Reedley College AgNR Department

Rhett Williams Plant Science 21

E-mail: Rhett.williams@reedleycollege.edu

**Plant Science 21: Fermentation Science – Course Information**

**Course Description**

Overview of beer brewing, including history, malting, brewing, fermentation, finishing and packaging. In addition, sensory analysis, lab analysis and quality assurance in beer production. Course enrollment is restricted to students 21 years of age or older.

**Units and Hours**

3 units; 1.5 hours of Lecture – T 6:00PM-7:50PM. 8-21-2018

 Final: December 11, 2018 6:00pm-8:00pm

 3 hours of Lab- TH: 6:00pm-8:50PM

 Final: December 11.2018 6:00-8:00pm

**Textbook**

1. Palmer, J. and Kaminski, C.. Water: A Comprehensive Guide for Brewers,ed Kristi Switzer 2013.

Assignments and Grading

Three major tests will be given that correlate to the assigned readings and course lecture notes. Quizzes will be given weekly on the discussed subject matter

Point Distribution
Lecture: Quizzes 100

 Assignments 100

 Midterms 200

 Final Exam 100

 Total Points **500**

90%=A 80%=B 70%=C 60%=D Less=F

**Important Dates:**

Last Day to Drop Class with Refund: August
Last Day to Drop w/o Transcript Record: Last Day to Change CR/NR: September
Last Day to Drop w/o Letter Grade Assigned: October

**Assignments**: All assignments are due at the beginning of class on the date due. Late submission of assignments will be assessed a penalty of 50%. No exceptions are made.

**Academic Dishonesty**: Plagiarism and cheating are serious offenses and may be punished by failure on exam, paper or project; failure in course; and or expulsion from the University. For more information refer to the "Academic Dishonesty" policy in the College Catalog.

**Need for Assistance:** If you have any condition, such as a physical or learning disability, which will make it difficult for you to carry out the work as I have outlined it, or which will require academic accommodations, please notify me as soon as possible.

**Posting of Grades:** Final grades will not be posted. If you wish to have your final grade sent to you, please bring a self-addressed, stamped envelope to the final exam.

**Attendance**

Attendance of lectures and labs is required and roll will be taken at each meeting. A "tardy" is considered an absence unless the student contacts and explains the incident. Students must make prior arrangements with the instructor to be excused from lectures and labs, make-up of missed tests and labs are permitted only with excused absences.

**Office Hours:**

TBD: Contact me to set up a time

**Lectures**

Week Topic Reading assignments

1 History of fermented foods as assigned from textbook

2 Regulatory agencies

3 Yeast and bacteria

4 Biochemical pathways

5 Brewing ingredients

6 Stages of brewing

7 Fermentation

8 Finishing

9 **Midterm**

10 Sensory evaluation

11 Methods of analysis

12 Water

13 Barley

14 Hops

15 Wort

16 Fermentation monitoring

17 Quality control and assurance

18 **Final**

**Lab Content:**

1 Introduction /Preparation

2 Sanitation Procedures

3 Equipment Operation and Procedures

4 Brewing Ingredients and Preparations

5 Fermentation I

6 Fermentation II

7 Fermentation III

8 Fermentation Monitoring

9 Methods of Analysis

10 Sensory Evaluation I

11 Sensory Evaluation II

12 Fermentation Defects

13 Finishing Defects

14 Quality Control and Assurance

15 Food Safety I

16 Food Safety II

17 Bottling and Packaging

**Students Learning Outcomes:**

1. Describe the raw materials used in brewing and their sources
2. Demonstrate the impacts of ingredients on finished beer
3. Evaluate beer color, aroma, flavor, and beer defects

**Course Outcomes**

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

1. Identify microbes encountered in beer production
2. Describe the chemical pathways in beer fermentation
3. Understand the stages in the beer brewing process
4. Identify sensory parameters of evaluating beer
5. Identify beer defects, their cause and prevention
6. Perform laboratory analysis on beer through the brewing process
7. Perform quality assurance test on finished or packaged beer