Beer Steward Exam Study Guide

Beer Steward Certificate Exam – Exam Question weighting per Chapter

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Chapter</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>7%</td>
<td>1</td>
<td>History of Beer</td>
</tr>
<tr>
<td>12%</td>
<td>2</td>
<td>Overview of Brewing</td>
</tr>
<tr>
<td>17%</td>
<td>3</td>
<td>World Beer Styles</td>
</tr>
<tr>
<td>15%</td>
<td>4</td>
<td>Beer Freshness</td>
</tr>
<tr>
<td>16%</td>
<td>5</td>
<td>Serving Beer</td>
</tr>
<tr>
<td>3%</td>
<td>6</td>
<td>Beer and Food</td>
</tr>
<tr>
<td>9%</td>
<td>7</td>
<td>Ingredients</td>
</tr>
<tr>
<td>4%</td>
<td>8</td>
<td>Draught Beer</td>
</tr>
<tr>
<td>15%</td>
<td>9</td>
<td>Evaluating Beer Flavor</td>
</tr>
<tr>
<td>1%</td>
<td>10</td>
<td>Beer and Health</td>
</tr>
<tr>
<td>1%</td>
<td>11</td>
<td>Beer and Regulation</td>
</tr>
<tr>
<td>100%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

General Structure of the Exam

- The exam consists of 75 questions that are made up of multiple-choice questions and some True-False questions.
- The test is one hour in duration and is taken online.
- The student must answer 75% of the questions correctly to receive a passing grade.
- This is an open book exam.
- Choose the most correct answer given for each question.
- No credit is given for skipped questions.
- The following study guide outlines the general information covered in the exam.

Chapter 1: History of Beer

- What influence has beer had on the following areas of human society: nutrition, health, commerce, technology, and politics?
- How does brewing compare to baking, whisky distilling, and the making of wine, cider, and mead?
- How did the appearance, taste, and flavor stability of beer change from ancient to modern times?
- What ancient and medieval civilizations brewed beer and how was beer important to the growth of civilization, especially cities?
- How do pH, alcohol, hops, wort boiling, and carbonation protect beer from infection by human pathogens?
- What were the reasons for the development of monastic breweries in medieval Europe, why were they important, and what is their influence on modern brewing?
- What is the Reinheitsgebot, and what is its past and present relevance to beer and brewing?
- What was the importance of beer and taverns in Colonial America, especially as it relates to health, nutrition, and the founding fathers?
- How did the following technological and industrial advances of the 19th century contribute to the development and spread of pale lager beers throughout the world: railroads, pasteurization, refrigeration, filtration, malt kilns, microbiology, and packaging?
- What was Prohibition, when did it exist in the US, and what factors led to its establishment?
- What were the factors that caused consolidation in the US brewing industry in the early 20th Century and de-consolidation in the late 20th Century?
Chapter 2: Overview of Brewing

- What is beer?
- Explain how beer is brewed by describing the 10 processes outlined in Chapter 2 and the purpose of each: 1) malting, mashing, 2) wort separation, 3) boiling, 4) wort clarification and chilling, 5) fermentation, 7) conditioning, 8) filtration, 9) packaging, and 10) pasteurization.
- How do the following terms relate to the malting process: starch, steeping, germination, enzymes, modification, kilning, melanoidins, and roasting?
- How does malting affect the color and flavor of beer?
- How do the following terms relate to mashing: milling, water, mash temperature, enzymes, conversion, starch, dextrins, fermentable sugars, extract, original gravity, °Plato, specific gravity?
- How do brewers use mashing to control the sweetness in beer?
- What are the differences between “infusion” mashing and “decoction” mashing and how do they affect the character of beer?
- What is a common use of spent grains?
- What is the contribution of malt husks in the lautering process?
- How do the following terms relate to wort boiling: sterilization, isomerization of alpha acids, extract concentration, and wort color?
- How do the following terms relate to wort clarification: whirlpool, coolship, trub, hopback, or hopjack?
- How do the following terms relate to fermentation? Saccharomyces cerevisiae, pitching, propagating, single strain yeast, sanitation, temperature control, oxygen, kräusen., open vs. closed fermentation.
- What are the two main by-products of yeast during fermentation?
- What secondary by-products of fermentation make important flavor contributions to beer flavor?
- What is the difference between ale and lager yeast and how do the beers they produce differ in character?
- What is the difference between top-fermenting and bottom-fermenting yeast?
- How do the following terms relate to conditioning: secondary fermentation, kräusen, natural carbonation, rüh beer, lagering, isinglass, barrel-aging?
- How do the following terms relate to packaging: air pickup, priming, bottle conditioning, mit Hefe?
- Why are the following considerations important when filling beer into bottles, cans or kegs: hygiene, oxygen, CO₂ pressure?
- What are the relative merits of cans, glass bottles, plastic bottles, and kegs for packaging beer?
- How is cask ale packaged and dispensed?
- How do the following terms relate to cask ale? Priming, dry hopping, isinglass finings, conditioning, beer engine, nitrogen, CAMRA?
- What is the purpose of pasteurization?
- How do time and temperature influence the effectiveness of pasteurization and the flavor freshness of beer?
- What is the purpose of aseptic filtration and what are the benefits and drawbacks compared to pasteurization?
- How are light beer, low-carbohydrate beer, and dry beer made, and how are they similar?
- How are the following beers brewed: ice beer, non-alcoholic beer, gluten-free beer, malt liquor, organic beer?
- How are high alcohol beers produced?
- How is whiskey connected to beer?
• What is Sake?

Chapter 3: World Beer Styles

• The applicant does not need to memorize statistics like ABV, IBU, and °Lovibond for each beer style, but they should be able to describe the main flavors and appearance of each beer style.
• The applicant should be able to identify the unique set of characteristics that define each style and identify the unique characteristics that differentiate it from other related styles.
• The applicant should be able to identify major ingredients and brewing techniques discussed in Chapter 2 that define each style.
• The tables listing individual beer styles in broad categories that identify the IBU, ABV, and Degrees Lovibond of the various styles are intended to highlight the differences between styles (e.g., what style is more bitter, darker, or higher in alcohol), and they are not intended to be memorized.
• The applicant should be able to identify the style-appropriate glass for each beer style.

Belgium

• What similarities exist between winemaking and Belgian brewing traditions?
• What brewing practices and ingredients help define Belgian beers?
• What are farmhouse ales?
• What is the difference between Trappist and Abbey-style ales?
• What two styles of Belgian ales were developed to compete with the popularity of pale lagers?
• How do the following terms relate to Belgian sours ales? Spontaneous fermentation, coolships, barrel-aging, Acetobacter, Lactobacillus, Brettanomyces,
• What Belgian beer style is protected by an Appellation d’Origne Contrôlée

England, Scotland, and Ireland

• How did taxation affect the alcohol strength of British beer?
• How does the hop and malt character of English ales differ from American interpretations of the same styles?
• How does the level of bitterness and ABV differ between the 3 types of English Bitter Ale?
• How does the level of bitterness and ABV differ between Pale Ale, India Pale Ales, and American and Belgian interpretations of the style?
• What characteristics related to ABV and bitterness do “export” beer styles have in common and why?
• What characteristics of the water at Burton-on-Trent made it compatible for brewing Pale Ale?
• What do the terms “double” or “imperial” indicate when used to describe a beer style?
• How are Porter and Stout similar and different?
• How do Scottish Ales and English Ales differ in terms of malt character, sweetness, bitterness, and fermentation character?
• Why is the monetary term “shilling” used to describe Scottish ales of different alcohol strength?
• How is the fermentation of Scottish and German ales similar?
• As the alcoholic strength of beers increases, what effect does the ABV have on the ester and fusel alcohol content of the beer?

Germany and Continental Europe
What are the major tenants of the *Reingheitsgebot* and how does it relate to the use of adjuncts, spices, and additives?

What distinction with regards to malted grains does the modern German legal interpretation of the *Reingheitsgebot* make between ales (top-fermenting) and lagers (bottom-fermenting)?

What British invention made possible the development of pale colored lager beers in continental Europe?

What characteristic of the water at Pilsen in the Czech Republic made it conducive to the brewing of pale colored beer with delicate bitterness?

What is meant by noble hop character?

Why is decoction mashing used in brewing malt accented beers and what are some typical examples of beer styles using this technique?

How is the production of *Eisbock* similar to distillation?

What characteristics of the water in Munich made it conducive to brewing dark colored beers?

What legal protection do the beer styles *Lambic*, *Kölsch*, and *Berliner Weisse* have in common?

What are the Belgian and German words for “white”?

What is the English meaning of: *dunkles*, *helles*, *kristall*, *Hefe*, *Roggen*, *Rauch*, *flaschengärung*, *nach dem Reinheitsgebot gebraut*, *März*, *Mai*, *Weizen*, *Weisse*, *Doppel*, *Mai*, *Eis*, *alt*

### North America

- How do the interpretations of European beer styles by American brewers generally compare to the original versions?
- Why was the use of adjuncts well suited with North American barley?

#### Chapter 4: Beer Freshness

- What is a “vertical” beer tasting?
- Why are sulfites commonly used in wine production but not in brewing?
- What are the four “T”s of beer freshness and how does each impact the freshness limit of beer?
- What is FIFO?
- What are the various methods for freshness coding on beer packaging, including “best before” and “born on” dating?
- Compare the effects on beer freshness between beer stored warm, beer stored cold, and beer that is bought cold, stored warm, and chilled again before serving.
- What is light struck beer and what types of packaging and storage practices protect beer from becoming light struck?
- What are the basic principles for preserving the freshness of draft beer?
- How do the following terms relate to beer freshness: marketing impact vs. quality, variety of brands vs. quality, bar code scanning, storing and packing bottle-conditioned beers, monitoring the quality of draft beer?

#### Chapter 5: Serving Beer

- How do beer aroma, carbonation, and volume of the packaged beer influence the selection of the appropriate glassware that individual beer styles are served in?
- How can the design and thickness of glassware be used to control the temperature of beer?
- Compare the design of a delicate bowl-shaped snifter to a thick German *Krug*.
- What is a “beer clean” glass?
- Describe the correct operation of an automatic washer to produce glasses that are “beer clean”.

• Describe how the three-sink hand washing method is properly performed to produce beer clean glasses.
• How should beer clean glasses be dried?
• How should beer clean glasses be stored?
• Describe the 4 methods to test for beer clean glasses.
• Describe the proper operation of a standard draft faucet in pouring draft beer.
• Describe the proper operation of stout-style faucet.
• Describe how to pour cask ale from a beer engine.
• What is the purpose of a sparkler?
• What is the purpose and effect of a beer ‘widget’?
• Describe the pouring techniques for bottled beer, including: classic pour, Pilsner pour, Weizen pour.
• What is the purpose of rinsing a glass with cold water before filling?
• What makes beer foam more stable than the foam of soft drinks or sparkling wine?
• Identify style-appropriate glassware for each beer style in Chapter 3 and why the glassware is compatible with the style.
• What is the difference between a US and an Imperial pint?
• What are the drawbacks of using a stackable shaker pint as a beer glass?
• What deleterious effects can occur when a beer glass is stored in freezer?
• What causes beer foam to collapse prematurely
• How does temperature affect the following attributes of beer: sweetness, bitterness, aroma, carbonation, mouthfeel?
• While the appropriate serving temperature for beer is a personal preference, what are comparative guidelines for serving various beer styles based on the flavor attributes of the style listed in the immediately preceding question?

Chapter 6: Beer and Food

• What two attributes of beer are especially effective in making beer refreshing?
• Describe the basis and provide examples of how the three following principles used to pair beer with food: Impact, Match, Contrast.
• What are some examples of high impact beers paired with high impact foods?
• What are some examples of low impact beers paired with low impact foods?
• What are some examples of matching beer and food flavors, in particular relating to malt, hop, and fermentation flavors?
• What is meant by matching “bright” and “dark” flavors?
• What are some examples of contrasting beer and food flavors, in particular astringency and richness, saltiness and bitterness, bitterness and richness, spicy heat and sweetness, acids and richness?
• What is meant by an aperitif and digestif and what beers represent examples of each and why?
• What are the basic principles of cooking with beer?

Chapter 7: Ingredients

Water

• Understand the role water plays in the various phases of brewing: malting, mashing, lautering, wort boiling, and fermentation.
• What are 4 characteristics of water suitable for brewing?
Is it possible for brewers to adjust the local water supply to suit the style of beer they want to brew?

What is the purpose of filtering water through activated charcoal?

Why is mineral-free water not used in brewing and what adjustments do brewers typically make to their water?

How does alkalinity effect the color and bitterness of beer?

What are the beer styles associated with each city and how did the local water influence the development of each respective style? Burton-on-Trent, Pilsen, Munich, Dublin.

Malt

Why is malt called the “soul of beer”?

Why is barley malt so well suited for making beer?

What is the role of malt in affecting the color, ABV, and sweetness of beer?

What is the purpose of base malt?

What are some examples of base malt, the flavors they impart to beer, and beers they are used to brew?

Why are sorghum and millet commonly used in brewing in warm regions of the world and for beer consumed by persons with celiac disease?

How are specialty malts different from base malt, especially in enzyme content, color, flavor, and the amount used in the mash?

How do the following terms relate to specialty malts: heat, moisture, browning reaction, melanoidins, and caramel?

What is the difference in the production of caramel (or crystal) malts compared to dry-roasted malts, what are examples of each, and what are the flavors they impart to beer?

What is the definition of an “adjunct” and what are examples of commonly used adjuncts, particularly grains and sugars?

How does the use of adjuncts affect the character of beer especially in terms of: color, body, foam, and ABV.

What are the names of the various units of measure used to describe beer color?

Hops

What are hops and where are they commercially grown?

How do the following terms relate to hops used in brewing: female cones, lupulin glands, alpha acids, aromatic oils, latitudes 35° to 55°, and humulus lupus?

Why are hops called the spice of beer?

Why did hops become the predominant flavoring in beer?

What is the generic term used for the mixture of beer spices that were largely replaced by hops?

What European country was one of the earliest to use hops in beer and eventually adopted its exclusive use by law?

Which country was one of the last to use hops, even calling hops in the 15th century a “wicked and pernicious weed”?

What can be done to remove the light struck potential from hops caused by the reaction of ultra-violet light with bitter acids?

What are the two major classifications of hops based on their flavor contributions?

What two components in the lupulin glands impart bitterness and aroma?

How do hopping techniques differ between bitterness and aroma hops?
- How do the following terms relate to bittering hops: alpha acids, isomerization, heat, time, International Bittering Unit (IBU)?
- Explain the different effect of time and heat on the level of bitterness and aroma in beer.
- Compare and contrast the flavor impact (both bitterness and aroma) of the following hopping techniques that are ordered by time from early in the brewing process to late: early kettle hops, late kettle hops, whirlpool, hop back/hop jack, dry hopping.
- Explain the differences in hop character and hopping techniques between German lagers and English ales.

**Yeast**

- What is yeast?
- What is fermentation and why is it important in brewing?
- Before Emil Hansen developed a technique to isolate pure yeast strains, why were brewers less effective in fermentation less effective in producing consistent tasting beer?
- What country is most frequently credited with the development of lager beer brewing?
- Even before the isolation of single strain yeast and advances in sanitation, why was lager (bottom fermenting) yeast more likely to produce consistent flavors than ale (top fermenting) yeast?
- What is the difference between and purpose of primary and secondary fermentation?
- Why do brewers strive to eliminate oxygen uptake during the brewing process except when pitching yeast into wort to start fermentation?
- How is the ester and fusel alcohol content of beer effected by original gravity of the wort and fermentation temperature?
- Why is yeast more than an ingredient?

**Chapter 8: Draught Beer**

- What is draft beer?
- What factors involved with filling, shipping, and serving draft beer can enhance its freshness compared to pasteurized beer in bottles or cans?
- What retail conditions cause draft beer to lose its freshness?
- Why do some brewers call certain bottled and canned beers “draft”?
- What are four reasons why CO₂ is suitable as a counter pressure dispense gas?
- Why is nitrogen suitable as a dispense gas in conjunction with CO₂ for balancing a draft system or serving “nitro-beers” like stout, but cannot be used alone?
- Why is oxygen unsuitable as a dispense gas?
- What is a balanced draft system?
- What is ideal gas pressure?
- How is the ideal gas pressure affected by temperature and elevation?
- Know how to use an ideal gas pressure chart like the one in Appendix B of the Beer Steward Handbook to regulate the gas pressure on a keg.
- In the US, what is the industry standard flow rate for beer from a standard beer faucet?
- How does a balanced draught system reduce beer waste?
- Know how to execute the proper pour from a standard beer faucet.
- What are the major principles for the proper handling and storage of kegs?
- How should kegs of unfiltered beers such as Hefeweizen be stored?
- How are the following 3 methods used to balance a draught system: tubing resistance, beer pumps, mixed gas?
What is “beer gas”, and what effect does it have when used with a faucet having a restrictor plate?
The appearance of a nitro-beer is intended to mimic the texture and appearance of what traditional ale served with a beer engine and a sparkler?

What are the 4 commonly used means to chill draft lines and under what different conditions are they used?

What 7 variables should be considered when designing an effective draft cleaning program?

What is the industry standard maximum time interval between draft system cleanings?

For taverns with multiple draft beers that don’t turnover in within a few days, how often should the beers be tasted to judge their freshness character?

What actions should a tavern owner consider when a slow selling keg beer is not emptied before it reaches its freshness limit?

What factors must be considered for the proper use of the following pieces of draft equipment: fittings, tubing, FOB stops, gas storage, series kegs, split lines.

Chapter 9: Evaluating Beer Flavor

What are the 4 basic tastes you perceive on your tongue?

What are some examples of the physical sensation known as mouthfeel?

How do the tongue and the olfactory systems work together to recognize the 4 basic tastes, aromas, and mouthfeel to experience the overall sensation known as flavor?

What is the difference between balance and fullness?

What is the 7-step protocol for tasting beer?

What are important physical conditions of the taster and the environment that affect the perception of flavor, including: taste buds, and olfactory system, adaption, and fatigue?

What are some basic considerations based on the flavor intensity of beer used in ordering the sequence in which a variety of beers are tasted?

Why is beer color not an indication of a beer’s ABV?

Describe the progression of malt flavors that develop as the color of the malt increases from the intensity of the heat in kilning or roasting. See table 6.1

How would you differentiate early and late amplitude flavors?

Explain the effect of dextrins (unfermentable sugars) and fermentable sugars on the alcohol content and sweetness of beer?

What are the four main beer flavor driven groups?

What kinds of flavors can special yeast produce in styles like Belgian ales and Bavarian Hefe-Weizen beers?

What aromas do hops contribute to beer? (see table 6.2)

What is meant by “noble” hop character and which countries are most identified with noble hops?

What would explain why a 5% ABV beer tastes more bitter than a 7% ABV beer when both beers have 30 IBU?

Sherry and Madeira-like flavors from the slow oxidation of alcohol may be desirable in what types of beer?

What kinds of conditions create papery, wet cardboard flavors in beer?

What off flavors might you taste in dirty draft lines? Improperly rinsed draft lines?

Chapter 10: Beer and Health

What is celiac disease and what component in beer affects the suffers of this disease?
• How is alcohol absorption and blood alcohol content affected by percentage body fat of the drinker?
• What is the legal blood alcohol content limit for drivers established by the federal government in 2000?
• How is the liver affected by excessive alcohol consumption?
• What does the J-curve indicate on a graph plotting the risk of death in relation to increasing consumption of alcohol?
• What component of beer adversely affects suffers of gout?
• What are the benefits of moderate beer consumption, particularly regarding atherosclerosis, hypertension, stroke, and brain function?
• What are the deleterious effects of excessive consumption of alcohol, particularly regarding the gastrointestinal system, cancer, cardiovascular system, brain function?
• What types of people should not drink alcohol?

Chapter 11: Beer and Regulation

• What is meant by the “three-tier system” of beer distribution and why was it created?
• What is “Dram Shop Liability”?
• What was the “tied house system” that was prevalent at the end of the 19th and beginning of the 20th Centuries?
• What constitutional amendment established Prohibition and when did Prohibition start?
• What constitutional amendment ended Prohibition and when did Prohibition end?
• Is the serving of alcohol to a minor or intoxicated person a violation of a states’ criminal or civil law?
• What is the Beer Institute Advertising and Marketing Code and what are its basic principles?