

BREW 120 Course Outline as of Fall 2016**CATALOG INFORMATION**

Dept and Nbr: BREW 120 Title: BREW OPS AND TECH

Full Title: Brewery Operations and Technology

Last Reviewed: 5/23/2016

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	3.00	Lecture Scheduled	3.00	17.5	Lecture Scheduled	52.50
Minimum	3.00	Lab Scheduled	0	8	Lab Scheduled	0
		Contact DHR	0		Contact DHR	0
		Contact Total	3.00		Contact Total	52.50
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 105.00

Total Student Learning Hours: 157.50

Title 5 Category: AA Degree Applicable

Grading: Grade or P/NP

Repeatability: 00 - Two Repeats if Grade was D, F, NC, or NP

Also Listed As:

Formerly:

Catalog Description:

Brewery equipment requirements and operation. Brewery design and its impact on operation, sustainability, sanitation, and final product.

Prerequisites/Corequisites:Course Completion of BREW 100 and BREW 112;
AND Concurrent Enrollment in BREW 122**Recommended Preparation:**

Eligibility for ENGL 100 or ESL 100

Limits on Enrollment:

Must be age 18 or older

Schedule of Classes Information:

Description: Brewery equipment requirements and operation. Brewery design and its impact on operation, sustainability, sanitation, and final product. (Grade or P/NP)

Prerequisites/Corequisites: Course Completion of BREW 100 and BREW 112;
AND Concurrent Enrollment in BREW 122

Recommended: Eligibility for ENGL 100 or ESL 100

Limits on Enrollment: Must be age 18 or older

Transfer Credit:

Repeatability: Two Repeats if Grade was D, F, NC, or NP

ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:

AS Degree:	Area	Effective:	Inactive:
CSU GE:	Transfer Area	Effective:	Inactive:
IGETC:	Transfer Area	Effective:	Inactive:
CSU Transfer:		Effective:	Inactive:
UC Transfer:		Effective:	Inactive:

CID:

Certificate/Major Applicable:

Certificate Applicable Course

COURSE CONTENT

Student Learning Outcomes:

At the conclusion of this course, the student should be able to:

1. Students will be able to:

Apply knowledge of brewery systems and equipment to produce beer on a commercial scale.

Objectives:

Upon completion of this course, students will be able to:

1. Identify different production zones of a brewery and the requirements of each area.
2. Describe basic principles of fluid dynamics, heat transfer, and carbonation of liquids and how they relate to beer production.
3. Describe various food contact surface and work surface (floor and wall) options and how they impact sanitation practices.
4. Describe proper cleaning agents and techniques to maintain a sanitary environment for food production, and perform safe handling procedures when using these chemicals.
5. Describe equipment used for brewing beer.
6. Solve problems related to beer production.
7. Evaluate different packaging options for beer and their impact on quality and cost of goods.
8. Describe how sustainability can be applied to brewery waste streams.

Topics and Scope:

I. Brewery Design

- A. Product flow
- B. Production zones and special requirements
- C. Mechanical systems
- D. Processing equipment
- E. Work surfaces

II. Food Engineering

- A. Fluid dynamics
- B. Heat transfer
- C. Carbonation of liquids

- D. Food contact surfaces
- III. Sanitation
 - A. The role of water
 - B. Sanitation agents and techniques
 - C. Sterilization
- IV. Brewery equipment
 - A. Grain mill
 - B. Mash tun
 - C. Lauter
 - D. Kettle
 - E. Hot liquor tank
 - F. Heat exchanger
 - G. Fermentation tanks
 - H. Filters
 - I. Brite beer tanks
 - J. Pumps
 - K. Packaging equipment
- V. Waste streams and sustainability
 - A. Wash water
 - B. Spent grain
 - C. Carbon dioxide
 - D. Tank solids

Assignment:

1. Reading in required text, 20 - 40 pages per week
2. Design a microbrewery including space for production, storage, lab, and administration
3. Create a manual of standard operation procedures for sanitation in a small brewery
4. Create flowchart of the brewing process with special requirements of each step
5. Research and report on creative ways to recover value and reduce volume of brewery waste streams (5-10 pages)
6. Problem solving simulation exercises
7. Midterm and final exam

Methods of Evaluation/Basis of Grade:

Writing: Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

Report; manual of standard operation

Writing 20 - 40%

Problem Solving: Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Microbrewery design; flowchart; simulation exercises
--

Problem solving 20 - 40%

Skill Demonstrations: All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

Microbrewery design

Skill Demonstrations
10 - 20%

Exams: All forms of formal testing, other than skill performance exams.

Midterm and final exam: multiple choice, true and false, completion

Exams
20 - 40%

Other: Includes any assessment tools that do not logically fit into the above categories.

Participation

Other Category
0 - 15%

Representative Textbooks and Materials:

Beer: Tap Into the Art and Science of Brewing. Bamforth, Charles. Oxford University Press, 2009. (Classic)

Instructor prepared materials