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## National Center of Excellence

Grape and Wine Education for the 21<sup>st</sup> Century

### ENO 1213 (VIN 110) - Introduction to Wine Microorganisms

Date: January 29 – May 11, 2018

VESTA Course No.: VIN 110

Course Name: Introduction to Wine Microorganisms

Office Hours: By appointment via phone or email

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Semester: Spring 2018

Instructor: Darren Michaels

Course Credit: 3 Hour

Delivery: Online

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#### Course Description

This course is designed to introduce students to the basic principles of wine microbiology and to serve as an introduction to the variety of microorganisms frequently encountered in the wine making process. Yeasts, bacteria, and molds play vital roles in the production of wine, both beneficial and harmful. Students will become familiar with the morphology, reproduction, and sensory attributes of wine microorganisms in order to understand their influence on winemaking, and a basic understanding of their effective management.

**Prerequisites:** None

**Next Course in Sequence:** VIN 148 or VIN 160

#### Course Objectives

Through lectures, facilitated discussions, quizzes and written assignments the student will be able to:

- Demonstrate basic knowledge of principles of wine microbiology
- List the important microorganisms encountered during wine production
- Describe the growth and control of various grape and wine microorganisms
- Describe microbiological processes involved in alcoholic fermentation
- Describe microbiological process of MLF
- Calculate appropriate SO<sub>2</sub> and Nitrogen additions to wine and must
- Describe methods and techniques used in wine production that reflect a basic understanding of the effects of various microorganisms
- Demonstrate basic understanding of how spoilage microorganisms in wine are diagnosed
- Describe processes used to prevent undesirable microorganism activity in wines
- Identify major wine spoilage organisms by sensory assessment
- Demonstrate basic understanding of various cleaning and sanitation regimes typically used in wineries.

## Textbooks

Students are responsible for acquiring their textbooks.

*Wine Microbiology: Practical Applications and Procedures.* (2<sup>nd</sup> ed.). Fugelsang and Edwards (2007). New York: Springer Science+Business Media, LLC.

*Making Wine for Home Use.* Wilker, K., Harris T., Odneal, M. and Dharmadhikari, M. (n.d.). Mountain Grove, MO: State Fruit Experiment Station of Missouri State University.

This document can be downloaded at: <https://ag.missouristate.edu/statefruit/publications/>

## Course Schedule and Outline of Topics

<b>Week — Dates</b>	<b>Monday Live Class Meeting</b>	<b>Lecture Topics</b>
<b>1</b> 01/29 - 02/04	01/29	Introduction to Wine Microorganisms 1. Basics of Growth and Development 2. Types of MOs in wine 3. Nutrition 4. Culturing microbes
<b>2</b> 02/05 - 02/11	02/05	Yeasts 1. Reproduction 2. Taxonomy 3. Metabolism
<b>3</b> 02/12 - 02/18	02/12	Bacteria 1. Reproduction 2. Taxonomy 3. Metabolism <b>Take Assessment A</b>
<b>4</b> 02/19 - 02/25	02/19	Molds and Other Microorganisms 1. Ecology 2. Taxonomy 3. Nutrition 4. Metabolism
<b>5</b> 02/26 - 03/04	02/26	Exam I Review <b>Take Exam I</b>
<b>6</b> 03/05 - 03/11	03/05	Managing Microbial Growth 1. Environmental impacts 2. Encouraging growth 3. Inhibiting growth 4. Filtration
<b>7</b> 03/12 - 03/18	03/12	Microbial Ecology During Fermentation 1. Stages of development 2. Positive and negative interactions of various MOs <b>Take Assessment B</b>

<b>8</b> 03/19 - 03/25	03/19	Wine Processing: Vineyard and Pre-fermentation Musts 1. Fruit Quality Assessment 2. Processing Must
<b>9</b> 03/26 - 04/01	03/26	Wine Processing: Managing Fermentation 1. Additives to must 2. Sluggish fermentations 3. Malolactic fermentation <b>Take Assessment C</b>
<b>10</b> 04/02 - 04/08	04/02	Wine Processing: Post-fermentation/Aging 1. Barrels and aging 2. Bottling issues Exam II Review <b>Take Exam II</b>
<b>11</b> 04/09 - 04/15	04/09	Winery Cleaning and Sanitation 1. Detergents and cleaners 2. Sanitizers 3. Preventatives
<b>12</b> 04/16 - 04/22	04/16	Spoilage Organisms and Sensory Attributes 1. Types of organisms
<b>13</b> 04/23 - 04/29	04/23	Spoilage Organisms and Sensory Attributes (continued) 1. Visual and olfactory associations with various MOs <b>Take Assessment D</b>
<b>14</b> 04/30 - 05/06	04/30	Media Preparation, Aseptic Technique 1. Selective vs. non-selective media 2. Media sterilization 3. Media additives 4. Basic microscopy <b>Complete Sensory Journal</b>
<b>15</b> 05/07 - 05/11	05/07	Exam III Review <b>Take Exam III (cumulative)</b>

*The instructor reserves the right to adjust the schedule as necessary.*

### **Instructional Format**

This is an online course with a synchronous component. An online course site (Learning Management System) is provided by the host institution to provide announcements, lectures, notes, supplemental printed and web-based materials, and assignments. It also serves as a central point for interaction/communication between the instructor and the students.

### **Live Class Meetings**

The live class meetings will take place **every Monday from 8:00 to 9:00 p.m. Central Time** via the **Zoom** web conferencing system. Participation to the live class meetings is *required* and a participation grade is assigned. This is an opportunity for the instructor to go over weekly topic highlights and for students to interact with the instructor and fellow students through questions and discussions. Students are expected to be prepared to ask questions and actively participate in the discussions.

The link to the Zoom virtual classroom will be posted at the top of each weekly module. Students will use the *same* virtual classroom for their live class meetings the entire semester. The sessions will take place on the dates listed in the above schedule.

It is the student's responsibility to notify the instructor in advance if he/she must miss a class. Students who missed a class meeting are required to view the recording of the live class as soon as possible.

### **Course Assignments**

There will be weekly lecture/reading assignments, discussion questions, four online assessments, and three exams. Students are also required to keep a Sensory Journal to record sensory notes on the online course site.

**Weekly Lecture/Reading Assignments and Questions:** Weekly lecture video and additional materials should be viewed **before** the live class meeting.

**Weekly Discussion Questions:** After viewing the weekly materials, students would post at least one question related to the weekly topic on the course site Discussion Board weekly forum no later than noon on Monday. Your instructor will address the questions during the live class meeting. After the live class meeting, students should return to the discussion forum to answer their own question and comment/add to at least two fellow students' posts.

**Online Assessments:** The four quiz-like assessments are intended to help students keep up with the progression of the course. Students can take an assessment as many times as they wish till they are satisfied with their scores before the deadline.

**Exams:** There will be three exams. Exam I will cover topics learned since the beginning of the semester. Exam II will cover topics learned since Exam I. Exam III will cover topics learned since Exam II with a small quantity of cumulative questions. Students will take the exams online through the course site.

**Sensory Notes/Journal:** During the semester students will be responsible for collecting notes on sensory effects associated with microbiological activity. Whether it would be directly from fermentations, samples or experiences from wineries, or from collecting finished wines at home, the notes need to be translated to effective winemaking measures and a basic understanding the effects of microbiological activity. The sensory notes will be entered on the online course site using the **Sensory Journal** space provided. You will receive full points for posting at least 20 sensory notes. Please refer to the sensory journal instructions provided on the online course site.

### **Expectations and Instructor Feedback**

With the online course format, students are expected to participate in and be prepared for the live class sessions by completing the weekly reading/questions assignments and watching the weekly video lecture prior to the sessions. During the first session, the instructor will cover the course requirements in detail. Students must check the course site regularly to keep updated on communications, change in schedules, and adherence to deadlines.

The instructor will make every effort to respond to student questions and complete assignment/exam grading in a timely manner.

**Grading**

- 90 – 100% = A
- 80 – 89.9% = B
- 70 – 79.9% = C
- 60 – 69.9% = D
- Below 60% = F

<b>The Percentage Weight of Student Performance</b>		
<b>Activity</b>	<b>Percentage</b>	<b>Points</b>
Examinations (3)	60%	600 (200 points each)
Online Assessments (4)	10%	100 (25 points each)
Sensory Notes/Journal	10%	100 (at least 20 entries for full points)
Live Class Participation	10%	100 (at least 14 participations for full points)
Weekly Questions	10%	100 (post at least 10 times for full points)
<b>Total</b>	<b>100%</b>	<b>1,000</b>

It is the students’ responsibility to see that all graded assignments and exams reach the instructor in a timely fashion, so grades can be issued.

## **Redlands Community College Institutional Policies**

### **Withdrawing from the Course**

Should it become necessary to withdraw, it is the student's responsibility to do so according to the guidelines in the Redlands Community College (RCC) *Student Handbook* found at: [https://www.redlandsccl.edu/files/Handbook\\_2014-2015.pdf](https://www.redlandsccl.edu/files/Handbook_2014-2015.pdf)

*\*Students planning to withdraw from this course must also complete the VESTA Withdrawal/Change of Schedule form and submitting to the VESTA office.*

### **Attendance Policy**

RCC believes that students must attend class in order to achieve the best learning results. In the case of VESTA online courses, attendance is defined as active participation in the form of attending synchronous class meetings (if applicable), completing reading/writing/testing assignments by assigned deadlines, and maintaining regular communication with course instructor via the online course site and communication tools designated by the instructor. For courses with a practicum/workshop component, students must participate and complete the number of hours of practical experience required. Instructors may assign attendance grade as part of course grade if they choose to do so.

### **Make-up Policy and Special Instructions**

The exams can be made up only in the event of an excused absence where the instructor has prior knowledge of the absence. Allowance of make-up tests will be at the discretion of the instructor and will be taken on the date of the student's return to class.

### **Accommodations for Students with Special Needs**

Redlands Community College is committed to making reasonable accommodations to assist individuals with disabilities. Students with documented disabilities that directly impact attendance or grades must register and request specific accommodations at the beginning of the semester. For ADA and Accessibility information go to:

<https://www.redlandsccl.edu/content/accessibility>