

## New Program Proposal

Date Submitted: 10/18/18 5:10 pm

### Viewing: **BREWCP : Brewing Science, Certificate of Proficiency**

Last edit: 12/04/18 2:38 pm

Changes proposed by: wstites

Submitter:	User ID:	wstites	Phone:
575-4601			
Program Status	Active		
Academic Level	Undergraduate		
Type of proposal	Certificate		
Select a reason for this new program	Adding New Undergraduate Certificate (6-21 semester hours)--(LON 8)		
Effective Catalog Year	Fall 2019		
College/School Code	Bumpers College of Agricultural, Food, and Life Sciences(AFLS)		
Department Code	Department of Food Science(FDSC)		
Program Code	BREWCP		
Degree	Certificate of Proficiency		
CIP Code			

#### In Workflow

1. AFLS Dean Initial
2. Provost Initial
3. Director of Program Assessment and Review
4. Registrar Initial
5. Institutional Research
6. FDSC Chair
7. FDSC Curriculum Committee
8. AFLS Faculty
9. AFLS Dean
10. ARSC Dean
11. ENGR Dean
12. AFLS Dean
13. Global Campus
14. Provost Review
15. University Course and Program Committee
16. Faculty Senate
17. Provost Final
18. ADE Licensure Approval
19. Provost's Office-- Documentation sent to System Office
20. Higher Learning Commission
21. Board of Trustees
22. ADHE Final
23. Provost's Office-- Notification of Approval
24. Registrar Final

## 25. Catalog Editor Final

**Approval Path**

1. 10/22/18 8:48 am  
Lona Robertson  
(ljrobert): Approved  
for AFLS Dean Initial
2. 10/22/18 9:21 am  
Terry Martin  
(tmartin): Approved  
for Provost Initial
3. 10/22/18 11:23 am  
Alice Griffin  
(agriffin): Approved  
for Director of  
Program  
Assessment and  
Review
4. 10/23/18 3:14 pm  
Lisa Kulczak  
(lkulcza): Approved  
for Registrar Initial
5. 10/24/18 12:22 pm  
Gary Gunderman  
(ggunderm):  
Rollback to Director  
of Program  
Assessment and  
Review for  
Institutional  
Research
6. 10/24/18 12:31 pm  
Alice Griffin  
(agriffin): Approved  
for Director of  
Program  
Assessment and  
Review
7. 10/25/18 11:12 am  
Lisa Kulczak

- (lkulcza): Approved  
for Registrar Initial
8. 10/25/18 11:22 am  
Gary Gunderman  
(ggunderm):  
Approved for  
Institutional  
Research
9. 10/25/18 2:11 pm  
Wayne Mackay  
(mackay): Approved  
for FDSC Chair
10. 11/09/18 11:54 am  
Jefferson Miller  
(jdmiller): Approved  
for FDSC Curriculum  
Committee
11. 11/29/18 1:37 pm  
Douglas Karcher  
(karcher): Approved  
for AFLS Faculty
12. 11/30/18 12:16 pm  
Lona Robertson  
(ljrobert): Approved  
for AFLS Dean
13. 11/30/18 12:40 pm  
Jeannine Durdik  
(jdurdik): Approved  
for ARSC Dean
14. 12/03/18 1:16 pm  
Norman Dennis  
(ndennis): Approved  
for ENGR Dean
15. 12/03/18 1:28 pm  
Lona Robertson  
(ljrobert): Approved  
for AFLS Dean
16. 12/04/18 10:55 am  
Leigh Ann Marshall

(lamarsh): Approved  
 for Global Campus  
 17. 12/04/18 2:04 pm  
 Terry Martin  
 (tmartin): Approved  
 for Provost Review

01.1002 - Food Technology and Processing.

Program Title

Brewing Science, Certificate of Proficiency

Program Delivery

Method

On Campus

Is this program interdisciplinary?

Yes

College(s)/School(s)

College/School Name
Bumpers College of Agricultural, Food, and Life Sciences(AFLS)
College of Engineering(ENGR)
Fulbright College of Arts and Sciences(ARSC)

Does this proposal impact any courses from another College/School?

Yes

College(s)/School(s)

College/School Name
Bumpers College of Agricultural, Food, and Life Sciences(AFLS)
Fulbright College of Arts and Sciences(ARSC)
College of Engineering(ENGR)

What are the total hours needed to complete the program?

15

## Program Requirements and Description

### Requirements

This program is designed to provide students with a theoretical and practical introduction to brewing and fermentation. This certificate requires 15 credit hours of work, selected from the list below. Students must take two courses in brewing, one lecture and one lab, complete three credit hours of an internship, research, or special problems course, and then take two additional courses in FDSC, BIOL, CHEM, BENG, or CHEG. To broaden the student's exposure to the skills needed in brewing and fermentation, for currently enrolled undergraduate students, at least one of these additional courses must be in a different department from the department of the student's major, and that course must also be outside of those already required for the student's major(s). If the student already holds a degree, the course must be a new one outside of the previous degree program.

#### Required courses

<u>FDSC 2723</u>	Course FDSC 2723 Not Found	3
<u>BIOL 2723L</u>	Course BIOL 2723L Not Found	3
Required internship, special problems, or honors research project		3

#### Internship

Students could participate in an approved three credit hour internship with a brewing industry partner. A three credit hour internship should involve approximately 120-130 hours of work with the partner. The internship need not be completed in a single semester, although that is acceptable. At the end of the final semester of the internship, students would have to present a written and oral report of the work performed and lessons learned.

#### Special problems or research hours

Students could complete three credit hours working on a practical research problem under the supervision of a faculty member in FDSC, BISC, CHEM, BENG, or CHEG. The topic of this work should be approved for relevance to the certificate before the work begins and reviewed if it changes substantially during the course of the work. Work that involves industry partners is particularly encouraged. At the end of the final semester of the work, students would have to present a written and oral report of the work performed and lessons learned. Credit hours and work done for an honors degree can satisfy this requirement, but if honors work is used, it must include at least one credit hour in three different semesters.

#### Elective courses

6

<u>BIOL 2013</u>	General Microbiology (ACTS Equivalency = BIOL 2004 Lecture)
or <u>BIOL 3123</u>	Prokaryote Biology
<u>BIOL 2533</u>	Cell Biology
or <u>BIOL 2323</u>	General Genetics
<u>CHEM 2613</u>	Organic Physiological Chemistry (ACTS Equivalency = CHEM 1224 Lecture)
or <u>CHEM 3613</u>	Organic Chemistry II
<u>FDSC 3103</u>	Principles of Food Processing
<u>FDSC 2603</u>	Science in the Kitchen
<u>FDSC 2523</u>	Sanitation and Safety in Food Processing Operations
<u>FDSC 4122</u>	Food Microbiology
<u>CHEG 2133</u>	Fluid Mechanics
<u>CHEG 3144</u>	Heat and Mass Transfer

**BENG 3113**

Measurement and Control for Biological Systems

**BENG 3733**

Transport Phenomena in Biological Systems

Total Hours

15

8-Semester Plan

Program Costs

The program requires no courses that have not already been taught. However, if the demand justifies it, FDSC 2723 and BIOL 2723L will need to be taught more frequently than the special topics courses that they are derived from. Both these course will have some transportation costs associated with trips to breweries. Again, that should not be greater than the current special topics courses. There will be some administrative cost associated with the program, but that is difficult to quantify at this time.

Library Resources

Holdings have already been expanded for the special topics classes. A handful of monographs will be added to the library collection.

Instructional

Facilities

Existing laboratory and lecture facilities will be adequate. The Microbial Fermentation Laboratory will require use of industrial partners facility. Jesse Core, Core Brewing, has agreed to help with this.

Faculty Resources

If the frequency of offering of FDSC 2723 and BIOL 2723L stays high this may require accommodation. Jesse Core has already been appointed as adjunct faculty, which will help with the internship requirements.

List Existing Certificate or Degree Programs

that Support the Proposed Program

<b>Program(s)</b>
BIOLBA - Biology, Bachelor of Arts
BIOLBS - Biology, Bachelor of Science
BENGBS - Biological Engineering, Bachelor of Science in Biological Engineering
CHEGBS - Chemical Engineering, Bachelor of Science in Chemical Engineering
CHEMBA-BIOC - Chemistry: Biochemistry Concentration
CHEMBS - Chemistry, Bachelor of Science
FDSCBS - Food Science, Bachelor of Science in Agri Food & Life Sciences

Are Similar Programs available in the area?

No

Estimated Student      12  
 Demand for Program

Scheduled Program      2025-2026  
 Review Date

Program Goals and Objectives

**Program Goals and Objectives**

Certificate program to provide graduates with improved job opportunities in the craft brewing industry. Support the craft beer industry in Arkansas.

Learning Outcomes

**Learning Outcomes**

At the end of this program students will be able to:

1. Describe the basic history, legal aspects, and economic impacts of brewing and fermentation.
2. Describe the basic chemistry and biology of fermentation and brewing.
3. Conduct basic fermentation processes and carry out basic brewing industry practices.

Description and Justification for this request

<b>Description of request</b>	<b>Justification for request</b>
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Description of request	Justification for request
Proposed new certificate of proficiency in brewing and fermentation.	<p>In 1978, there were only 42 companies brewing beer in the United States. Today there are in excess of 2,000 brewpubs and 4,000 micro or regional breweries in the United States, employing well over 100,000 people. According to the Brewers Association, the craft brewing industry in the United States had sales revenues in excess of \$26 Billion in 2017. Craft brewed barrels, 12.7% of the beer market, grew last year by 5.0% while overall barrels of beer brewed fell by 1.2%.</p> <p>In 2017, Arkansas had just 35 small breweries, 1.6 breweries per 100,000 21+ adults, which ranks us as 41st in the nation in breweries per capita, and brewed only 0.6 gallons in craft beer per 21+ adult, for a ranking of 47th. While small breweries had an economic impact in Arkansas of \$406 million total and \$191.60 per capita, this only ranked us at 46th in the country in per capita terms.</p> <p>Clearly, there is the potential for much growth in the industry in Arkansas. For example, if we hit the national median of 2.5 breweries per capita, we would expect to see another 18 to 20 breweries open in the state. A good supply of qualified workers is needed if such growth is to be realized, so the proposed certificate would benefit both recipients and local industry.</p> <p>In addition to those seeking employment, there is a large degree of interest in homebrewing as a hobby. It is estimated that there are 1 to 1.2 million homebrewers in the United States, which would translate into approximately 10,000 in Arkansas. This population is another that might be interested in formal study of brewing.</p>

## Upload attachments

[BREWCP - Undergraduate Cert - Ltr of Notification.docx](#)

## Reviewer Comments

**Alice Griffin (agriffin) (10/22/18 11:21 am):** Inserted credit hours for BIOL 2723L and clicked on sum hours in order for total hours to be presented in the catalog.

**Lisa Kulczak (lkulcza) (10/23/18 3:14 pm):** All courses not found currently in approval process for fall 2019.

**Gary Gunderman (ggunderm) (10/24/18 12:22 pm):** Changed CIP from 01.0401 to 01.1002 - rolling back to Alice for document changes.

**Gary Gunderman (ggunderm) (10/24/18 12:22 pm):** Rollback: CIP code change should be reflected in documents.

**Alice Griffin (agriffin) (10/24/18 12:28 pm):** Revised CIP Code in LON. Renamed document to match BOT naming convention.

**Alice Griffin (agriffin) (12/04/18 2:38 pm):** Revised campus approval date in LON. Uploaded new copy.



