

**WINE 55 Course Outline as of Fall 2022****CATALOG INFORMATION**

Dept and Nbr: WINE 55 Title: LAB ANALYSIS OF WINES

Full Title: Lab Analysis of Wines

Last Reviewed: 2/14/2022

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	3.00	Lecture Scheduled	2.00	17.5	Lecture Scheduled	35.00
Minimum	3.00	Lab Scheduled	3.00	8	Lab Scheduled	52.50
		Contact DHR	0		Contact DHR	0
		Contact Total	5.00		Contact Total	87.50
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 70.00

Total Student Learning Hours: 157.50

Title 5 Category: AA Degree Applicable

Grading: Grade Only

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

Also Listed As:

Formerly: WINE 55A

**Catalog Description:**

In this course, students learn about and practice winery laboratory procedures including basic chemistry principles, laboratory techniques, and commonly used analysis methods for musts and wines.

**Prerequisites/Corequisites:**

Course Completion of CHEM 3A AND CHEM 3AL; OR CHEM 1A; OR CHEM 8; OR CHEM 42; OR CHEM 60

**Recommended Preparation:****Limits on Enrollment:****Schedule of Classes Information:**

Description: In this course, students learn about and practice winery laboratory procedures including basic chemistry principles, laboratory techniques, and commonly used analysis methods for musts and wines. (Grade Only)

Prerequisites/Corequisites: Course Completion of CHEM 3A AND CHEM 3AL; OR CHEM 1A; OR CHEM 8; OR CHEM 42; OR CHEM 60

Recommended:  
Limits on Enrollment:  
Transfer Credit: CSU;  
Repeatability: Two Repeats if Grade was D, F, NC, or NP

## **ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:**

<b>AS Degree:</b>	<b>Area</b>	Effective:	Inactive:
<b>CSU GE:</b>	<b>Transfer Area</b>	Effective:	Inactive:
<b>IGETC:</b>	<b>Transfer Area</b>	Effective:	Inactive:
<b>CSU Transfer:</b>	Transferable	Effective: Fall 2004	Inactive:
<b>UC Transfer:</b>		Effective:	Inactive:

**CID:**

### **Certificate/Major Applicable:**

Both Certificate and Major Applicable

## **COURSE CONTENT**

### **Student Learning Outcomes:**

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

1. Explain the basic chemistry principles associated with major lab procedures performed in a medium-sized wine lab.
2. Execute all major lab procedures performed in a medium-sized wine lab.

### **Objectives:**

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

1. Apply basic chemistry theory and lab practice in a wine lab.
2. Understand the set-up and accurate use of major lab instruments used in a medium-sized wine lab.
3. Understand the theory and procedures to assay major wine components analyzed in a medium-sized wine lab.
4. Understand the basic theory behind procedures normally performed in a state-of-the art wine lab, including genetic, microbiological, and chemical assays.

### **Topics and Scope:**

#### **I. Basic Chemistry Theory and Practice**

- A. Lab safety
- B. Wine lab analysis (chemical theory, formulas and equations)
- C. Principles of enzymatic analyses of wine
- D. Procedures for preparing wine samples
- E. Disposal of samples and reagents
- F. Lab data collection process and recordkeeping
- G. Lab assay results and reports
- H. Sanitation in lab areas
- J. Standardize sodium hydroxide

## II. Wine lab instruments

- A. pH meter
- B. Manual titratable acidity glassware
- C. Autotitrator for titratable acidity
- D. Centrifuge
- E. Conductivity meter
- F. Dissolved oxygen meter
- G. Confined space atmosphere monitor
- H. Aeration-oxidation apparatus
- I. Cash still
- J. Spectrophotometer (UV-VIS)
- K. Alcolyzer
- L. Deionized water unit system
- M. OenoFoss
- N. Chemwell (Astoria Pacific) discrete analyzer
- O. Gas chromatograph
- P. Nephelometer
- Q. Phase contrast microscope
- R. Brightfield microscope

## III. Assay principles and procedures for wine properties

- A. pH
- B. Titratable acidity
- C. Turbidity
- D. Alcohol
- E. Residual sugar
- F. Volatile acidity
- G. Malic acid
- H. Assimilable nitrogen
- I. Sulfides
- J. Proteins
- K. Potassium bitartrate
- L. Dissolved oxygen
- M. Phenolics (tannins and pigments)
- N. Total and free SO<sub>2</sub>
- O. Wine spoilage organism presence and by-products
- P. Other assays appropriate to medium-sized wine lab

## IV. Theory of state-of-the art wine analyses

- A. Fourier Transform Infrared Spectroscopy (FTIR)
- B. High Pressure Liquid Chromatography (HPLC)
- C. Gas Chromatography-Mass Spectrometry (GC- MS)
- D. Scorpion assay for detection of DNA
- E. Hemocytometer

### **Assignment:**

#### Lecture Related Assignments:

1. Weekly reading (5-20 pages)
2. Exams (2-3), including a final exam

#### Lab Related Assignments:

1. 2-3 lab reports (1-6 pages each)
2. Weekly lab protocol preparation (1-2 pages each)

3. Worksheets (8-12)
4. Troubleshoot lab instrument problems (1-4)
5. Perform lab assays for 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.

Lab Reports, Lab protocol preparation, Worksheets

Writing  
10 - 40%

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

Troubleshoot lab instrument problems

Problem solving  
5 - 10%

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

Lab assays for final exam

Skill Demonstrations  
10 - 40%

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

Exams, including a final exam

Exams  
15 - 35%

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

Lab participation

Other Category  
10 - 25%

### Representative Textbooks and Materials:

Wine Analysis and Production. Zoecklein, Bruce W. et. al. Springer. 2013  
Instructor prepared materials