

ORIGINATOR'S SECTION:

1. College: CHABSS CoBA CoEHHS CSM
 Desired Term and Year of Implementation (e.g., Fall 2008):
 Fall 2017

2. Course is to be considered for G.E.? (If yes, also fill out appropriate GE form*) Yes No

3. Course will be a variable-topics (generic) course? Yes No
 ("generic" is a placeholder for topics)

4. Course abbreviation and Number:* ENGB 401

5. Title: (Titles using jargon, slang, copyrighted names, trade names, or any non-essential punctuation may not be used.)
Brewing Materials

6. Abbreviated Title for PeopleSoft:
 (no more than 25 characters, including spaces)
 Brewing Materials

7. Number of Units: 3

8. Catalog Description: (Not to exceed 80 words; language should conform to catalog copy. Please consult the catalog for models of style and format; include all necessary information regarding consent for enrollment, pre- and/or corequisites, repeated enrollment, crosslisting, as detailed below. Such information does not count toward the 80-word limit.)

 Introduces the chemistry of water, hops, barley, and other ingredients in the context of brewing. Emphasizes water quality, testing, and purification and includes discussions of polarity and pH as well the basics of functional groups in organic chemistry followed by the application of these topics to brewing. *Prerequisites: ENGB 301 or suitable brewing experience.*

9. Why is this course being proposed?

 Course is being proposed as part of Engibeering™ certificate programs through extended learning.

10. Mode of Instruction*
 For definitions of the Course Classification Numbers:
http://www.csusm.edu/academic_programs/curriculumschedu ling/catalogcurricula/DOCUMENTS/Curricular_Forms_Tab/Instructional%20Mode%20Conventions.pdf

Type of Instruction	Number of Credit Units	Instructional Mode (Course Classification Number)
Lecture	3	C-2
Activity		
Lab		

11. Grading Method:*
 Normal (N) (Allows Letter Grade +/-, and Credit/No Credit)
 Normal Plus Report-in-Progress (NP) (Allows Letter Grade +/-, Credit/No Credit, and Report-in-Progress)
 Credit/No Credit Only (C)
 Credit/No Credit or Report-in-Progress Only (CP)

12. If the (NP) or (CP) grading system was selected, please explain the need for this grade option.

13. Course Requires Consent for Enrollment? Yes No
 Faculty Credential Analyst Dean Program/Department - Director/Chair

14. Course Can be Taken for Credit More than Once? Yes No
 If yes, how many times? (including first offering)

15. Is Course Crosslisted: Yes No
 If yes, indicate which course _____ and check "yes" in item #22 below.

16. Prerequisite(s): Yes No **ENGB 301 or suitable brewing experience**

17. Corequisite(s): Yes No

* If Originator is uncertain of this entry, please consult with Program/Department Director/Chair.

Tracker _____
 RP _____
 PS _____
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 BY: _____

19. If this course has been offered as a topic, please enter topic abbreviation, number, and suffix:* Not offered as a topic course.

20. How often will this course be offered once established? Once per year.

PROGRAM DIRECTOR/CHAIR - COLLEGE CURRICULUM COMMITTEE SECTION:
(Mandatory information – all items in this section must be completed.)

21. Does this course fulfill a requirement for any major (i.e., core course or elective for a major, majors in other departments, minors in other departments)? Yes No

If yes, please specify:

Required in the Certificate of Advanced Study in Brewin Science and elective in the Certificate of Specialized Study in Basic EngiBeerig™.

22. Does this course impact other discipline(s)? *(If there is any uncertainty as to whether a particular discipline is affected, check "yes" and obtain signature.)* Yes No

If yes, obtain signature(s). Any objections should be stated in writing and attached to this form.

Biological Sciences
Discipline


Signature

10/17/17
Date

Support Oppose

Discipline


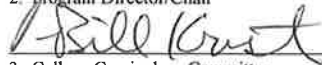
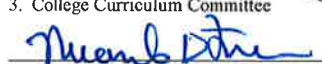
Signature

Date

Support Oppose

SIGNATURES : (COLLEGE LEVEL) :

(UNIVERSITY LEVEL)

- 1. Originator (please print or type name) Rebecca Perren 2/3/17
Date
- 2. Program Director/Chair  10/17/17
Date
- 3. College Curriculum Committee  10/27/17
Date
- 4. College Dean (or Designee)  10/31/17
Date

- 5. UCC Committee Chair _____ Date
- 6. Vice President for Academic Affairs (or Designee) _____ Date
- 7. President (or Designee) _____ Date

* If Originator is uncertain of this entry, please consult with Program/Department Director/Chair.

ENGB 401 – Brewing Materials
(PROSPECTIVE COURSE OUTLINE/SAMPLE SYLLABUS)
Spring, 2018 CN XXXXX
Tuesdays, 5:30-8:00pm MARK 106

Instructor TBD

Email TBD

Office TBD

Best contact number TBD

Course Description: Introduces the chemistry of water, hops, barley, and other ingredients in the context of brewing. Emphasizes water quality, testing, and purification, discussions of polarity and pH. The flavor chemistry of hops, and the development of a grain bill. *Prerequisites: ENGB 301 or suitable brewing experience.*

Student Learning Outcomes:

Upon successful completion of the course, students will be able to:

1. Apply basic chemical concepts, such as polarity and pH, to brewing materials and process steps.
2. Analyze water quality reports and develop strategies to amend water to make it more suitable as an ingredient or as an effluent.
3. Relate functional group and molecular class to flavors in beer, as well as in hops, fruits, and herbs.
4. Develop a grain bill based on predicted flavor, color, and clarity.
5. Control extraction and malting processes in a way that gives desired flavors.

Textbooks:

Ockert, Karl. "Raw Materials and Brewhouse Operations. Vol. 1 of MBAA Practical Handbook for the Specialty Brewer." Published by Master Brewers Association of America, 2006.

Palmer, John and Colin Kaminski. "Water: A Comprehensive Guide for Brewers." Brewers Publications, 2013.

Hieronymous, Stan. "For the Love of Hops: The Practical Guide to Aroma, Bitterness, and the Culture of Hops." Brewers Publications, 2012.

Mallett, John. "Malt: A Practical Guide from Field to Brewhouse." Brewers Publications, 2014.

Course Activities:

Homework: Approximately 9 homework assignments worth 15 points each will include reading guides, activities, and review exercises.

Quizzes: Three quizzes will be included to allow demonstration of mastery of each major section of the course. These quizzes will be worth 50 points each.

Tests: Mid-term worth 100 points and final exam worth 150 points.

Project: Each student will be given an analysis of their water, and present a treatment of the water, 3 distinct types of beer, including the grain bill, a type of hops, and all processing variables for the beers. A paper describing the proposals will satisfy the All-University Writing Requirement. Each student will also present their work to the class.

Grading Scheme:

	# of Items	Pts. Per Item	Total Points
Homework	8	15	120
Quizzes	3	50	150
Project	1	80	80
Midterm Exam	1	100	100
Final Exam	1	150	150
			600

# points	Grade
549 and up	A
540-548	A-
531-539	B+
489-530	B
480-488	B-
471-479	C+
429-470	C
420-428	C-
360-419	D
Below 360	F

Students are encouraged to contact the instructor ahead of class in the event of an absence. When possible, late work will be accepted up to one week late with some deduction. (Additional info will be added by the instructor for the class.)

Anticipated schedule:

Lectures Topics /Readings

Week 1 Intro to General Chemistry of Water

Week 2 Water Chemistry, an introduction to ions and pH

- Week 3-4 Water Quality Workshop
Water supplies: General; Water Supplies San Diego region (surface water, desalination, very little groundwater).
Potable water quality characteristics: microbial, chemical (inorganic, organic), physical (taste, odor, temperature, clarity), radiological.
Predicting water quality; obtaining water quality data; monitoring water quality for brewing.
Identifying important water quality characteristics for brewing.
Establishing brewing water quality goals.
Designing brew water treatment systems.
Monitoring/maintaining/sanitizing brew water treatment systems.
Quiz 1 – Week 5
- Week 5 Introduction to Organic Chemistry and Terpenes
• Alkanes, Alkenes, Alkynes
• Functional Groups
• Terpenes
Read Ockert, Ch. 4 for next week
- Week 6 Hops Biology and Chemistry – Read selections from Hieronymus
• Growing and evaluating hops
• Chemistry of hops – a-acids and other terpene chemistry
• Varieties of hops
- Week 7 Quiz 2 – Hops Chemistry
More Hieronymus reading selections
• Extraction of hops
• Dry hopping
• Processing and Storage
- Week 8 Fruit and Herb Chemistry
Review Exercises
- Week 9 Mid-Term Exam and Discussion of Projects
- Week 10 The Biology and Processing of Grain
Before class – read Ockert Ch. 2
• The Grain Bill – Read Mallett, Ch. 2, pp. 9-26
• The Biology of Barley – Read Mallett, Ch. 8, pp. 129-134
• Processing: Steeping, Germination, Kilning – Read Mallett, Ch. 4, pp. 51-67
- Week 11 Malt Chemistry – Read Mallett, Ch. 6, pp. 93-109
• Lipids
• Starches
• Sugars
• Proteins

- Week 12 Quality of Barley – Read Mallett, Ch. 10
 Specialty Malt Introduction – Read Ockert, Ch. 3
- Week 13 Quiz 3 on Grains
 More on Specialty Malts, including Wheat, Rye, Oat, Honey
 Read Selections (TBD) from Mallett, Ch. 5, 7, 9
- Week 14-15 Presentations & Review

Academic Honesty:

Students will be expected to adhere to standards of academic honesty and integrity, as outlined in the Student Academic Honesty Policy. All written work and oral presentation assignments must be original work. All ideas/material that are borrowed from other sources must have appropriate references to the original sources. Any quoted material should give credit to the source and be punctuated with quotation marks.

Students are responsible for honest completion of their work including examinations. There will be no tolerance for infractions. If you believe there has been an infraction by someone in the class, please bring it to the instructor's attention. The instructor reserves the right to discipline any student for academic dishonesty, in accordance with the general rules and regulations of the university. Disciplinary action may include the lowering of grades and/or the assignment of a failing grade for an exam, assignment, or the class as a whole."

ADA Statement:

Students with disabilities who require reasonable accommodations must be approved for services by providing appropriate and recent documentation to the Office of Disabled Student Services (DSS). This office is located in Craven Hall 5205, and can be contacted by phone at (760) 750-4905, or TTY (760) 750-4909. Students authorized by DSS to receive reasonable accommodations are encouraged to meet with me outside of class, e.g. during my office hours in order to ensure confidentiality.