Brewing Science (BREW, BREWC, BREWLC, & BREWPC)

Brewing Science (BREW)

The craft beer and beverage industry is one of the fastest growing in the United States and many other parts of the world.

The Brewing Science associate's degree program provides knowledge and skills related to introductory and advanced production processes, finishing and packaging techniques, product analysis, and operation of brewing facilities. Cooperative education experiences add to the student's career-readiness.

Graduates of the Brewing Science program earn an Associate of Applied Science degree, and are qualified for employment opportunities in many areas of the craft beverage industry including brewer/assistant brewer, cellar manager, or brewery manager.

For more information, please contact the Business Technologies Division at (513) 569-1620.

To apply for this program at Cincinnati State, visit the Admissions (http://www.cincinnatistate.edu/academics/admission/) section of the College website.

Brewing Sales and Marketing Certificate (BREWC)

The craft beer and beverage industry is one of the fastest-growing in the United States and many other parts of the world. The Brewing Sales and Marketing Certificate prepares its graduates for employment opportunities in many areas of the craft beverage industry including brewery representatives, craft beer sales and distribution, or tasting room management.

Students develop skills and gain knowledge of topics such as the history of brewing, serving and glassware, the brewing process, taproom management, and key components of beer tourism. Most of the certificate courses can be completed online.

For more information, please contact the Business Technologies Division at (513) 569-1620.

To apply for this program at Cincinnati State, visit the Admissions (http://www.cincinnatistate.edu/academics/admission/) section of the College website.

Brewing and Beverage Laboratory Certificate (BREWLC)

The Brewing and Beverage Laboratory Certificate prepares graduates for employment opportunities in many areas of the craft beverage industry including lab technician work at a brewery, distillery, or winery; quality assurance lab work; quality control lab work; yeast propagation; hop crop testing; or packaged product testing.

Students gain knowledge and develop skills related to sanitation and safety in the craft beverage field, sensory evaluation of beverages, sample collection, and QA/QC testing.

For more information, please contact the Business Technologies Division at (513) 569-1620.

To apply for this program at Cincinnati State, visit the Admissions (http://www.cincinnatistate.edu/academics/admission/) section of the College website.

Brewing Production Certificate (BREWPC)

The Brewing Production Certificate prepares graduates for employment opportunities in many areas of the craft beverage industry including as a production brewer or as a lab technician/analyst at a brewery, distillery, or winery. Other options for graduates include quality assurance lab work, quality control lab work, yeast propagation, hop crop testing, or packaged product testing.

Students gain knowledge and develop skills required to complete daily production tasks in a brewery or beverage facility or to serve as a lab analyst with significant knowledge of the brewing process.

After completing the certificate, students are prepared for the General Certificate in Brewing exam administered by the Institute of Brewing and Distilling.

For more information, please contact the Business Technologies Division at (513) 569-1620.

To apply for this program at Cincinnati State, visit the Admissions (http://www.cincinnatistate.edu/academics/admission/) section of the College website.

Brewing Science (BREW)

Student applicants must be at least 21 years of age before entering the program. Graduates should be able to work in a physically demanding environment including, but not limited to, standing in a hot and wet work area for extended lengths of time, climbing stairs, repeatedly lifting equipment and products weighing up to 55 lbs., and safely maneuvering by hand equipment that weighs up to 170 lbs. Reasonable accommodations may be made to enable individuals with disabilities to perform the essential functions of a position.

Semester 1		**Lec**	**Lab**	**Credits**
FYW 1XX First Year Experience Elective (**B**)		1	0	1
BREW 110	Brewing Sanitation and Safety (**B**)	2	0	2
CHE 110	Fundamentals of Chemistry (**G**)	3	3	4
ENG 101	English Composition 1 (**G**)	3	0	3
BREW 140	Brewing Ingredients (**B**)	2	2	3
MAT 1XX Mathematics Elective (**G**)		2	2	3
Semester 2				

ACC 101	Financial Accounting (**B**)	3	0	3
BREW 120	Brewing Technology and Calculations (**T**)	1	3	2
BREW 160	Sensory Evaluation of Beer (**T**)	3	0	3
BREW 115	Sustainability for Brewing and Beverage (**T**)	3	0	3
BUS 190	Professional Practices (**B**)	1	0	1
Semester 3				
BREW X9X Cooperative Education Elective: Brewing Science (**T**)		1	40	2
BREW 150	Applied Brewing Microbiology (**T**)	3	2	4
Semester 4				
BREW 130	Brewing Production (**T**)	2	4	4
ENG 10X or COMM 110 Communication Elective (**G**)		3	0	3
BREW 220	Brewing Packaging, Materials, and Quality Control (**T**)	2	3	3
BREW 240	Legal Issues in Brewing and Beverages (**T**)	3	0	3
Semester 5				
XXX XXX Arts/ Humanities Elective (**G**)		3	0	3
BREW 230	Advanced Brewing Production (**T**)	3	3	4
ECO 105	Principles of Microeconomics (**G**)	3	0	3
XXX XXX Technical Elective (**T**)		3	0	3
Total Credits:		**50**	**62**	**60**

Electives

First Year Experience Elective		
FYE 100	Essentials for College Success	1
FYE 105	Skills for Academic and Personal Success	2
FYE 110	Intensive College Success Strategies	3
FYE 120	College Success Strategies: Campus Integration	4
Mathematics Elective		
MAT 105	Quantitative Reasoning	3
MAT 125	Algebra and Trigonometry	4
MAT 131	Statistics 1	3
MAT 151	College Algebra	4
MAT 152	Trigonometry	4
MAT 153	Pre-Calculus	6
MAT 215	Business Calculus	6
MAT 251	Calculus 1	5
MAT 252	Calculus 2	5
MAT 253	Calculus 3	5
English Composition Elective		
ENG 102	English Composition 2: Contemporary Issues	3
ENG 104	English Composition 2: Technical Communication	3
ENG 105	English Composition 2: Business Communication (Arts/Humanities Elective)	3
COMM 110	Public Speaking	3
Arts/Humanities Elective		
Any ART, LIT, MUS, PHI, REL, THE		3
Technical Elective		
MGT 120	Entrepreneurship	3
BREW 105	Beverage Tour and Tasting Management	3
BREW 210	Beverage Marketing and Sales	3
Cooperative Education Elective (2 credits required)		
BREW 191	Part-time Cooperative Education 1: Brewing Science	1
BREW 192	Part-Time Cooperative Education 2: Brewing Science	1
BREW 193	Part-Time Cooperative Education 3: Brewing Science	1
BREW 194	Part-time Cooperative Education 4: Brewing Science	1
BREW 195	Part-Time Cooperative Education 5: Brewing Science	1
BREW 196	Part-Time Cooperative Education 6: Brewing Science	1
BREW 197	Part-Time Career Education Project: Brewing Science	1
BREW 291	Full-Time Cooperative Education 1: Brewing Science	2
BREW 292	Full-Time Cooperative Education 2: Brewing Science	2
BREW 293	Full-Time Cooperative Education 3: Brewing Science	2
BREW 297	Full-Time Career Education Project: Brewing Science	2

Some courses are offered in alternative versions identified with a letter after the course number-- for example, ENG 101 and ENG 101A.

- This curriculum displays only course numbers without the added letter.
- The alternative version, when available, meets the requirements of the course version without the added letter.

The letters G, B, and T (displayed after course titles or elective descriptions) identify types of courses required by the Ohio Department of Higher Education as part of an associate's degree curriculum.

G = General Education course in this curriculum

B = Basic Skills course in this curriculum

T = Technical course in this curriculum

Brewing Sales and Marketing Certificate (BREWC)

Program prerequisite: Applicants must be at least 21 years old before entering the certificate program.

First Year				
Semester 1		**Lec**	**Lab**	**Credits**
BREW 100	Introduction to Craft Beer	3	0	3
BREW 240	Legal Issues in Brewing and Beverages	3	0	3
HRM 110	Food and Beverage Cost Control	3	0	3
MKT 130	Principles of Sales	3	0	3
Semester 2				
BREW 105	Beverage Tour and Tasting Management	2	2	3
BREW 115	Sustainability for Brewing and Beverage	3	0	3
BREW 210	Beverage Marketing and Sales	3	0	3
MKT 105	Marketing and Customer Relations	3	0	3
Total Credits:				**24**

Brewing and Beverage Laboratory Certificate (BREWLC)

First Year				
Semester 1		**Lec**	**Lab**	**Credits**
BREW 110	Brewing Sanitation and Safety	2	0	2
BREW 140	Brewing Ingredients	2	2	3
MAT XXX	Mathematics Elective	3	0	3
CHE 110	Fundamentals of Chemistry	3	3	4
Semester 2				
BREW 120	Brewing Technology and Calculations	1	3	2
BREW 150	Applied Brewing Microbiology	3	2	4
BREW 160	Sensory Evaluation of Beer	2	3	3
BREW 220	Brewing Packaging, Materials, and Quality Control	2	3	3
Total Credits:		**18**	**16**	**24**

Electives

Mathematics Elective		
MAT 105	Quantitative Reasoning	3
MAT 125	Algebra and Trigonometry	4
MAT 131	Statistics 1	3
MAT 132	Statistics 2	3
MAT 151	College Algebra	4
MAT 152	Trigonometry	4
MAT 153	Pre-Calculus	6

Brewing Production Certificate (BREWPC)

First Year				
Semester 1		**Lec**	**Lab**	**Credits**
MAT XXX	Mathematics Elective	3	0	3
CHE 110	Fundamentals of Chemistry	3	3	4
BREW 140	Brewing Ingredients	2	2	3
BREW 130	Brewing Production	2	4	4
Semester 2				
BREW 120	Brewing Technology and Calculations	1	3	2
BREW XXX	Brewing Elective	3	0	3
Total Credits:		**14**	**12**	**19**

Electives

Mathematics Elective		
MAT 105	Quantitative Reasoning	3
MAT 124	Applied Algebra and Geometry	4
MAT 125	Algebra and Trigonometry	4
MAT 131	Statistics 1	3
MAT 151	College Algebra	4
MAT 152	Trigonometry	4
MAT 153	Pre-Calculus	6
Brewing Elective (choose one)		
BREW 150	Applied Brewing Microbiology	4
BREW 160	Sensory Evaluation of Beer	3

Brewing Science (BREW)

- Demonstrate an understanding of the basic processes and procedures employed in the production of beer.
- Identify and describe the purpose and/or contribution of the primary ingredients employed in the production of beer.
- Recognize the variety of beer styles represented by the brewing industry.
- Identify and describe the purpose of the vessels, primary support equipment and secondary processing equipment employed in the production of beer.
- Successfully brew beer on a standard brewing system.
- Demonstrate knowledge of social and regulatory environments regarding reasonable standards for responsible consumption.

Courses

BREW 100 Introduction to Craft Beer
3 Credits. 3 Lecture Hours. 0 Lab Hour.
An introduction to craft beers and brewing for those not pursuing the Brewing Science associate's degree. Topics include: beer and brewing history, production, characteristics, taxonomy, and evaluation.
Prerequisites: None

BREW 105 Beverage Tour and Tasting Management
3 Credits. 2 Lecture Hours. 2 Lab Hours.
A course on developing, marketing, and managing the craft beverage tour experience. Topics include: providing customer service, implementing special events, and operating a tasting room.
Prerequisites: None

BREW 110 Brewing Sanitation and Safety
2 Credits. 2 Lecture Hours. 0 Lab Hour.
A course on sanitation and safety procedures applicable to brewing products, facilities, and equipment. Topics include: selecting, handling, and storing the chemicals required for sanitation control within the brewing process.
Prerequisites: Admitted to the BREW degree program

BREW 115 Sustainability for Brewing and Beverage
3 Credits. 3 Lecture Hours. 0 Lab Hour.
A course on issues and individual contributions to environmental sustainability in the brewing and beverage industries. Topics include: renewable/non-renewable energy resources, economics of sustainability, and reduction of environmental impacts in breweries, distilleries, and other craft beverage manufacturing processes.
Prerequisites: None

BREW 120 Brewing Technology and Calculations
2 Credits. 1 Lecture Hour. 3 Lab Hours.
A course on the equipment and mathematical calculations used in craft brewing production. Topics include: using brewing equipment and other technology related to scheduling/record keeping, developing recipes, and calculating use of alcohol and other ingredients.
Prerequisites: MAT 093 or MAT 105A or appropriate Math placement, and minimum age 21

BREW 130 Brewing Production
4 Credits. 2 Lecture Hours. 4 Lab Hours.
A course on basic methodologies used in the production of beers. Topics include: recipe development, basic sanitation techniques, fermentation management, and storage.
Prerequisites: BREW 110 and BREW 120, and minimum age 21

BREW 140 Brewing Ingredients
3 Credits. 2 Lecture Hours. 2 Lab Hours.
A course on how ingredients used in the beer-making process affect the style and quality of beer. Topics include: selecting and growing barley, varieties of malting, growing hops, and the effect of hops in development of beer flavor and aroma.
Prerequisites: Minimum age 21

BREW 150 Applied Brewing Microbiology
4 Credits. 3 Lecture Hours. 2 Lab Hours.
A course on microbiology concepts and laboratory practices applicable to the brewing industry. Topics include: yeast biology, fermentation, microorganisms in brewing, and sanitation.
Prerequisites: BREW 110 and CHE 110, and minimum age 21

BREW 160 Sensory Evaluation of Beer
3 Credits. 3 Lecture Hours. 0 Lab Hour.
A course on the visual, olfactory, and gustatory parameters used in the evaluation of beer. Topics include: aromas, finish, flavor/taste interaction, and factors affecting product quality; descriptive analysis/model systems; judging systems; and set-up and operation of beverage competitions.
Prerequisites: CHE 110 and minimum age 21

BREW 191 Part-time Cooperative Education 1: Brewing Science
1 Credit. 1 Lecture Hour. 20 Lab Hours.
Students seeking an associate's degree participate in their first part-time field learning experience related to their degree. Students are expected to register for academic courses during the same semester. Students must follow cooperative education policies and procedures to earn credit. Grades issued are Satisfactory or Unsatisfactory.
Prerequisites: BUS 190 (minimum grade C), and minimum age 21

BREW 192 Part-Time Cooperative Education 2: Brewing Science
1 Credit. 1 Lecture Hour. 20 Lab Hours.
Students seeking an associate's degree participate in their second part-time field learning experience related to their degree. Students are expected to register for academic courses during the same semester. Students must follow cooperative education policies and procedures to earn credit. Grades issued are Satisfactory or Unsatisfactory.
Prerequisites: BREW 191, and minimum age 21
Instructor Consent Required

BREW 193 Part-Time Cooperative Education 3: Brewing Science
1 Credit. 1 Lecture Hour. 20 Lab Hours.
Students seeking an associate's degree participate in their third part-time field learning experience related to their degree. Students are expected to register for academic courses during the same semester. Students must follow cooperative education policies and procedures to earn credit. Grades issued are Satisfactory or Unsatisfactory.
Prerequisites: BREW 192, and minimum age 21
Instructor Consent Required

BREW 194 Part-time Cooperative Education 4: Brewing Science
1 Credit. 1 Lecture Hour. 20 Lab Hours.
Students seeking an associate's degree participate in their fourth part-time field learning experience related to their degree. Students are expected to register for academic courses during the same semester. Students must follow cooperative education policies and procedures to earn credit. Grades issued are Satisfactory or Unsatisfactory.
Prerequisites: BREW 193, and minimum age 21
Instructor Consent Required

BREW 195 Part-Time Cooperative Education 5: Brewing Science
1 Credit. 1 Lecture Hour. 20 Lab Hours.
Students seeking an associate's degree participate in their fifth part-time field learning experience related to their degree. Students are expected to register for academic courses during the same semester. Students must follow cooperative education policies and procedures to earn credit. Grades issued are Satisfactory or Unsatisfactory.
Prerequisites: BREW 194, and minimum age 21
Instructor Consent Required

BREW 196 Part-Time Cooperative Education 6: Brewing Science
1 Credit. 1 Lecture Hour. 20 Lab Hours.
Students seeking an associate's degree participate in their sixth part-time field learning experience related to their degree. Students are expected to register for academic courses during the same semester. Students must follow cooperative education policies and procedures to earn credit. Grades issued are Satisfactory or Unsatisfactory.
Prerequisites: BREW 195, and minimum age 21
Instructor Consent Required

BREW 197 Part-Time Career Education Project: Brewing Science
1 Credit. 1 Lecture Hour. 20 Lab Hours.
Students seeking an associate's degree complete individual study or a special project related to their major field and pertaining to their career goals. Working with an assigned faculty mentor, students define the project goals, carry out project tasks, and evaluate the results. Grades issued are Satisfactory or Unsatisfactory.
Prerequisites: BUS 190 and coordinator consent
Instructor Consent Required

BREW 210 Beverage Marketing and Sales
3 Credits. 3 Lecture Hours. 0 Lab Hour.
A course on marketing and selling beer and other brewed, fermented, or distilled products. Topics include: industry/consumer trends; and economic, legal, and social considerations that affect beverage marketing and sales, including branding, pricing, promotion, and distribution.
Prerequisites: ENG 101, and minimum age 21

BREW 220 Brewing Packaging, Materials, and Quality Control
3 Credits. 2 Lecture Hours. 3 Lab Hours.
A course on practices associated with packaging beer, including canning, bottling, box presentations, and kegging. Topics include: expanding product shelf life; selecting containers; controlling temperature and light; and evaluating options for labeling, capping, and sealing.
Prerequisites: BREW 120, and minimum age 21

BREW 230 Advanced Brewing Production
4 Credits. 2 Lecture Hours. 4 Lab Hours.
A course on processes and equipment used in an on-site brewery and fermentation facility. Topics include: analyzing and monitoring fermentation, producing specialty beers, quality control, sustainable brewing practices, and operating and managing brewing facilities.
Prerequisites: BREW 130, and minimum age 21

BREW 240 Legal Issues in Brewing and Beverages
3 Credits. 3 Lecture Hours. 0 Lab Hour.
A course on the legal and regulatory environment applicable to the brewing, distillation, and fermentation industries. Topics include: social and ethical responsibilities; and state/federal regulations including licensing, taxation, labeling, record keeping, permits, inspections, and interstate/international commerce.
Prerequisites: ENG 101, and minimum age 21

BREW 291 Full-Time Cooperative Education 1: Brewing Science
2 Credits. 1 Lecture Hour. 40 Lab Hours.
Students seeking an associate's degree participate in their first full-time field learning experience related to their degree. Students must follow cooperative education policies and procedures to earn credit. Grades issued are Satisfactory or Unsatisfactory.
Prerequisites: BUS 190 (minimum grade C), and minimum age 21

BREW 292 Full-Time Cooperative Education 2: Brewing Science
2 Credits. 1 Lecture Hour. 40 Lab Hours.
Students seeking an associate's degree participate in their second full-time field learning experience related to their degree. Students must follow cooperative education policies and procedures to earn credit. Grades issued are Satisfactory or Unsatisfactory.
Prerequisites: BREW 291, and minimum age 21
Instructor Consent Required

BREW 293 Full-Time Cooperative Education 3: Brewing Science
2 Credits. 1 Lecture Hour. 40 Lab Hours.
Students seeking an associate's degree participate in their third full-time field learning experience related to their degree. Students must follow cooperative education policies and procedures to earn credit. Grades issued are Satisfactory or Unsatisfactory.
Prerequisites: BREW 292, and minimum age 21
Instructor Consent Required

BREW 297 Full-Time Career Education Project: Brewing Science
2 Credits. 1 Lecture Hour. 40 Lab Hours.
Students seeking an associate's degree complete individual study or a special project related to their major field and pertaining to their career goals. Working with an assigned faculty mentor, students define the project goals, carry out project tasks, and evaluate the results. Grades issued are Satisfactory or Unsatisfactory.
Prerequisites: BUS 190 and coordinator consent
Instructor Consent Required