San José State University
Chemistry
Chem 172, Chemistry of Wine, 01, Fall, 2016

Course and Contact Information

Instructor: Grant N. Holder, Ph.D.
Office Location: Duncan Hall 516
Telephone: (828) 719-8389
Email: grant_holder@sjsu.edu
Office Hours: 1:00-2:00 Tuesday/Thursday
Class Days/Time: Tuesdays/6:30-7:20 p.m.
Classroom: DH 416
Prerequisites: CHEM1B

Course Format

Technology Intensive, Hybrid, and Online Courses
No special technology or specific computer programs are necessary for the completion of this course.

Faculty Web Page and MYSJSU Messaging (Optional)
This class will rely heavily on the CANVAS page so that I can distribute worksheets and reading assignments.

Course Description

Introduction to chemistry of important components (organic acids, pigments, tannins, flavor constituents, etc.) of grape wine. Chemical changes that occur during fermentation, maturation and aging. Prerequisite: CHEM 1B (with a grade of "C" or better; "C-" not accepted) or instructor consent.

Program Learning Objectives
This course addresses the following Chemistry Program Learning Objectives

Program Learning Objectives #3 - Demonstrate understanding of core concepts, methods and limits of scientific investigation to effectively solve problems in analytical chemistry.
Program Learning Objectives #5 - Demonstrate understanding of core concepts, methods and limits of scientific investigation to effectively solve problems in biochemistry.
Program Learning Objectives #8 - Effectively present a scientific paper that applies the scientific approach to address a chemical problem in a poster session, as at an American Chemical Society symposium.
Program Learning Objectives #9 - Effectively present a scientific paper orally applying the scientific approach, as at an American Chemical Society symposium.
Course Learning Outcomes (CLO) (Required)

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

At the completion of this course, the student will have mastered the following learning outcomes:

1. Module 1: Assessment, Analysis, and Harvest Decision
   1.1. Course Learning Outcomes for Module 1
       1.1.1. Defined sampling protocols for vineyard assessment.
       1.1.2. Learned concepts and terms for fruit and wine quality, both traditional (sensory) and modern (instrument-based).
       1.1.3. Learned needed parameters for collecting sensory and analytical determinations of fruit maturation
       1.1.4. Learned practical analytical methods to obtain data to support a harvest decision.
       1.1.5. Module 1 Assessments Mechanisms
   1.2. Assessment Mechanisms
       1.2.1. Discussion board
       1.2.2. Reading & Writing
       1.2.3. Worksheet
       1.2.4. Quiz
   1.3. Assignment Description
       1.3.1. You will share your insights and questions with your fellows in an on-line discussion forum.
       1.3.2. External reading assignments will be (provided) to illustrate new concepts. You will prepare a short written summary of the paper(s) assigned (one per student) to share with your classmates.
       1.3.3. Winemaking is a science; calculating real values for important parameters will be an important part of your overall quality plan.
       1.3.4. The quiz will ask you to determine fruit quality, its effect on wine quality, and whether or not (theoretically) harvest is indicated.

2. Module 2: Preparing the Winery for Harvest
   2.1. Course Learning Outcomes for Module 2
       2.1.1. Identified the names and functions of necessary of equipment
       2.1.2. Learned the importance of water quality and how to monitor it. Issues includes “hardness,” “softness,” sourcing and others.
       2.1.3. Understood appropriate use and limitations of cleaners and sanitizers, both new and traditional
       2.1.4. Understood how to calibrate the volume of vessels
   2.2. Assessment Mechanisms
       2.2.1. Discussion boards
       2.2.2. Worksheet
       2.2.3. Quiz
   2.3. Assignment Description
       2.3.1. You will share your insights and questions with your fellows in an online discussion forum
       2.3.2. Practice problems will be assigned for you to calculate the important numerical aspects to your work.
       2.3.3. You will be asked to take a brief online quiz to demonstrate your mastery of this material.

3. Module 3: Fermentation & Microbiology
   3.1. Course Learning Outcomes for Module 3
       3.1.1. Learned the basic procedures necessary to begin; stemming, crushing, etc.
       3.1.2. Understanding of the characteristics and types of alcohol fermentations
       3.1.3. Learned about factors affecting fermentation
       3.1.4. Learned to describe the environmental factors affecting yeast biochemistry
       3.1.5. Learned about factors affecting malolactic fermentation
       3.1.6. Learned to assess microbiological difficulties and how they affect sensory characteristics
       3.1.7. Learned what steps to take (corrective, preventative, or compensatory) when fermentation outcomes do not match expectations
   3.2. Assessments
3.2.1. Discussion Board
3.2.2. Reading & Writing
3.2.3. Quiz

3.3. Assignment Description
3.3.1. You will share your insights and questions with your fellows in an on-line discussion forum.
3.3.2. External reading assignments will be (provided) to illustrate new concepts. You will prepare a short written summary of the paper(s) assigned (one per student) to share with your classmates.
3.3.3. You will prepare a table, wheel, or some other learning mnemonic to help correlate sensory inputs in the winemaking process to incipient faults and remediation protocols.
3.3.4. An examination will provide scenarios for which you should provide the decisions.

4. Wine & Must Adjustments and their Limitations
4.1. Course Learning Objectives for Module 4
4.1.1. Learned how to identify and remediate incipient faults in musts and wines.
4.1.2. Learned the effect of various strategies on wine quality.
4.1.3. Understood current U.S. laws regarding allowable materials and the extent of amelioration allowed.

4.2. Module 4 Assessments
4.2.1. Discussion Board
4.2.2. Worksheet
4.2.3. Quiz

4.3. Assignment Description
4.3.1. You will share your insights and questions with your fellows in an on-line discussion forum.
4.3.2. Various scenarios will be provided as practice for decisions regarding wine adjustments.
4.3.3. A quiz will test your memory of these concepts through the same test scenarios as in the practice problems; the short online quiz will also test your knowledge of applicable wine laws.

5. Module 5: Envisioning a Style
5.1. Module 5 Objectives
5.1.1. Understanding of variations in process, decisions, and critical control points necessary to successfully make specialized wine styles.
5.1.2. Common “special” varieties and harvest conditions
5.1.3. Sweet Table Wines
5.1.4. Red Wine Styles
5.1.5. Sparkling Wines
5.1.6. Fortified Wines

5.2. Module 5 Assessments
5.2.1. Discussion board
5.2.2. Reading & Writing
5.2.3. Quiz

5.3. Module 5 Assessment Description
5.3.1. You will share your insights and questions with your fellows in an on-line discussion forum.
5.3.2. External reading assignments will be (provided) to illustrate concepts in specialized regional winemaking. You will prepare a short written summary comparing and contrasting various styles (which you will select) and determining key HACCPs in their production.
5.3.3. A quiz will concentrate on winemaking processes peculiar to these styles, and how they can be reproduced. Questions may include equipment, yeasts, conditions, grape growing conditions, or some combination thereof.

6. Module 6: In the Winery Laboratory
6.1. Module 6 Objectives
6.1.1. Learned to select and maintain wine analysis equipment.
6.1.1.1. Learned the basics of sensory evaluation
6.1.1.2. Understood methods of analysis – how equipment works; what do the results mean?

6.1.2. Module 6 Assessment
   6.1.2.1. Discussion board
   6.1.2.2. Worksheet
   6.1.2.3. Quiz

6.1.3. Module 6 Assessment Descriptions
   6.1.3.1. You will share your insights and questions with your fellows in an on-line discussion forum.
   6.1.3.2. Worksheet will be provided to link sensory evaluation to appropriate descriptive language for HAACP
   6.1.3.3. Quiz will concentrate on relating needed information to available methodology.
   6.1.3.4. Worksheet will be provided with very simple demonstrative exercises to illustrate the power of principle component analysis.

7. Module 7: Chemical Components of Wine and the Most Common Organoleptic Defects

7.1. Module 7 Objectives
   7.1.1. Learned why it is important to know this information
   7.1.2. Common analytical components
   7.1.3. Chemical definitions and terms peculiar to wine and their chemical counterparts.
   7.1.4. Sugars
   7.1.5. Acids
   7.1.6. Alcohol/Extract
   7.1.7. Terpenes
   7.1.8. Phenols
   7.1.9. Nitrogen
   7.1.10. Color in wines: genesis and the tristimulus test
   7.1.11. Compounds and sources of the major organoleptic faults

7.2. Module 7 Assessment
   7.2.1. Discussion board
   7.2.2. Reading and Writing
   7.2.3. Worksheet
   7.2.4. Quiz

7.3. Module 7 Assessment Descriptions
   7.3.1. Share your insights and questions with your fellows in an on-line discussion forum.
   7.3.2. External reading assignments will be (provided) to illustrate concepts in specialized regional winemaking. You will prepare a short written paper comparing and contrasting various styles and determining key HACCPs in their production.
   7.3.3. Worksheet will be provided to link sensory evaluation to appropriate descriptive language for HAACP
   7.3.4. Quiz will concentrate on relating needed information to available methodology.
   7.3.5. A paper will be required on effective methods of minimizing “green characters” in red and white wines.

8. Module 8: Wine Balance

8.1. Module 8 Objectives
   8.1.1. Appreciated the scientific aspects of wine balance
   8.1.2. Understood the general description of balance in wine
   8.1.3. Understood how individual components harmonize to produce good balance
   8.1.4. Understood some of the common terminology employed

8.2. Module 8 Assessments
   8.2.1. Discussion board
   8.2.2. Reading & Writing
8.2.3. Worksheet
8.2.4. Quiz

8.3. Module 8 Assessment Description
8.3.1. You will share your insights and questions with your fellows in an on-line discussion forum.
8.3.2. Quiz questions on the ramifications of SO₂ for browning, pinking, and preservation.
8.3.3. Quiz questions on the effect of SO₂ on fermentations and how to control it for optimum quality wines.
8.3.4. Quiz questions will probe knowledge of the effect of SO₂ on wine color, aging, and pH.
8.3.5. Quiz questions will probe your ability to correlate needed additives with sensory and/or instrumental detection of faults.

9. Module 9 Aroma, Flavor, & Sensory Analysis
9.1. Module 9 Objectives
   9.1.1. Understood the relation between “vegetative aroma” and vineyard practices
   9.1.2. Understood appropriate responses to “tasting room” questions regarding chemical components of wine
   9.1.3. Learned the language of assessment, including visual, aromatic and gustatory
   9.1.4. Learned the fundamentals of wine and food pairing
   9.1.5. Learned the basics of wine, health, and food and their chemical underpinnings

9.2. Module 9 Assessments
   9.2.1. Discussion board
   9.2.2. Reading & Writing
   9.2.3. Quiz

9.3. Module 9 Assessment Description
   9.3.1. You will share your insights and questions with your fellows in an on-line discussion forum.
   9.3.2. External reading assignments will illustrate common faults (such as vegetative aromas). You will prepare a glossary of applicable terms and relate each to the chemical or microbiological cause
   9.3.3. A complete description of sensory analytical terms for a given sample will be described.
   9.3.4. A radar chart will be prepared with common descriptive terminologies and compared to others generated in class for the same sensory objects
   9.3.5. Quiz questions focus on winemaking methods and common descriptive language.

Required Texts/Readings

Textbook & Other Readings

NO Specific textbook exists that appropriately corresponds to this material
Citations from current literature will be provided online for you to read
Specific portions of numerous texts relevant for your education will be provided
Other technology requirements / equipment / material

None other than a computer to access our CANVAS site.

Course Requirements and Assignments
Discrete assignments

Reading & Writing: The understanding of winemaking and fermentation is constantly evolving even after 5,000+ years of intense study. Most of this was trial and error until the discovery of yeasts and their attendant fermentation mechanisms; the process was accelerated in the twentieth century until now one may purchase a bottle of red table wine for $8 the quality of which was nearly unobtainable a century ago.

I will assign a raft of papers for some of the modules (see schedule below). You can claim them on a first-come, first-served basis. These papers constitute original research in the field of wine production and analysis OR popular literature that is considered relevant in my view. The “styles” of papers will not be mixed for a particular assignment; popular or scholarly papers will not be “up for grabs” in the same module. You will have to prepare a written summary of your paper to post on our Canvas website in the discussion section. This summary will be no more than 250 words (in other words, one page or less). Other students will comment on what you have written, indicating whether or not the findings agree with their experience, or whether they have found the information useful, etc. Remember, JUST because you didn’t get a paper you really wanted (if someone claimed it first) there is no reason you can’t read it too! Add you original comments as a reply. Deadlines for posting your summaries are given in the schedule below. Reviews/arguments/dissent can be posted at any time. The arguments between professionals are among the best (and most useful) aspects of winemaking.

Writing Assignments: Modules mostly have reading and writing assignments. As this is a one-hour course I am not going to call on you to slavishly read reams of paper. There is one formalized writing assignment on the subject of YOUR CHOICE; you should have this approved by me as I want to make certain you have some unique perspective or objective in your selection. They should describe some aspect of your reading YOU wish to apply to YOUR future as a winemaker.

Summarize the paper and discuss what it might mean to you in the future as a winemaker. Apply the SWOT test: what individual components are important in the application of the paper to winemaking? Note you will be asked to synthesize your knowledge and apply it to the parameters discussed in the work. These exist ONLY in the later MODULES because you should have a good working knowledge of the course before you present a reasoned, cogent argument.

Sensory Glossary Project: The final MODULE of the course relates what you have learned to your potential customers; i.e., descriptions in the “tasting room.” When you emerge from your winery to greet visitors or host wine/food pairing dinners, the last thing you want to do is describe your product as though it was a beaker full of chemical compounds. How do you translate what you know to the colorful, terse, descriptive prose necessary to generate enough romance to cause the listener to purchase a case? What is an effective bridge between your practice and your customer? This is what we will call the GLOSSARY Project. Each of you will read (and see presentations) regarding wine faults and their genesis; as you go forward, make notes, relating these to the “punchy” prose necessary to move the merchandise.

Your final result will be a table of around 5 pages with scientific descriptors, where these qualities arose, how they can be exacerbated or avoided, and proper “tasting room” descriptions. This Glossary will be due NO later than ONE day before the final examination.
Worksheets: This course will have a numerical component as well; when you make analyses of various aspects of grape or wine characteristics, often this will require the derivation of a number indicating a useful parameter. You will be given exercises on-line to download as *.pdf (portable document format) files.

These problems will be UNIQUE for each student in that subtle aspects of the analysis will be changed. You will not be able to collaborate directly with your colleagues; this part of the course is between YOU and ME. If you have questions about how to do an analysis, or the meaning, you should direct your comments to your instructor.

NOTE: NO late submissions are allowed for worksheets.

Quizzes and Examinations

Quizzes: Most MODULES have assessment components. Your quizzes will be given on-line and will be available only for a set time period. For example, if we are to take a quiz at the end of MODULE 4 (and we are) the quiz will “uncover” itself and be available for a MAXIMUM of 48 hours. Questions will be multiple choice, short answer, calculation, or essay. All but the essay will be machine-graded to avoid bias. Missed quizzes will result in a grade of ZERO. The lowest quiz score will be dropped before calculating the final grade.

Examinations: Exams are longer and more involved than quizzes. There will be two of these a mid-term and final. Please note that examinations will be taken in class. If you have a scheduling conflict, please see your instructor BEFORE a quiz. Missed exams will result in a grade of ZERO.

Grading Information (Required)

Grading Scale

A total of 1,966 points are available in this course. They are available according to the following breakdown for each category:

<table>
<thead>
<tr>
<th>Grade Category</th>
<th>Times/semester</th>
<th>Max Points Each</th>
<th>Max/week</th>
<th>Max/Term</th>
<th>% of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discussion Forum</td>
<td>Weekly</td>
<td>4</td>
<td>8</td>
<td>112</td>
<td>11.76%</td>
</tr>
<tr>
<td>Reading &amp; Writing</td>
<td>7</td>
<td>25</td>
<td>25</td>
<td>175</td>
<td>18.38%</td>
</tr>
<tr>
<td>Worksheets</td>
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<td>20</td>
<td>25</td>
<td>125</td>
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</tr>
<tr>
<td>Quizzes</td>
<td>4</td>
<td>50</td>
<td>35</td>
<td>140</td>
<td>14.71%</td>
</tr>
<tr>
<td>Examinations</td>
<td>2</td>
<td>100</td>
<td>100</td>
<td>200</td>
<td>21.01%</td>
</tr>
<tr>
<td>Written Papers</td>
<td>1</td>
<td>50</td>
<td>100</td>
<td>100</td>
<td>10.50%</td>
</tr>
<tr>
<td>Glossary Project</td>
<td>1</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>10.50%</td>
</tr>
</tbody>
</table>

Grades will be assigned to reflect the number of points (of 952) earned, in accordance with the following scale:

<table>
<thead>
<tr>
<th>Grades</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>866</td>
</tr>
<tr>
<td>A-</td>
<td>857</td>
</tr>
<tr>
<td>B+</td>
<td>838</td>
</tr>
<tr>
<td>B</td>
<td>828</td>
</tr>
<tr>
<td>B-</td>
<td>771</td>
</tr>
<tr>
<td>C+</td>
<td>752</td>
</tr>
</tbody>
</table>
Schedule

We will meet once per week during the semester (6:30 p.m. on Tuesdays). During this period, we will discuss, as is given above, various chemical and biochemical highlights of wine production, including the relationship between grape quality and wine quality. Part of the wine experience is, of course, sensory analysis. Because this course is not required for an Associate’s or Bachelor’s degree, it does not fall under California’s new “sip-and-spit” law allowing limited tasting for those 18 -21. For that reason, we cannot “taste,” but there is nothing forbidden about evaluating aromas, which we will do when the time to time when it is appropriate for the lesson.

Important Dates

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>August 24</td>
<td>First day of Instruction</td>
</tr>
<tr>
<td>September 6</td>
<td>Last day to drop without a “W”</td>
</tr>
<tr>
<td>September 13</td>
<td>Last day to add classes</td>
</tr>
<tr>
<td>September 21</td>
<td>Enrollment census date for Fall</td>
</tr>
<tr>
<td>November 11</td>
<td>Veteran’s Day – campus closed</td>
</tr>
<tr>
<td>November 17</td>
<td>Last day to Withdraw</td>
</tr>
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</table>

AREAS OF EVALUATION

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>10.50%</td>
</tr>
<tr>
<td>C-</td>
<td>11.76%</td>
</tr>
<tr>
<td>D+</td>
<td>18.38%</td>
</tr>
<tr>
<td>D</td>
<td>13.13%</td>
</tr>
<tr>
<td>D-</td>
<td>14.71%</td>
</tr>
<tr>
<td>F</td>
<td>21.01%</td>
</tr>
<tr>
<td></td>
<td>10.50%</td>
</tr>
</tbody>
</table>
Attendance

If you intend to come to class, please arrive on time. You must complete all graded exercises in order to receive a passing grade in the class. One of the wonderful aspects of the study of wine is its universality and community; the more you interact and discuss items of interest of curiosity with your classmates, the more you will learn. I encourage you to form groups dedicated to the course or to the study of your favorite wine or style (e.g., Alsace or Porto). Such interests can last a lifetime.

Reporting and paper format will be discussed, developed, and refined in class.

Emergencies and Building Evacuations

If you hear a continuously sounding alarm, or are told to evacuate the building by an Emergency Coordinator, walk quickly to the nearest exit. Take your personal belongings as you may not be allowed to return. Follow the instructions of the Emergency Coordinators. Be quiet so you can hear instructions. Once outside, move away from the building. Do not return to the building unless the Police or the Emergency Coordinator announces that this is permissible.

Library Liaison
Jennifer Dinalo, jennifer.dinalo@sjsu.edu

Dropping and Adding

Students are responsible for understanding the policies and procedures about add/drop, grade forgiveness, etc. Refer to the current semester’s Catalog Policies section at http://info.sjsu.edu/static/catalog/policies.html. Add/drop deadlines can be found on the current academic calendar web page located at http://info.sjsu.edu/home/schedules.html. The Late Drop Policy is available at http://www.sjsu.edu/aars/policies/latedrops/policy/. Students should be aware of the current deadlines and penalties for dropping classes.

Information about the latest changes and news is available at the Advising Hub at http://www.sjsu.edu/advising/.

University Policies

Academic integrity

Students should know that the University’s Academic Integrity Policy is available at http://info.sjsu.edu/static/catalog/integrity.html. Your own commitment to learning, as evidenced by your enrollment at San Jose State University, and the University’s integrity policy, require you to be honest in all your academic course work. Faculty members are required to report all infractions to the office of Student Conduct and Ethical Development. The Student Conduct and Ethical Development website is available at http://www.sjsu.edu/studentconduct/.

Instances of academic dishonesty will not be tolerated. Cheating on exams or plagiarism (presenting the work of another as your own, or the use of another person’s ideas without giving proper credit) will result in a failing grade and sanctions by the University. For this class, all graded materials must be the original work of the student to whom the grade is assigned unless otherwise specified. Under no circumstances may you look at
another student’s written report prior to turning in your own report nor may you provide a copy of your report to another student. This includes materials submitted for peer review! Any text, diagram, chart or data that is not the product of the student author must cite a reference next to it for the source as appropriate. This includes (but is not limited to) material taken from reference books, tables, primary research literature, laboratory manuals and computer programs. Failure to adhere to the principles that protect the academic integrity of this course will be dealt with according to the policies and procedures of the Department of Chemistry, the College of Science and San Jose State University.

If you would like to include in your assignment any material you have submitted, or plan to submit for another class, please note that SJSU’s Academic Policy F06-1 requires approval of instructors.

Campus Policy in Compliance with the American Disabilities Act

If you need course adaptations or accommodations because of a disability, or if you need to make special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during office hours. Presidential Directive 97-03 at http://www.sjsu.edu/president/docs/directives/PD_1997-03.pdf requires that students with disabilities requesting accommodations must register with the Accessible Education Center (AEC) at http://www.sjsu.edu/aec to establish a record of their disability.

If you need to make special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during office hours.

Peer Connections

Peer Connections is the campus-wide resource for mentoring and tutoring located in Room 600 in the Student Services Center. It is designed to inspire students to develop their potential as independent learners while they learn to successfully navigate through their university experience. The center provides support services which include course-content based tutoring, enhanced study and time management skills, more effective critical thinking strategies, decision making and problem-solving abilities, and campus resource referrals. The Peer Connections website is located at http://peerconnections.sjsu.edu/
CHEM 172/ Chemistry of Wine Course Schedule

List the agenda for the semester including when and where the final exam will be held. Indicate the schedule is subject to change with fair notice and how the notice will be made available.

Course Schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topics, Readings, Assignments, Deadlines</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8/30/2016</td>
<td>Module 1, part A – Protocols for sampling, concepts and terms for fruit and wine quality.</td>
</tr>
<tr>
<td>1</td>
<td>8/30-9/5</td>
<td>Worksheet 0, Reading assignment for Module 1</td>
</tr>
<tr>
<td>2</td>
<td>9/13</td>
<td>Module 1 part B, maturation fruit, analytical methods to obtain data to support a harvest decision.</td>
</tr>
<tr>
<td>2</td>
<td>9/13-9/19</td>
<td>Worksheet 1, Reading and writing assignment for Module 1</td>
</tr>
<tr>
<td>3</td>
<td>9/20</td>
<td>Module 2 – Preparing the winery for harvest.</td>
</tr>
<tr>
<td>3</td>
<td>9/20-9/26</td>
<td>Quiz #1; writing summary due</td>
</tr>
<tr>
<td>4</td>
<td>9/27</td>
<td>Module 3, part A – Fermentation and Microbiology – stemming, crushing, fermenters, environmental factors affecting yeast biochemistry.</td>
</tr>
<tr>
<td>4</td>
<td>9/27-10/3</td>
<td>Reading and writing assignment for Module 3</td>
</tr>
<tr>
<td>5</td>
<td>10/4</td>
<td>Module 3, part B – Fermentation and Microbiology – microorganism-based faults and flaws such as <em>Brettanomyces</em>, <em>Pediococcus</em>, <em>Lactobacillus</em>, etc.</td>
</tr>
<tr>
<td>5</td>
<td>10/4-10/10</td>
<td>Worksheet 3; Quiz #2</td>
</tr>
<tr>
<td>6</td>
<td>10/11</td>
<td>Module 4 – part A – wine and must adjustments and their limitations – identification and sources of flaws and what NOT to do to fix them.</td>
</tr>
<tr>
<td>6</td>
<td>10/11-10/17</td>
<td>Reading and writing assignment for Module 4</td>
</tr>
<tr>
<td>7</td>
<td>10/18</td>
<td>Mid-term examination</td>
</tr>
<tr>
<td>7</td>
<td>10/18-10/24</td>
<td>No assignment</td>
</tr>
<tr>
<td>8</td>
<td>10/25</td>
<td>Module 4 - part B – Chemical wine &amp; must adjustments and their limitations - remediation</td>
</tr>
<tr>
<td>8</td>
<td>10/25-10/31</td>
<td>Worksheet 4</td>
</tr>
<tr>
<td>9</td>
<td>11/1</td>
<td>Module 6 part A– methods of analyses in the field and the winery laboratory</td>
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<td>9</td>
<td>11/1-11/7</td>
<td>Reading and writing assignment for module 6</td>
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<tr>
<td>10</td>
<td>11/8</td>
<td>Module 7: Chemical components of wine (color)</td>
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<td>10</td>
<td>11/8-11/14</td>
<td>Quiz #3; Reading and writing assignment</td>
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<td>11</td>
<td>11/15</td>
<td>Module 7: Chemical components of wine (acid, sugars)</td>
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<td>11</td>
<td>11/15-11/21</td>
<td>Reading and writing assignment</td>
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<td>12</td>
<td>11/22</td>
<td>Module 8: Wine Balance</td>
</tr>
<tr>
<td>Week</td>
<td>Date</td>
<td>Topics, Readings, Assignments, Deadlines</td>
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<tr>
<td>12</td>
<td>11/22-11/28</td>
<td>Worksheet 5</td>
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<tr>
<td>13</td>
<td>11/29</td>
<td>Aroma, Flavor, &amp; Sensory Analysis part A – green characters</td>
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<td>13</td>
<td>11/29-12/5</td>
<td>Quiz #5: formalized writing assignment due, glossary project warning (due no later than 12/19).</td>
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<tr>
<td>14</td>
<td>12/6</td>
<td>Aroma, Flavor, &amp; Sensory Analysis part B – monoterpenes, VA, and the tyranny of expectations.</td>
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<tr>
<td>14</td>
<td>12/20</td>
<td>Final Examination (cumulative).</td>
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