

**WINE 55 Course Outline as of Fall 2020****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:**

An introduction to winery laboratory practices 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: An introduction to winery laboratory practices 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:**

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

1. Understand the theory behind and execute all procedures performed in a medium-sized wine lab.
2. Understand the basic theory behind procedures normally performed in a large wine lab, including genetic, microbiological, Fourier Transform Infrared Spectroscopy (FTIR), High Pressure Liquid Chromatography (HPLC), and Gas Chromatography-Mass Spectrometry (GC-MS) assays.

**Objectives:**

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

1. Utilize basic laboratory principles and practices common to the wine industry.
2. Perform laboratory tests using appropriate instrumentation.
3. Integrate chemistry theory into wine lab practices.
4. Set up, carry out, and evaluate results of a variety of laboratory trials for analysis of wines.
5. Understand the common microbial assays used in the wine industry.
6. Evaluate and control quality of lab analyses and wine products.

**Topics and Scope:**

- I. Apply Basic Chemistry Theory and Practice in a Wine Lab
  - A. Apply basic principles of lab safety to a wine lab
  - B. Recognize, understand the use of, and be able to assemble all wine lab equipment used in a standard, medium-sized wine lab
  - C. Perform all wine assays (details below) done in-house in a standard, medium-sized wine lab
  - D. Understand chemical theory, formulas and equations used in wine lab analysis
  - E. Understand the principles of enzymatic analyses of wine
  - F. Know procedures for preparing wine samples
  - G. Dispose appropriately of samples and reagents

- H. Understand how to collect, record and effectively present lab data
  - I. Effectively communicate the results of a lab assay in a written report
  - J. Understand and use scientific notation
  - K. Maintain sanitation in lab areas
- II. Use the Following Instrumentation
- A. Centrifuge
  - B. Conductivity meter
  - C. Aeration-oxidation apparatus
  - D. Cash still
  - E. Spectrophotometer (UV-VIS)
  - F. DI (deionized water unit) system
- III. Understand the Basic Theory and Use in Wine of the Following Instrumentation and Assays
- A. Nephelometer
  - B. High Performance Liquid Chromatography (HPLC)
  - C. Gas chromatograph/mass spectrometer (GC-MS)
  - D. Automated lab sampling instrument
  - E. Atomic absorbance and Inductively Coupled Plasma mass spectrometer (ICP-MS)
  - F. Thermocycler
  - G. Scorpion™ assay and similar genetic analyses
  - H. Selective plating for microbe identification
- IV. Perform the Following Laboratory Procedures
- A. Standardize NaOH with potassium hydrogen phthalate
  - B. Ammonia by ammonia probe
  - C. Yeast assimilable nitrogen assay by OPA
  - D. Volatile acidity by cash still
  - E. Total and free SO<sub>2</sub> by aeration-oxidation
  - F. Malic acid by enzymatic assay
  - G. Residual sugar/glucose by enzymatic assay
  - H. Color/phenols by UV-Visible Spectroscopy
  - I. Cold stability
  - J. Heat stability
  - K. Other assays appropriate to medium-sized wine lab

**Assignment:**

1. Weekly lab analyses
2. Weekly lab reports
3. Midterm; final exam
4. Reading 20 - 30 pages per week
5. Homework problem sets

**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
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Writing 15 - 30%
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**Problem Solving:** Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Homework problem sets; lab reports and analyses with attention to evaluation of lab data

Problem solving  
15 - 35%

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

Ability to accurately perform lab analyses

Skill Demonstrations  
20 - 40%

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

Midterm and final: multiple choice, true/false, matching items, completion, short answer.

Exams  
30 - 50%

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

Attendance and participation

Other Category  
0 - 10%

**Representative Textbooks and Materials:**

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