Spring 2016
The Chemistry of Alcohol
Chem 283  Maybank 322
Jan 11, 25  Feb 1, 8, 15, 22, 29  March 14, 21, 28  April 4, 11, 18
6:30-8:15pm
Instructor: Michael Cohen
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e-mail: orthowine@gmail.com, cohenmm@cofc.edu
Office hours: By appointment.

Course prerequisites: one year college level biology or chemistry

Course description:
This course will explore the understandings of chemistry and it’s application in the creation of alcoholic beverages. Beer, wine and spirit will be broken down to the molecular level to gain an understanding of how fermentation works to create such radically different alcoholic beverages available in the market place. Laboratory analysis will be conducted in conjunction with the course.

Student Learning Outcomes:
Topics:
• Learn of the basic components of beer and how they are manipulated to create differing flavor profiles
• Understand the concept of acidity in wine and titrate out an example in a laboratory setting
• Evaluate the contribution of wood and its components in the creation of alcohol
• Understand the biochemistry behind sensory analysis and how it impacts organoleptics with respect to the wine industry

Learning methods: The class is broken up into three sections: wine, spirit, beer. The start of class teaches the nuances of microbiology in regards to the creation of beer. The students will make their own beer with the ability to manipulate the process from learned objectives in lecture. Wine science reviews the basics of fermentation and then delves into the science of manipulation of all facets of wine production. This culminates in the lab mid term identifying titratable acidity in wine. Distillation chemistry will be taught with an emphasis on chemistry as it pertains to batch distillation and continuous distillation. All concepts including fermentation, aging in wood, and transition of organoleptics in spirit will be covered.

The course will support the School of Science and Math learning goals:
• Effective Communications: The students are encouraged to participate in interactive lecture discussion of material. Field trips to a brewery and a distillery will provide the student an opportunity to interact with experts in their particular field
• Ethical Awareness: Students will recognize and be able to appraise ethical dilemmas involved in Science and Math industries. Medical science will be incorporated into the curriculum to expose the student to medical issues as they pertain to alcohol production and consumption.
• Global Awareness: Students will exposed to the international contributions of scientists who have expanded the base knowledge of chemistry as it pertains to alcohol. The need for future scientific discovery as it pertains to alcohol creation will be stressed.
· **Problem Solving Ability:** Students will be tasked with creating beer, analyzing this in a laboratory setting and submitting their scientific discovery for mid-term grading. Additionally, students will select a wine of their choosing for a laboratory analysis of titratable acidity and submit their findings for the second mid-term. Lecture material will provide directional assistance in this creation.

**Recommended Text:**
The Chemistry of Alcohol
By Michael Cohen, DO FAAOS
Spiral bound book offered by the book store

**Academic Integrity:** The College of Charleston’s Honor Code is in effect in this course. Any student caught cheating will receive a failing grade in the course and additional action may be taken. Cheating includes copying someone else’s work in exams, quizzes, and assignments. It includes using notes and other aids during exams when not authorized to do so, collaborating with others for take-home exams, using someone else’s idea’s without referencing them, or turning in an assignment for this class that was submitted, in whole or in part, for another class. Cheating also includes the allowing of one’s work to be copied by another and doing work for another student. If you are unclear about what constitutes cheating, please see the Instructor.

· **Students Needing Access Parity (SNAP)** – We provide services and accommodations for students with disabilities (physical, psychological, learning or attentional) that have been documented by a qualified MD or psychologist. Documentation must meet criteria published in the SNAP brochure and on our website http://disabilityservices.cofc.edu. Accommodations are decided on a case-by-case basis and are determined by the type and severity of the disability and the essential elements of the course the student is taking. Accommodations are designed to provide access to education and to circumvent or reduce the effect of the disability as much as possible, not to give advantage or guarantee success.

**Grades:**

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<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>A</td>
<td>92-100</td>
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<tr>
<td>A-</td>
<td>89-91.9</td>
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<tr>
<td>A+</td>
<td>86-88.9</td>
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<tr>
<td>B</td>
<td>81-86</td>
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<tr>
<td>B+</td>
<td>79-80.9</td>
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<tr>
<td>C</td>
<td>77-78.9</td>
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<tr>
<td>C+</td>
<td>72-76.9</td>
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<tr>
<td>C-</td>
<td>70-71.9</td>
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<tr>
<td>D</td>
<td>67-69.9</td>
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<tr>
<td>D+</td>
<td>60-66.9</td>
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<td>F</td>
<td>59 or less</td>
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**Factors in Grading:** There will be two mid-term examinations. The first is the creation of beer during the first section of the course culminating in a laboratory analysis of this product. The second mid-term will be a laboratory experiment to titrate acidity from a wine of the students choosing. The final exam will have an emphasis on the last section of the course which is spirit chemistry, but the final exam will be COMPREHENSIVE for the entire course. The final exam will count 50% towards the final grade.

Class participation, attitude, and demeanor will be noted by the instructor and used to swing grades up or down.

**Class attendance and participation:** Attendance is important. Due to the in depth coverage of the subject matter, missing one class can be difficult to make up on your own. Research indicates that class discussion/participation fosters enhanced learning for all members of the class.

- Anyone missing more than 2 classes may be deemed ineligible for a grade of ‘A’
• Anyone missing more than 3 classes may be deemed ineligible for a grade of ‘B’
• Anyone missing more than 4 classes may be deemed ineligible for a grade of ‘C’
• Anyone missing more than 5 classes may be deemed ineligible for a grade of ‘D’

**Attendance is only excused for medical or other serious and legitimate reasons. Students MUST submit documentation for any absence considered for excuse.**