



Funded by the National Science Foundation

National Center of Excellence

Grape and Wine Education for the 21st Century

VIN 110 - Introduction to Wine Microorganisms

Date: **January 25 – May 07, 2021**

Instructor: Darren Michaels

Email: darrenmichaels@missouristate.edu

Phone: (509) 240-7956

Office Hours: Virtual, by appointment, phone, email

Semester: **Spring 2021**

Host: Missouri State University

Host Course No.: VIN211-SP21-20543-WP

Course Credit: 3 Hours

Delivery Format: Online

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 SO₂ 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.

Required Textbooks

It is your responsibility to obtain the textbooks for this course by the first week of class. Check with the vendor of your choice for pricing and availability.

Fugelsang, K. C., & Edwards, C. G. (2007). *Wine Microbiology: Practical Applications and Procedures*. (2nd ed.). Springer Science+Business Media, LLC. ISBN-13: 978-03-8733-341-0

Wilker, K., Harris T., Odneal, M. and Dharmadhikari, M. (2016). *Making Wine for Home Use*. State Fruit Experiment Station of Missouri State University. This document can be downloaded for free by clicking on [this link](#).

Course Schedule and Outline of Topics

Week — Dates	Monday Live Class Meeting	Lecture Topics
1 01/25 - 01/31	01/25	Introduction to Wine Microorganisms 1. Basics of Growth and Development 2. Types of MOs in wine 3. Nutrition 4. Culturing microbes
2 02/01 - 02/07	02/01	Yeasts 1. Reproduction 2. Taxonomy 3. Metabolism
3 02/08 - 02/14	02/08	Bacteria 1. Reproduction 2. Taxonomy 3. Metabolism Take Assessment A
4 02/16 - 02/21	—	Molds and Other Microorganisms 1. Ecology 2. Taxonomy 3. Nutrition 4. Metabolism No live class – President’s Day
5 02/22 - 02/28	02/22	Exam I Review Take Exam I
6 03/01 - 03/07	03/01	Managing Microbial Growth 1. Environmental impacts 2. Encouraging growth 3. Inhibiting growth 4. Filtration
7 03/08 - 03/14	03/08	Microbial Ecology During Fermentation 1. Stages of development 2. Positive and negative interactions of various MOs Take Assessment B

8 03/15 - 03/21	03/15	Wine Processing: Vineyard and Pre-fermentation Musts 1. Fruit Quality Assessment 2. Processing Must
9 03/22 - 03/28	03/22	Wine Processing: Managing Fermentation 1. Additives to must 2. Sluggish fermentations 3. Malolactic fermentation Take Assessment C
10 03/29 - 04/04	03/29	Wine Processing: Post-fermentation/Aging 1. Barrels and aging 2. Bottling issues Exam II Review Take Exam II
11 04/05 - 04/11	04/05	Winery Cleaning and Sanitation 1. Detergents and cleaners 2. Sanitizers 3. Preventatives
12 04/12 - 04/18	04/12	Spoilage Organisms and Sensory Attributes 1. Types of organisms
13 04/19 - 04/25	04/19	Spoilage Organisms and Sensory Attributes (continued) 1. Visual and olfactory associations with various MOs Take Assessment D
14 04/26 - 05/02	04/26	Media Preparation, Aseptic Technique 1. Selective vs. non-selective media 2. Media sterilization 3. Media additives 4. Basic microscopy Complete Sensory Journal
15 05/03 - 05/07	05/03	Exam III Review Take Exam III

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. The recording of each live class will be available within 24-48 hours after each session for those who miss a live class.

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. 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

Student grades will be determined based on their total points earned in the class. The table below outlines the total points possible for this class and their percentage weight.

Percentage Weight of Student Performance		
Activity	Percentage	Points
Exams (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)
Total	100%	1,000

Grade calculation: total points earned ÷ total points possible. Then using the following scale to determine final letter grades:

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

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.

INSTITUTIONAL POLICIES ON FOLLOWING PAGE

Missouri State University Institutional Policies

Withdrawing from the Course

It is the students' responsibility to see that all requirements are completed within the semester timeframe so grades can be issued. Should it become necessary to withdraw, it is the student's responsibility to do so according to the university guidelines found at: <http://wp.missouristate.edu/recreg/withdrawl-procedures.htm>

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

Online Student Academic and Student Support Resources

Missouri State University-West Plains provides a full-range academic and student support for online students. To learn more about specific academic and student support and how to access the resources, go to <http://online.wp.missouristate.edu/>

Attendance Policy

Missouri State University 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. MSU expects instructors to be reasonable in accommodating students whose absence from class resulted from: 1) participation in University-sanctioned activities and programs; 2) personal illness; or 3) family and/or other compelling circumstances. The University's attendance policy can be found at:

<http://www.missouristate.edu/registrar/catalog/attendan.html>

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.

Statement of Grading Policy

Faculty have the choice to utilize either the standard grade policy or the plus/minus grading option but are required to indicate their grading scale on their syllabus. The University's plus/minus grading system can be found at <http://wp.missouristate.edu/recreg/grade-policies.htm>

Title IX Policy

Missouri State University does not discriminate on the basis of sex in the education program or activity that it operates, including in admission and employment. Concerns regarding discrimination on the basis of sex, including sexual harassment, should be referred to Jill Patterson, Title IX Coordinator, Carrington 205, 901 S. National Ave., Springfield, MO 65897, 417-836-8506, or jillpatterson@missouristate.edu. MSU has adopted a grievance procedure policy for the prompt and equitable resolution of allegations of sexual discrimination, including sexual harassment. This policy is available at the [Title IX website](#). Individuals may report an allegation of sex discrimination, file a complaint of sexual discrimination, or file a formal complaint of sexual harassment by contacting MSU's Title IX Coordinator.

Statement of Nondiscrimination

Missouri State University is an equal opportunity/affirmative action institution, and maintains a grievance procedure available to any person who believes he or she has been discriminated against. At all times, it is your right to address inquiries or concerns about possible discrimination to the Office for Institutional Equity and Compliance, Park Central Office Building, 117 Park Central Square, Suite 111, 417-836-4252. Other types of concerns (i.e., concerns of an academic nature) should be discussed directly with your instructor and can also be brought to the attention of your instructor's Department Head. Please visit the OED website at: <http://www.missouristate.edu/equity/>

Academic Integrity Statement

Missouri State University is a community of scholars committed to developing educated persons who accept the responsibility to practice personal and academic integrity. You are responsible for knowing and following the university's student honor code, Student Academic Integrity Policies and Procedures, available at: <http://www.missouristate.edu/academicintegrity/> and also available at the Reserves Desk in Meyer Library. Any student participating in any form of academic dishonesty will be subject to sanctions as described in this policy.

Statement on Disability Accommodation

If you are a student with a disability and anticipate barriers related to this course, it is important to request accommodations and establish an accommodation plan with the University. Please contact the Disability Resource Center (DRC) at the [Disability Resource Center website](#), Meyer Library, Suite 111, 417-836-4192, to initiate the process to establish your accommodation plan. The DRC will work with you to establish your accommodation plan, or it may refer you to other appropriate resources based on the nature of your disability. In order to prepare an accommodation plan, the University usually requires that students provide documentation relating to their disability. Please be prepared to provide such documentation if requested. Once a University accommodation plan is established, you may notify the class instructor of approved accommodations. If you wish to utilize your accommodation plan, it is suggested that you do so in a timely manner, preferably within the first two weeks of class. Early notification to the instructor allows for full benefit of the accommodations identified in the plan. Instructors will not receive the accommodation plan until you provide that plan, and are not required to apply accommodations retroactively. For information about

testing, contact the Director of the [Learning Diagnostic Clinic](http://psychology.missouristate.edu/ldc), (417) 836-4787, <http://psychology.missouristate.edu/ldc>.

Religious Accommodation

The University may provide a reasonable accommodation based on a person's sincerely held religious belief. In making this determination, the University reviews a variety of factors, including whether the accommodation would create an undue hardship. The accommodation request imposes responsibilities and obligations on both the individual requesting the accommodation and the University. Students who expect to miss classes, examinations, or other assignments as a consequence of their sincerely held religious belief shall be provided with a reasonable alternative opportunity to complete such academic responsibilities. It is the obligation of students to provide faculty with reasonable notice of the dates of religious observances on which they will be absent by submitting a Request for Religious Accommodation Form to the instructor by the end of the third week of a full semester course or the end of the second week of a half semester course. For more information see: http://www.missouristate.edu/policy/op1_02_1_religiousaccommodation.htm