Beer and Wine

Introduction: We will introduce and demonstrate the process of home wine and beer production, expose students to the unique flavorants and odorants of beer and wine to learn the associated beverage notes, and then taste a range of beers and wines.

Background: Beer, Wine, Whiskey, Gin, Sake, Tequila; at the heart of each of these and many more liquors is a basic process which shares its science and technology with baking bread, making cheese and other microbiology sciences. The process has been refined for over 7000 years. Sumerians wrote poems of the effects of wine on cranky teenage princesses, chemists have found trace molecules from beer in ancient Chinese containers, and the code of Hammurabi included punishments for overcharging tavern customers for drink! Someone, somewhere first found some wild yeast growing in liquid with a sugar or starch source and convinced someone to try it, and an alcoholic drink was born.

For any alcoholic beverage, the basics are simple: water, yeast, a source of sugar and time. This is alcoholic fermentation. Depending on the conditions (anaerobic and the type of yeast) carbohydrates are primarily metabolized to ethanol and carbon dioxide. While bakers use the carbon dioxide to give rise to their dough, the ethanol is the prized final compound produced by the microbiological factories for alcoholic drinks. The starting source of sugar demands a method to harvest the simple sugars (fruit and grapes) or to convert the complex carbohydrates (starches) from seeds and cereals into simple sugars using a method called malting and mashing. Fermented beverages including wine, beer, sake, cider and mead, involve minimal post fermentation processing and are not enriched in their alcoholic content. Liquor, hard liquor, spirits or more formally distilled spirits, begin with the same basic principle of fermented beverages. That is, a sugar source and yeast. As per the name "distilled spirits", the fermented liquid is enriched in its ethanol content by distillation. Alcoholic beverages owe their flavor and color to the starting compounds, the strain of yeast, and how the fermented mother liquor is processed. Some of the beverages are aged for more complex flavors and others are bottled for immediate consumption.

The aroma and flavors of beer and wine are due to the starting products, reactions of fermentation and the interaction-reactions of fermented sugars, skins, hops and other compounds with each other and oxygen. As you go through this laboratory, consider the molecular nature of each compound, how and from what it was generated and the mixture of aromas and flavorants that give each beverage its unique taste and quality.

SAFETY REMINDER: California State Law: Sections 25658 and 25662 of, and to add Section 25668 to, the Business and Professions Code, relating to alcoholic beverage control, allows for qualified students at an academic institution to taste alcoholic beverage while being trained in the production of wine or beer for educational purposes as part of a bachelor's degree. "taste" means to draw an alcoholic beverage into the mouth, but does NOT include swallowing or otherwise consuming the alcoholic beverage. SPIT IT OUT PEOPLE!

How to appreciate beer and wine:

Judging beer and wine is a serious and lucrative business or a very expensive hobby! For the purposes of this class, we will use the Beer Judge Certification Program instructions for describing styles of beer and their scoresheet. The respected magazine WineEnthusiast and book (with website) Wine Folly The Master Guide, Magnum Edition are used liberally to describe how to smell, taste and judge a wine.

Judging a Beer

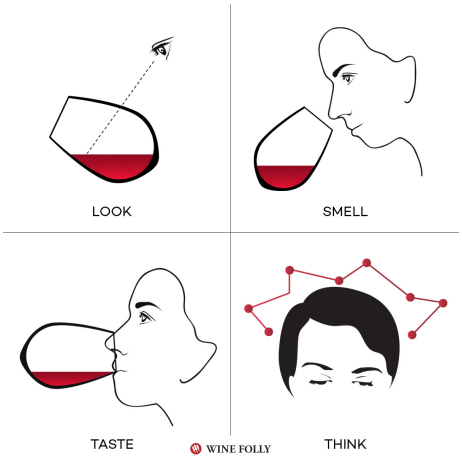
1. Make sure your bottle of beer is around 45 to 50 degrees in temperature. If it is too cold then a lot of the flavors and aromas will be subdued. Evaluate your bottle to make sure it has a proper fill level and to see if you can see any signs of infection-like a ring around the top of the fill.
2. Open the bottle. Listen for a "pssft" noise, which if it not present could be a sign of under carbonation. Pour your sample and immediately take a deep sniff. Write down any smells that you notice in the **Aroma** category.
3. Cover your cup with your extra cup (to hold in the aromas) and then hold both cups up to the light so you can better see through. Write down the color of the beer, how clear the beer is and the color and visual appearance of the foam in the **Appearance** category.
4. Swirl the beer in the cup and then remove the extra cup and sniff again. Write down any additional on smells you now perceive in the **Aroma** section.
5. Finally, you can now take a sip of the beer. Make sure it hits all parts of the inside of your mouth. Swallow the beer. Now in the **Flavor** section write down any of the flavors that you notice considering the malt, hops or other characteristics.
6. Take another sip and note of the mouthfeel of the beer by identifying the body, the carbonation level, the creaminess, the presence of alcohol warmth, or any astringent (puckering on the tongue) feeling. Write these perceptions under the **Mouthfeel** category.
7. Take another sip and go back to the flavor category. Identify the level of hop bitterness as well as the level and kind of hop flavor. Identify the finish of the beer which is where it lies on the spectrum of dry to sweet.
8. Continue to sip and identify other aspects of the beer. As it warms different flavors will come forward, or fade away.
9. Compare your perceived notes to the style guidelines and see how much they match up. Try to allocate points accordingly to the **Aroma**, **Appearance**, **Flavor** and **Mouthfeel** areas.
10. Provide your **Overall Impression** and how well, or not well, the beer is a representation of the style. Assign an overall impression score.
11. Add up your total points and assign a final number. Does that number fall in the range for how you feel this beer should be scored based on the scoring guide (lower left)?
12. Lastly make sure to check any of the descriptor definition check boxes on the left hand side of the style guideline sheet. Also check off the stylistic accuracy, technical merit, and intangible boxes.
13. See the website for the BJCP style guide and scoresheet.

The "Art" of Wine Judging

Judging appearance The first step is to look at the wine against a white backdrop, like a blank piece of paper. This ensures that wines are not distorted by external colors. In addition to the color, there are various levels of intensity to gauge. White wines gain color as they age, ranging from lemon and gold to dark caramel. By contrast, reds lose color and intensity with age, as they progress from purple to ruby to deep tawny. So while a typical aged Italian Barolo might be described as pale or medium garnet (a hue between ruby and tawny), a young Australian shiraz (also known as shyah) may lean toward deep purple or ruby.

- White wines deeper in color is usually an indication of aging or oxidation. White wines aged in oak have a deeper color than white wines aged in stainless steel, which doesn't let the oxygen in.
- Rose wines have a pale to medium red color intensity due to how long the winemaker leaves the must exposed to the juice and the level of maceration.

- Red wines with a red-colored tint likely have a higher acidity (lower pH) (what is the pH indicator????) while those that are more purple or even blue will be more alkali (still acidic, but less so than the red tinted wines). A deeply colored opaque red wine is likely to be youthful with a higher tannin content. All red wines become more pale as the tannins oxidize.
- Viscosity – wines with higher viscosity have higher alcohol or sugar content or both. The wine legs (tears) are also called the Gibbs-Marangoni effect. Caused by fluid surface tension created from evaporating alcohol. See Winefolly.com for images showing these descriptions.



Approaching the nose Here's where it starts to get fun. First, you swirl. Swirling allows for increased oxygenation, which can bring out more complex secondary aromas.

- The first assessment is to determine if the wine is clean or faulty. Hold your glass under your nose and take a small sniff to "prime" your senses. Then swirl the wine and take a slow, delicate wiff of the wine. Pause and pick out the aroma.
- Faults can include excess levels of brettanomyces, cork taint, volatile acidity or oxidization. Once you've determined a wine is free of faults, the next step is to gauge intensity.
- What to smell
  - Fruit – First, try to pick out a fruit aroma. Second see if you can add an adjective. If you are getting strawberry whit kind of strawberry is it? Fresh, ripe, stewed, dried? Two to three fruits is a good objective.
  - Herb/Other – Some wines are more savory than others and have many non-fruit smells including herbs, flowers and minerals. Be descriptive.
  - Oak – If a wine has aromas of oak it might have been aged in a barrel or oak chips/spirals soaked in the wine. Different species of oak (see your book) will add dill and coconut (American) vanilla, allspice and nutmeg (European). The level of toast (char) to the oak will also add to the complexity.
  - Earth – When you taste earthiness, try to figure out if it smells organic (loam, mushroom, forest floor), or inorganic (slate, chalk, gravel clay). This group of aromas is thought to be microbial derived and gives clues to the origin of the wine.
- Intensity is usually measured on a scale of low, medium or high. If you can smell a wine from a few inches away, it's generally regarded as high intensity. If you must put your nose slightly inside the glass, that would equate to a medium intensity. Medium-minus and medium-plus cover the ranges in-between. If you can detect the wine's aroma with the glass just below your nose, it might be considered medium-plus.
- Aroma characteristics are where much obscure wine-geek jargon originates. Aromas of pencil shavings, cat pee, rubber hose or wet dog? The tasting grid tries to eliminate these subjective and eccentric descriptors with specific, standardized terms for each aroma cluster.

Evaluating the palate The description of the palate, or what you taste, is by far the most in-depth category. A complete tasting note would include levels of sweetness, acid, tannin, alcohol, body and intensity. Once again, these are all graded at low, medium and high levels, with plus or minus used as modifiers for the medium range. Flavor characteristics and finish are factored in as well.

- With flavor, the wine is to be described in terms of primary attributes like fruit, floral, herbal or spice. Secondary characteristics include oak, earth, and flavors that result from production techniques like malolactic fermentation and lees contact.
- Tertiary factors can be bottle age, oxidation and long-term fruit development.

Think – Developing your palate will not happen overnight. It is a process of actively tasting and more important, thinking about what you like and why. Keep notes and compare wines.

Part 1: Home Brew and Wine Production
This is a demonstrated only function. Your instructor and/or invited guest will bring the materials needed to brew beer or ferment and bottle wine.

Beer and Wine – introduction to steps of homebrew beer and considerations for choosing starting components. Observe and take notes!

Part 2: Beer aroma and flavorants – judging beer.

A. Analysis of beer adulterants. You and your partner will select 5 of the beer sensory samples (BSS #1-#5). Using your disposable pipette, transfer a few drops of doctored beer into a labeled cup (BSS#1-#5). Each is labeled contains a specific flavorants/odorant. ONLY smell the beer (please don't drink the beer). Share your thoughts with your lab partners. Write down notes for each sample. Then uncover the answer provided at each desk. Re-smell your samples.

B. Tasting Beer. Your instructor's chipper assistant, Dr. Bolender, has gone way out of his way to prepare two types of beer. He will describe the process by which he made the beer. Record the ingredients and the types of yeast he used to make this special treat. Other beers will provided. Sniff then taste the beer. Do not swallow, instead spit into your provided spit cup. Use your newly developed sense of taste and small to evaluate each beer following the protocol listed above. Fill out the Beer Scoresheet for each beer.

Part 3. Wine. Wine flavorants. This will repeat part 2 but with wine that was carefully crafted by your glorious instructor Dr. Provost.

A. You will have a series of wine sensory flavors/aromas provided at each station. Repeat as you did with each individual flavor sample and record your observations. This time test 3-4 white wine samples (labeled white sensory sample WSS#) and another 3-4 red wine samples (red sensory sample RSS#).
B. Taste 3-4 wine types. Clear your pallet between tastings with a bit of cracker.

BEER SCORESHEET

http://www.bjcp.org **AHA/BJCP Sanctioned Competition Program** http://www.homebrewersassociation.org

Judge Name (print) _____

Judge BJCP ID _____

Judge Email _____

Use Avery label # 5160

Category # _____ **Subcategory (a-f)** _____ **Entry #** _____

Subcategory (spell out) _____

Special Ingredients: _____

Bottle Inspection: ☐ Appropriate size, cap, fill level, label removal, etc.

Comments _____

BJCP Rank or Status:

☐ Apprentice ☐ Recognized ☐ Certified
☐ National ☐ Master ☐ Grand Master
☐ Honorary Master ☐ Honorary GM ☐ Mead Judge
☐ Provisional Judge ☐ Rank Pending ☐ Cider Judge

Non-BJCP Qualifications:

☐ Professional Brewer ☐ Beer Sommelier ☐ GABF/WBC
☐ Certified Cicerone ☐ Adv. Cicerone ☐ Master Cicerone
☐ Sensory Training ☐ Other _____

Descriptor Definitions (Mark all that apply):

☐ **Acetaldehyde –** Green apple-like aroma and flavor.

☐ **Alcoholic –** The aroma, flavor, and warming effect of ethanol and higher alcohols. Sometimes described as *hot*.

☐ **Astringent –** Puckering, lingering harshness and/or dryness in the finish/aftertaste; harsh graininess; huskiness.

☐ **Diacetyl –** Artificial butter, butterscotch, or toffee aroma and flavor. Sometimes perceived as a slickness on the tongue.

☐ **DMS (dimethyl sulfide) –** At low levels a sweet, cooked or canned corn-like aroma and flavor.

☐ **Estery –** Aroma and/or flavor of any ester (fruits, fruit flavorings, or roses).

☐ **Grassy** – Aroma/flavor of fresh-cut grass or green leaves.

☐ **Light-Struck –** Similar to the aroma of a skunk.

☐ **Metallic –** Tinny, coiny, copper, iron, or blood-like flavor.

☐ **Musty** – Stale, musty, or moldy aromas/flavors.

☐ **Oxidized –** Any one or combination of stale, winy/vinous, cardboard, papery, or sherry-like aromas and flavors.

☐ **Phenolic –** Spicy (clove, pepper), smoky, plastic, plastic adhesive strip, and/or medicinal (chlorophenolic).

☐ **Solvent –** Aromas and flavors of higher alcohols (fusel alcohols). Similar to acetone or lacquer thinner aromas.

☐ **Sour/Acidic –** Tartness in aroma and flavor. Can be sharp and clean (lactic acid), or vinegar-like (acetic acid).

☐ **Sulfur –** The aroma of rotten eggs or burning matches.

☐ **Vegetal –** Cooked, canned, or rotten vegetable aroma and flavor (cabbage, onion, celery, asparagus, etc.)

☐ **Yeasty –** A bready, sulfury or yeast-like aroma or flavor.

Aroma (as appropriate for style) _____/12
Comment on malt, hops, esters, and other aromatics

Appearance (as appropriate for style) _____/ 3
Comment on color, clarity, and head (retention, color, and texture)

Flavor (as appropriate for style) _____/20
Comment on malt, hops, fermentation characteristics, balance, finish/aftertaste, and other flavor characteristics

Mouthfeel (as appropriate for style) _____/ 5
Comment on body, carbonation, warmth, creaminess, astringency, and other palate sensations

Overall Impression _____/10
Comment on overall drinking pleasure associated with entry, give suggestions for improvement

Total _____/50

SCORING GUIDE

Outstanding	(45 - 50):	World-class example of style.
Excellent	(38 - 44):	Exemplifies style well, requires minor fine-tuning.
Very Good	(30 - 37):	Generally within style parameters, some minor flaws.
Good	(21 - 29):	Misses the mark on style and/or minor flaws.
Fair	(14 - 20):	Off flavors/aromas or major style deficiencies. Unpleasant.
Problematic	(00 - 13):	Major off flavors and aromas dominate. Hard to drink.

Stylistic Accuracy
Classic Example ☐ ☐ ☐ ☐ ☐ **Not to Style**
Technical Merit
Flawless ☐ ☐ ☐ ☐ ☐ **Significant Flaws**
Intangibles
Wonderful ☐ ☐ ☐ ☐ ☐ **Lifeless**

 Please send any comments to Comp_Director@BJCP.org

Winc

Tasting Notes

Wine #_: White | Rosé | Red

Look

Clarity: Clean | Slightly Hazy | Hazy

White: Straw | Yellow | Gold | Amber

Rosé: Pink | Salmon | Copper

Red: Purple | Ruby | Garnet | Brown

Viscosity (Tears): Low | Medium | High

Sniff

Intensity: Low | Medium | High

Fruit: _____

Earth: _____

Wood: _____

Taste

Fruit: _____

Earth: _____

Wood: _____

Sweetness: Dry | Off-Dry | Sweet

Alcohol: Low | Medium | High

Acidity: Low | Medium | High

Body: Light | Medium | Full

Tannins (Reds): Low | Medium | High

Conclusion

Balance: Is this wine balanced? _____

Finish: Short | Medium | Long | Very Long

Rating: ☆ ☆ ☆ ☆ ☆

Guess the Varietal: _____ **Where's it From:** _____