriculum before they gain approval to take classes in the third year of the curriculum and beyond.

Cooperative Education

The Bachelor of Science in Corrosion Engineering can be combined with the Cooperative Education, College of Engineering and Polymer Science (<https://bulletin.uakron.edu/undergraduate/colleges-programs/engineering-polymer-science/cooperative-education/>) certificate, for a nominal five-year plan of study that includes four total years of coursework and one full year of relevant work experience. Alternatively, the Bachelor of Science in Corrosion Engineering can be earned without the certificate, with a nominal four-year plan of study.

The following information has official approval of the **Department of Chemical, Biomolecular, and Corrosion Engineering** and **The College of Engineering and Polymer Science**, but is intended only as a supplemental guide. Official degree requirements are established at the time of transfer and admission to the degree-granting college. Students should refer to the Degree Progress Report (DPR) which is definitive for graduation requirements. *Completion of this degree within the identified time frame below is contingent upon many factors, including but not limited to: class availability, total number of required credits, work schedule, finances, family,*

course drops/withdrawals, successfully passing courses, prerequisites, among others. The transfer process is completed through an appointment with your academic advisor.

Requirements Summary

Code	Title	Hours
	General Education Requirements (https://bulletin.uakron.edu/undergraduate/general-education/) *	21
	Program-Specific General Education	14
	Math and Natural Science	21
	Advanced Chemistry	11
	Engineering Core	11
	Corrosion Engineering	37
	Technical Electives	15
	Total Hours	130

* Several courses required for the major also satisfy General Education requirements. The University minimum of 36 credits are required for General Education and credit for these courses will apply to multiple requirements.

General Education Courses

Code	Title	Hours
	Students pursuing a bachelor's degree must complete the following General Education coursework. Diversity courses may also fulfill major or Breadth of Knowledge requirements. Integrated and Applied Learning courses may also fulfill requirements in the major.	
	Academic Foundations	12
	<i>Mathematics, Statistics and Logic: 3 credit hours</i>	
	<i>Speaking: 3 credit hours</i>	
	<i>Writing: 6 credit hours</i>	
	Breadth of Knowledge	22
	<i>Arts/Humanities: 9 credit hours</i>	
	<i>Natural Sciences: 7 credit hours</i>	
	<i>Social Sciences: 6 credit hours</i>	
	Diversity	
	Domestic Diversity	
	Global Diversity	
	Integrated and Applied Learning	2
	<i>Select one class from one of the following subcategories:</i>	
	Complex Issues Facing Society	
	Capstone	
	<i>Review the General Education Requirements page for detailed course listings.</i>	
	Total Hours	36

Program-Specific General Education

The program-specific courses also satisfy General Education requirements.

Code	Title	Hours
MATH:221	Analytic Geometry-Calculus I	4
CHEM:151	Principles of Chemistry I	3
CHEM:152	Principles of Chemistry I Laboratory	1
CHEM:153	Principles of Chemistry II	3
ECON:244	Introduction to Economic Analysis	3
Total Hours		14

Math and Natural Science

Code	Title	Hours
CHEM:154	Qualitative Analysis	2
MATH:222	Analytic Geometry-Calculus II	4
MATH:223	Analytic Geometry-Calculus III	4
MATH:335	Introduction to Ordinary Differential Equations	3
PHYS:291	Elementary Classical Physics I	4
PHYS:292	Elementary Classical Physics II	4
Total Hours		21

Advanced Chemistry

Code	Title	Hours
CHEM:263	Organic Chemistry Lecture I	3
CHEM:264	Organic Chemistry Lecture II	3
CHEM:265	Organic Chemistry Laboratory I	2
CHEM:424	Analytical Chemistry II	3
Total Hours		11

Engineering Core

Code	Title	Hours
CHEE:305	Materials Science	2
CORE:105	Corrosion Engineering Computations	2
CIVE:201	Statics	3
ELEN:307	Basic Electrical Engineering	4
Total Hours		11

Corrosion Engineering

Code	Title	Hours
CHEE:110	Project Management and Teamwork I	1
CHEE:210	Project Management and Teamwork II	1
CHEE:220	Introduction to Thermodynamic Processes	3
CHEE:310	Project Management and Teamwork III	1
CHEE:321	Transport Phenomena	3
CHEE:410	Project Management and Teamwork IV	1
CORE:101	Tools for Corrosion Engineering	2
CORE:200	Material and Energy Balances for Corrosion Engineers	4
CORE:300	Introduction to Corrosion Science and Engineering	3
CORE:301	Aqueous Corrosion Lab I	1
CORE:305	Corrosion Prevention	3
CORE:306	Aqueous Corrosion Lab II	1
CORE:310	Fundamentals of Dry Corrosion	3
CORE:311	High Temperature Corrosion Lab	1

CORE:440	Corrosion Engineering Design I	3
CORE:441	Corrosion Engineering Design II	3
CIVE:202	Introduction to Mechanics of Solids	3
Total Hours		37

Technical Electives

Code	Title	Hours
	Biology or Chemistry Elective	3
	Corrosion Engineering Science Elective	6
	Corrosion Engineering Design Elective	6
Total Hours		15

Recommended Sequence

Recommended Schedule with Cooperative Education

This plan of study shows the recommended schedule for students who are also earning the "Cooperative Education, College of Engineering and Polymer Science" certificate. Together, the Bachelor of Science and certificate require a five-year plan of study. The program recommends that students earn this certificate.

1st Year

Fall Semester	Hours
CHEM:151 Principles of Chemistry I ¹	3
CHEM:152 Principles of Chemistry I Laboratory	1
ENGL:111 English Composition I ^{1,2}	3
MATH:221 Analytic Geometry-Calculus I ¹	4
CHEE:110 Project Management and Teamwork I	1
CORE:101 Tools for Corrosion Engineering	2
Hours	14

Spring Semester

CHEM:153 Principles of Chemistry II ¹	3
CHEM:154 Qualitative Analysis	2
MATH:222 Analytic Geometry-Calculus II ¹	4
CORE:105 Corrosion Engineering Computations	2
Writing Second Course ^{1,3}	3
General Education or Honor Distribution ³	3
Hours	17

2nd Year

Fall Semester

CHEM:263 Organic Chemistry Lecture I	3
CHEM:265 Organic Chemistry Laboratory I	2
MATH:223 Analytic Geometry-Calculus III ¹	4
PHYS:291 Elementary Classical Physics I ¹	4
CHEE:210 Project Management and Teamwork II	1
CORE:200 Material and Energy Balances for Corrosion Engineers	4
Hours	18

Spring Semester

CHEM:264 Organic Chemistry Lecture II	3
MATH:335 Introduction to Ordinary Differential Equations	3

PHYS:292	Elementary Classical Physics II ¹	4
CHEE:220	Introduction to Thermodynamic Processes	3
CHEE:305	Materials Science	2
Hours		15

Summer Semester

GGEN:300	Cooperative Education Work Period (possible)	0
Hours		0

3rd Year**Fall Semester**

CHEE:310	Project Management and Teamwork III	1
CHEE:321	Transport Phenomena	3
CORE:300	Introduction to Corrosion Science and Engineering	3
CORE:301	Aqueous Corrosion Lab I	1
CIVE:201	Statics	3
ELEN:307	Basic Electrical Engineering	4
Hours		15

Spring Semester

GGEN:301	Cooperative Education Work Period (for Cooperative Education Certificate)	0
Hours		0

Summer Semester

CIVE:202	Introduction to Mechanics of Solids	3
General Education or Honors Distribution ³		3
Hours		6

4th Year**Fall Semester**

GGEN:302	Cooperative Education Work Period (for Cooperative Education certificate)	0
Hours		0

Spring Semester

CHEM:424	Analytical Chemistry II	3
ECON:244	Introduction to Economic Analysis	3
CORE:305	Corrosion Prevention	3
CORE:306	Aqueous Corrosion Lab II	1
Biology or Chemistry Elective		3
General Education or Honors Distribution ³		3
Hours		16

Summer Semester

GGEN:403	Cooperative Education Work Period (for Cooperative Education certificate)	0
Hours		0

5th Year**Fall Semester**

CHEE:410	Project Management and Teamwork IV	1
CORE:310	Fundamentals of Dry Corrosion	3
CORE:311	High Temperature Corrosion Lab	1
CORE:440	Corrosion Engineering Design I	3
4250:xxx	Corrosion Engineering Science Elective	3
General Education or Honors Distribution ³		3
Hours		14

Spring Semester

CORE:441	Corrosion Engineering Design II	3
4250:xxx	Corrosion Engineering Science Elective	3
4xxx:xxx	Corrosion Engineering Design Elective	3
4xxx:xxx	Corrosion Engineering Design Elective	3
General Education or Honors Distribution ³		3
Hours		15
Total Hours		130

¹ Honors sections may be available; check the schedule of classes.

² Check General Education Program or Honors Distribution to find courses that satisfy the Writing Second Course requirement.

³ Credit hours shown for General Education or Honors Distribution are general guidelines only. These courses should be chosen in accordance with the appropriate General Education curriculum guide (for non-honors students) or Honors Distribution (for honors students). Honors students must also ensure that their course selections meet additional requirements not shown on this curriculum guide.

Recommended Schedule without Cooperative Education

If a student chooses not to earn the Cooperative Education certificate, the following four-year plan of study is used.

1st Year

Fall Semester		Hours
CHEM:151	Principles of Chemistry I ¹	3
CHEM:152	Principles of Chemistry I Laboratory	1
ENGL:111	English Composition I ^{1,2}	3
MATH:221	Analytic Geometry-Calculus I ¹	4
CHEE:110	Project Management and Teamwork I	1
CORE:101	Tools for Corrosion Engineering	2
Hours		14

Spring Semester

CHEM:153	Principles of Chemistry II ¹	3
CHEM:154	Qualitative Analysis	2
MATH:222	Analytic Geometry-Calculus II ¹	4
CORE:105	Corrosion Engineering Computations	2
Writing Second Course ^{1,2}		3
General Education or Honor Distribution ³		3
Hours		17

2nd Year**Fall Semester**

CHEM:263	Organic Chemistry Lecture I	3
CHEM:265	Organic Chemistry Laboratory I	2
MATH:223	Analytic Geometry-Calculus III ¹	4
PHYS:291	Elementary Classical Physics I ¹	4
CHEE:210	Project Management and Teamwork II	1
CORE:200	Material and Energy Balances for Corrosion Engineers	4
Hours		18

Spring Semester

CHEM:264	Organic Chemistry Lecture II	3
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MATH:335	Introduction to Ordinary Differential Equations	3
PHYS:292	Elementary Classical Physics II ¹	4
CHEE:220	Introduction to Thermodynamic Processes	3
CHEE:305	Materials Science	2
Hours		15

students must also ensure that their course selections meet additional requirements not shown on this curriculum guide.

3rd Year

Fall Semester

CHEE:310	Project Management and Teamwork III	1
CHEE:321	Transport Phenomena	3
CORE:300	Introduction to Corrosion Science and Engineering	3
CORE:301	Aqueous Corrosion Lab I	1
CIVE:201	Statics	3
ELEN:307	Basic Electrical Engineering	4
Hours		15

Spring Semester

	Biology or Chemistry Elective	3
CHEM:424	Analytical Chemistry II	3
ECON:244	Introduction to Economic Analysis	3
CORE:305	Corrosion Prevention	3
CORE:306	Aqueous Corrosion Lab II	1
	General Education or Honors Distribution ³	3
Hours		16

Summer Semester

CIVE:202	Introduction to Mechanics of Solids	3
	General Education or Honors Distribution ³	3
Hours		6

4th Year

Fall Semester

CHEE:410	Project Management and Teamwork IV	1
CORE:310	Fundamentals of Dry Corrosion	3
CORE:311	High Temperature Corrosion Lab	1
CORE:440	Corrosion Engineering Design I	3
CORE:xxx	Corrosion Engineering Science Elective	3
	General Education or Honors Distribution ³	3
Hours		14

Spring Semester

CORE:441	Corrosion Engineering Design II	3
CORE:xxx	Corrosion Engineering Science Elective	3
	Corrosion Engineering Design Elective	3
	Corrosion Engineering Design Elective	3
	General Education or Honors Distribution ³	3
Hours		15
Total Hours		130

¹ Honors sections may be available; check the schedule of classes.

² Check General Education Program or Honors Distribution to find courses that satisfy the second writing course requirement.

³ Credit hours shown for General Education or Honors Distribution are general guidelines only. These courses should be chosen in accordance with the appropriate General Education curriculum guide (for non-honors students) or Honors Distribution (for honors students). Honors