Instructor: Dr. Mark Morvant  
Office: Copeland 101  
Email: mmorvant@ou.edu  
Phone: (405) 325-0763  
Office Hours: MW 3:30-4:30 pm, Copeland 101  
Learning Management System: https://learn.ou.edu  
Course Site: https://janux.ou.edu

Course Prerequisite: Monday 2:30-3:20, PHSC 122  
Course Prerequisite: CHEM 3053: Organic Chemistry Biological Emphasis I  
Course Delivery: Blended

Course Description:
This course covers the process of brewing from grain to final bottle product and the chemical and biochemical process involved in each step. Students will be required to utilize previous knowledge in General and Organic chemistry to understand: chemistry of the ingredients and products and the molecules involved in the biochemical processes. During the course, students will also learn the similarities and differences between beer styles, the impact of brewing techniques as related to chemical processes, and the chemical compounds that impact beer aesthetics. There is a great deal of Biochemistry and Organic Chemistry involved in the malting, mashing and fermentation process and understanding the chemistry behind the flavor, aroma, and color of beer.

Course Goals:
The overall goal of this course is for the student to understand the Biochemistry and Organic Chemistry of the brewing and beer by understanding the mechanism for the transformation of the four main ingredients into beer.

Learning Outcomes:
At the successful completion of the course, student will be able to:

1) Describe the steps and processes involved in brewing: Malting, Kilning, Mashing, Lautering, Boiling, Hopping, Fermentation, Finishing, and Packaging
2) Outline the aspects of brewing conditions effecting beer quality throughout the brewing process as related to the chemical compounds or transformations
3) Relate ingredient selection (grain, hops, yeast, water) to various styles of beer
4) Predict the effects of appropriate versus improper brewing conditions on the chemo of the beer
5) Explain the chemical process to each step of brewing process
6) Illustrate the chemical and biochemical processes in brewing, including: Alcohol Metabolism, Starch Conversions, Maillard Reactions, Isomerization of a-Acids, Glycolysis, TCS, and Anaerobic Respiration
7) Summarize techniques associated with the quality beer
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Specific learning outcomes for each unit are listed online at janux.ou.edu and in the appendix of the syllabus. Students should become familiar with the specific learning outcomes for each unit to prepare for the quizzes, discussions, and Final Exam.

**Texts and Materials:**

All of the course materials are available in Janux or by links to content listed in Janux.

**Teaching Philosophy:**

Learning is a process. To learn, a student must engage in the process. I design my courses to facilitate the learning process, but a student will only learn if they engage in course through reading, video, discussions, interactions, and assessments.

Learning is social. The feedback from the instructor and fellow students is important in mastery of the content and concepts within the course. Collaboration is strongly encouraged in this course during the learning process. Of course, collaboration on graded assignments is a violation of academic integrity unless the assignment is specifically noted as a group assignment.

Learning takes time and effort. You are building new connections in your brain when learning. This cannot be done quickly or without effort. It is important to take time to study, practice, and reflect in this course.

**Expectations:**

You can expect me to:

- Challenge you to think about and understand the material in this course.
- Encourage you to learn the material in this course and become a life long learner.
- Be available for office hours and return e-mails in a timely fashion, within 24 hours.
- Return written assignments in a week or less, quizzes and exams in 72 hours or less.
- Engage you in the lecture and around campus.

I expect you to:

- Attend class and be engaged.
- Study at least 2 hours outside of class for every hour of class (Nationwide Standard)
- Keep up with reading and end of chapter problems.
- Accept responsibility for your learning.

**Learning Activities and Assessment**

**Quizzes:**

The quizzes will consist of selected response questions and be worth twenty points. The questions on the quizzes will come from the prior video, required reading materials, and discussions. The quizzes submitted late will be worth a maximum of 15 points.
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Discussions
Participation in discussions in the online platform are an important part of the learning process in this course. It is important that discussion be thoughtful, civil, and well written. It is acceptable and encouraged to read through the discussion topics before providing your original response. The discussions will be graded on participation as well as the demonstration of understanding of the chemical concepts in the unit. A rubric for each Discussions will be available on the learning management system.

Final Exam
The Final Exam will be 100-points and may contain both selected response (multiple choice, ranking, matching…) and free response questions (short answer, structure, mechanism…). The questions on Final Exam will come from the prior video and reading material, as well as discussions within the online platform and in class. The Final Exam will be given in-person during the Final Exam period.

Alignment of Course Learning Outcomes with Assessments and Learning Activities

<table>
<thead>
<tr>
<th>Student Learning Outcomes</th>
<th>Learning Activities</th>
<th>Quizzes (8@20)</th>
<th>Discussions (8@5)</th>
<th>Final Exam</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Describe the steps and processes involved in brewing: Malting, Kilning, Mashing, Lautering, Boiling, Hopping, Fermentation, Finishing, and Packaging</td>
<td>Video and Reading</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>2) Outline the aspects of brewing conditions effecting beer quality throughout the brewing process as related to the chemical compounds or transformations</td>
<td>Video, Reading and Discussions</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>3) Relate ingredient selection (grain, hops, yeast, water) to various styles of beer</td>
<td>Video, Reading and Discussions</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>4) Predict the effects of appropriate versus improper brewing conditions on the chemo of the beer</td>
<td>Video, Reading and Discussions</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>5) Explain the chemical process to each step of brewing process</td>
<td>Video and Reading</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>6) Illustrate the chemical and biochemical processes in brewing, including: Alcohol Metabolism, Starch Conversions, Maillard Reactions, Isomerization of a-Acids, Glycolysis, TCS, and Anaerobic Respiration</td>
<td>Video and Reading</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>7) Summarize techniques associated with the quality beer</td>
<td>Video, Reading and Discussions</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

| Maximum Points | 160 | 40 | 100 |

* A rubric should be used to determine the quality of the discussions.
Final Grade:
The course grade will be determined by the average of the quizzes, discussions, and Final Exam. The final letter grading for the course will be as follows: A $\geq$ 90%, B = 89-80%, C = 79-70%, D = 69-60%, F = <60%. The instructor will round all averages to two significant figures (69.5 will round to 70 and 69.4 will round to 69) to determine the student's letter grade in the course (70 = C, 69 = D).

There is no curve in this course. The instructor reserves the right to make linear adjustments to quiz and final exam grades in cases were a quiz or exam question was found to be in error or unreasonably difficult. Linear adjustments will not be made to increase the average on a quiz or Final Exam.

<table>
<thead>
<tr>
<th>COURSE GRADE</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Quizzes</td>
<td>8@20</td>
</tr>
<tr>
<td>Discussions</td>
<td>8@5</td>
</tr>
<tr>
<td>Final Exam</td>
<td>100</td>
</tr>
<tr>
<td>Points Possible</td>
<td></td>
</tr>
</tbody>
</table>

Additional Support for Learning
The University of Oklahoma provides additional support to assist in your success in this class. The University College provides free tutoring through the Action Tutoring, [www.ou.edu/univcoll/action_tutoring.html](http://www.ou.edu/univcoll/action_tutoring.html). The Writing Center, [www.ou.edu/writingcenter/](http://www.ou.edu/writingcenter/), provides assistance on writing and consultations to improve writing skills.

Course Policies

**Make-up Policy**
Although the Instructor does not expect a student to miss an assignment, if a student does miss an assignment for a legitimate, verifiable reason, the Instructor will work with the student to provide an opportunity for make-up work.

**Absences**
Attending every lecture is highly recommended and expected. Not attending class will have an indirect negative effect on your grade. If low attendance to lectures becomes problematic, the instructor reserves the right to use attendance as extra-credit. There will not be assigned seating in the lecture, but students are expected to sit next to their study group partners to facilitate communication during problem solving sessions in class.

**Civility**
All students are expected to follow proper classroom behavior and treat other students and the instructor with respect. If the instructor deems a student’s actions or behavior disruptive to the class, the students will be asked to leave the class for that day.

**Emergency Contact**
In case of family or medical emergencies, students can leave a message on the instructor’s voice mail (405-325-9011) or by e-mail (mmorvant@ou.edu). Once the emergency has passed, the student can meet with the instructor to discuss what material/assignments the student has missed and what steps would beneficial to aid the student in continued success in the course.
Changes in the Syllabus

As the course develops, it might be desirable/necessary to make appropriate changes in aspects of this syllabus. The Instructor reserves the right to make changes if desirable or necessary.

University Policies

Academic Integrity:
All students are expected to conform to college-level standards of ethics, academic integrity, and academic honesty. By enrolling in this course, you agree to be bound by the Academic Misconduct Code published in The University of Oklahoma Student Code (www.ou.edu/studentcode/OUStudentCode.pdf). For further clarification please see: www.ou.edu/provost/integrity-rights/.

All members of the community recognize the necessity of being honest with themselves and with others. Cheating in class, plagiarizing, lying and employing other modes of deceit diminish the integrity of the educational experience. None of these should be used as a strategy to obtain a false sense of success. The need for honest relations among all members of the community is essential.

Religious Observance:
It is the policy of the University to excuse the absences of students that result from religious observances and to reschedule examinations and additional required classwork that may fall on religious holidays, without penalty.

Reasonable Accommodation Policy:

Students requiring academic accommodation should contact the Disability Resource Center for assistance at (405) 325-3852 or TDD: (405) 325-4173. For more information please see the Disability Resource Center website http://www.ou.edu/drc/home.html.

Any student in this course who has a disability that may prevent him or her from fully demonstrating his or her abilities should contact me personally as soon as possible so we can discuss accommodations necessary to ensure full participation and facilitate your educational opportunities.

Every effort has been made to make the platform and content accessible. If you have any difficulty with the content on Janux or with the platform please contact info@nextthought.com.
## Tentative Schedule

<table>
<thead>
<tr>
<th>Unit</th>
<th>Topic</th>
<th>Lessons Available On</th>
<th>Discussion Responses By</th>
<th>Quiz: Available On</th>
<th>Quiz: Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Overview of Brewing</td>
<td>August 18</td>
<td>August 22</td>
<td>August 22</td>
<td>August 24</td>
</tr>
<tr>
<td>2</td>
<td>Health Impact of Alcohol</td>
<td>August 25</td>
<td>August 29</td>
<td>August 29</td>
<td>August 31</td>
</tr>
<tr>
<td>3</td>
<td>Beer Styles</td>
<td>September 1</td>
<td>September 5</td>
<td>September 5</td>
<td>September 7</td>
</tr>
<tr>
<td>4</td>
<td>Malting and Kilning</td>
<td>September 8</td>
<td>September 12</td>
<td>September 12</td>
<td>September 14</td>
</tr>
<tr>
<td>5</td>
<td>Mashing and Lautering</td>
<td>September 15</td>
<td>September 19</td>
<td>September 19</td>
<td>September 21</td>
</tr>
<tr>
<td>6</td>
<td>Boiling and Hopping</td>
<td>September 22</td>
<td>September 26</td>
<td>September 26</td>
<td>September 28</td>
</tr>
<tr>
<td>7</td>
<td>Fermentation</td>
<td>September 29</td>
<td>October 3</td>
<td>October 3</td>
<td>October 5</td>
</tr>
<tr>
<td>8</td>
<td>Finishing and Packaging</td>
<td>October 6</td>
<td>October 10</td>
<td>October 10</td>
<td>October 12</td>
</tr>
</tbody>
</table>